

Digital Economy Empowerment and the International Competitiveness of China's Sports Industry: A Qualitative Analysis

Li Minyi¹, Noorziah Mohd Salleh^{2*}, Pg Mohd Auza'e Pg Arshad³

¹Faculty of Business Management, Universiti Teknologi MARA Cawangan Sabah, Kota Kinabalu 88770, Sabah, Malaysia

XinYu University Xinyu Sunshine Road 2666,338000, Jiang xi, China

Email: 70035030@qq.com

²Faculty of Business Management, Universiti Teknologi MARA Cawangan Sabah, Kota Kinabalu 88770, Sabah, Malaysia

Email: noorziah@uitm.edu.my

³Faculty of Business Management, Universiti Teknologi MARA Cawangan Sabah, Kota Kinabalu 88770, Sabah, Malaysia

Email: mohdauzae@uitm.edu.my

ABSTRACT

The digital economy is fundamentally transforming global industries; however, its specific impact on enhancing the international competitiveness of China's sports sector remains inadequately examined. As a significant contributor to economic growth and a strategic tool for global engagement, China's sports industry increasingly depends on digitalization to maintain its competitive advantage. This study addresses a critical gap in the literature by investigating the mechanisms through which digital economy empowerment fosters international competitiveness. Utilizing a qualitative approach grounded in theory and supplemented by case studies, we draw insights from 23 in-depth interviews with industry experts and enterprise representatives. Our findings reveal that four primary digital drivers—technological innovation, digital platforms, financial systems, and policy support—activate enabling mechanisms such as efficiency enhancement, innovation-driven development, global market expansion, and user engagement. These mechanisms are mediated by organizational capabilities, including dynamic adaptability, digital governance, brand and intellectual property management, and internationalization capacity. The resulting outcomes encompass significant improvements in cost efficiency, innovation speed, market share, brand premium, and supply chain leadership. Despite promising opportunities arising from increasing global digital demand and emerging markets, challenges such as regulatory complexity, cost pressures, and talent shortages remain prevalent. This study proposes a novel theoretical framework that delineates the digital empowerment process, providing valuable academic and practical contributions for policymakers and enterprises seeking to

CORRESPONDING

AUTHOR (*):

Noorziah Mohd Salleh

(noorziah@uitm.edu.my)

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harness digital transformation for sustained international competitiveness.

Contribution/Originality: The paper's primary contribution is finding that a new theoretical framework that elucidates the mechanism and process by which digital transformation empowers China's sports industry to enhance its international competitiveness, providing theoretical and practical references for policymakers and enterprises.

1. Introduction

The rapid rise of the digital economy has significantly transformed global economic landscapes, prompting fundamental changes in industrial structures and reshaping international competitive dynamics (Brynjolfsson & Kahin, 2002). Within this evolving framework, digitalization is increasingly viewed not merely as an option but as a strategic imperative for sustaining long-term competitive advantage among nations (Bukht & Heeks, 2017). As the world's second-largest economy, China has prioritized digital transformation within its developmental strategy, as demonstrated by national initiatives such as "Digital China" and "Internet Plus," which embody a state-driven effort to integrate digital technologies across all economic sectors.

In this broader context of transformation, the sports industry is marked by both tension and potential. While China has emerged as the world's largest manufacturer of sporting goods, leveraging economies of scale and traditional low-cost production advantages, this competitive model centered on cost leadership is becoming increasingly unsustainable. The digital transformation of China's sports industry is not only a path to enhance competitiveness, but also a key lever for achieving sustainable development. The digital innovation practices of domestic enterprises have proven its positive role in optimizing structure and reducing energy consumption. Rising labor costs, the restructuring of international supply chains, and the resurgence of trade protectionism have all diminished the original competitive advantage (Porter, 1990). According to the National Bureau of Statistics, the total output of China's sports industry reached 38,421 billion yuan (approximately USD 541 billion) in 2024, while its value added was 16,033 billion yuan (approximately USD 226 billion), accounting for about 1.19% of GDP (National Bureau of Statistics of China, 2025). The development bottleneck of China's sports industry is closely related to its unreasonable organizational structure. The traditional hierarchical structure is difficult to adapt to the agility requirements of digital transformation. Furthermore, the development of the manufacturing and service industries remains unbalanced. Although the sports service industry accounted for 57.3% of China's sports industry in 2023 (General Administration of Sport of China, 2024), it still lacks strength and cohesion in cross-border competitiveness. In 2023, the import value of major sports service trade reached 51.72 billion yuan, accounting for 97.79% of the total import and export value, while the export value reached 1.17 billion yuan, accounting for 2.21% of the total import and export value, resulting in a trade deficit of 50.55 billion yuan. Concurrently, the COVID-19 pandemic has accelerated structural changes, compelling enterprises to swiftly adopt digital channels, such as online fitness platforms, virtual event operations, and cross-border e-commerce, to ensure business continuity and market growth. Competition in the global sports industry has shifted from resource grabbing to value co-creation, with emerging markets such as the Middle East becoming hotspots for investment in sports

digitalization, providing new opportunities for Chinese companies (PwC, 2023).

In response to these challenges, emerging digital technologies—including artificial intelligence (AI), big data analytics, blockchain, cloud computing, and the Internet of Things (IoT)—are creating new avenues for innovation, operational efficiency, and market development in sports (Teece, Pisano, & Shuen, 1997). The global sports industry is witnessing accelerated professionalization driven by digital transformation, with sports organizations increasingly leveraging data analytics, immersive technologies, and digital platforms to optimize operations and enhance fan experiences (Pete, Kat Harwood, Brooke, David, Chad, Laura & Jeff, 2025). These technologies enhance production and supply chain efficiency while simultaneously reshaping value creation within the sports ecosystem. For instance, AI-driven product design and intelligent manufacturing reduce the research and development cycle, whereas digital platforms facilitate precision marketing and global fan engagement (Brynjolfsson & Kahin, 2002). Cloud-based data analytics support evidence-based management decisions, and blockchain technology ensures transparency in sponsorship and broadcasting rights. Concurrently, advancements such as 5G and immersive media are transforming the sports consumption experience. The "holographic live broadcast" implemented by the Qingdao Marathon in 2025 represents a significant milestone in the digital management of events. According to Guo's viewpoint, these innovations demonstrate that digitalization constitutes not merely a technical adjustment but also a structural transformation that redefines the competitive landscape, facilitating the transition of China's sports industry from a cost-driven model to an innovation-driven one, thereby positioning it as a key player in the global digital economy (Guo & Guo, 2025).

Nevertheless, these promising developments are tempered by persistent challenges. This technological divide reflects the heterogeneous distribution of strategic resources and capabilities among firms, which, according to the Resource-Based View (Barney, 1991), constitutes a key determinant of sustained competitive advantage. Although global research has highlighted the role of digitalization in enhancing competitiveness, there remains a lack of systematic investigation into how digital transformation specifically reshapes the global competitiveness of China's sports industry. This study addresses this critical research gap. By employing a qualitative methodology that integrates grounded theory with case study analysis, this research explores the mechanisms, opportunities, and limitations associated with digitalization. Ultimately, it aims to foster a comprehensive understanding of how the digital economy enhances the international competitiveness of China's sports industry, providing nuanced insights in the context of evolving global digital trends.

1.1 Research Objectives

This study aims to:

- i. Examine how the digital economy empowers the international competitiveness of China's sports industry through technological, financial, and policy-driven mechanisms.
- ii. Identify the enabling processes and organizational capabilities mediating this empowerment.
- iii. Develop a conceptual framework that explains the dynamic interaction between digital transformation and global competitiveness in the sports sector.

2. Literature Review

2.1. International Competitiveness in the Sports Industry

The concept of international competitiveness has consistently held a central position in economic and management scholarship, typically framed through attributes such as productive efficiency, innovative capacity, and the maintenance of advantageous positions in global markets (Porter, 1990). Porter's Diamond Model (1990) emphasizes the importance of demand conditions, factor endowments, related industries, and firm strategies in shaping competitive outcomes. When applied to the sports industry, competitiveness transcends conventional metrics like production efficiency and cost leadership, encompassing aspects such as brand equity, innovation in offerings, and the ability to penetrate and expand in international markets (Barney, 1991). An increasing body of literature argues that the sports sector possesses a dual character, functioning simultaneously as an economic engine and a cultural institution (Andreff & Szymanski, 2006). Therefore, evaluating international competitiveness requires moving beyond purely economic indicators to include symbolic and experiential elements, such as fan engagement, media visibility, and mega sporting events. In China, the government has prioritized the sports industry as a strategic initiative, viewing it as essential for both economic modernization and the enhancement of cultural soft power. However, despite being the world's largest manufacturer of sporting goods, China's global competitiveness is hindered by relatively weak brand recognition, reliance on OEM models, and a delay in adopting digital technologies. Customs statistics confirm the trade pattern of China's sports industry, which is characterized by "strong manufacturing and weak services." Digital transformation needs to focus on overcoming the shortcomings in service trade exports.

Empirical studies increasingly demonstrate that competitive advantages in the sports industry are primarily driven by the integration of digital tools, which foster innovation and enhance global reach. For example, established international brands such as Nike and Adidas have developed deeply immersive consumer experiences through cohesive digital ecosystems. In contrast, prominent Chinese companies like Li-Ning and Anta have only recently escalated their initiatives toward digital modernization. This disparity highlights the necessity of examining how the digital economy can act as a catalyst for enhancing the international competitiveness of China's sports sector.

2.2. The Digital Economy: Concepts and Dimensions

Broadly defined, the digital economy encompasses economic activities that emerge from the diverse daily interactions among individuals, businesses, devices, data, and processes via digital networks (Bukht & Heeks, 2017). It includes core digital sectors—such as ICT manufacturing and platform-based services—as well as digitally enhanced operations within traditional industries. Fundamentally, the digital economy signifies a shift from resource-intensive growth to models driven by knowledge and data (Brynjolfsson & Kahin, 2002).

Several interconnected dimensions support the digital economy's significance to the sports industry:

- i. **Digital Technologies:** Cutting-edge innovations—including artificial intelligence (AI), big data, the Internet of Things (IoT), blockchain, and 5G—are transforming the generation, dissemination, and application of information. AI-powered

analytics enhance athlete training regimens and improve predictions of consumer behavior, while IoT-enabled wearables collect real-time biometric and performance data. Additionally, blockchain technology ensures the integrity and management of digital assets and broadcasting rights.

- ii. **Digital Platforms:** E-commerce portals, streaming services, and social networks form the backbone of digital consumer interaction. In the realm of sports, these platforms facilitate global event broadcasting, cultivate interactive fan communities, and promote direct-to-consumer (DTC) strategies. Notably, cross-border e-commerce has emerged as a crucial avenue for Chinese sports enterprises pursuing international expansion.
- iii. **Digital Finance:** The rise of mobile payments, online banking, and blockchain-enabled settlements reduces transactional friction in international trade. For sports organizations, digital financial systems optimize processes such as ticketing, merchandise sales, and subscription-based services for audiences across borders.
- iv. **Policy Environment:** Government initiatives significantly shape the digital economy. In China, policies like the Digital Economy Development Plan (2021–2025) and the “Internet Plus” strategy have not only allocated resources but also provided institutional legitimacy for digital transitions within the sports sector and related fields.
- v. Collectively, these elements demonstrate that the digital economy represents a complex constellation of technological, platform-driven, financial, and policy components that collectively redefine industrial competitiveness.

2.3. Digital Transformation in the Sports Industry

Digital transformation refers to the extensive integration of digital technologies into organizational processes, fundamentally reshaping operational methodologies and value creation (Verhoef et al., 2021). In the sports industry, this transformation is evident across several domains:

- i. **Manufacturing and Supply Chains:** Intelligent manufacturing systems, which incorporate automated production and predictive maintenance, reduce costs and enhance adaptability in the production of sporting goods. Chinese companies are increasingly utilizing AI-assisted design and digital twinning to accelerate product development timelines.
- ii. **Sports Consumption and Fan Engagement:** Digital streaming services provide global real-time access to athletic events, effectively overcoming geographical barriers. Social media promotes participatory fandom, while gamification and virtual reality (VR) enhance consumer immersion. The rise of online fitness platforms during the COVID-19 pandemic exemplifies this trend, introducing innovative revenue models and engagement strategies.
- iii. **Event Management and Broadcasting:** Digital solutions are transforming ticketing, venue management, and content distribution. “Smart stadiums,” equipped with IoT sensors, improve safety, operational efficiency, and the spectator experience. Recent industry practices show that innovative out-of-venue immersive experiences, such as shared reality domes and large-screen simulator-based events, are redefining fan engagement beyond traditional stadiums (Pete Giorgio et al., 2025). Additionally, blockchain applications enhance transparency in broadcasting rights management, mitigating piracy and stabilizing revenue streams (OECD, 2020).
- iv. **Marketing and Branding:** Digital marketing enables sports organizations to

deliver personalized content, track engagement metrics, and assess investment returns. The construction of a sports digital ecosystem requires the driving force of innovation and entrepreneurship. Enterprises need to integrate resources from multiple parties, including platforms, users, and partners, to form a value-symbiotic network (Thukral & Ratten, 2021). In China, live commerce, which combines live streaming with e-commerce, has emerged as an effective platform for promoting sports merchandise.

- v. Internationalization Strategies: The digital economy reduces market entry barriers for small and medium-sized enterprises (SMEs) by lowering transactional costs and facilitating direct consumer engagement (Brynjolfsson & Kahin, 2002). Cross-border e-commerce and digital supply chains enable Chinese brands to compete in global markets with minimal reliance on intermediaries. Sports startups are key drivers of digital transformation, and their flexible organizational structure gives them unique advantages in areas such as cross-border digital services and innovation in niche markets.
- vi. Essentially, digital transformation is reshaping the entire sports value chain—from production to consumption—thereby directly impacting international competitiveness (Porter, 1990; Teece et al., 1997).

2.4. Mechanisms of Digital Empowerment

While the adoption of digital technology is increasingly prevalent, the mechanisms through which the digital economy enhances competitiveness require further theoretical examination. A synthesis of empirical and conceptual literature reveals four enabling mechanisms:

- i. Efficiency Enhancement: Digital tools optimize production and logistics, reducing costs and expediting processes. In supply chain management, predictive analytics and intelligent logistics mitigate inefficiencies and delays, thereby strengthening cost-based competitive advantages (Brynjolfsson & Kahin, 2002).
- ii. Innovation-Driven Development: Digitalization fosters the creation of novel products and services. Online fitness applications, e-sports, and virtual tournaments exemplify new business paradigms enabled by digital technologies. This innovation promotes differentiation, a vital component of success in international markets.
- iii. Global Market Expansion: Digital platforms for cross-border e-commerce and media streaming provide firms with access to international audiences, free from traditional physical constraints. These platforms also assist smaller enterprises in overcoming marketing and distribution challenges, thereby facilitating internationalization.
- iv. User Engagement and Value Co-Creation: Digital media facilitate interactive and collaborative consumption experiences. Consumers evolve from passive recipients to active co-creators of value through fan communities, real-time feedback, and customized services. This shift reinforces brand loyalty and establishes lasting competitive advantages (Andreff & Szymanski, 2006).
- v. These mechanisms align with dynamic capability theory (Teece et al., 1997), which emphasizes the ability to sense, seize, and reconfigure resources to maintain competitiveness.

2.5. Challenges in Digital Economy Adoption in Sports

Despite its potential, the integration of the digital economy presents significant

challenges for sports enterprises, particularly in China. Digital transformation is essentially a symbiotic process of opportunities and challenges. Its core contradiction lies in the synergy between technology adaptation, organizational change and the external environment. This principle also applies to the sports industry (Cho et al., 2018).

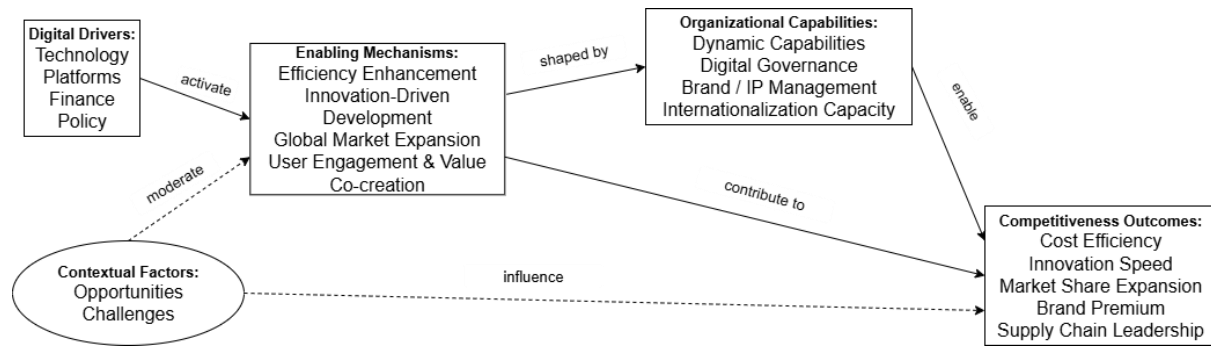
- i. High Costs of Digital Transformation: Small and medium-sized enterprises (SMEs) often face financial constraints that hinder the adoption of advanced technologies. Investments in smart manufacturing or digital platform integration frequently entail prohibitive upfront costs.
- ii. Regulatory Barriers: Cross-border e-commerce and digital content distribution navigate complex regulatory landscapes, including data protection laws, intellectual property regulations, and trade policies (OECD, 2020).
- iii. Data Security and Privacy: Increased reliance on big data and digital platforms raises concerns about cybersecurity and data ethics. Organizations must balance regulatory compliance with the necessity of building consumer trust.
- iv. Talent Shortage: The sports industry requires interdisciplinary talent skilled in both sports management and digital competencies. Currently, China faces a shortage of such expertise, which hampers digital initiatives.
- v. Global Competition: As digital transformation advances globally, Chinese enterprises face competition not only from traditional rivals but also from digitally mature firms in Europe, North America, and emerging Southeast Asian markets.
- vi. These challenges highlight that digital adoption is non-linear and path-dependent, influenced by economic, institutional, and organizational contingencies (Barney, 1991; Teece et al., 1997).

2.6. Research Gap and Conceptual Framework

The existing literature reveals three key observations. First, international competitiveness in sports increasingly intertwines with digitalization, impacting production, innovation, and global outreach (Porter, 1990). Second, the digital economy is multidimensional, encompassing technological, platform, financial, and policy aspects that collectively reshape competitive outcomes (Brynjolfsson & Kahin, 2002; Bukht & Heeks, 2017). Third, while international studies have addressed digital transformation in sports, a comprehensive understanding of how the digital economy enhances international competitiveness in China's sports industry remains insufficiently developed.

This study aims to fill these gaps by introducing a theoretical framework based on empirical evidence collected from industry experts and enterprises. The digital transformation of global industries relies heavily on dynamic capabilities, namely, the ability of enterprises to perceive, seize, and reconstruct digital resources. This theoretical perspective provides key support for analyzing the competitiveness of the sports industry. The framework proposes that digital drivers serve as catalytic inputs that activate enabling mechanisms, which are mediated by organizational capabilities and moderated by contextual opportunities and challenges (As shown in Figure 1). This process ultimately leads to enhanced international competitiveness across dimensions such as cost efficiency, innovation velocity, market share, brand equity, and supply chain leadership.

Figure 1: Analytical framework of digital economy empowerment and international competitiveness in the sports industry



Source: Constructed based on Porter's diamond model (Porter, 1990), dynamic capability theory (Teece et al., 1997), and relevant insights from literature on digital economy and platform-based internationalization.

Figure 1 illustrates the conceptual framework of this study, which illustrates how the digital economy can enhance the international competitiveness of China's sports industry. As shown in the figure, digital economy factors (such as digital technologies, digital platforms, and digital services) are key drivers that activate multiple enabling mechanisms. These mechanisms include: expanding international influence, enhancing product and value chain competitiveness, promoting platform-based market access, and driving digital transformation of sports services and consumption. These mechanisms work through organizational level capabilities, including digital governance, data-driven decision-making, platform utilization, and internationalization capabilities. At the same time, the framework explicitly incorporates contextual constraints that affect the effect of digital empowerment, such as regulatory complexity, cultural perceptions and human capital constraints. In general, Figure 1 visually shows the non-linear and multi-dimensional path of digital economy reshaping the competition pattern of the sports industry, providing a comprehensive framework for data analysis and interpretation of this study.

3. Research Methods

3.1. Research Design

This study employs a qualitative research framework to develop a nuanced understanding of how the digital economy influences the international competitiveness of China's sports industry. Given the exploratory aims of this research and the relatively limited empirical foundation in this specific area, a qualitative methodology was deemed most suitable for capturing rich, contextual insights and facilitating theory building based on empirical evidence. Methodologically, the investigation integrates grounded theory with a case study approach. Grounded theory provides a systematic process for conceptualizing and categorizing phenomena through iterative coding and constant comparative analysis (Corbin & Strauss, 2014), while the case study component allows for contextual grounding and empirical validation within real-world organizational and industrial settings.

3.2. Sampling and Participants

A purposive sampling strategy was employed to identify individuals with significant expertise and practical experience in China's sports industry. The study included in-depth interviews with 23 participants, selected to ensure representation across key stakeholder groups, such as sports equipment manufacturers, operators of digital fitness platforms, event management specialists, policy officials, and academic researchers. This strategic diversity facilitated the incorporation of multifaceted perspectives from various segments of the sports sector. Participant selection was guided by their documented involvement in digitalization projects or roles in competitiveness-related strategic planning.

Table 1: Distribution of Respondents on Demographic Profile

Demographic Criteria	Characteristic	Frequency	Percentage (%)
Gender	male	15	65.2%
	female	8	34.8%
Age	Under 30	4	17.4%
	31-40 years old	7	30.4%
	41-50 years old	9	39.1%
	51-60 years old	3	13.0%
Level of study	Over 60	0	0.0%
	Associate degree or below	3	13.0%
	Bachelor's degree	5	21.7%
	Master's degree	10	43.5%
The located City	Doctoral degree	5	21.7%
	First-tier cities	12	52.2%
	Second-tier cities	4	17.4%
	Third tier and below	7	30.4%
Industry sector	Government department management	2	8.7%
	Business management	5	21.7%
	Competition performance	2	8.7%
	Fitness and Leisure	4	17.4%
	Facility construction management	1	4.3%
	Education and training	4	17.4%
Industry sector	Sports economics	1	4.3%
	Research institutions	2	8.7%
	Consumer representative	2	8.7%

Years in the industry	Less than 5 years	3	13.0%
	6-10 years	10	43.5%
	More than 10 years	10	43.5%
TOTAL		23	100%

As summarized in Table 1, the demographic composition of the participants reveals several noteworthy patterns. Gender representation was skewed toward males (65.2%, $n = 15$), with females constituting 34.8% ($n = 8$). This disparity reflects persistent gender imbalances in certain segments of China's sports industry, although female involvement is on the rise. Regarding age distribution, the majority of respondents were in their peak career phases: 39.1% ($n = 9$) were between 41 and 50 years old, while 30.4% ($n = 7$) were aged 31 to 40. Smaller proportions were under 30 (17.4%, $n = 4$) or between 51 and 60 (13%, $n = 3$). This profile suggests a sample characterized by extensive professional experience and a receptiveness to technological innovation. The educational backgrounds of participants were predominantly advanced, with 43.5% ($n = 10$) holding a master's degree and 21.7% ($n = 5$) possessing doctoral qualifications. Bachelor's degrees were held by 21.7% ($n = 5$), while 13% ($n = 3$) had an associate degree or lower. These figures highlight the highly qualified nature of the sample, which aligns with the knowledge-intensive demands of digitalization in sports. Geographically, over half of the participants were based in first-tier cities (52.2%, $n = 12$), with the remainder located in second-tier (17.4%, $n = 4$) and third-tier or lower-tier cities (30.4%, $n = 7$). This distribution indicates that digital transformation efforts, while concentrated in major urban centers, are also emerging in less developed regions.

The sample included a variety of industry sectors, such as business management (21.7%, $n = 5$), fitness and leisure (17.4%, $n = 4$), and education and training (17.4%, $n = 4$). Other represented sectors included government departments, competitive sports performance, and research institutions (each 8.7%, $n = 2$), as well as niche roles in facility management, sports economics, and consumer representation. Regarding professional experience, 87% of participants possessed over five years of industry involvement, evenly divided between those with 6–10 years and those with over ten years (each 43.5%, $n = 10$). Only 13% ($n = 3$) had fewer than five years of experience, indicating that the sample primarily consisted of seasoned professionals.

Table 2. Profile of Interview Participants

Participant Code	Surname	Position
P1	Zhang	Section Head, Sports Industry Division, Municipal Bureau of Education and Sports
P2	Li	Researcher in Digital Economy, Department of Economic Affairs, National Sports Administration
P3	Wang	Director, New Retail Business Unit, Leading Sportswear Group
P4	Chen	Vice President, Digital Fitness Products, Sports Technology Platform
P5	Zhang	Operator and Manager of Aquatic Sports Facilities
P6	Zhang	Founder, Sports Technology Enterprise

Participant Code	Surname	Position
P7	Liu	Head of Digital Marketing, Professional Basketball League
P8	Lin	Virtual Reality Training Consultant, National Artistic Swimming Team
P9	Zhao	Head of Intelligent Equipment R&D, Chain Fitness Brand
P10	Xu	Digital Curriculum Designer for Personal Training Programs
P11	Yu	Founder, Sports and Leisure Enterprise
P12	Xie	Sports Dance Training Operator and Coach
P13	Zheng	Director, Smart Stadium Operations Center
P14	Zhou	Project Manager, Intelligent Stadium Systems
P15	Fang	Professor and Director, Digital Sports Research Center
P16	Liu	Founder, Sports Education and Training Enterprise
P17	Hu	Associate Dean, School of Physical Education
P18	Tang	Founder, Local Sports Service Enterprise
P19	Wu	Head, Esports Athlete Management Division
P20	Cheng	Senior Analyst, Sports Industry Research Institute
P21	Chen	Researcher in Digital Economy, University Faculty Member
P22	Lu	Data Analyst, Marathon Enthusiasts Association
P23	Su	Experienced User of Virtual Sports Event Streaming Platforms

Table 2 summarizes the coding scheme and professional backgrounds of the 23 interview participants. To ensure confidentiality, only participant codes and surnames are reported.

In summary, the demographic characteristics of the participants suggest a mature, highly educated, and experienced cohort, with substantial representation from economically advanced regions and diverse industry backgrounds. This composition ensures that the collected data reflect not only high-level strategic and policy perspectives but also operational and consumer-focused insights, thereby providing a comprehensive foundation for analyzing the interplay between digital economy factors and the international competitiveness of China's sports industry.

3.3. Research site and background

This study was conducted in China, and data collection focused on major sports industry centers, including Beijing, Shanghai, and some cities with more developed sports and digital economies. These locations were chosen mainly for the following three reasons. First of all, these regions are the core regions for China's sports industry policy making,

industrial clusters and international cooperation, with a large number of sports enterprises, professional leagues, digital platform companies and regulatory agencies gathered. Secondly, these regions have been at the forefront of digital economy development, especially in the areas of platform services, data-driven management and cross-border digital trade, which are highly compatible with the objectives of this study. Third, experts and stakeholders in these regions are more likely to have direct experience of international markets and digital transformation practices, thus providing rich and information-intensive insights for qualitative analysis.

3.4. Research object and sample selection

The subjects of this study are the key stakeholders involved in the internationalization and digital transformation of China's sports industry. Unlike program participants or consumers, the target population of this study is industry experts and practitioners with strategy, management or policy-related experience. Specifically, the subjects included senior managers of sports enterprises, managers of digital sports platforms, professionals in sports related technology companies, industry consultants, and policy makers or association representatives with direct knowledge of international operations and digital governance. The stakeholder focus was chosen because this study aims to explore mechanisms, capabilities and contextual factors at the organizational and industry levels, which require respondents with decision-making power or deep professional experience. By focusing on knowledgeable stakeholders rather than end users, this study ensured that the data reflected a strategic perspective on competitiveness and digital empowerment.

A total of 23 participants were included in this study. The sample size was determined according to the theory saturation principle, which is widely used in grounded theory research. Data collection and primary analysis were conducted in an iterative manner, with interviews continuing until no substantive new themes, categories or relationships emerged in the data. After about 20 interviews, patterns related to digital enabling mechanisms and international competitiveness began to repeat, so three more interviews were conducted to confirm saturation and ensure the robustness of the analysis.

Given the qualitative exploratory nature of this study, statistical power calculations or formula-based sample size determination methods are not applicable. Therefore, this study focuses on the richness of information, the diversity of professional contexts, and the depth of insights. Ultimately, the interview sample of 23 respondents was deemed sufficient to capture the complexity of the studied phenomenon and to provide support for a reliable qualitative analysis.

3.5. Data Collection

Semi-structured interviews served as the primary method of data collection, conducted between May and August 2025. An interview protocol was developed around four core research themes: digital technologies, enabling mechanisms, competitiveness outcomes, and contextual opportunities and challenges. Each interview lasted approximately 60 to 90 minutes and was administered either in person or online, depending on participant availability. With informed consent, all interviews were audio-recorded and transcribed verbatim to ensure accuracy. To enhance triangulation, supplementary materials were gathered from corporate reports, policy documents, and industry white papers.

3.6. Analysis framework and coding strategy

Guided by the principles of grounded theory, this study employs a theory-driven analytical framework to structure data analysis and interpretation. As shown in Figure 1, the framework conceptualizes the digital economy as a multidimensional enabling system that enhances the international competitiveness of China's sports industry through a series of interrelated mechanisms, organizational capabilities and situational conditions.

The framework explicitly incorporates contextual constraints that may influence or moderate the effect of digital empowerment. These constraints include regulatory complexity, cost pressures, talent shortages, and cross-cultural market barriers, which emerged generically during the coding process and were repeatedly highlighted by respondents. By integrating enablers and constraints, the framework reflects the complex and nonlinear characteristics of digital transformation in the sports industry.

In terms of methodology, Figure 1 serves as an analytical guide rather than a preset causal model. In the open coding phase, the researchers analyzed the interview data line by line to identify concepts related to digitization practices, organizational responses, and international competitiveness outcomes. Subsequently, axial coding links these concepts to the core dimensions of the frame-drivers, mechanisms, capabilities, and contextual conditions-while selective coding further refines the relationship between them. This iterative process ensures that the analytical framework can be continuously refined through empirical evidence, thus enhancing the rigor and transparency of the qualitative analysis.

3.7. Data Analysis

The analytical process followed the grounded theory techniques of open, axial, and selective coding (Corbin & Strauss, 2014). The initial phase of open coding identified salient concepts from the interview transcripts, resulting in over 200 preliminary codes. These codes were subsequently synthesized into broader thematic categories through axial coding, culminating in five core dimensions: digital drivers, enabling mechanisms, organizational capabilities, competitiveness outcomes, and contextual factors. During the selective coding phase, these categories were integrated into a cohesive theoretical framework that articulates the process of "Digital Economy Empowerment of International Competitiveness in the Sports Industry."

To enhance the validity of the findings, case examples from representative enterprises were included to illustrate the practical impact of digital initiatives on competitiveness. Rigor was bolstered through ongoing comparative analysis, peer debriefing, and triangulation of primary interview data with secondary sources. Theoretical saturation was determined to be reached after the 23rd interview, as subsequent data did not produce any new thematic categories or conceptual insights.

4. Findings

Through semi-structured in-depth interviews with 23 people engaged in the sports industry and stakeholders from China, this study examines how the digital economy can help enhance the international competitiveness of China's sports industry. Respondents included government officials, sports industry decision makers, business managers,

event organizers, digital technology practitioners, and academic experts. Using thematic analysis, five interrelated themes were identified. The findings presented below are based on a large number of verbatim quotes from participants, ensuring that the interpretation comes directly from empirical data rather than abstract assumptions.

4.1. Digital Economy and the Expansion of International Exposure

The first important theme of all the interviews was that the digital economy has significantly expanded the international exposure of the Chinese sports industry. The interviewees highlighted that digital platforms including live streaming, short video apps and social media have fundamentally changed the way Chinese sports events, brands and services are disseminated globally.

A government official responsible for regional sports development explained:

“In the past, our sports events mainly relied on on-site spectators and domestic television broadcasting. Overseas audiences could hardly access this information. Now, through live streaming platforms, overseas viewers can watch the events in real time. During one cycling event, overseas viewership accounted for more than one-third of the total audience.” (P1)

These perspectives indicate that digital exposure is understood not only as increased visibility but also as a cumulative branding process at the policy level. Individual respondents noted that digital exposure not only helps to increase audience numbers, but may also reshape international perceptions. A director of a regional sporting Authority emphasized:

“Digital dissemination allows repeated exposure. Overseas audiences gradually become familiar with the event brand, competition rules, and even the cultural elements behind the event.” (P2)

Event organizers emphasized that international exposure through digital platforms is a cumulative process rather than a one-off outcome:

“Previously, foreign audiences might watch an event once out of curiosity. Now, through continuous short-video updates and interactive content, we are cultivating relatively stable overseas fan communities.” (P4)

From the enterprise perspective, increased digital exposure was directly associated with market opportunities. A sports enterprise manager stated:

“After our competitions were broadcast on international platforms, overseas distributors contacted us. This type of international cooperation opportunity was very rare before digitalization.” (P6)

Another enterprise representative emphasized the branding implications of sustained digital visibility:

“Long-term online exposure helps overseas consumers associate our products with professional sports events instead of low-cost manufacturing. This association is very important for entering high-end

international markets.” (P7)

Some interviewees also highlighted the role of digital platforms in amplifying symbolic and cultural values. A government-affiliated cultural and sports promotion agent explained:

“Once sports events are disseminated through digital platforms, they become part of international cultural communication rather than merely competitive activities.” (P3)

Overall, these findings suggest that digital technologies enhance the international exposure of the Chinese sports industry through a multi-level mechanism. Digital platforms not only increase awareness, but also facilitate repeat participation, brand identification, and cultural interpretation, thus embedding Chinese sports events and products more deeply into the global sports consumption network.

4.2. Digital Technologies and Product Competitiveness

A second important theme is how digital technologies can enhance the competitiveness of sports-related products and services in international markets. Respondents generally emphasized that digitization has reshaped product development, manufacturing processes, and quality assurance mechanisms.

A manager from a sports equipment manufacturing enterprise explained:

“By using digital simulation and testing systems, we can identify design problems at an early stage. This significantly reduces trial-and-error costs and improves product precision, which is particularly important for exporting high-end sports equipment.” (P8)

A product manager from a sportswear company highlighted the role of data analytics in guiding innovation:

“Digital tools allow us to track overseas consumers’ preferences almost in real time. Compared with before, the product development cycle has been shortened by nearly 30%, and design decisions are more targeted.” (P9)

This shift reflects a broader transition from experience-based to data-driven product governance within internationally oriented sports enterprises.

Some interviewees noted that digitalization also enhanced compliance with international standards. A technical expert involved in the certification process said:

“Digital testing systems and standardized production data make it much easier to meet international technical standards. Without these systems, exporting products would be much more difficult.” (P13)

Trust and transparency were repeatedly mentioned as key dimensions of international competitiveness. One interviewee explained:

“Through digital traceability systems, foreign consumers can clearly see

where materials come from and how products are manufactured. This significantly increases trust in Chinese brands.” (P11)

Another respondent added that digital transparency facilitates smoother international cooperation:

“When overseas partners can access detailed digital records of production and testing, negotiations become much more efficient and misunderstandings are reduced.” (P12)

From a strategic perspective, some enterprise managers emphasized that digital technologies alter internal decision-making logic:

“Previously, product design relied heavily on experience. Now, data from overseas markets directly influences design adjustments, which reduces uncertainty.” (P8)

These narratives indicate that digital technologies enhance product competitiveness not only through efficiency gains and cost reduction but also by improving strategic alignment with international market expectations, strengthening compliance, and building trust with overseas consumers and partners.

4.3. Platform-Based Models and International Market Access

Digital platforms have become a key factor for Chinese sports enterprises and service providers to access international markets more effectively. Respondents consistently stressed that platform-based models reduce reliance on traditional intermediaries and lower barriers to internationalization.

An enterprise manager involved in overseas sales explained:

“In the past, entering foreign markets required agents and exhibitions, which were costly and inefficient. Now, cross-border e-commerce platforms allow us to directly reach international consumers.” (P12)

Another interviewee highlighted the inclusiveness of digital platforms for smaller firms:

“For small and medium-sized sports enterprises, digital platforms provide a realistic path to internationalization. Without platforms, many companies would not have the resources to go abroad.” (P14)

In the fitness and training sector, platform-based services were perceived as particularly transformative. A practitioner noted:

“Online fitness platforms allow Chinese coaches to provide services to overseas users without leaving China. This model greatly reduces operational costs.” (P16)

Another respondent emphasized scalability:

“Once the platform system is mature, international user growth can be

very fast, and marginal costs are relatively low.” (P17)

Some participants also pointed out that digital platforms reshape power relations in international markets. An SME owner stated:

“Previously, overseas agents controlled pricing and market information. Now, platforms allow us to interact directly with consumers and obtain real-time feedback.” (P15)

Overall, respondents agreed that the platform model is a mechanism capable of lowering barriers to entry and redistributing information and pricing power in international markets.

4.4. Digital Transformation of Sports Services and Consumption

In addition to manufacturing and market access, most respondents emphasized that the digital economy has fundamentally reshaped sports services and consumption patterns, thereby contributing to the international competitiveness of the industry in a more indirect but sustainable way. Respondents noted that digital transformation has changed the way domestic and foreign consumers produce, deliver and experience sports services.

A manager of a digital fitness platform explained:

“Through online platforms, our training programs are no longer limited by geography. Overseas users can subscribe to personalized training plans and interact with Chinese coaches in real time.” (P16)

Several respondents highlighted that such digital services enable the internationalization of intangible sports products, which was previously difficult. One interviewee stated:

“Compared with physical products, sports services are harder to export. Digital platforms make it possible to ‘export’ coaching, training concepts, and fitness culture.” (P18)

From the perspective of service internationalization, participants emphasized that digital technologies enhance user engagement and service quality. A practitioner involved in digital course design explained:

“By analyzing user data, we can continuously adjust training intensity and content. This improves user satisfaction and retention, especially among overseas users.” (P19)

From the consumer perspective, digitalization was perceived to reduce participation barriers. One respondent noted:

“Overseas users are more willing to try Chinese fitness services online because the cost is lower and the risk is controllable.” (P20)

Several interviewees stressed that digital platforms also facilitate community-building,

which enhances long-term competitiveness. A platform operator explained:

“Online interaction functions allow users from different countries to communicate and share experiences. This creates a sense of belonging that traditional offline services cannot easily achieve.” (P17)

Another respondent emphasized the cultural dimension of digital sports services:

“Digital sports services often incorporate Chinese cultural elements, such as traditional training philosophies. This cultural uniqueness increases international attractiveness.” (P3)

Participants further noted that digital services generate valuable feedback loops. A manager from a sports service enterprise explained:

“User feedback collected through platforms directly informs service optimization. This data-driven improvement mechanism is crucial for competing internationally.” (P21)

Overall, these findings suggest that digital transformation enables the internationalization of sports services by lowering barriers to entry, enhancing user engagement, and embedding cultural values in service delivery. Digital sports services do not rely solely on physical exports, but create new avenues for sustained international competitiveness.

4.5. Institutional, Cultural, and Human-Capital Constraints

While the benefits of the digital economy are widely recognized, respondents also pointed to multiple constraints that limit its enabling role for international competitiveness. These constraints are often framed in institutional, cultural, and human capital terms.

From an institutional perspective, several interviewees highlighted regulatory fragmentation. A policy-related respondent stated:

“Digital sports services involve multiple regulatory bodies. In some cases, unclear responsibilities slow down innovation and international expansion.” (P5)

Another government-affiliated interviewee added:

“Cross-border digital services still face regulatory uncertainties, particularly in data security and compliance with overseas regulations.” (P1)

Beyond institutional factors, cultural perceptions were also identified as persistent constraints. Cultural factors were also perceived as significant barriers. One enterprise manager explained:

“Some international consumers still associate Chinese sports products with low prices rather than high quality. Changing this perception

requires long-term branding efforts.” (P7)

Another respondent emphasized internal organizational culture:

“Some traditional sports enterprises are conservative and reluctant to adopt digital technologies, which limits their international competitiveness.” (P14)

Human-capital constraints emerged as one of the most frequently mentioned challenges. A digital technology practitioner explained:

“There is a shortage of professionals who understand both sports industry operations and digital technologies. This talent gap restricts digital transformation.” (P22)

Another interviewee highlighted uneven skill distribution:

“Large enterprises can attract digital talent, but small and medium-sized firms struggle to recruit and retain such professionals.” (P15)

Participants also noted that internationalization requires interdisciplinary skills. An academic expert stated:

“To compete internationally, talents need not only digital skills but also international communication abilities and cross-cultural understanding.” (P23)

Some respondents further emphasized learning costs and adaptation challenges:

“Digital transformation requires continuous learning. For some enterprises, the cost of training and system upgrading is relatively high.” (P8)

Overall, these findings suggest that while digital economy initiatives create new opportunities, their effectiveness is affected and limited by institutional alignment, acculturation, and human capital development. If these limitations are not addressed, the empowering potential of digitalization may remain uneven across the sports industry.

4.6. Synthesis of Findings

The research results reveal the multi-dimensional enabling mechanism of digital economy to enhance the international competitiveness of China's sports industry. Digital technology expands international exposure, improves product competitiveness, makes platform market access more convenient, and effectively enables the internationalization of sports services. At the same time, constraints such as institutions, culture and human capital determine the magnitude and sustainability of these effects.

Importantly, these findings suggest that digital empowerment is not a linear or uniform process. Different actors experience different levels of benefits depending on organizational capabilities, resource endowments, and external environments. While

large enterprises and digitally proactive organizations tend to benefit more directly, smaller companies and traditional actors face greater challenges in adapting.

By basing these insights on extensive verbatim evidence, this study highlights the complexity and contingency of enabling the digital economy. The results provide a solid empirical basis for subsequent discussion of theoretical implications and policy recommendations.

5. Conclusion

This study utilized grounded theory and case-based analysis of 23 expert interviews to explore how the digital economy enhances the international competitiveness of China's sports industry. The findings reveal that four digital drivers—advanced technologies, digital platforms, financial systems, and supportive policies—activate key mechanisms, including efficiency enhancement, innovation-driven development, global market expansion, and user engagement. These mechanisms operate through organizational capabilities such as dynamic adaptability, digital governance, brand and intellectual property management, and internationalization capacity, while being influenced by contextual factors like regulatory complexity, cost pressures, and talent shortages. Collectively, these elements yield significant outcomes, including improved cost efficiency, accelerated innovation, expanded market share, enhanced brand value, and strengthened supply chain positioning. Theoretically, this research contributes a conceptual framework that integrates digital empowerment with established competitiveness theories, extending Porter's Diamond Model and dynamic capability theory to include mediated and moderated pathways specific to the sports industry. Practically, this study provides actionable insights: managers should align technological adoption with capability development, strengthen governance systems, and pursue culturally adaptive global strategies; policymakers are encouraged to streamline regulations, offer targeted financial support, and promote interdisciplinary talent development to facilitate sector-wide digital transformation.

A limitation of this study is its qualitative design and focus on a single country, which may constrain the generalizability of the findings. Future research could utilize mixed-methods approaches, quantitatively assess the proposed mechanisms, conduct cross-country comparisons, and monitor digitalization outcomes over time. In conclusion, the digital economy functions not only as a collection of technologies but also as a systemic force that reconfigures competitive dynamics within the global sports industry. This transformation enables sustainable and inclusive growth when supported by coherent organizational strategies and conducive policy environments.

Ethics Approval and Consent to Participate

The researchers used the research ethics provided by the Research Ethics Committee of Universiti Teknologi MARA (UiTM). All procedures performed in this study involving human participants were conducted in accordance with the ethical standards of the institutional research committee. Informed consent was obtained from all participants according to the Declaration of Helsinki.

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