

From 'Likes' to Hikes: A Systematic Review of Social Media's Impact on Consumer Decision-Making in Adventure Tourism

Mega Fitriani Adiwarna Prawira^{1*}

¹Tourism Department, Politeknik Pariwisata NHI Bandung

*Email: megafitriani@poltekpar-nhi.ac.id

Abstract

The digital transformation of outdoor recreation has fundamentally reshaped consumer decision-making, shifting destination selection from traditional marketing communications toward real-time, social media-driven interactions. This systematic literature review (SLR) investigates the influence of social media and user-generated content (UGC) on destination choice, risk perception, psychological restoration, and management strategies in adventure tourism. Following PRISMA guidelines, 52 peer-reviewed journal articles retrieved from the Scopus database were systematically analyzed using thematic synthesis and bibliometric mapping. The findings reveal three interrelated themes. First, social media reconfigures destination choice by prioritizing visually appealing and shareable experiences, often encouraging visitors to value content creation over traditional adventure attributes. Second, UGC plays a dual role, amplifying risk through aestheticized representations of hazardous environments and supporting risk mitigation through peer-generated safety information and electronic word-of-mouth (e-WOM). Third, outdoor recreationists continuously negotiate the tension between seeking psychological restoration and maintaining digital social validation, highlighting the emergence of hybrid management approaches that integrate digital communication with protected area governance. Building on these findings, this review proposes an integrated conceptual framework that explains how social media shapes consumer decision-making while providing practical guidance for destination managers seeking to balance visitor engagement, safety, and the restorative value of nature. The study contributes to the growing literature on digitally mediated tourism by synthesizing fragmented evidence into a comprehensive framework for understanding social media's role in contemporary adventure tourism.

Keywords: Social Media, Adventure Tourism, Risk Perception, Psychological Restoration, Hybrid Governance, Systematic Review.

A. INTRODUCTION

The global landscape of adventure tourism and outdoor recreation has undergone a profound digital transformation over the last decade. As nature-based destinations increasingly become "mediatized," the traditional consumer decision-making process is no longer solely reliant on institutional marketing but is significantly shaped by real-time digital narratives (Mangold et al., 2024). This phenomenon, often described as the transition from digital engagement ("Likes") to physical participation ("Hikes"), highlights the pivotal role of social media in contemporary recreation. Recent studies underscore that social media platforms have evolved into robust "choice architectures" that influence how visitors perceive, evaluate, and eventually consume wilderness experiences (Cornell, Piatkowski, et al., 2025).

From a theoretical perspective, the growing influence of social media on adventure tourism can be understood through several complementary behavioral frameworks. First, the Stimulus–Organism–Response (S–O–R) paradigm suggests that digital stimuli, such as visual content, electronic word-of-mouth (e-WOM), and influencer-generated narratives, shape tourists' internal cognitive and emotional evaluations before influencing behavioral responses, including destination choice and travel intentions. Second, Uses and Gratifications Theory explains why individuals actively engage with social media not only to obtain travel information but also to satisfy psychological needs for self-expression, identity construction, and social recognition. Together, these perspectives suggest that social media functions not merely as an information channel but as a psychological environment that actively reconstructs consumer decision-making throughout the adventure tourism journey.

The allure of "selfie-worthy" locations in national parks and remote coastal areas has sparked a surge in social-media-instigated visitation (Cornell, Piatkowski, et al., 2025). Visual aesthetics, particularly "Instagrammability," have become primary drivers for destination selection, often overshadowing traditional adventure qualities. For instance, (Sinsup & Phumsathan, 2025) identified "scenic immersion" as a dominant factor in social media

* Corresponding author

frameworks for sustainable recreation planning, while (Rödl et al., 2024) explored how platform affordances shape the quest for "nature" in selfies. This shift in motivation is further reflected in the way users utilize platforms like Instagram and TikTok to construct a "romantic gaze" on protected areas (Fälton, 2024) and establish new relations with wild places (Molin et al., 2025).

However, the rapid digitalization of the outdoors presents a dual-edged sword. While social media facilitates "e-WOM" (electronic word-of-mouth) that can enhance attitudes and behavioral intentions toward adventure destinations (Kumar et al., 2025), it also introduces significant challenges for visitor management and public safety. Risky photography practices and off-trail excursions—driven by the need for social validation—have contributed to an increase in fatal and non-fatal injuries in high-visitation national parks (Cornell, Piatkowski, et al., 2025). Furthermore, the overwhelming influence of viral landscapes can lead to overtourism, necessitating innovative management strategies such as "social nudging" and co-produced safety campaigns (Cornell, Peden, et al., 2025; Mangold et al., 2024).

Beyond influencing destination selection, digital interactions also reshape how visitors perceive environmental risks and experience natural settings. Attention Restoration Theory (ART) argues that natural environments facilitate cognitive recovery through immersive experiences and effortless attention. However, the increasing tendency to document, share, and perform experiences through social media may interrupt this restorative process by redirecting attention toward digital audiences rather than the surrounding environment. Consequently, contemporary adventure tourism is characterized by a dynamic interaction between restorative motivations and digitally mediated self-presentation, creating new behavioral patterns that remain insufficiently integrated within existing tourism literature.

From a managerial and research perspective, the massive volume of user-generated content (UGC) provides unprecedented opportunities for monitoring visitor experiences. Platforms like Flickr, despite their shifting popularity, remain vital for analyzing visitation patterns and ecosystem service preferences (Daymond et al., 2023; Leppämäki et al., 2025). Researchers are increasingly using non-geotagged social media data and multi-source geospatial information to quantify recreational values in post-pandemic contexts (Kubota et al., 2024; Xu et al., 2023). However, there remains a critical gap in understanding the psychological tension between the desire for "digital detox" and the compulsion for digital documentation, as well as the extent to which digital influences distort consumer risk perceptions (Norman & Pickering, 2023; Ortanderl & Bausch, 2023).

Despite the rapid expansion of research on social media, user-generated content, and outdoor recreation, the existing literature remains fragmented in several important respects. First, previous studies have predominantly examined isolated aspects of digital influence, such as destination image formation, electronic word-of-mouth, visitor safety, or psychological restoration, without integrating these dimensions into a comprehensive consumer decision-making framework. Second, although emerging studies acknowledge the dual role of social media as both a promotional and risk-amplifying mechanism, limited attention has been given to explaining how these competing influences simultaneously shape tourists' cognitive evaluations before and during adventure experiences. Third, the growing psychological tension between restorative motivations, digital self-presentation, and destination management responses has not yet been synthesized into a unified conceptual perspective. Consequently, there remains no systematic review that comprehensively explains how social media influences the complete consumer decision-making process in adventure tourism—from destination discovery and risk evaluation to on-site behavioral negotiation and management intervention. This Systematic Literature Review (SLR) addresses this gap by synthesizing peer-reviewed articles to answer the following Research Questions:

- RQ1: How do visual aesthetics on social media platforms transform the hierarchy of destination selection in adventure tourism, and to what extent does this facilitate a shift from 'adventure-quality' to 'content-potential' as a primary decision driver?
- RQ2: How does user-generated content (UGC) mitigate or, conversely, distort consumer risk perception during the decision-making process for high-risk outdoor recreational activities?
- RQ3: How do outdoor recreationists negotiate the psychological tension between the motivation for restorative 'unplugged' experiences and the simultaneous need for social validation through digital documentation during the visit?
- RQ4: To what extent do social media-based marketing strategies employed by park authorities successfully 'nudge' visitor decision-making away from overtouristed hotspots toward more sustainable and less-congested recreational alternatives?

By addressing these research questions, this review contributes to the literature in three ways. First, it synthesizes fragmented evidence on the role of social media across the entire adventure tourism consumer

journey. Second, it develops an integrated conceptual perspective linking destination choice, risk perception, psychological restoration, and governance within a single analytical framework. Third, it provides practical implications for destination managers and protected area authorities seeking to balance visitor engagement, safety, and the restorative value of nature in increasingly digitalized tourism environments.

B. METHODS

The primary data for this study were retrieved from the Scopus database, selected for its comprehensive coverage of high-impact journals in the fields of tourism, management, and environmental studies. The Scopus database was selected because of its rigorous indexing standards, multidisciplinary coverage, and comprehensive representation of high-quality tourism, hospitality, environmental management, and consumer behavior journals. This database has been widely adopted in systematic literature reviews owing to its consistency in bibliographic metadata and compatibility with transparent evidence synthesis procedures. The search was conducted using a specific Boolean query designed to capture the intersection of outdoor recreation and digital marketing. The final query string utilized was: TITLE-ABS-KEY (("outdoor recreation" OR "adventure tourism" OR "nature-based tourism") AND ("social media" OR "digital marketing" OR "influencer*" OR "user-generated content" OR "Instagram" OR "TikTok" OR "e-WOM")). To maintain a focused and contemporary dataset, specific inclusion and exclusion criteria were applied. These criteria were established to ensure that the analyzed literature reflects the most recent technological shifts (e.g., the rise of short-form video content and post-pandemic travel behaviors).

Table 1. Inclusion and Exclusion Criteria

Criterion	Inclusion Criteria	Exclusion Criteria
Time Period	2020 – 2025	Pre-2020 publications
Document Type	Peer-reviewed journal articles	Books, chapters, conference papers, editorials
Publication Stage	Final	Articles in press or pre-prints
Language	English	Non-English publications
Access Type	Open Access	Restricted or subscription-only access
Thematic Focus	Direct link between social media/digital marketing and consumer behavior in outdoor settings	Technical ecological studies or purely biological research without a marketing focus

Source: Research data, 2025

The decision to include only Open Access publications was made for methodological rather than merely practical reasons. Open Access articles provide unrestricted access to complete methodological descriptions, analytical procedures, and research findings, thereby facilitating transparent quality assessment and minimizing interpretation bias during thematic synthesis. Furthermore, restricting the review to fully accessible publications ensures that all selected studies can be examined consistently throughout the coding, comparison, and synthesis processes, in accordance with the principles of transparency and reproducibility recommended for systematic literature reviews. While this criterion may exclude some relevant subscription-based studies, it enhances methodological consistency and enables complete verification of the evidence included in the review.

The study followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to ensure a transparent, reproducible, and systematic selection of articles. The screening procedure was conducted in five sequential stages to refine the initial search results into a robust evidence base for thematic synthesis: 1) Identification: The initial keyword search yielded 187 documents; 2) Temporal Filtering: After limiting the results to the 2020–2025 period, 150 documents remained. This filter ensures the review captures the most relevant trends in the "post-digital" and post-pandemic recreation era; 3) Formal Filtering: Applying filters for document type (Article), source type (Journal), and language (English) reduced the pool to 115 documents; 4) Accessibility Filtering: To ensure full-text availability for comprehensive analysis and to align with open-science standards, only Open Access articles were selected, resulting in 64 documents; 5) Qualitative Eligibility Screening: The final stage involved a manual screening of titles, abstracts, and full texts to ensure alignment with the Research Questions (RQs). Studies that did not specifically address consumer decision-making or social media's impact were excluded. This resulted in a final sample of 52 documents for systematic synthesis.

To improve consistency, the eligibility assessment followed the predefined inclusion and exclusion criteria established prior to the screening process. Each article was evaluated based on its relevance to the research questions, conceptual alignment, and methodological suitability for the objectives of this review. Following study

selection, the included articles were analyzed using thematic synthesis complemented by descriptive bibliometric mapping. Thematic synthesis was employed to identify recurring concepts, patterns, and relationships across studies, whereas bibliometric mapping provided an overview of publication trends, thematic evolution, and dominant research areas. The coding process was guided by the four research questions, allowing themes to emerge inductively while maintaining analytical consistency across the reviewed literature.

C. RESULTS AND DISCUSSIONS

Bibliometric Trends and the Evolution of the Digital-Nature Nexus (RQ1)

The systematic analysis of the 52 identified documents reveals a dynamic and rapidly evolving research landscape. While outdoor recreation research has historically focused on physical activity and ecological impact, the integration of social media, risk perception, and restorative values has emerged as a critical contemporary nexus.

Temporal Trends: The 2020 Pivot

As illustrated in Figure 1, the volume of research in this field remained relatively modest until a significant surge in 2020 (n=14). This spike likely reflects a global research response to the COVID-19 pandemic, during which the value of outdoor spaces for mental restoration became a public health priority (Buckley & Westaway, 2020). Following a brief stabilization, the field saw another peak in 2023 (n=13), continuing into 2025 with eight early-access publications. This trend indicates that the "digital-nature" intersection is no longer a niche topic but a permanent fixture in recreational management and environmental psychology.

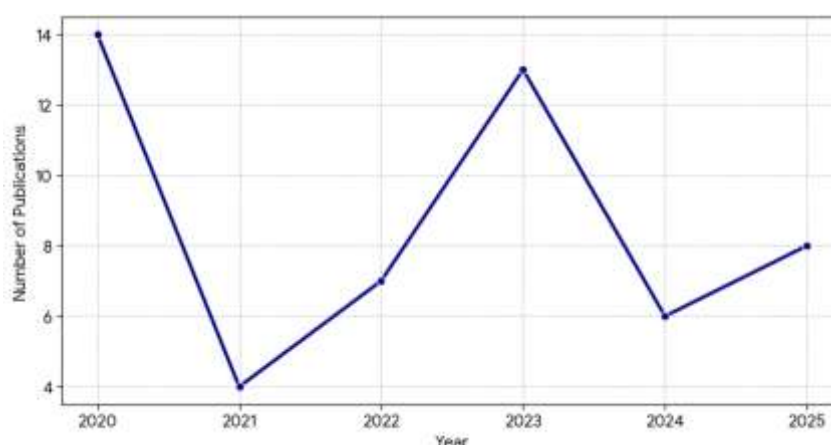


Figure 1. Temporal Evolution of Research (2015-2025)

Source: Research data, 2025

Thematic Clusters: From Nature Restoration to Digital Mediation

The distribution of research themes (Figure 2) suggests an analytical shift from examining nature's benefits in isolation to understanding how digital platforms mediate them. First, Digital & Social Media (Core Pillar): Dominating the dataset (n=50 mentions), studies in this cluster move beyond descriptive analytics to explore the mechanisms of influence. For instance, (Leppämäki et al., 2025; Teles da Mota & Pickering, 2020) demonstrate how Instagram has transformed visitor behavior from passive observation to active "aesthetic hunting." Restoration & Well-being (n=34): This cluster emphasizes the "psychological rescue" provided by nature. Significant contributions from (Buckley & Westaway, 2020; Xu et al., 2023) analyze how urban-dwellers utilize outdoor recreation as a primary tool for mental health recovery. Management & risk (n=35 combined): This is the most practical segment of the literature. It explores the tension between attracting visitors and maintaining safety. (Cornell, Peden, et al., 2025; Sinsup & Phumsathan, 2025) highlight a critical shift: management is no longer just about physical barriers but about "digital co-production" of safety narratives.

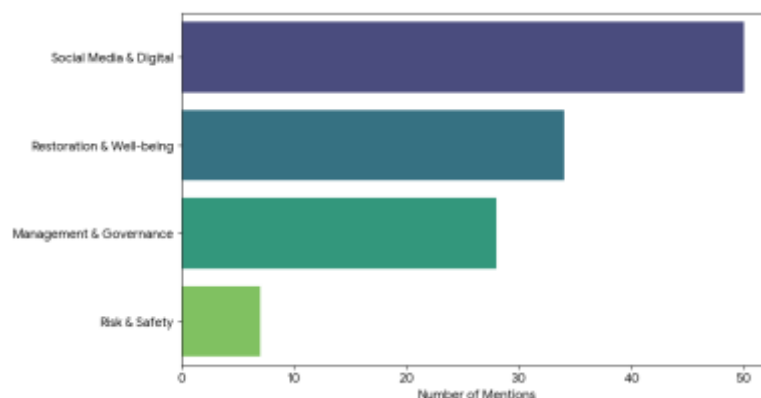


Figure 2. Distribution of Research Themes

Source: Research data, 2025

Geographic and Institutional Hubs

The research is geographically concentrated in regions characterized by high-risk outdoor landscapes and advanced digital infrastructure. Australia (n=11) and Norway (n=4) emerge as leaders. Australia: Research is heavily focused on aquatic and coastal safety, driven by the need to manage diverse visitor groups in high-risk national parks (Cornell, Piatkowski, et al., 2025; Pickering et al., 2020). Europe (UK, Norway, Finland): These studies focus on the "restorative" value of mountains and the "screen ambivalence" of trekkers, with (Syvertsen, 2022) providing key insights into the "Offline Tourism" movement in the Norwegian mountains. Asia (China): Emerging research centers on the "digital discovery" of nature in urbanized contexts, where e-WOM significantly shapes destination image (Kumar et al., 2025; Xu et al., 2023).

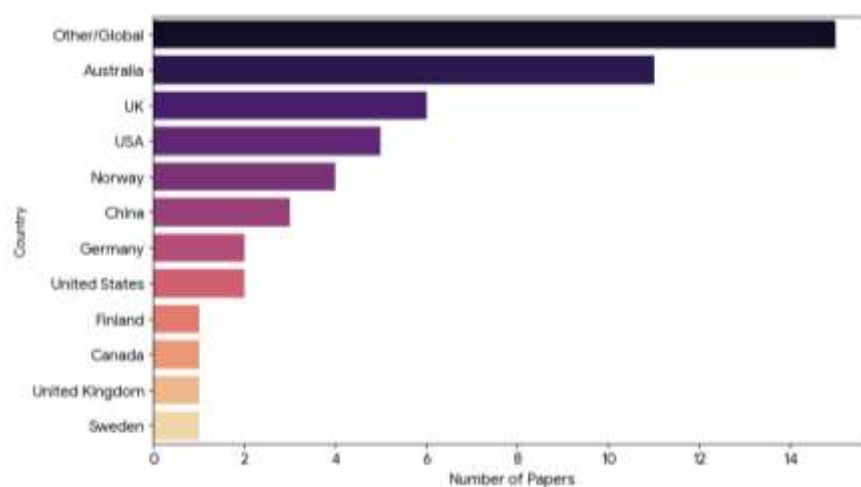


Figure 3. Geographic Distribution of Case Studies

Source: Research data, 2025

Key Knowledge Pillars

To provide an analytical overview of the most influential works, Table 2 categorizes top-cited and cutting-edge papers that form the theoretical foundation of this field.

Table 2. Influential Papers and Their Contribution to the Field

Theme	Authors (Year)	Core Contribution
Digital Analytics	(Teles da Mota & Pickering, 2020)	Established the use of social media as a proxy for mapping nature-based tourism.
Restorative Values	(Buckley & Westaway, 2020)	Argued for nature as a "psychological rescue" post-COVID-19.
Risk & Safety	(Cornell, Piatkowski, et al., 2025)	Evaluated co-produced social media campaigns for aquatic safety.

Theme	Authors (Year)	Core Contribution
Management	(Syvertsen, 2022)	Explored "digital detox" and screen ambivalence in remote mountain huts.
Behavioral Intention	(Kumar et al., 2025)	Analyzed how e-WOM influences risk-taking and adventure destination choice.
Social Sensing	(Molin et al., 2025)	Developed a framework for using social media as a real-time behavioral sensor.

Source: Research data, 2025

Collectively, these influential studies illustrate the interdisciplinary evolution of the field. Early research primarily used social media as a data source to understand visitation patterns and recreational ecosystem services. More recent studies increasingly conceptualize social media as an active behavioral mechanism capable of shaping destination preferences, risk perceptions, psychological restoration, and governance practices. This progression reflects a shift from descriptive digital analytics toward explanatory frameworks that investigate how digitally mediated interactions influence consumer behavior in adventure tourism. The bibliometric landscape indicates that research has transitioned through three stages: 1) Phase I (Pre-2020): Exploratory use of digital data for mapping visitor volume; 2) Phase II (2020-2023): Focus on nature-based well-being and the "mental health" imperative; and 3) Phase III (2024-Present): Analytical focus on the "management of influence," where digital tools (e-WOM, UGC, co-production) are used to mitigate the risks they create.

The bibliometric evidence further suggests that research has progressively shifted from describing digital technologies as promotional tools toward examining their behavioral and psychological consequences for outdoor recreationists. Rather than merely facilitating destination awareness, social media increasingly shapes destination evaluation, perceived risk, restorative experiences, and management responses. This evolution provides the conceptual foundation for the following thematic synthesis, which examines how these emerging dimensions collectively transform consumer decision-making in adventure tourism.

The Dual Role of UGC – From Cognitive Distortion to Risk Mitigation (RQ2)

The synthesis of 52 core documents reveals that User-Generated Content (UGC) operates as a potent psychological mediator in high-risk outdoor settings. From the perspective of Risk Perception Theory, individuals rarely evaluate environmental hazards solely based on objective information; instead, perceived risks are shaped by cognitive heuristics, prior experiences, and socially mediated cues. In digitally mediated tourism, UGC is among the most influential external cues, continuously reshaping visitors' judgments of both the attractiveness and safety of destinations. The findings suggest that UGC does not merely provide information but actively reconfigures tourists' internal risk-benefit evaluation, often leading to a state conceptualized in this review as "Digital Risk Dissonance."

In this review, Digital Risk Dissonance is defined as the psychological inconsistency that arises when visually attractive and socially validated digital content reduces the perceived seriousness of objectively hazardous environments. Unlike traditional cognitive dissonance, which concerns conflicts between attitudes and behaviors, Digital Risk Dissonance refers specifically to the discrepancy between objectively existing environmental risks and the subjective safety perceptions constructed through digitally mediated information. This phenomenon emerges when aesthetic appeal, social endorsement, and anticipated online recognition collectively outweigh rational assessments of physical danger during destination evaluation and on-site decision-making.

The Distortion Mechanism: Aesthetic Allure and Situational Blindness

The literature provides compelling evidence that UGC frequently distorts risk perception by prioritizing "aesthetic rewards" over "environmental hazards." First, the Aesthetic-Risk Trade-off: As noted by (Sinsup & Phumsathan, 2025), scenic imagery is the most influential theme in social media-driven tourism. This visual dominance creates a "halo effect" where the perceived beauty of a location (e.g., a cliff edge or a waterfall) suppresses the cognitive processing of objective dangers. Second, Situational Blindness and Photography-Induced Risk: (Cornell, Peden, et al., 2025) found that 36% of visitors who were motivated by social media to visit New South Wales national parks engaged in "risky photography," such as standing on unstable cliff edges (see Table 3). The act of documenting the experience—specifically the "selfie"—leads to a loss of situational awareness, where the screen becomes a barrier to perceiving immediate physical threats like sneaker waves or crumbling terrain. Third, Survivorship Bias and Social Proof: UGC creates a false sense of security through social proof. The observed normalization of risky behavior also reflects principles of Social Cognitive Theory, whereby

repeated exposure to socially rewarded behaviors encourages observational learning and behavioral imitation. When hazardous activities consistently receive positive digital engagement without visible negative consequences, individuals may reinterpret these behaviors as socially acceptable and relatively safe. When high-risk behaviours are repeatedly shared without visible negative consequences, they become normalized. (Kumar et al., 2025) argue that "digital discovery" via e-WOM significantly alters the attitude toward adventure destinations, often lowering the perceived threshold of danger through the sheer volume of "successful" (i.e., non-fatal) posts.

This mechanism can also be interpreted through the heuristic-systematic processing perspective. Highly visual social media content encourages heuristic processing, whereby tourists rely on simple cues such as image attractiveness, popularity indicators (likes and shares), and influencer credibility rather than engaging in systematic evaluation of potential hazards. Consequently, aesthetic heuristics frequently dominate analytical reasoning, increasing the likelihood of risk underestimation in adventure tourism settings.

Table 3. Psychological Drivers of Risk Distortion in UGC

Mechanism	Description	Impact on Decision-Making	Key Reference
Aesthetic Primacy	High-saturation, filtered images prioritize visual beauty.	Hazard detection is delayed or ignored.	(Sinsup & Phumsathan, 2025)
Survivorship Bias	Only "successful" risky photos are posted.	Underestimation of accident probability.	(Cornell, Peden, et al., 2025)
Situational Blindness	Focus on the phone screen during photography.	Loss of awareness of environmental shifts.	(Cornell, Piatkowski, et al., 2025)
Digital Social Proof	High engagement (likes/shares) on risky content.	Social rewards incentivize risk-taking.	(Arts et al., 2021)

Source: Research data, 2025

The Mitigation Mechanism: Peer-to-Peer Early Warning Systems

Conversely, the data highlights how UGC can be a vital tool for risk mitigation when it functions as an authentic "social sensor." First, E-WOM as Decentralised Safety Data: Unlike official signage, which 20% of users in (Cornell, Piatkowski, et al., 2025) study found "patronizing," peer-generated reviews are perceived as highly credible. (Kumar et al., 2025) emphasize that e-WOM acts as a decentralized warning system where users document real-time trail conditions or unexpected hazards (e.g., flash floods or animal aggression). Second, Visual Hazard Education: A striking example of UGC-driven mitigation is found in the study by (Barra et al., 2020). By analyzing above- and underwater videos shared on social media, researchers identified that humpback whales exhibited agonistic behaviors in 42.1% of "swim-with" interactions (see Figure 4). Such videos, when shared with educational narratives, provide visceral, visual proof of risk that traditional brochures cannot replicate. Third, the Co-Production Model: Management strategies are shifting toward "co-produced" safety campaigns. (Cornell, Piatkowski, et al., 2025) evaluated an Instagram campaign in Queensland that used influencer-style aesthetics to deliver safety messages. The result was a 32% message recall rate—significantly higher than traditional park signage—demonstrating that "joining the digital conversation" is more effective than "policing" it.

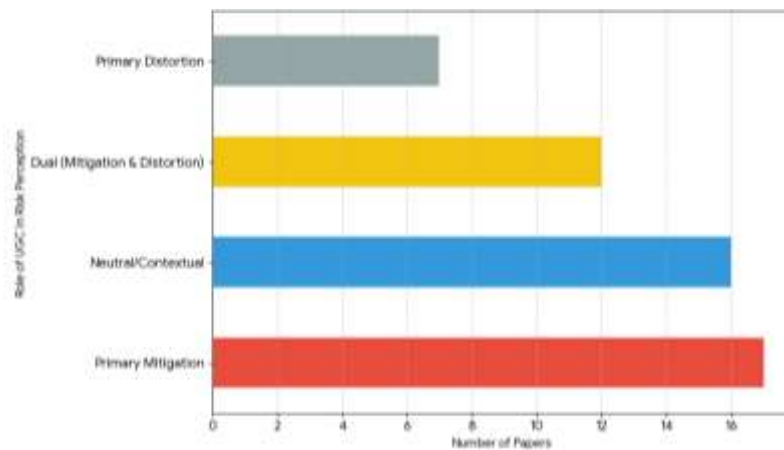


Figure 4. Frequency of Risky Behaviors vs. Safety Awareness in UGC-Driven Visitors

Source: Analytical Visualization based on (Barra et al., 2020; Cornell, Piatkowski, et al., 2025) data)

Synthesis: The "Digital Risk Dissonance" Framework

The collective evidence suggests that recreationists navigate a dual-process mechanism of digital risk evaluation. Initial destination evaluations are predominantly influenced by fast, heuristic processing triggered by visual aesthetics and social validation cues. However, this process may subsequently be moderated by slower, analytical evaluation when users encounter peer-generated safety information, official risk communication, or personal experience. Consequently, Digital Risk Dissonance should not be interpreted as a permanent cognitive state but rather as a dynamic psychological process in which competing digital signals continuously reshape perceived risk throughout the consumer decision-making journey. On the other hand, a "Slow/Analytical" system can be activated by informative, peer-led safety narratives. Ultimately, UGC is neither purely harmful nor purely helpful; it is a medium of "Negotiated Risk." The transition from distortion to mitigation depends on whether the content is designed to stimulate "social validation" or "social sensing." Studies by (Gundersen et al., 2024; Molin et al., 2025) conclude that management must leverage social media as a "behavioral sensor" to detect when "Aesthetic Allure" is beginning to outweigh visitor safety in specific geographical hotspots.

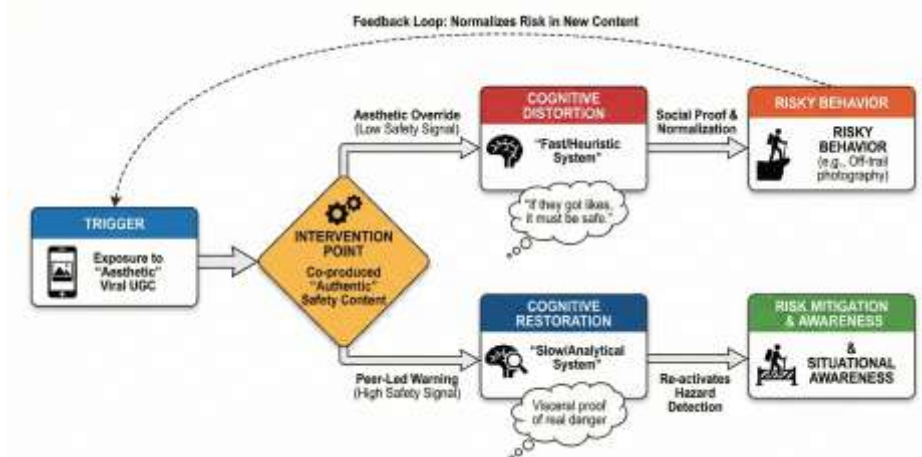


Figure 5. The UGC-Risk Decision Loop

Source: Research data, 2025

Overall, the findings indicate that UGC simultaneously functions as both a risk amplifier and a risk mitigation mechanism. Whether digital content increases or decreases perceived risk depends not only on the information conveyed but also on the psychological processes through which tourists interpret visual cues, peer influence, and social validation. This synthesis, therefore, extends existing research by positioning Digital Risk Dissonance as a dynamic cognitive mechanism linking digital communication, consumer psychology, and behavioral decision-making in adventure tourism.

Negotiating the Paradox of Digital Restoration and Social Validation (RQ3)

The results regarding RQ3 uncover a complex psychological landscape in which outdoor recreationists are not merely consumers of nature or users of technology but active negotiators of competing psychological needs. From the perspective of environmental psychology, nature-based recreation is traditionally viewed as a context that facilitates cognitive restoration, emotional recovery, and psychological well-being. However, the widespread integration of digital technologies has introduced a competing motivational system in which the pursuit of social validation increasingly accompanies the search for restorative experiences. The analysis of the literature (N = 52) therefore identifies a significant tension between the intrinsic motivation to disconnect from everyday cognitive demands and the extrinsic motivation to remain digitally visible through social media engagement.

The "Screen Ambivalence" Phenomenon

Research by (Syvertsen, 2022) in the context of Norwegian mountain huts provides a foundational perspective on this tension. This phenomenon can be interpreted through Attention Restoration Theory (ART), which argues that natural environments promote cognitive recovery by providing opportunities for effortless attention, psychological distance from routine demands, and immersive engagement with natural settings. Continuous interaction with smartphones and social media may interrupt these restorative processes by redirecting attentional resources toward digital communication and self-presentation. Consequently, visitors experience a state of "Screen Ambivalence," characterized by the simultaneous desire to disconnect for psychological restoration while remaining connected for social participation and identity expression.

Visitors often report a desire to disconnect from the "digital leash" to achieve a state of "psychological rescue" (Buckley & Westaway, 2020). However, the results show that even in remote areas, the absence of internet is met with mixed emotions—a state termed "screen ambivalence." First, Restorative Motivation: The data confirms that nature-based tourism is a primary vehicle for mental health recovery, especially in the post-pandemic era (Larson et al., 2022; Xu et al., 2023). This process requires deep immersion and "situational awareness" (Cornell, Piatkowski, et al., 2025). Second, Social Validation Need: Paradoxically, the restorative value of an experience is increasingly viewed as "incomplete" until it is validated through social media (Arts et al., 2021). The documentation of nature serves as a form of "cultural ecosystem service" where the user communicates their personal well-being to their digital network (Egarter Vigl et al., 2021).

Similarly, Stress Recovery Theory suggests that exposure to natural environments reduces physiological and emotional stress through positive affective responses. However, digitally mediated behaviors, including continuous photography, content curation, and online interaction, may partially offset these restorative benefits by maintaining cognitive engagement with external audiences rather than the immediate natural environment. This finding suggests that restoration in contemporary adventure tourism is no longer determined solely by environmental quality but also by visitors' ability to regulate digital engagement.

A Typology of Negotiation Strategies

Outdoor recreationists do not typically choose a binary "on/off" state. Instead, the literature suggests a spectrum of negotiation strategies used to balance these competing needs (see Table 4).

Table 4. Typology of Negotiation Strategies in Digitized Nature Experiences

Strategy Category	Description	Psychological Mechanism	Supporting Evidence
Spatial Isolation	Intentional selection of "offline" zones or huts with no internet.	<i>Enforced Boundaries:</i> Removing the choice to connect to preserve restoration.	(Syvertsen, 2022)
Temporal Batching	Capturing documentation (selfies/videos) in short bursts, followed by long periods of offline immersion.	<i>Compartmentalization:</i> Protecting the "restorative core" from digital distraction.	(Cornell, Piatkowski, et al., 2025)
Liminal Mediation	Using social media as a "window" to share the experience while in a liminal state between nature and society.	<i>Identity Reinforcement:</i> Validating the "restored self" to the social network.	(Conti & Heldt Cassel, 2020)
Aesthetic Curation	Prioritizing the "instagrammability" of the experience as a form of social achievement.	<i>Status Validation:</i> The restorative value is secondary to the visual proof of visit.	(Sinsup & Phumsathan, 2025)

Negotiation through Infrastructure: The Role of "Digital Free" Zones

The role of management in facilitating this negotiation is a critical theme. (Syvertsen, 2022) argues that the "offline" state is becoming a luxury good. Management policies that maintain digital-free zones allow users to resolve their internal conflict by "delegating" the responsibility of disconnection to the park's lack of infrastructure. This creates a safe psychological space where the user is "allowed" to be unplugged without the anxiety of social non-responsiveness (FOMO). Conversely, in urbanized park settings like Beijing, (Xu et al., 2023) found that digital documentation is so deeply integrated into the "camping" experience that it is no longer viewed as a tension, but as a core component of the recreational service. This suggests that the negotiation threshold is highly dependent on the "wildness" of the setting and the cultural expectations of the user group.

The Negotiation Spectrum: A Conceptual Model

To synthesize these findings, Figure 6 presents the Nature-Digital Negotiation Spectrum. This model illustrates that as the "Restorative Depth" increases, the "Documentation Intensity" typically decreases, necessitating an active negotiation at the intersection of these two drives.

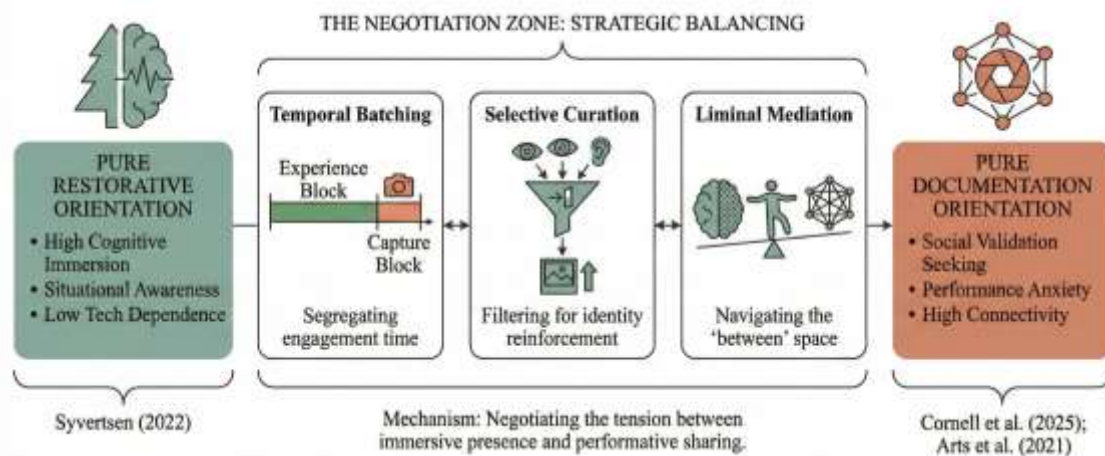


Figure 6. The Nature-Digital Negotiation Spectrum

Source: Research data, 2025

The Nature-Digital Negotiation Spectrum illustrates that digital engagement and restorative immersion should not be interpreted as mutually exclusive states but rather as dynamically regulated psychological processes. Rather than completely abandoning digital technologies, visitors continuously adjust their level of connectivity according to situational goals, environmental characteristics, and perceived social expectations. This adaptive regulation resembles self-regulatory mechanisms in environmental psychology, whereby individuals actively balance competing psychological needs to maximize both restoration and social connectedness.

Analytical Synthesis: Digital Identity as a Restorative Tool?

A novel perspective emerging from the collective data (Conti & Heldt Cassel, 2020; Kumar et al., 2025) is that digital documentation might not always be an opponent of restoration. For some users, the act of "curating" their nature experience for an audience is itself a restorative act of identity building. By sharing their "unplugged" moments, they reinforce their identity as someone who values nature, which in turn enhances their long-term well-being. This suggests that the tension is not between "nature and tech," but between "immersion and performance." The negotiation of digital tension is a dynamic process where recreationists use spatial and temporal boundaries to protect their mental well-being. While documentation often threatens situational awareness and risk perception (as seen in RQ2), it also serves a vital social function. The most successful recreationists are those who can move fluidly across the Negotiation Spectrum, using technology as a tool for validation without compromising the cognitive restoration provided by the outdoor environment. This observation also extends contemporary perspectives on nature connectedness by suggesting that restoration may occur not only through direct interaction with natural environments but also through the construction and reinforcement of environmentally oriented identities. In this sense, digital documentation may function as a mechanism of identity affirmation rather than merely a source of distraction, provided that digital engagement complements rather than dominates the outdoor experience.

Overall, the findings suggest that contemporary adventure tourism is characterized not by a simple opposition between technology and nature but by an ongoing negotiation between competing psychological motivations. Screen Ambivalence, therefore, represents a dynamic adaptive process through which visitors continuously balance cognitive restoration, social identity, and digital connectivity. This synthesis extends environmental psychology literature by demonstrating that the restorative benefits of natural environments increasingly depend not only on environmental characteristics but also on individuals' capacity to regulate digital behavior throughout the recreation experience.

Towards an Integrated Framework for Digital-Outdoor Governance (RQ4)

The synthesis of management strategies from 52 core documents identifies a paradigm shift in protected area governance. Rather than relying exclusively on reactive, physically based management approaches, destination authorities are increasingly adopting hybrid governance models that integrate digital communication, visitor participation, data-driven monitoring, and conventional safety interventions. From a governance perspective, this transition reflects the recognition that visitor behavior is increasingly shaped before arrival through digitally mediated interactions, requiring management strategies that operate across both physical and virtual environments.

The Taxonomy of Management Interventions

As illustrated in Figure 7, the literature is categorized into four primary strategic pillars. Spatial & Infrastructure Governance remains the most discussed (n=14), but it is increasingly augmented by Big Data Monitoring (n=11) and Digital Co-production (n=7).

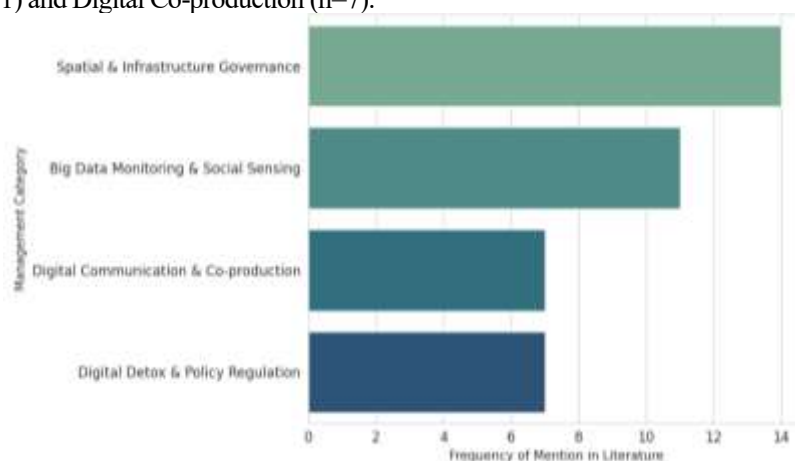


Figure 7. Distribution of Management and Policy Approaches

Source: Research data, 2025

Strategy 1: Digital Co-production and Peer-Led Communication

Traditional, authoritative signage is being challenged by "co-produced" digital safety narratives. (Cornell, Piatkowski, et al., 2025) provide the most robust evidence for this, demonstrating that safety campaigns designed in collaboration with influencers and target demographics (e.g., aquatic safety in Queensland) achieve significantly higher message recall than standard government warnings. Analytical Insight: Management must shift from "command-and-control" to "influence management." By leveraging the same visual aesthetics that drive viral visitation (Sinsup & Phumsathan, 2025), agencies can embed safety "anchors" into the visitor's digital journey before they even arrive at the site.

Strategy 2: Spatial Governance of "Digital Hotspots"

The emergence of unauthorized "viral" trails poses a dual threat to visitor safety and ecological integrity. First, Physical Interventions: (Cornell, Piatkowski, et al., 2025; Gundersen et al., 2024) suggest that physical facilities (e.g., barriers at cliff edges) must be reinforced at "digital hotspots"—locations made popular by social media—rather than distributed uniformly across the landscape. Second, Geotagging Policy: Several studies propose "Digital De-marketing" strategies, where management discourages geotagging in vulnerable zones to prevent

"swarming" behaviors that overwhelm both the visitor experience and the park's rescue capacity (Kubota et al., 2024; Leppämäki et al., 2025).

Strategy 3: Preserving Restoration through Digital-Free Policy

A significant argument in the dataset concerns the preservation of "unplugged" values. (Mangold et al., 2024; Syvertsen, 2022) highlight that the absence of digital connectivity should be managed as a "Core Product" of the nature experience rather than a service deficiency. Policy recommendations include the designation of "Quiet Zones" or "Offline Huts" (as modeled in Norwegian mountain regions), where the lack of internet access is legally protected to ensure mental restoration is not compromised by the "performance" of digital documentation.

Strategy 4: Social Sensing and Real-Time Behavioral Monitoring

A novel management capability identified is the use of UGC as a "Behavioral Sensor." (Kumar et al., 2025; Molin et al., 2025) argue that agencies should monitor e-WOM (electronic Word-of-Mouth) to detect emerging risky trends or negative visitor sentiments. This allows for: 1) Early Warning Systems: Detecting when a new, dangerous trail is becoming popular; and 2) Resource Allocation: Deploying mobile ranger units to digital hotspots based on real-time tagging density (Korcz et al., 2024). However, the effectiveness of behavioral sensing depends upon the quality, representativeness, and timeliness of user-generated data. Social media activity may disproportionately reflect younger, digitally active visitor segments, potentially overlooking less visible user groups. Consequently, behavioral sensing should complement rather than replace traditional monitoring approaches such as ranger observations, visitor surveys, and environmental assessments.

Table 5. Integrated Management Matrix for Digital Outdoor Recreation

Strategic Pillar	Management Action	Intended Outcome	Primary Reference
Co-Production	Partnering with influencers for safety "vlogging."	Improved safety message adoption.	(Cornell, Piatkowski, et al., 2025)
Spatial Planning	Reinforcing infrastructure at "selfie-points."	Prevention of falls and off-trail erosion.	(Gundersen et al., 2024)
Policy Regulation	Protecting "Offline Huts" & signal-free zones.	Preservation of restorative "unplugged" value.	(Syvertsen, 2022)
Data Governance	Monitoring UGC to identify "viral" risky spots.	Proactive safety and search-and-rescue.	(Molin et al., 2025)
e-WOM Influence	Engaging in digital forums to correct risk bias.	Mitigation of "normalizing" risky behaviors.	(Kumar et al., 2025)

Source: Research data, 2025

Overall, the findings indicate that hybrid governance should not be interpreted simply as the digitalization of traditional park management, but rather as a comprehensive governance paradigm that integrates technological capabilities, collaborative stakeholder engagement, behavioral insights, and adaptive policy responses. The effectiveness of this approach ultimately depends on destination managers' ability to balance visitor experience, environmental protection, public safety, and ethical considerations related to digital data use.

Implementation Challenges of Hybrid Governance

Despite its considerable potential, the literature consistently indicates that implementing hybrid governance presents several institutional and operational challenges. First, digital governance requires substantial organizational capacity, including technical expertise, continuous social media monitoring, and inter-agency coordination that may not be available in many protected areas. Second, managing visitor-generated digital content raises ethical concerns regarding data privacy, surveillance, and the responsible use of publicly shared information. Third, collaboration with influencers and online communities may create tensions between conservation objectives and commercial promotion, particularly when highly visible destinations experience increased visitation following successful digital campaigns. Finally, unequal levels of digital literacy among visitors and park authorities may reduce the effectiveness of technology-based interventions, especially in developing regions where digital infrastructure remains uneven. These findings suggest that successful hybrid governance depends not only on technological innovation but also on institutional readiness, stakeholder collaboration, and adaptive management capacity.

Discussion

The synthesis of the 52 reviewed studies demonstrates that the digital transformation of adventure tourism extends far beyond changes in marketing practices. Rather, it represents a fundamental shift in how tourists discover destinations, evaluate risks, negotiate restorative experiences, and interact with destination management systems. Collectively, the findings suggest that outdoor recreation has evolved from a predominantly physical-ecological encounter into a digitally mediated decision-making process in which consumer behavior is continuously influenced by visual communication, social validation, and technology-enabled governance. This discussion integrates these findings through three complementary perspectives: environmental psychology, socio-digital risk construction, and adaptive governance.

The Restoration Paradox: Immersion versus Digital Performance

The findings reaffirm that nature remains a vital venue for "psychological rescue" (Buckley & Westaway, 2020), particularly in the post-pandemic recovery phase (Syvertsen, 2022). However, this study identifies a tension that challenges traditional Attention Restoration Theory (ART). While nature is expected to provide "soft fascination" for cognitive recovery, the modern imperative for social validation creates a state of "Screen Ambivalence" (Syvertsen, 2022). Recreationists are no longer seeking pure isolation; they are navigating a liminal space where the restorative value of nature is often "traded" for digital capital. This "performance of nature" through Instagrammable content (Arts et al., 2021) suggests that the quality of restoration is now contingent on visitors' ability to manage their digital boundaries. These findings extend Attention Restoration Theory by suggesting that restorative outcomes are no longer determined exclusively by environmental characteristics such as naturalness, fascination, or compatibility. Instead, cognitive restoration increasingly depends upon visitors' capacity to regulate digital engagement throughout the recreation experience. Consequently, restoration should be understood as a co-produced psychological outcome emerging from the interaction between environmental qualities and digital behavior.

Socio-Digital Risk Construction and the Erosion of Hazard Detection

This study contributes a new perspective on risk perception by proposing the concept of "Digital Risk Dissonance." The collective evidence from (Cornell, Piatkowski, et al., 2025; Kumar et al., 2025) suggests that risk is increasingly constructed through social proof rather than objective environmental assessment. The aesthetic allure of viral UGC distorts the cognitive processing of hazards, where the "reward" of social engagement (likes/shares) overrides the "cost" of potential injury. Furthermore, the normalization of risky behavior through social media documentation creates a cycle where the environment is perceived as a "background" for content rather than a hazardous landscape. This shift necessitates a re-evaluation of how risk communication is delivered, as traditional signage fails to compete with the visceral authority of peer-generated visual proof.

The concept of Digital Risk Dissonance provides a complementary explanation to conventional risk perception theories by illustrating how digitally mediated social cues increasingly shape environmental judgment. Rather than relying primarily on objective assessments of physical hazards, tourists frequently construct perceived risk through heuristic interpretation of aesthetic content, peer endorsement, and social proof. This finding suggests that risk perception in adventure tourism is increasingly socially constructed in digital environments before visitors even arrive at the destination. This conceptualization also complements heuristic-systematic models of information processing by demonstrating that visually attractive digital content frequently activates rapid heuristic judgments, whereas official safety information requires slower analytical processing. Consequently, effective risk communication should compete not only with misinformation but also with the psychological attractiveness of highly aesthetic user-generated content.

Towards Hybrid Governance: Integrating Social Sensing and Co-production

The practical implications of these findings point towards a move from reactive policing to "Hybrid Governance." The effectiveness of co-produced safety campaigns (Cornell, Piatkowski, et al., 2025) and the potential for using social media as a "behavioral sensor" (Molin et al., 2025) indicate that management must become digitally proactive. By adopting "Digital Zoning"—the intentional management of connectivity to protect restorative values (Syvertsen, 2022)—protected area managers can preserve the very essence of the outdoor experience. Ultimately, the future of outdoor management lies in the ability to balance the intelligence provided by digital data with the physical and psychological needs of the "unplugged" visitor. Importantly, the findings also demonstrate that successful hybrid governance extends beyond technological adoption. Effective

implementation requires institutional capacity, stakeholder collaboration, digital literacy, and ethical management of visitor-generated data. Therefore, hybrid governance should be interpreted as an adaptive governance approach in which digital communication complements rather than replaces traditional conservation practices and visitor management strategies.

Viewed collectively, the findings indicate that four interrelated conceptual dimensions increasingly shape contemporary adventure tourism. First, destination selection is increasingly influenced by content potential, in which destinations are evaluated based on their anticipated capacity to generate visually appealing, socially shareable experiences. Second, the widespread circulation of user-generated content contributes to Digital Risk Dissonance, altering visitors' subjective assessments of environmental hazards through aesthetic cues and social validation. Third, recreationists continuously negotiate Screen Ambivalence as they balance psychological restoration with digital identity construction during their outdoor experiences. Finally, destination managers are responding to these behavioral transformations through Hybrid Governance approaches that combine digital communication, collaborative safety management, and adaptive monitoring systems. Together, these concepts demonstrate that digital technologies no longer function merely as communication tools but have become integral components of the consumer decision-making process throughout the entire adventure tourism experience.

Overall, the evidence suggests that the future of sustainable adventure tourism depends not on minimizing digital technologies but on strategically integrating them into visitor management, environmental protection, and psychological well-being. The challenge for both researchers and practitioners, therefore, lies in designing tourism systems that simultaneously maximize restorative experiences, encourage responsible digital engagement, and maintain the ecological integrity of outdoor destinations.

Conceptual Framework

Figure 8 presents "The Sustainable Digital-Outdoor Interaction Framework," an integrative conceptual model that synthesizes the primary findings from a systematic review of the 52 Scopus-indexed documents analyzed in this study. This framework maps the dynamic interplay between digital dimensions and the outdoor recreational experience, aiming to provide a holistic understanding of how technology mediates the human-nature relationship.

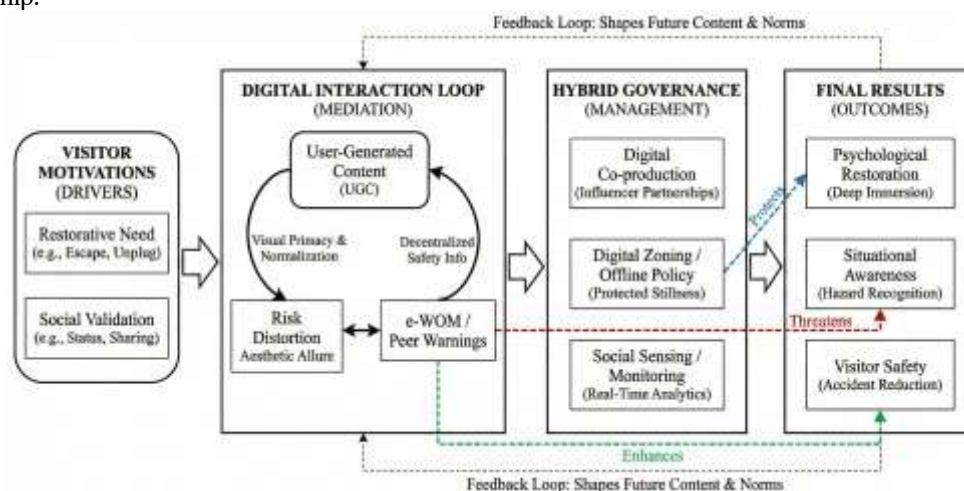


Figure 8. The Sustainable Digital-Outdoor Interaction Framework

Source: Research data, 2025

Unlike previous conceptualizations that examine destination marketing, visitor behavior, or protected area management separately, the proposed framework integrates these perspectives into a unified consumer decision-making model. It explicitly links motivational drivers, digital interactions, psychological processes, and governance responses, thereby providing a holistic explanation of how social media shapes both visitor behavior and destination management in adventure tourism.

The framework is structured around four primary pillars: 1) Drivers (Visitor Motivations): Delineates the duality between the intrinsic pursuit of cognitive restoration ("unplugged") and the extrinsic drive for digital social validation and identity construction; 2) Digital Interaction Loop (Digital Mediation): Illustrates how User-Generated Content (UGC) operates as a double-edged sword—serving as both a catalyst for risk distortion

through viral aesthetics and a vital tool for risk mitigation via peer-led early warning systems (e-WOM); 3) Hybrid Governance (Management Intervention): Highlights the paradigm shift in protected area management from traditional physical oversight to proactive digital governance. This includes the co-production of safety narratives and the implementation of digital zoning policies (digital-free zones) to safeguard restorative values; and 4) Outcomes (Final Results): Demonstrates the target indicators of success, specifically the achievement of situational awareness, enhanced visitor safety, and profound cognitive restoration.

Analytically, the framework in Figure 8 proposes a sequential causal pathway. Visitor motivations initiate destination evaluation, which is subsequently mediated by digitally generated information through user-generated content and social media interactions. These digital influences simultaneously shape destination choice, risk perception, and restorative experiences, which are then moderated by hybrid governance interventions implemented by destination managers. The interaction between individual psychological processes and management responses ultimately determines visitor outcomes, including situational awareness, behavioral safety, cognitive restoration, and sustainable destination use. Accordingly, the framework conceptualizes digital technologies not as external influences but as embedded mechanisms operating throughout the entire consumer decision-making process in adventure tourism.

D. CONCLUSION

This systematic literature review demonstrates that social media has fundamentally transformed consumer decision-making in adventure tourism, extending its influence far beyond destination promotion. Rather than functioning solely as a communication platform, social media now shapes destination selection, perceived risk, psychological restoration, and visitor behavior throughout the recreation experience. The synthesis of 52 studies reveals that digital interactions increasingly determine how destinations are discovered, evaluated, experienced, and managed. Collectively, these findings indicate that contemporary outdoor recreation should be understood as a digitally mediated decision-making process in which technological engagement and nature experiences continuously interact. Furthermore, the review highlights that user-generated content simultaneously acts as a catalyst for destination inspiration, a mechanism of risk distortion, a source of peer-based safety communication, and a driver of adaptive management responses.

Theoretical and Practical Contributions

Theoretically, this review makes four primary contributions to the literature. First, it conceptualizes content potential as a complementary dimension of destination evaluation, demonstrating that tourists increasingly assess destinations based on their capacity to generate visually attractive and socially shareable experiences. Second, it introduces Digital Risk Dissonance as a conceptual explanation for how aesthetic user-generated content reshapes subjective risk perception in adventure tourism. Third, it extends environmental psychology by positioning Screen Ambivalence as a dynamic negotiation between cognitive restoration and digital self-presentation, thereby expanding the explanatory scope of Attention Restoration Theory in digitally connected recreation settings. Finally, the study proposes Hybrid Governance as an integrative management perspective that combines digital communication, collaborative safety practices, behavioral sensing, and adaptive governance to address the challenges of digitally mediated outdoor recreation.

Practically, the findings suggest that destination managers should move beyond traditional visitor management approaches by integrating digital communication into conservation and safety strategies. Rather than competing with social media, protected area authorities should actively leverage user-generated content, influencer partnerships, and electronic word of mouth as complementary management tools. At the same time, the implementation of digital zoning, offline recreation spaces, and real-time behavioral monitoring should be balanced with ethical considerations, institutional capacity, and visitor privacy. Such integrated approaches are expected to enhance visitor safety while preserving the restorative value and ecological sustainability of outdoor destinations.

Limitations and Future Research

Despite its comprehensive synthesis, this review has several limitations. First, the analysis was restricted to English-language, Open Access journal articles indexed in Scopus, potentially excluding relevant evidence published in other databases or subscription-based journals. Second, the geographical concentration of existing

studies in high-income countries such as Australia, Norway, and China limits the generalizability of current knowledge to regions with different institutional capacities, cultural contexts, and digital infrastructures.

Future research should empirically validate the conceptual relationships proposed in this review through quantitative and mixed-method approaches across diverse geographical settings. Particular attention should be directed toward testing the proposed constructs of Content-Potential, Digital Risk Dissonance, Screen Ambivalence, and Hybrid Governance using structural equation modeling or longitudinal research designs. Comparative studies between developed and developing destinations would also improve understanding of how differences in digital literacy, governance capacity, and cultural values influence digitally mediated consumer decision-making in adventure tourism.

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