Future of Work and Digital Management Journal

Article type:
Original Research

Article history:
Received 02 November 2024
Revised 01 February 2025
Accepted 11 February 2025
Published online 30 March 2025

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How to cite this article:
Mehrjouyan, N., & Salimi Naeini, S. (2025). Identification of the Operational Dimensions of Dynamic Managerial Capabilities for the Development of a Business Innovation Model in Sports Enterprises. *Future of Work and Digital Management Journal, 3*(1), 1-14. https://doi.org/10.61838/fwdmj.3.1.4

Identification of the Operational Dimensions of Dynamic Managerial Capabilities for the Development of a Business Innovation Model in Sports Enterprises

ABSTRACT

The present study was conducted with the aim of identifying the operational dimensions of dynamic managerial capabilities to develop a business innovation model for sports enterprises. This research employed a mixed-methods approach (qualitative and quantitative). In the qualitative phase, a meta-synthesis method and thematic analysis were first used to extract key concepts from 22 scholarly articles. Subsequently, semi-structured interviews were conducted with 12 academic experts and managers of sports enterprises to collect and analyze data. The validity of the findings was confirmed using Scott's Pi coefficient, and reliability was assessed through the Lawshe method. In the quantitative phase, a 50-item questionnaire was designed based on the qualitative findings, and its analysis through structural equation modeling confirmed the validity and reliability of the model. The results indicated that the operational dimensions of dynamic managerial capabilities include eight main dimensions: organizational learning and continuous development, organizational agility and environmental adaptability, networking and collaboration, resource management and opportunity-seeking, knowledge and customer management, innovative and transformational leadership, technology orientation, and innovation in a sustainable business model. These dimensions were identified as key infrastructures for enhancing innovation in the sports industry and highlight that the success of sports enterprises requires a comprehensive and dynamic system capable of adaptation, responsiveness to environmental changes, and exploitation of innovative opportunities.

Keywords: Dynamic managerial capabilities, innovation, sports enterprises, organizational learning, agility, innovative leadership, business model.

Introduction

The concept of dynamic managerial capabilities has emerged as a pivotal framework for understanding how organizations adapt, innovate, and sustain competitiveness in turbulent environments. Building on the foundational theory proposed by [1], dynamic capabilities refer to the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments. Within this paradigm, dynamic managerial capabilities specifically highlight the role of managers in sensing opportunities and threats, seizing them through appropriate resource allocations, and transforming the organization to maintain strategic advantage [2, 3]. These capabilities are particularly critical in industries characterized by high levels of uncertainty and innovation intensity, such as the sports industry, where shifts in consumer preferences, technological advancements, and global market dynamics require constant adaptation [4, 5].

In recent years, the sports business environment has undergone transformative changes due to digitalization, globalization, and increased competition, creating a fertile ground for the application of dynamic managerial capabilities in

fostering innovation. Research underscores that managerial cognition and decision-making play a decisive role in shaping business model innovation and firm performance [6, 7]. In sports enterprises, managers are tasked with orchestrating diverse resources, including human capital, technological assets, and brand value, to create and sustain unique competitive advantages [8, 9]. Such orchestration demands agility, strategic foresight, and an openness to creativity, which are inherent in the construct of dynamic managerial capabilities [10, 11].

The integration of dynamic managerial capabilities with innovation strategies is particularly significant in the sports sector, where market differentiation often depends on the continuous development of novel products, services, and fan engagement models [12, 13]. Innovation in this context is not limited to technology adoption but encompasses creative changes in processes, marketing approaches, and organizational structures [14, 15]. Dynamic managerial capabilities enable firms to sense emerging opportunities, such as shifts towards sustainable business practices [16, 17], digital transformation [18], and advanced data analytics in performance and consumer behavior [19, 20], and to align their innovation processes accordingly.

The application of dynamic managerial capabilities in sports businesses is further reinforced by the growing body of evidence linking these capabilities to improved organizational performance through enhanced innovation capacity [21, 22]. Firms that actively develop and deploy these capabilities can better navigate complex stakeholder environments, manage competitive tensions, and achieve alignment between mission and market demands [10, 23]. For example, leveraging technological innovation and co-creation with stakeholders fosters service innovation and enhances firm performance in highly competitive industries [24, 25]. In sports, such capabilities translate into adaptive fan engagement platforms, personalized service offerings, and real-time operational adjustments [11, 19].

Moreover, the role of dynamic managerial capabilities extends to sustaining business model innovation (BMI), a process by which organizations design, implement, and refine the ways they create, deliver, and capture value [26, 27]. In sports enterprises, BMI may involve the integration of digital platforms, expansion into new markets, and adoption of sustainability-oriented models [17, 18]. The literature reveals that BMI success hinges not only on technological resources but also on the managerial ability to align such innovations with market demands and organizational strengths [28, 29]. Managers with strong dynamic capabilities can foster a culture of continuous learning, promote cross-functional collaboration, and drive strategic agility [9, 30].

Within the broader context of strategic management, dynamic managerial capabilities also contribute to resilience and adaptability in the face of environmental dynamism [31, 32]. In sports, environmental dynamism manifests in fluctuating sponsorship markets, evolving regulatory frameworks, and rapidly changing fan expectations [33, 34]. The ability to respond effectively to these changes requires not only operational capabilities but also the strategic vision to anticipate shifts and reconfigure resources proactively [2, 5]. Studies confirm that firms with higher levels of dynamic managerial capabilities exhibit greater innovation performance and competitive sustainability, especially when market orientation and entrepreneurial strategies are integrated into their operations [6, 30].

Sustainability and social responsibility have also become integral to sports business strategy, further amplifying the need for dynamic managerial capabilities [16, 17]. Managers must balance economic performance with environmental stewardship and social engagement, leading to the emergence of sustainable business model innovation [10, 12]. Such models often require the adoption of new technologies, partnerships, and governance structures that align with evolving societal

expectations [23, 28]. Dynamic managerial capabilities provide the cognitive and relational tools necessary for orchestrating these multi-dimensional strategies [2, 3].

In addition, the literature highlights the significance of networking and collaboration as enablers of innovation in sports enterprises [11, 31]. Through strategic partnerships and ecosystem participation, sports organizations can access complementary resources, share risks, and accelerate innovation cycles [13, 14]. Dynamic managerial capabilities facilitate the identification and management of such partnerships, ensuring that they contribute to long-term strategic goals [24, 25]. Furthermore, leveraging collaborative innovation enhances adaptability to technological disruptions and market shifts [18, 20].

The intersection of digital transformation and dynamic managerial capabilities is another prominent theme in recent research [19, 28]. The adoption of artificial intelligence, big data analytics, and blockchain technologies in sports operations offers unprecedented opportunities for efficiency and value creation [12, 18]. However, the successful deployment of these technologies depends on managerial competencies in aligning them with strategic objectives and stakeholder needs [22, 23]. Dynamic managerial capabilities, therefore, act as a bridge between technological potential and realized innovation outcomes [6, 9].

Given the complexity of today's sports business landscape, the development of operational dimensions of dynamic managerial capabilities is essential for fostering sustainable innovation models. Prior studies emphasize that these dimensions—such as organizational learning, agility, networking, resource management, knowledge integration, innovative leadership, technology orientation, and sustainable business model design—are interdependent and collectively shape an organization's ability to innovate [8, 21, 31]. The present study builds on this body of knowledge to systematically identify and validate the operational dimensions of dynamic managerial capabilities that drive innovation in sports enterprises.

By adopting a comprehensive approach that integrates insights from strategic management, innovation theory, and sports business studies, this research aims to contribute both theoretically and practically. Theoretically, it extends the application of dynamic managerial capabilities to the context of sports business innovation, offering a detailed operational framework grounded in empirical evidence [1, 2]. Practically, it provides sports managers and policymakers with actionable insights into how these capabilities can be cultivated and leveraged to sustain competitive advantage in increasingly dynamic environments [3, 9]. In doing so, it responds to the growing call for research that bridges the gap between conceptual models of dynamic capabilities and their practical implementation in industry-specific contexts [4, 12].

The aim of this study, therefore, is to identify, categorize, and validate the operational dimensions of dynamic managerial capabilities that can effectively support the development of innovation models in sports enterprises, thereby enabling them to thrive in a rapidly evolving global sports industry.

Methods and Materials

This research is a mixed-methods study (qualitative phase: meta-synthesis and thematic analysis; quantitative phase: structural equation modeling), developmental–applied in terms of purpose, and cross-sectional in terms of the time horizon. In this study, both library and field methods were employed to collect the required research data. In addition to reviewing literature related to the operational dimensions of dynamic managerial capabilities for the development of an innovation model (data collection through library research and meta-analysis of previous studies), semi-structured interviews with

experts and thematic analysis were used to identify and analyze the operational dimensions of dynamic managerial capabilities for the development of the innovation model.

Initially, to identify and analyze the operational dimensions of dynamic managerial capabilities for developing the innovation model, the research field for determining the indicators included all relevant scholarly articles and documents as the selection criteria. Using a systematic literature review tool, articles were retrieved from scientific databases such as Google Scholar, Elsevier, ScienceDirect, SID, and CiteSeer for the period from 2010 to 2024. In this stage, the meta-synthesis method (systematic literature review) was used to analyze the background. To assess the accuracy of the selected items, the Lawshe method was applied, and the opinions of several experts in physical education and sports management were utilized. Meta-synthesis is a qualitative method based on a systematic review of library-based studies to achieve an in-depth understanding of the phenomenon under investigation. Using the Critical Appraisal Skills Programme (CASP) with ten qualitative criteria, each article was evaluated in terms of quality. Each article was scored between 1 and 5 for each criterion. Articles with a total score of 25 or higher were qualitatively approved, and the rest were excluded. Scott's Pi coefficient was used to assess the reliability or validity of the results.

Subsequently, the study employed semi-structured interviews with academic experts (individuals holding a PhD degree, being faculty members, and having at least three published articles related to the topic) to identify and analyze the operational dimensions of dynamic managerial capabilities for developing the innovation model in sports enterprises. The initial coding was performed using thematic analysis. To enhance the validity of the model, expert selection was conducted through purposive sampling and the snowball method. After interviewing 12 experts and conducting initial and secondary coding, the process continued until theoretical saturation was reached. In the final stage, expert opinions were reviewed and matched by two independent coders, and the reliability was calculated using Scott's method, yielding a coefficient of 0.91.

Validity, reliability, and objectivity are criteria used in the conventional positivist research paradigm to evaluate research quality. Similar to an interpretive approach, qualitative thematic analysis differs from the positivist tradition in terms of main assumptions, research objectives, and reasoning processes. Since this study applied a qualitative method, the corresponding validity and reliability measures were adopted. According to Guba and Lincoln (2000), verification of validity and reliability in qualitative research involves four criteria: credibility, transferability, dependability, and confirmability. In this regard, along with the interview questions, a letter signed by the researcher was sent to participants stating an ethical commitment to maintain the confidentiality of interview content and participant information and to refrain from disclosure. Furthermore, with participants' consent, all interviews were recorded to extract key points. Upon obtaining consent, interviews were conducted focusing on perceptions, interpretations, and relevant indicators. In these interviews, respondents were asked to provide feedback on introducing new components or indicators and confirming the collected components and indicators.

To ensure dependability and confirm the validity of the instrument in this study, several measures were taken to maintain interview consistency. These included conducting interviews in a quiet and suitable environment, stating the research purpose at the beginning, ensuring participants' willingness to take part, confirming the clarity of interview questions, transcribing interview content promptly, providing transcripts to interviewees for verification, and analyzing and coding the interviews at the earliest opportunity. In summary, to ensure the trustworthiness of the research data, techniques such as repeated reading, data comparison, summarization, and categorization of information without altering the data were applied. After each interview, the notes were carefully transcribed and returned to the interviewee for verification and correction if

discrepancies were found. To assess the reliability of the interview protocol, the percentage agreement method between two coders was employed.

Table 1.

Reliability Assessment Between Two Coders

No.	Interview No.	Number of Codes	Agreed Codes	Reliability
1	Third Interview	19	16	0.84
2	Seventh Interview	12	12	1.00
3	Tenth Interview	14	13	0.92
Total	45	41	0.91	

Based on this evaluation, the reliability coefficient for the interview protocol in this study was 0.91, which is considered a desirable value from the perspective of researchers. Finally, to examine the appropriateness and validity of the model, the structural equation modeling (SEM) method was used. In this regard, a researcher-developed questionnaire was created based on the factors extracted from the library sources and expert opinions. The items were arranged sequentially, duplicates and similar items were removed, and the final questionnaire included 51 items. After validation using the Lawshe method, one item was removed, resulting in a 50-item questionnaire for distribution. In this study, the opinions of 11 experts were obtained for validation through the Lawshe method. Based on the results, three items scored less than 0.60 and were thus removed, resulting in the final 50-item questionnaire. Construct validity was assessed using SEM, and reliability was measured using Cronbach's alpha. For construct validity, the SEM method with SmartPLS software was applied, and reliability was confirmed with Cronbach's alpha.

Table 2.

Assessment of Cronbach's Alpha, Convergent Validity, and Discriminant Validity Using SEM

Factors	1	2	3	4	5	6	7	8	9	AVE	Cronbach's Alpha (>0.70)
Model	1									1	0.849
Organizational Learning and Continuous Development	0.796	1								0.632	0.796
Organizational Agility and Environmental Adaptability	0.716	0.755	1							0.517	0.845
	Networking and Collaboration	0.643	0.698	0.456	1					0.498	0.765
		Resource Management and Opportunity-Seeking	0.465	0.604	0.549	0.659	1			0.653	0.718
		Knowledge and Customer Management	0.429	0.564	0.456	0.607	0.607	1		0.639	0.817
		Innovative and Transformational Leadership	0.401	0.438	0.427	0.568	0.598	0.578	1	0.718	0.786
	Technology Orientation	0.319	0.369	0.407	0.314	0.498	0.639	0.519	1	0.769	0.746
Innovation in a Sustainable Business Model	0.267	0.396	0.321	0.402	0.428	0.208	0.325	0.446	1	0.607	0.822

In the model, all Cronbach's alpha values for the variables and their sub-components exceeded 0.70, indicating approved and high reliability. To assess validity, both convergent and discriminant validity tests were used. The AVE statistic was greater than 0.40, and the Fornell–Larcker matrix showed a descending pattern, confirming the discriminant and convergent validity of the model's constructs. Additionally, in the data analysis phase, the Kolmogorov–Smirnov test and skewness–kurtosis tests

were applied to assess normality. The research data were found to be non-normal; therefore, confirmatory factor analysis was conducted to validate the model using SmartPLS software.

Findings and Results

The theoretical literature and research background were carefully reviewed and analyzed. First, using the meta-synthesis method, all related articles from 2010 to 2024 in domestic and international scientific databases were examined. The validity of the meta-synthesis for all selected studies was evaluated using the 10 CASP criteria. A total of 246 articles were initially found; after screening titles and abstracts, 149 articles were excluded due to lack of relevance to the study's subject and objectives. From the remaining 97 articles, 48 were removed due to duplication or incompatibility with the study population. Finally, after a full-text review of the remaining 53 articles, 31 were excluded for failing to meet the inclusion criteria. At the last step, 22 articles that met the inclusion criteria and had a quality score above 31 were selected. The coding and classification methods for the extracted information were also reviewed multiple times. All these activities were conducted to ensure the quality of the research findings, through which the items in Table 3 were extracted as the operational dimensions of dynamic managerial capabilities for the development of the innovation model.

Table 3.

Operational Dimensions of Dynamic Managerial Capabilities for the Development of the Innovation Model Extracted from Empirical Background

Theme or Concept	Sub-themes	Researcher (Year)
Organizational Learning Capabilities	Learning during projects, continuous organizational learning, learning from the competitive environment	Harris et al. (2020), Zolfaghari et al. (2021), Alush & Carvalho (2023), Bihat & Sharma (2022)
Innovative Leadership and Change Management	Innovative leadership, creative strategies, dynamic strategy implementation	Kafashpour et al. (2023), Seyedkalali & Heydari (2021), Lin et al. (2020)
Networking and Collaboration	Social networking, inter-organizational collaboration, ecosystem development	Seyedkalali & Heydari (2021), Hammerschmidt et al. (2024), Nosrat Panah (2024)
Resource Management and Opportunity-Seeking	Resource allocation, opportunity identification, entry into emerging markets, knowledge management, integration of digital technology	Bihat & Sharma (2022), Obaya et al. (2019), Seyedkalali & Heydari (2021), Kafashpour et al. (2023), Helfat & Petrov (2015)
Environmental Adaptability and Organizational Agility	Environmental scanning, strategic adaptation, operational agility, social interaction, environmental monitoring	Norouzi et al. (2022), Harris et al. (2020), Andren & Helfat (2023), Teece (2018)
Sustainable Business Model Innovation	Business model design based on sustainability, use of digital technologies, social commitment, marketing innovation	Varess et al. (2023), Andren & Helfat (2023), Ratten (2021), Teece (2020)

The findings indicated that 23 initial concepts, grouped into 6 main concepts or themes, were identified as the operational dimensions of dynamic managerial capabilities for the development of the innovation model, based on the review of 22 articles related to empirical background. To assess content validity, the background evaluation was reviewed by two specialists in this field, and reliability was tested using Scott's Pi coefficient. Scott's Pi, developed by William Scott (1955), is used to measure the reliability of nominal data. In this method, two coders (evaluators) assign codes to the data, and reliability is determined based on the correlation of their coding results:

$$Pi = (OA - EA) / (1 - EA)$$

$$Pi = (0.896 - 0.50) / (1 - 0.50) = 0.792$$

Given that the Scott's Pi coefficient was above 0.70, the reliability of the method and evaluation was confirmed. Then, by referring to the study population, semi-structured interviews were conducted with 12 university professors and managers of sports enterprises (9 academic experts, including 1 full professor, 5 associate professors, and 4 assistant professors, and 3 managers of successful sports enterprises; 71% held doctoral degrees, 39% held master's degrees, and their average work experience exceeded 11.2 years). These experts were selected through a combination of purposive and snowball sampling

methods. Their opinions regarding the operational dimensions of dynamic managerial capabilities for the development of the innovation model were recorded. They mentioned many points and provided explanations for each, which led the researcher to both ask follow-up questions and gather additional items. Ultimately, confident that theoretical saturation had been reached through snowball sampling (based on repetition of opinions during interviews), the researcher summarized the responses, coded them, and categorized the factors after condensing the content.

Table 4.

Coding of Categories and Themes

Theme	Subcategories
Organizational Learning	Knowledge sharing, continuous organizational learning, feedback analysis and process improvement, training and empowerment of human resources, knowledge transfer, continuous improvement
Organizational Agility	Rapid decision-making, responsiveness to market changes, decentralized structure, time management and planning, quick reaction to changes
Networking	Effective stakeholder communication, internal and external networking, cross-sector collaboration, participation in the innovation ecosystem, creation of strategic partnerships
Resource and Opportunity Management	Dynamic resource allocation, multi-skilled hiring, adaptive technologies, optimal resource allocation, innovation opportunity identification, investment attraction
Flexibility and Environmental Adaptation	Continuous monitoring of environmental changes, rapid adaptability to new conditions, risk and uncertainty management, organizational structure adaptation, process innovation, crisis management
Knowledge Management	Partnership with start-ups, personalization of sports services, support for new ideas, transformation of customer knowledge into innovation, innovation in services, product personalization, innovative marketing
Technology Orientation	Use of artificial intelligence, analysis of sports data, online platforms, provision of digital services, development of digital technology capabilities
Innovative and Strategic Leadership	Creating an innovation culture, defining and implementing innovative strategies, employee motivation, transformational leadership, future-oriented vision, systems thinking

Based on the results of the interviews, 46 components within the framework of 8 factors were extracted as the operational dimensions of dynamic managerial capabilities for the development of the innovation model. Finally, the factors extracted from library sources and the opinions of professors and experts were arranged in sequence, and duplicate and similar items were removed.

Table 5.

Final Dimensions and Elements of the Research

Theme	Subcategories
Organizational Learning and Continuous Development	Knowledge sharing, learning during projects, learning from the competitive environment, feedback analysis, knowledge transfer, employee training, continuous improvement
Organizational Agility and Environmental Adaptability	Rapid decision-making, responsiveness to changes, decentralized structure, time management, monitoring environmental changes, strategic adaptation, crisis management, operational agility, social interaction, environmental scanning
Networking and Collaboration	Effective communication with stakeholders, internal and external networking, cross-sector collaboration, strategic partnerships, innovation ecosystem development, inter-organizational cooperation
Resource Management and Opportunity-Seeking	Dynamic and optimal resource allocation, multi-skilled hiring, adaptive technologies, innovation opportunity identification, entry into emerging markets, investment attraction
Knowledge and Customer Management	Partnership with start-ups, market needs analysis, transforming customer knowledge into innovation, innovative marketing, innovation in services, personalization of services and products
Innovative and Transformational Leadership	Creating an innovation culture, employee motivation, transformational leadership, future-oriented vision, systems thinking, formulating innovative strategies, agile strategy implementation
Technology Orientation	Use of artificial intelligence, analysis of sports data, digital platform development, provision of digital services, integration of digital technology into the business model
Innovation in a Sustainable Business Model	Designing a business model with a sustainability approach, using modern technologies, social commitment, alignment with environmental and social values, marketing innovation

The findings showed that 51 initial concepts (elements) and 8 main themes were identified as the operational dimensions of dynamic managerial capabilities for the development of the innovation model in sports enterprises. After obtaining face and content validity using the Lawshe method, 1 component was removed, and 50 concepts were confirmed.

Figure 1.

Qualitative Model of the Operational Dimensions of Dynamic Managerial Capabilities for the Development of the Innovation Model in Sports Enterprises

To confirm the identified dimensions, structural equation modeling (SEM) was used. SEM is a powerful multivariate analysis method that, as an extension of the general linear model, allows the simultaneous testing of a set of regression equations. This method enables researchers to model and evaluate complex relationships between latent (construct) and observed (measured) variables. In SEM, the main goal is to confirm the hypothesized relationships between constructs based on theory. For a relationship in the SEM model to be considered significant, the corresponding path coefficient must be statistically significant (usually tested using the t-test by comparing the calculated t-value with the critical value of 1.96). In PLS software, there are three different approaches to estimating model parameters, each relating to a specific type of data and hypotheses.

The standardized coefficients for all subcomponents were above 0.4; therefore, all values had acceptable factor loadings. Based on the findings, the critical t-statistics for all variables and subcomponents were above 2, confirming the significance of all variables and subcomponents of the research at the 0.05 confidence level.

Table 6.

Values Related to the Measurement Model of Direct Relationships

Relationships	Standardized Coefficient	t-statistic	Significance Level	Result
Organizational Learning and Continuous Development → Development of the Innovation Model	0.200	3.143	0.01	Confirmed
Organizational Agility and Environmental Adaptability → Development of the Innovation Model	0.366	9.653	0.01	Confirmed
Networking and Collaboration → Development of the Innovation Model	0.233	5.369	0.01	Confirmed
Resource Management and Opportunity-Seeking → Development of the Innovation Model	0.687	3.946	0.01	Confirmed
Knowledge Management → Development of the Innovation Model	0.687	3.946	0.01	Confirmed
Innovative and Transformational Leadership → Development of the Innovation Model	0.687	3.946	0.01	Confirmed
Technology Orientation → Development of the Innovation Model	0.687	3.946	0.01	Confirmed
Innovation in a Sustainable Business Model → Development of the Innovation Model	0.687	3.946	0.01	Confirmed

As shown, all constructs of the operational dimensions of dynamic managerial capabilities for the development of the innovation model had acceptable t-values (t > 1.98). In other words, the presence of values above 2 for all remaining path coefficients in the model indicates that all studied constructs were measured optimally with the questions used. Therefore, the results from the questions of each construct can be considered valid and analyzable because, first, they precisely measured what the researcher intended, and second, all respondents had the same interpretation of them. Consequently, these elements explain the operational dimensions of dynamic managerial capabilities for the development of the innovation model.

Table 7.

Goodness-of-Fit Indices

Fit Indices	X^2/df	RMSEA	RMR	GOF
Value	0.9580	0.077	0.0017	0.519
Minimum Acceptable Value	In an ideal fit, this criterion equals one	Less than 0.10	The smaller and closer to zero, the better the model fit	Ideally above 0.40

Based on the findings, the model fit indices indicated good alignment of the data with the research model. The RMSEA value was 0.077, and the GFI value was 0.93, both within the acceptable range. Moreover, the GOF value of 0.519 confirmed the overall fit of the model, indicating strong overall model adequacy. Since all fit indices were within the desired range, the model demonstrated good fit.

Discussion and Conclusion

The results of this study identified eight core operational dimensions of dynamic managerial capabilities—organizational learning and continuous development, organizational agility and environmental adaptability, networking and collaboration, resource management and opportunity-seeking, knowledge and customer management, innovative and transformational leadership, technology orientation, and innovation in a sustainable business model—that collectively support the development of innovation models in sports enterprises. These findings align with the conceptualization of dynamic capabilities as the firm's ability to sense opportunities and threats, seize them through resource orchestration, and reconfigure organizational assets to maintain competitiveness [1, 2]. In the context of sports, these dimensions provide a structured operational framework for responding to the sector's complex and evolving demands, where competitive advantage increasingly hinges on adaptability, creativity, and strategic foresight [4, 5].

The strong relationship observed between organizational learning and continuous development with innovation model advancement supports earlier findings that emphasize the necessity of knowledge acquisition, knowledge sharing, and continuous improvement for sustained innovation performance [21, 22]. Organizational learning equips sports enterprises to absorb new information from competitive and technological environments, transforming it into actionable strategies that enhance performance [7, 9]. This aligns with the argument that learning during projects, feedback analysis, and continuous skill development serve as a foundation for strategic agility [3]. The high factor loadings in this dimension reflect that sports managers who institutionalize learning processes are better positioned to anticipate and respond to market shifts.

Organizational agility and environmental adaptability emerged as the second significant dimension, indicating the necessity for rapid decision-making, strategic flexibility, and operational responsiveness. This finding resonates with studies that highlight agility as a dynamic capability enabling firms to navigate uncertainty and leverage emergent opportunities [14,

28]. In sports enterprises, agility not only involves swift reactions to market changes but also proactive environmental scanning and crisis management [10, 15]. The results underscore that agility is both a cultural and structural characteristic, where decentralized decision-making and cross-functional coordination play vital roles [13, 29].

The dimension of networking and collaboration further reinforces the interdependence of internal and external resources in driving innovation. Strong, trust-based relationships with stakeholders, both within and outside the organization, facilitate access to complementary assets, market knowledge, and co-innovation opportunities [11, 31]. Previous research has shown that collaboration within innovation ecosystems accelerates product and service development cycles, especially when technological changes and customer expectations evolve rapidly [24, 25]. The present study confirms that sports enterprises leveraging strategic partnerships—whether with technology firms, academic institutions, or other sports organizations—are more capable of sustaining innovation momentum and achieving market differentiation [12, 23].

Resource management and opportunity-seeking also proved to be a crucial operational dimension, reflecting the capacity to allocate and reallocate resources dynamically to exploit emerging opportunities. The results are consistent with prior studies suggesting that opportunity identification and optimal resource deployment are critical drivers of innovation performance [6, 8]. In the sports context, this often entails securing multi-skilled talent, integrating adaptive technologies, and expanding into emerging markets [18, 33]. The alignment between resource management and opportunity-seeking highlights a proactive managerial mindset, where resource fluidity is leveraged as a competitive weapon [2, 19].

The knowledge and customer management dimension emphasizes the role of integrating customer insights and knowledge systems into the innovation process. This aligns with the growing recognition that customer knowledge is a strategic resource for service personalization and innovation design [15, 29]. The transformation of customer feedback into innovative offerings is particularly relevant in sports enterprises, where fan engagement and satisfaction are primary performance indicators [7, 9]. Prior studies confirm that knowledge-driven customer relationship strategies contribute to both short-term performance gains and long-term brand loyalty [22, 25].

The inclusion of innovative and transformational leadership as a core operational dimension aligns with literature emphasizing leadership's catalytic role in shaping organizational culture, vision, and change readiness [3, 10]. Leaders who articulate a compelling vision, inspire employees, and foster a culture of innovation significantly enhance organizational capability to adapt and thrive in dynamic environments [14, 20]. The present findings corroborate that transformational leadership not only motivates personnel but also ensures the alignment of strategic initiatives with environmental realities [11, 12].

Technology orientation emerged as a distinct operational dimension, underscoring the necessity of integrating emerging technologies into core operations. This finding is in line with the literature that positions technology adoption—such as artificial intelligence, data analytics, and digital platforms—as a pivotal enabler of innovation and performance in sports organizations [18, 28]. The successful integration of technology requires managerial skills in aligning digital tools with strategic objectives [13, 19]. The high statistical significance of this dimension supports the argument that technology-oriented firms are better equipped to design and implement innovative business models [23, 26].

Finally, innovation in a sustainable business model was validated as a core operational dimension, reflecting the integration of environmental, social, and economic considerations into value creation strategies [16, 17]. In the sports sector, this involves aligning operations with sustainability goals while maintaining market competitiveness [10, 12]. Prior studies

confirm that sustainability-oriented innovation not only meets regulatory and societal expectations but also enhances brand image and stakeholder trust [18, 28]. The present results reinforce the view that embedding sustainability into business models requires dynamic managerial capabilities to navigate the trade-offs between short-term profitability and long-term viability [2, 3].

Overall, the findings contribute to the growing body of knowledge that positions dynamic managerial capabilities as essential enablers of innovation in sports enterprises. The operationalization of these capabilities into eight dimensions provides a practical framework for managers seeking to systematically enhance their organization's innovation potential. These results also extend the theoretical scope of dynamic capability literature by contextualizing it within the specific challenges and opportunities of the sports industry [1, 4]. The alignment of this study's findings with previous research confirms the robustness of the identified dimensions and their relevance to contemporary sports business contexts.

Despite the valuable contributions of this study, several limitations must be acknowledged. First, the research design relied on data collected from a specific subset of sports enterprises, which may limit the generalizability of the findings to other industries or broader segments of the sports sector. The purposive and snowball sampling methods, while effective for accessing expert insights, may introduce selection bias, potentially overrepresenting perspectives aligned with particular managerial philosophies. Second, the cross-sectional nature of the study prevents examination of how the operational dimensions of dynamic managerial capabilities evolve over time in response to environmental changes. Third, although the study employed both qualitative and quantitative methods to enhance validity, the measurement of some constructs was based on self-reported data, which could be influenced by social desirability bias. Finally, the model validation was conducted using a specific statistical approach, and future studies could benefit from employing alternative modeling techniques to test the stability of the findings across different analytical frameworks.

Future studies should explore the longitudinal dynamics of the identified operational dimensions, investigating how they adapt and interact over time in response to shifts in the sports business environment. Comparative studies across different sports industries, regions, or organizational sizes could yield deeper insights into the contextual factors influencing the development and deployment of dynamic managerial capabilities. Additionally, integrating performance metrics—such as financial outcomes, fan engagement indicators, and sustainability performance—could help establish stronger causal links between the identified dimensions and organizational success. Future research could also benefit from expanding the methodological scope to include experimental or simulation-based approaches that model how changes in specific dimensions influence innovation outcomes under varying environmental conditions. Finally, investigating the role of cultural, institutional, and policy contexts in shaping these capabilities would provide a more comprehensive understanding of their applicability in diverse global settings.

Practitioners in sports enterprises should prioritize the systematic development of the eight identified operational dimensions of dynamic managerial capabilities to foster innovation readiness. Organizational learning systems should be institutionalized to ensure continuous skill enhancement and knowledge transfer across all levels of the organization. Building agility into decision-making processes, supported by decentralized structures, will enable rapid responses to market and environmental shifts. Establishing strong networks and strategic collaborations can enhance resource access and innovation capacity. Effective resource management and opportunity-seeking should be embedded into managerial routines, supported by robust knowledge and customer management practices that leverage market insights for service personalization.

Leadership development programs should emphasize transformational and innovative leadership qualities, while technology orientation must be integrated into the strategic planning process to ensure alignment between digital tools and organizational goals. Finally, embedding sustainability into business models should be treated as both a strategic imperative and a source of competitive advantage, ensuring long-term resilience and relevance in an increasingly sustainability-conscious market.

Acknowledgments

We would like to express our appreciation and gratitude to all those who cooperated in carrying out this study.

Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. Written consent was obtained from all participants in the study.

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.

Funding

This research was carried out independently with personal funding and without the financial support of any governmental or private institution or organization.

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