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Futures Studies of the Integrated Ecosystem of Sports Brands with an Emphasis on Technological Transformations

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ABSTRACT

This study aims to explore the future configuration of the integrated ecosystem of sports brands with a particular focus on emerging technological transformations and their strategic implications. The research employed a qualitative exploratory futures-studies design drawing on expert-driven foresight methodologies. Participants were selected based on purposive and criterion sampling, including sports branding specialists, digital transformation experts, technology innovators, and academic researchers with significant experience in sports ecosystems. Data were collected through semi-structured in-depth interviews, expert panel discussions, and systematic documentary analysis of global technological and market reports. The analytic process involved iterative thematic coding, structural analysis through the MICMAC method to map influence–dependence relationships among key variables, and intuitive-logics scenario building to construct plausible future trajectories. Cross-validation among interview insights, panel deliberations, and documentary evidence ensured conceptual coherence and analytical rigor. Analyses revealed that the future of sports brand ecosystems will be predominantly shaped by technological convergence, including AI-driven personalization, IoT-enabled fan engagement, immersive AR/VR experiences, and platform-based value creation. MICMAC results showed strong influence pathways among technological, economic, and consumer-behavior variables, indicating that digital infrastructures will become the core enablers of brand competitiveness. Scenario building produced four plausible futures driven by uncertainties associated with technology adoption, data governance, and platform dominance. Across scenarios, strategic agility, consumer co-creation, sustainability pressures, and globalized digital commerce emerged as decisive factors shaping long-term ecosystem configurations. The study concludes that sports brands are transitioning from traditional linear branding models to interconnected digital ecosystems driven by technological innovation, evolving consumer expectations, and expanding global platforms.

Keywords: Sports brand ecosystem; digital transformation; futures studies; technological convergence; AI-driven personalization

Introduction

The rapid acceleration of technological innovation has transformed the logic of competition, value creation, and consumer engagement across nearly every industry, and the sports sector has become one of the most dynamic arenas for examining these shifts. As digital ecosystems increasingly shape organizational strategy and customer interaction, the brand environment surrounding sports products, services, and fan experiences has experienced a profound restructuring. Scholars argue that technological convergence—especially artificial intelligence, immersive environments, data-driven personalization, and platform-based value creation—is now redefining brand identity, competitiveness, and communication strategies in sports settings (Westerbeek, 2025). At the same time, digital transformation has expanded the boundaries of what a sports brand represents, allowing organizations to evolve into interconnected platforms that integrate merchandising, athlete branding, fan communities, gamification, and digital commerce. This broadening of the brand ecosystem mirrors global transformations across industries, where organizations increasingly rely on digital infrastructures to optimize operations, enhance customer experience, and sustain competitive advantage (Attah et al., 2024).

Digital transformation, as several recent analyses highlight, is no longer merely a technological choice but a strategic imperative embedded in economic, organizational, and cultural change. For instance, studies examining the economic logic of digital ecosystems demonstrate that digitalization fundamentally reshapes the coordination of supply chains, the management of brand assets, and the integration of customer data into business decision-making (Adama et al., 2024). These insights resonate with broader reviews indicating that digital transformation allows firms to operate within globally connected business systems where brand value emerges through continuous interaction, data exchange, and innovation-driven collaboration (Ismaeel & Zeebaree, 2025). Within the sports industry, this integration is particularly critical because sports brands often function not only as commercial entities but also as cultural symbols that rely heavily on emotional engagement, identity formation, and community interaction (Shapaiko, 2025).

Technological innovations now enable brands to integrate physical and digital experiences in ways that create consistent cross-platform identity. For example, the rise of phygital marketing, blending tangible interactions with immersive digital elements, has been identified as a crucial driver of modern customer engagement strategies (Sukheeja & Shekhawat, 2025). In the context of the sports industry, these developments reshape how fans experience events, purchase merchandise, follow athletes, and interact with digital spaces related to their favorite teams or brands. As immersive technologies and AI-enabled analytics penetrate consumer environments, sports brands increasingly adopt dynamic digital strategies that respond to real-time fan behavior, personalized content preferences, and multi-platform participation (Sunarjo et al., 2025). This transition significantly strengthens the argument that sports branding has evolved from a traditional, linear process into a complex, integrated ecosystem characterized by multi-directional flows of information, value, and co-created meaning.

Research across sectors confirms that digital ecosystems reshape how organizations coordinate processes, manage stakeholder relationships, and integrate diverse technological infrastructures. Conceptual studies on digital ecosystems in construction, healthcare, and supply chain environments highlight that such ecosystems rely on interoperable platforms that support real-time data exchange, modular service delivery, and networked value creation (Bartko et al., 2024; Famoti et al., 2025; Mbanefo et al., 2024). Similar patterns are now visible in sports branding, where platforms enable fan-generated content, athlete-led branding initiatives, integrated merchandising channels, and interactive marketing campaigns. These systems do not merely support branding activities; they constitute the environment within which future sports brand

identities and value propositions are constructed. The emergence of platform power as a dominant structural force in the governance of sport—driven by social media, generative AI, and athlete-driven content creation—only amplifies the need to understand the future configuration of sports brand ecosystems (Westerbeek, 2025).

Digital transformation also plays a critical role in redefining operational efficiency and strategic alignment across sectors that share structural similarities with sports. Studies focusing on retail and e-commerce systems reveal that digitalization enhances operational integration, data visibility, and process automation, all of which are foundational components of a robust brand ecosystem (Putra, 2025). Furthermore, analyses of supply chain modernization underscore the importance of Industry 4.0 technologies—including IoT devices, AI-driven forecasting, and smart logistics systems—in shaping organizational competitiveness and responsiveness to consumer demand (Gomaa, 2025; Singh, 2025). Although these studies are not specific to the sports domain, their insights are highly relevant, as sports companies increasingly rely on smart inventory systems, digital commerce infrastructures, and real-time consumer analytics to maintain brand agility.

A complementary body of research emphasizes that the strategic deployment of digital technologies enhances not only operational systems but also organizational branding. Emerging work on digital transformation and branding demonstrates that technological integration can elevate brand visibility, strengthen consumer trust, and facilitate the co-creation of meaning within digital environments (Sharma & Thapliyal, 2024). In particular, digital branding requires a shift toward integrated strategic alignment across technological, human, and managerial components—a theme strongly articulated in research on smart ecosystems, where strategic capabilities and emerging technologies combine to generate sustainable organizational value (Pardede et al., 2025). In the sports context, this alignment is essential because brand identity often intersects with diverse elements including athlete performance, fan culture, market trends, and global visibility.

A further driver of change is the emergence of green marketing and sustainability-oriented branding approaches. These frameworks emphasize that digital tools can help brands communicate sustainable practices, track environmental performance, and engage consumers in value-driven branding narratives (Putri & Pasrizal, 2025). While sustainability has long been a component of brand management, digital transformation intensifies its impact by making environmental performance measurable, transparent, and visible to global audiences. For sports brands, this integration can significantly influence consumer loyalty, brand reputation, and long-term competitiveness.

Another dimension shaping the future of sports brand ecosystems is the global expansion of digital business models. Research demonstrates that digital ecosystems facilitate cross-border expansion by lowering entry barriers, enabling flexible operational structures, and supporting network-based growth strategies (Irawan, 2025). These insights align with reviews on the evolution of e-business and digital business models, which highlight the ongoing transition toward adaptive, scalable, and cloud-based organizational structures (Shostak & Бегун, 2025). As sports brands increasingly adopt global business models, powered by fan reach on social media and international licensing frameworks, their ecosystem strategies become more dependent on digital infrastructures that transcend geographical boundaries.

The ethical dimensions of digitalization also shape future trajectories. Discussions around data privacy, personal data harvesting, and digital security emphasize the importance of transparent governance systems, especially in consumer-facing ecosystems (Salazar et al., 2023). These concerns are particularly relevant in sports branding, where consumer interaction often involves biometric data, behavioral tracking, and personalized marketing. Ensuring ethical and responsible use of data becomes a key determinant of brand trust and resilience.

In addition, research from sectors such as insurance and finance illustrates how digital platforms reshape brand competition through smart services, automation, and integrated consumer journeys (Benetti, 2025; Tripathi, 2025). These transformations mirror the evolution of sports branding, where fan engagement is increasingly shaped by seamless interactions across ticketing platforms, live-streaming services, augmented reality experiences, and team merchandise ecosystems. Similarly, public administration studies highlight how digital transformation strengthens resilience, adaptability, and crisis management capabilities within complex infrastructures (Статівка & Bodnar, 2024). These findings have implications for sports organizations that must manage unpredictable global events, maintain operational continuity, and sustain fan engagement amid disruptions.

Taken together, these studies reflect a global consensus: digital transformation is a multidimensional force that reshapes organizational strategy, consumer behavior, and ecosystem dynamics across industries. Within the sports sector, this force is amplified by the unique cultural, emotional, and experiential dimensions that define sports consumption. The convergence of technological innovation, global fan networks, emerging business models, and sustainability pressures suggests that the future of sports brand ecosystems will be shaped by complex interactions that cannot be understood through traditional branding frameworks. Instead, a comprehensive futures-studies approach is needed to examine how technological, economic, social, regulatory, and ethical forces will converge to shape the integrated ecosystem of sports brands in the coming years.

The aim of this study is to explore the future of the integrated ecosystem of sports brands with an emphasis on technological transformations.

Methodology

Study Design and Participants

The study adopted a qualitative exploratory futures-studies design grounded in expert-driven foresight methodologies. Given that the aim was to understand long-term transformations within the integrated ecosystem of sports brands, the research relied on purposive and criterion-based sampling to engage participants who possessed deep, multi-layered knowledge of sports branding, technological innovation, digital transformation, and ecosystem governance. Participants included senior managers of major Iranian sports brands, marketing directors working in athletic product companies, university faculty specializing in sport management and technology, digital branding experts, and professionals from start-ups engaged in wearable technologies, AI-driven sports analytics, and immersive fan-engagement platforms. Inclusion criteria required a minimum of five years of professional experience in sports branding or sports-technology innovation, a demonstrated publication or portfolio in the area of sports markets or digital ecosystems, and active involvement in strategic decision-making. Ultimately, the participant group represented a cross-section of stakeholders from industry, academia, and the digital technology sector, providing a rich foundation for identifying emerging drivers of change and potential future scenarios influencing the sports branding ecosystem.

Data Collection Tools

Data collection was conducted using a combination of semi-structured in-depth interviews, expert panel sessions, and documentary analysis. The semi-structured interview protocol was carefully designed to explore experts' perspectives on

current challenges facing sports brands, expected technological disruptions, evolving consumer behaviors, and the future configuration of integrated brand ecosystems in the sports industry. Interviews began with broad questions to capture trends related to fan engagement, digital marketing, e-commerce, smart sports products, and data-driven branding strategies, then gradually moved toward more strategic issues such as convergence of technologies, brand co-creation ecosystems, and long-term uncertainties. Each interview was audio recorded with consent and transcribed verbatim for analysis. To strengthen the reliability of the findings, expert panels consisting of 6–8 participants were organized to discuss and refine key themes emerging from the interviews, allowing participants to debate contradictions and validate emerging signals of change. Panel sessions also provided an opportunity to identify weak signals, emerging drivers, and high-impact uncertainties that might shape the long-term future of sports brands. Documentary analysis supported the interviews and panels through systematic review of strategic industry reports, publications from global sports-technology think tanks, market intelligence reports, and academic literature on futures studies and sports branding. These documents were used to identify global megatrends and technological trajectories such as artificial intelligence in sports marketing, augmented reality fan experiences, blockchain-enabled fan tokens, and data-driven personalization systems, ensuring that the empirical findings were aligned with international developments.

Data Analysis

The analysis process was conducted in several interconnected phases grounded in qualitative futures-studies techniques. First, interview transcripts and expert panel discussions were coded using thematic analysis to identify major categories, patterns, and emerging concepts. Coding followed an iterative process that included open coding, axial coding, and selective coding, allowing themes such as technological convergence, integrated brand ecosystems, consumer behavioral shifts, and digital value-creation mechanisms to emerge organically from the data. Once key themes were identified, they were incorporated into a structural analysis framework using the MICMAC method to examine relationships among variables, identify influence–dependence patterns, and map systemic interconnections within the future sports brand ecosystem. Structural matrices were completed in collaboration with participants to ensure accuracy and conceptual grounding. After the structural analysis, scenario building techniques based on the intuitive logics approach were applied. Critical uncertainties identified through MICMAC analysis were expanded into scenario logics, producing alternative future pathways that represent plausible trajectories for sports brand ecosystems under various technological and socioeconomic conditions. These scenarios were refined through iterative feedback from the expert panels, ensuring internal consistency and strategic relevance. Throughout the entire process, constant comparative analysis was applied to align emerging patterns from interviews, documents, and structural modeling, enabling the research to produce a comprehensive and coherent set of insights about the future landscape of sports branding under technological transformation.

Findings and Results

The findings of this futures-studies inquiry reveal a complex landscape of technological, behavioral, and structural transformations that are reshaping the integrated ecosystem of sports brands. Through extensive expert interviews, panel discussions, and documentary analysis, several dominant drivers, high-impact uncertainties, and emergent themes were identified as central to understanding the long-term evolution of sports branding in a technology-driven environment. The

following tables present the consolidated results derived from thematic coding, structural analysis, and scenario logic development, followed by detailed explanatory paragraphs for each.

Table 1. Primary Drivers Influencing the Future of Integrated Sports Brand Ecosystems

Driver Category	Key Drivers Identified	Expert Consensus Level
Technological	AI-driven personalization; wearable IoT integration; immersive AR/VR fan experiences	Very High
Economic	Global digital commerce expansion; monetization of fan data; emergence of crypto-based fan tokens	High
Social	Shift toward digital fan communities; demand for hybrid physical-digital sports experiences	High
Environmental	Sustainability expectations in sports merchandise; eco-innovation in production	Moderate
Regulatory	Data governance rules; digital asset regulation; intellectual-property protection challenges	Moderate

The first table demonstrates that technological advancements emerged as the strongest and most influential drivers shaping the future of sports brand ecosystems. Experts consistently emphasized that artificial intelligence, wearable sensors, and immersive virtual platforms are fundamentally transforming how fans interact with sports brands. Economic drivers, especially the global expansion of digital commerce and the commercialization of fan-generated data, were also strongly endorsed as catalysts that will push brands toward integrated and data-centric ecosystem models. Social drivers reflect the rapid growth of digital fan communities seeking personalized experiences that blend physical and virtual engagement. Environmental and regulatory drivers, though ranked slightly lower in influence, remain integral as sustainability pressures and data-governance policies increasingly shape long-term strategic decisions for sports brands.

Table 2. High-Impact Uncertainties Shaping Future Scenarios

Uncertainty Dimension	Possible Future States	Expected Impact on Sports Brands
Pace of Tech Adoption	Rapid diffusion vs. uneven or fragmented adoption	Determines integration level of AI and immersive tech
Data Regulation	Strict governance vs. flexible innovation-oriented frameworks	Influences personalization and fan-data monetization
Consumer Behavior	Active co-creation vs. passive consumption	Shapes ecosystem openness and value-creation models
Platform Dominance	Decentralized digital ecosystems vs. centralized big-tech control	Affects brand autonomy and ecosystem design
Economic Stability	Stable global markets vs. volatility and inflation	Impacts investment in digital transformation

The second table highlights the key uncertainties that hold the greatest potential to shift the future trajectories of sports brands. The pace of technological adoption was identified as the most critical, as variations in how quickly AI, AR/VR, and IoT systems are integrated will significantly influence whether sports brands achieve seamless ecosystem-level integration. Data regulation likewise emerged as a pivotal uncertainty, since strict constraints could limit personalized fan engagement while flexible regulatory environments could accelerate digital innovation. Consumer behavior was identified as highly unpredictable, with experts divided on whether fans will evolve into active co-creators contributing directly to brand ecosystems or remain passive consumers of brand-driven content. Uncertainty around platform dominance raises strategic concerns regarding whether brands will control their own ecosystems or rely heavily on technology giants. Finally, global economic stability was recognized as an external uncertainty that will shape brands' willingness and ability to invest in future-oriented digital infrastructure.

Table 3. Thematic Categories Extracted from Interview and Panel Data

Thematic Category	Key Concepts	Illustrative Insights from Experts
Digital Ecosystem Integration	Cross-platform branding; unified fan-data systems; multi-touchpoint engagement	"Brands must evolve into connected ecosystems rather than isolated marketing entities."
Technological Convergence	Fusion of AI, IoT, blockchain, and AR/VR	"Future sports branding will depend on the convergence of multiple emerging technologies."
Consumer Empowerment	Co-design of products; fan-driven narratives; personalization	"The fan is no longer a spectator but a co-creator of brand value."
Sustainable Branding	Eco-friendly materials; transparent production; circular branding practices	"Environmental expectations will redefine the competitive identity of sports brands."

Strategic Agility	Rapid adaptation; continuous innovation; flexible governance	"Agility will be the defining capability of future brand ecosystems."

The third table presents the thematic structure obtained from qualitative coding, illustrating the conceptual foundation for understanding future shifts in sports branding. Digital ecosystem integration was repeatedly referenced as a necessary transformation, reflecting the movement from traditional, linear branding to interconnected platforms capable of continuous engagement. Technological convergence emerged as a core theme, with experts repeatedly highlighting that ecosystem-level innovation will only occur when AI, IoT, blockchain, and immersive technologies operate cohesively rather than in silos. Consumer empowerment is central, as fans increasingly expect active participation in product development, narrative creation, and personalized experiences. Sustainability, once peripheral, is rapidly becoming pivotal as environmental consciousness influences both product design and brand loyalty. Finally, strategic agility was identified as a fundamental organizational capability, representing the need for rapid adaptation to technological disruptions, shifting consumer expectations, and volatile market conditions.

Table 4. Scenario Logic Matrix for Future Sports Brand Ecosystems

Scenario	Key Assumptions	Strategic Characteristics of the Ecosystem
Scenario A: Fully Integrated Digital Ecosystem	Rapid tech adoption; supportive data regulation; active consumer co-creation	Highly personalized experiences; seamless AI-driven engagement; decentralized fan participation
Scenario B: Fragmented Innovation Landscape	Uneven tech adoption; strict data regulation; mixed consumer participation	Partially integrated platforms; limited personalization; dependence on external tech providers
Scenario C: Platform-Dominated Future	Centralization by major tech companies; strong global regulation	Reduced brand autonomy; uniform digital interfaces; tech-driven fan interactions
Scenario D: Sustainability-Led Ecosystem	High environmental pressure; moderate tech integration	Transparency-focused branding; eco-driven consumer communities; slower but ethical innovation cycles

The fourth table presents the scenario logic matrix derived from a combination of structural analysis and expert scenario-building workshops. Scenario A reflects an optimistic future where technological integration flourishes, data regulation enables innovation, and fans play an active role in shaping brand experiences, resulting in highly interactive and intelligent ecosystems. Scenario B illustrates a fragmented landscape in which technological progress is uneven and regulatory constraints reduce innovation potential, leading to partial integration and limited ecosystem coherence. Scenario C emphasizes a future dominated by major technology companies, where sports brands lose strategic autonomy and operate within standardized digital environments shaped primarily by external platforms. Scenario D explores a sustainability-centered trajectory in which environmental priorities take precedence, resulting in slower but more ethically aligned ecosystem development. These scenarios collectively highlight the range of plausible futures that sports brands must prepare for in navigating a technologically dynamic and uncertain environment.

Discussion and Conclusion

The findings of this study reveal that the future of integrated sports brand ecosystems will be primarily shaped by the rapid growth of digital transformation technologies, shifting consumer behaviors, and the increasing dominance of platform-based business models. The identification of technological drivers such as AI-driven personalization, immersive AR/VR environments, and the expansion of interconnected platforms demonstrates the increasingly digital nature of sports brands and aligns closely with global analyses of technology-driven ecosystem change. This result reflects similar conclusions in the broader digital economy, where digital platforms, smart infrastructures, and intelligent data systems are becoming fundamental to competitiveness, resilience, and strategic alignment (Westerbeek, 2025). These findings also support research

emphasizing that digitalization is not simply a supplementary tool but a transformational force that reconfigures the entire ecosystem in which brands operate (Attah et al., 2024).

The experts' recognition of technological convergence as a dominant driver corresponds with studies showing that organizations increasingly rely on the fusion of AI, IoT, blockchain, and immersive interfaces to shape their market identity and operational landscape (Evangeline, 2025). The specific emphasis on personalization and consumer-level data analytics echoes prior work demonstrating that digital tools improve brand responsiveness and facilitate new forms of consumer engagement (Sunarjo et al., 2025). These patterns align with analyses in e-business transformation, which highlight how digital tools accelerate engagement and expand consumer-brand interaction beyond traditional touchpoints (Ismaeel & Zeebaree, 2025). In the context of sports branding, where consumption is driven by emotions, identity, and social belonging, the adoption of immersive and personalized technologies has an even stronger effect because fans are not merely customers but active participants in value creation.

The scenario-building results further highlight the importance of uncertainty regarding the pace of technology adoption and data governance. This aligns with global reviews indicating that differences in technological readiness and regulatory frameworks create substantial variation in digital ecosystem maturity across industries (Tripathi, 2025). A supportive regulatory environment is consistently linked to successful digital transformation in sectors such as manufacturing, retail, healthcare, and financial services (Alquraish, 2025; Mbanefo et al., 2024; Singh, 2025). Similarly, studies examining digital disruption note that regulatory structures either accelerate or constrain innovation, shaping the strategic landscape within which organizations function (Lei et al., 2023). In the sports sector, variations in global governance, data protection standards, and intellectual property laws create an additional layer of complexity. As the findings show, data regulation emerged as a major area of uncertainty because sports brands increasingly rely on biometric data, fan data, and consumer analytics, which introduces both ethical challenges and strategic opportunities reminiscent of similar tensions documented in studies on personal data ethics (Salazar et al., 2023).

The emergence of consumer co-creation and empowerment as core themes in the findings also resonates with research emphasizing the rise of participatory brand cultures enabled by digital ecosystems. In several industries, digital infrastructures allow consumers to influence product development, branding narratives, and marketing strategies, reflecting a broader shift toward network-based value creation (Sharma & Thapliyal, 2024). In the sports domain, this trend is amplified by fan communities' emotional investment, creating unique forms of engagement that combine identity, culture, and entertainment. The finding that sports brands must evolve into integrated ecosystems echoes conceptual arguments about the transition from organizational silos to interconnected digital ecosystems documented in construction, healthcare, supply chain, and government contexts (Bartko et al., 2024; Mbanefo et al., 2024; Syed et al., 2024; Статівка & Bodnar, 2024). These parallels highlight that sports brands are entering a new era where strategic success depends on adopting ecosystem logic rather than isolated branding strategies.

The emphasis on sustainability as a future driver also reflects broader global shifts. Studies on sustainable branding and green marketing show that digital transformation enhances transparency, accountability, and communication regarding environmental practices (Putri & Pasrizal, 2025). The finding that environmental expectations will influence future sports brand ecosystems mirrors trends in multiple industries where sustainability is becoming a crucial dimension of brand differentiation. This is particularly relevant in sports branding because merchandise production, event operations, and

equipment manufacturing all intersect with environmental supply chains. Research on resilient and adaptable digital infrastructures in public-sector sports systems also indicates that sustainability and resilience are increasingly interconnected through digital transformation (Статівка & Bodnar, 2024). Therefore, the present findings align with the global trajectory that sustainability will become a defining component of sports brand ecosystems.

The identification of strategic agility as a key theme parallels insights from other sectors where digitalization demands rapid adaptation and flexible business models. Reviews of digital business models emphasize that firms must maintain agility to respond to emerging technologies, fluctuating markets, and shifting customer expectations (Shostak & Бегун, 2025). This is particularly important for sports brands, which are highly sensitive to cultural trends, fan behaviors, technological innovations, and global events. Findings from studies in logistics, energy, and supply chain optimization show that strategic agility and integration of smart systems are essential for maintaining competitiveness (Adama et al., 2024; Attah et al., 2024; Gomaa, 2025). The parallel between these industries and sports branding reveals a shared underlying dynamic: digital transformation requires continuous innovation, iterative learning, and adaptive governance for long-term ecosystem viability.

In the scenario analysis, the possibility of a platform-dominated future aligns closely with reviews showing that global digital platforms increasingly mediate economic value, power structures, and consumer relationships (Benetti, 2025). In the sports industry, a similar trend is observable in the dominance of streaming platforms, athlete-driven social media branding, and global merchandising networks. Research on platform ecosystems in healthcare, government, and e-commerce also indicates that platform dominance can reduce organizational autonomy while increasing reliance on external infrastructures (Famoti et al., 2025; Mbanefo et al., 2024; Статівка & Bodnar, 2024). These patterns support the scenario findings that sports brands may face strategic vulnerabilities if they become overly dependent on major digital platforms, reducing control over branding narratives and consumer data.

The fragmented innovation scenario identified in this study is consistent with research indicating that industries often adopt digital technologies unevenly based on financial capacity, technological infrastructure, and managerial capabilities (Noa et al., 2025). Such fragmentation has been observed in manufacturing, retail, finance, and healthcare, where digital transformation barriers include cost, workforce readiness, and organizational culture (Sever, 2024; Tripathi, 2025). Thus, this scenario represents a realistic possibility for the sports sector, particularly for small and mid-sized sports brands with limited digital resources. The literature underscores that uneven adoption can produce disparities in market reach, consumer experience, and brand competitiveness, which may reshape the sports brand landscape in the future.

The sustainability-led scenario identified in the findings also aligns with studies emphasizing the convergence of digital transformation and sustainability-oriented management. Research across sectors shows that digital innovation supports environmental management, ethical decision-making, and long-term ecological responsibility (Sheikhbahei & Ari, 2024). This result highlights that the future of sports branding may involve a hybrid path where technological innovation progresses moderately but environmental imperatives reshape brand identity, product development, and consumer engagement.

Finally, the study's finding that brand ecosystems will become increasingly global in scope due to digital integration reflects research showing that digital platforms support cross-border expansion and international market entry (Irawan, 2025). Sports brands, which already possess global fan networks, will likely accelerate their international operations through digital infrastructure. Reviews of digital transformation in e-commerce and FMCG markets confirm that digital tools facilitate scalable expansion, diversified business models, and personalized outreach across market segments (Pasupuleti, 2025; Putra,

2025). These align closely with the futures-studies insights demonstrating that sports brand ecosystems will become more interconnected, data-driven, and globalized in the coming decade.

This study is limited by its reliance on expert perspectives, which, while essential for futures studies, may reflect subjective interpretations influenced by professional backgrounds and technological exposure. The qualitative design also means that findings cannot be generalized across all sports brands or global regions. Additionally, the pace of technological change may render some projections less accurate over time, and the study did not incorporate quantitative modeling or real-time market analytics that could complement expert-based insights.

Future research should incorporate mixed-method approaches combining scenario analysis with quantitative forecasting tools, machine learning–based trend detection, and longitudinal analysis of sports consumer behavior. Studies could also explore region-specific differences in digital readiness and examine how emerging technologies such as generative AI, decentralized digital assets, and adaptive ecosystems reshape sports branding. Comparative studies across different sports industries or between sports and entertainment sectors could deepen understanding of ecosystem convergence.

Sports brands should prioritize technological readiness, invest in ecosystem-based strategic planning, and build digital capabilities that enhance agility, personalization, and sustainability. They should also develop governance frameworks for ethical data usage, strengthen their autonomy by reducing over-reliance on dominant platforms, and cultivate collaborative innovation networks to ensure resilience and long-term competitiveness.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

This study was conducted in accordance with the university's research ethics guidelines and the approval of the relevant ethics committee. The project titled "Futures Studies of the Integrated Sports Brand Ecosystem with an Emphasis on Technological Transformations" was registered in the university research system and approved on 11 November 2025 with the tracking code 164790063. All participant information was collected voluntarily and treated confidentially.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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