

Ethical boundary and governance path of commercial application of sports event data

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Abstract

In the current era of deep integration between digital technology and the sports industry, sports event data is gradually evolving into a commercial asset with diverse value. Relevant forecasts indicate that its global market size will surpass the trillion-dollar mark by 2025. However, the unrestricted expansion of data collection technologies and the excessive pursuit of commercial interests have led to frequent ethical controversies such as privacy breaches, algorithmic biases, and data monopolies. This study employs methods including literature analysis, questionnaire surveys, and field research to systematically explore the ethical dilemmas and governance paths faced during the commercial application of sports event data. The results show that despite the rapid development of China's sports industry (with total output reaching 3.67 trillion yuan by 2025), there are still some pressing issues that need to be addressed. From a policy and regulatory perspective, the current Sports Law does not include specific provisions on data ethics, highlighting the lag in policy and regulations; in terms of industry self-regulation, statistics show that about 70% of relevant institutions have yet to establish an ethical review mechanism, indicating a lack of self-discipline; in terms of technical governance capabilities, there are also shortcomings, making it difficult to effectively address various challenges in the process of data commercialization. In response to these issues, the study proposes a three-tier composite governance framework. Firstly, construct a legal system centered on the Sports Data Law to clarify ownership and circulation rules of data, providing solid legal protection for data commercialization; secondly, strengthen industry self-regulation by formulating detailed ethical guidelines and establishing a tiered supervision mechanism to ensure that data applications within the industry comply with ethical standards; thirdly, promote technological innovation by leveraging technologies such as layered encryption and blockchain to embed ethical rules into code, ensuring the legality and rationality of data applications from a technical perspective. The research recommends that through interdisciplinary collaborative governance, joint governance by multiple stakeholders, and the organic integration of localized and international rules[1], while releasing the commercial value of data, ethical constraints should be strengthened to provide theoretical and practical references for the sustainable development of the sports industry.

Keywords : Sports event data; ethical boundaries; governance path

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1.Introduction

In the context of deep integration between digital technology and the sports industry, sports event data has transcended the realm of traditional competitive records^[2], evolving into a composite commercial asset with economic, social, and cultural value. According to the 2024 report by the International Sports Business Federation (ISBF), the global sports data market has reached \$870 billion, with commercial application scenarios contributing 68% of the market share. While this trend of data assetization drives industrial innovation, it also gives rise to numerous ethical challenges. The contradiction between the borderless expansion of data collection technology and the drive for commercial interests is becoming increasingly evident, leading to frequent issues such as privacy violations, algorithmic discrimination, and data monopolies. A typical case is the unauthorized scraping of heart rate and exercise load data from 236 athletes by a third-party data service provider in the 2023 CBA League, which sparked a class-action lawsuit; during the 2022-2023 NBA season, a team's trading decisions heavily relied on player genetic testing and biometric data, leading to an ethics committee ruling that there was a risk of objectifying athletes. These events reflect the imbalance between technological innovation and ethical regulation in the commercialization of sports data. How to establish a dynamic balance mechanism that integrates technological innovation with ethical constraints has become a core issue for the sustainable development of the sports industry. This not only requires clarifying data ownership and transfer rules at the legal level but also forming a collaborative governance framework at the industry self-regulation and technical governance levels to achieve

2.Research background

2.1The booming sports industry

Under the continuous advancement of the "Healthy China" strategy, China's sports industry is showing a trend towards diversified development, with urban residents' sports consumption patterns gradually shifting from spectator to participatory and experiential. According to data jointly released by the National Bureau of Statistics and the General Administration of Sport of China, the total scale of the sports industry has maintained steady growth in recent years. By 2025, the total output value of the national sports industry is expected to reach 3.67 trillion yuan, representing an increase of 11.4% over the previous year; the added value of the industry will be 1.49 trillion yuan, accounting for 1.15% of GDP, highlighting its growing importance in the national economy. In terms of industrial structure, service-oriented sectors such as sports event operations, broadcasting rights development, and derivative product sales have made significant contributions, accounting for more than 70% of the industry's added value. For example, in the revenue composition of top domestic professional leagues like the Chinese Super League and the CBA, sponsorship income typically exceeds 70%, while international events like the UEFA Champions League generate derivative revenues (including copyright trading, licensed merchandise, and event tourism) that account for 40%, reflecting the differences in commercialization paths across different tiers of competitions. Regional development practices have further confirmed the economic driving effect of the sports industry: In 2024, Shanghai successfully hosted 178 international and domestic sports events, generating direct and indirect economic benefits exceeding 41.3 billion yuan, demonstrating the radiating impact of major events on urban economies; Jiangxi Province aims to achieve a total scale of the sports industry reaching 215 billion yuan by 2025, planning to host over 4,200 events including the Asian Canoe Sprint Championships, with an expected output benefit of 13 billion yuan. The path of regional industrial upgrading driven by event economy is clearly visible. These data and cases indicate that the sports industry has become a significant force in optimizing industrial structure and promoting economic growth.

Table 2-1 Summary of major sports events

Name of the event	Duration of the event	place	Core features
Chinese Men's Professional Basketball League (CBA)	From March to November every year	Multiple cities across the country	China's top basketball league, which has produced stars such as Yao Ming and Yi Jianlian, generates more than 70 percent of its revenue from sponsorship.
Chinese Football Association Super League (CSL)	From March to November every year	Multiple cities across the country	In the 2024 season, 16 teams will participate in the competition, and commercial revenue is mainly sponsored (accounting for more than 70%).
China Open tennis	September to October every year	Beijing	The highest level of tennis in Asia, attracting more than 220,000 spectators in 2023
The Shanghai Masters	September to October every year	Shanghai	In 2025, it will cover the National Day Golden Week and launch a "ticket + culture and tourism" linkage mode. In 2024, more than 220,000 visitors will visit the site.
National Games (National Games)	Every four years (2025)	Guangdong-Hong Kong-Macao Greater Bay Area in 2025	For the first time, Hong Kong and Macao jointly hosted the event, which is expected to drive cultural and tourism consumption of more than 30 billion yuan.
Shanghai International Marathon	Every year in November	Shanghai	In 2025, it plans to qualify for the world Grand Slam event and the highest level marathon in China.
China Open Badminton Championships	Every September	Changzhou/Shenzhen	The 2025 Shenzhen leg of the BWF Tour is scheduled for November.
Shanghai Rowing Open	Every September	The Huangpu River in Shanghai	The landscape event will be combined with the city culture display in 2025.

2.2The lag of domestic policies, regulations and industry standards

The current legal response to the commercial use of data by organizers of international sports events is insufficient. Although the Civil Code of the People's Republic of China (hereinafter referred to as "the Civil Code") and the newly revised

Sports Law of the People's Republic of China (hereinafter referred to as "the Sports Law") have made certain provisions for the protection of data property rights of sports event organizers, they remain general, referential, principled, and unclear. For example, China's Sports Law does not address data ethics. Article 49 of the Sports Law encourages "using modern information technology and other means to promote the development of the sports industry," but it does not mention data security or ethical boundaries. This tendency of "emphasizing development over regulation" and the legal neglect of sports data ethics are partly related to the overall lag in digital economy legislation around 2022. Nowadays, more and more relevant laws are gradually maturing, and foundational laws such as the Personal Information Protection Law and the Data Security Law have been implemented. At the same time, regulations in the sports sector should also be further optimized. It is believed that under the backdrop of today's socialized and legalized era, relevant laws and regulations in the sports sector will also be further improved and optimized. The fairness in the sports sector should gain recognition from society as a whole.

In addition, the self-discipline of most people in the sports industry has been widely questioned by society. This is because most sports organizations or institutions do not set up ethical reviews related to their own industries, leading to widespread ethical concerns across society for many sectors of the sports industry, sometimes even causing negative impacts that affect the entire industry. For example, Shanghai University of Sport requires human experimentation to be approved by an ethics committee, but most commercial data projects in sports events generally lack such reviews. This phenomenon has led to numerous issues, as described in Table (1-2), including safety incidents, protection of participants 'and consumers' rights, and athletes' privacy. These situations not only impact athletes and consumers but also tarnish the image of the entire sports industry. Therefore, the industry needs to enhance its understanding of ethics and develop corresponding mechanisms to address the current special circumstances.

Table 2-2 Ethical situation of sports industry

pattern of organization	Principal character	typical problem	legislative authority
Unregistered outdoor sports club	<ol style="list-style-type: none"> 1. Not registered with the civil affairs or sports department 2. The team leader has no professional qualifications 3. The route is mostly informal "wild road" 	<ol style="list-style-type: none"> 1. Frequent accidents (such as getting lost, falling off the cliff) 2. No protection of participants' rights and interests 3. Avoiding liability for accident compensation 	The organizer shall bear the fault liability for failing to fulfill the security obligation in violation of article 1176 of the Civil Code, which stipulates "voluntary risk"
Non-profit sports training institutions	<ol style="list-style-type: none"> 1. No ethics committee has been set up 2. Lack of proof of professional sports technicians 3. Ambiguous contract terms 	<ol style="list-style-type: none"> 1. There are violations such as corporal punishment and discrimination in the training of teenagers. 2. False publicity about the effect of courses. 3. Students' injuries are neglected 	Article 3 of the Interim Measures for the Registration, Examination and Management of Non-profit Sports Organizations requires the competent business unit to examine the ethical compliance
Commercial event operator	<ol style="list-style-type: none"> 1. Profit motive to avoid ethical review 2. No doping control mechanism established 3. Data use not desensitized 	<ol style="list-style-type: none"> 1. Privacy leakage of athletes (such as biometric data) 2. Fraud of events (such as false results) 3. Transfer of interests of sponsors 	Article 13 of the Personal Information Protection Law requires separate consent to process sensitive information
Community sports self-governing organizations	<ol style="list-style-type: none"> 1. Loose management style 2. No ethics charter 3. Intransparent financial transactions 	<ol style="list-style-type: none"> 1. Misappropriation of funds for activities 2. Unequal distribution of equipment and facilities 3. Gender/age discrimination 	Article 52 of the Sports Law clearly stipulates that community sports organizations should establish internal supervision mechanisms

3. Research purpose and significance

3.1 Purpose of research

(1) Clarify the characteristics of commercial operation models for large-scale sports events, summarize their operational models, and analyze their ethical practices. The research focuses on the ethics of commercial application of data from large-scale sports events under the background of commercial operation models. Based on the analysis of relevant microeconomic theories and the balance of core stakeholders' demands, it outlines the key elements and typical features of the commercial operation model, laying a solid foundation for creating a fair, stable, and open sports event environment.

(2) To propose a decision-making path that aligns with the ethical and moral models of commercial data operations for major sports events. Aiming to achieve the ethical and moral realization of data commercialization, a decision-making model based on ethical mechanisms is established to link and couple data metrics with ethical and moral assessments. This forms an ethical and moral design decision visualization tool. At the same time, practical and specific ethical design measures are integrated to combine theoretical models with real-world ethical boundary constraints, forming a comprehensive ethical and moral design decision path^[3] for the commercial application of data from major sports events, providing reference and guidance for related projects in China.

3.2 Research meaning

(1) Theoretical significance:

Large-scale sports events, led by the government, sports organizations, or enterprises, are competitive sports activities with extensive social influence and economic benefits. In recent years, the number of large-scale sports events held in China has increased annually. However, there is currently no clear definition of the ethical boundaries for commercializing event data, and related theoretical research is scarce. This study, based on referencing and drawing from the commercial operation research results of other domestic sports events, integrates the opinions of experts and scholars in sports events to provide a theoretical reference for the ethical boundaries of commercial operations in Chinese sports events. It also offers a theoretical basis for decision-making in spatial design of related practical projects, aiming to enhance the visibility and influence of domestic sports events, lay a solid foundation for athletes' positive image, and establish a strong brand for Chinese sports events.

(2) Practical significance:

In recent years, large-scale sports events have been thriving in our country, and the commercial operation model has become a clear trend in such events. However, there is still a lack of systematic and theoretical guidance for ethical and moral design in large-scale sports events in China. The main reason lies in the fact that most ethical and moral boundaries in the field of sports events originate from foreign institutions or are designed with their assistance, while practitioners in the sports sector themselves lack reflection and theoretical analysis on the design of ethical boundaries. This study, based on numerous domestic and international cases, conducts an in-depth investigation into the adaptive design of ethical and moral boundaries in the commercial operation models of large-scale sports events. By examining the characteristics of these operational models and their logical relationships, specific design measures are proposed to address potential constraints during the design process of ethical boundaries. This provides reliable and practical evidence for the ethical and moral boundaries of sports events, contributing to the development and improvement of sports events in China.

4. Research technique; research method

4.1 Literature method

In the literature screening, the following four aspects were mainly selected, and the search basis and irrelevant reference materials were eliminated according to the research needs, so as to obtain the latest data related to the development of sports dance projects and sports dance competitions, and provide theoretical basis and support for the research direction.

Table 4-1 List of literature sources and search topics

Source category	Specific content and examples	Search tools/platforms	Citation basis
Academic database	Sports academic journals (such as Sports Science, Sports Culture Guide), master's and doctoral dissertations (CALIS, CNKI)	China National Knowledge Network (CNKI), Wanfang Data, Weipu Network, Chaoxing Digital Library, Google Academic, Baidu Academic	It includes event theory, case analysis, policy research and so on
Policy and regulatory documents	Policies and documents of the General Administration of Sport of China, Sports Law, local sports industry plans and event management	Official website of General Administration of Sport of China, official website of local government, Peking University Law, database of laws and	It involves event bidding, operational compliance, data security and so

Source category	Specific content and examples	Search tools/platforms	Citation basis
	norms	regulations	on
International Sports Organization Database	The International Olympic Committee (IOC), FIFA (FIFA) and other event reports, technical standards, event economic evaluation	Official websites of international organizations (such as olympics.com and fifa.com), Statista database	It covers international competition cases and globalization competition analysis
Official website and news media	Official websites of the games (such as Chinese Super League, CBA), Xinhua Sports Channel, Sina Sports, Tencent Sports, etc	Official website, news client, social media (Weibo, Twitter)	Provide event dynamics, audience behavior data, media coverage
Academic conferences and research reports	Sports industry forums (such as China Sports Industry Summit), think tank reports (such as iResearch, China Business Intelligence Network)	Academic conference proceedings, industry research report platform	Analyze the economic scale of the competition and the trend of technology application

4.2Questionnaire survey method

(1) Questionnaire design

Based on the content of the survey questionnaire designed in master's and doctoral theses on the commercialization of sports events, this questionnaire was compiled by integrating interview opinions and research needs, titled "A Survey Questionnaire on the Current Status, Perspectives, and Related Ethical Issues of Sports Event Data Commercialization." The data from the questionnaire were input into Excel statistical software, where functions such as functional analysis were used to process and calculate the data. The calculations mainly included averages, percentages, and consistency tests, which were then visualized into charts to clearly express the research findings, providing a clear and data-driven method for the study. This study distributed 150 questionnaires to multiple groups including event staff, students, and athletes, with 137 returned and 113 valid, resulting in an effective rate of 75%.

(2) Validity test

The validity of the questionnaire content was tested using a validity study to analyze whether the research items are reasonable and meaningful. The validity analysis employed factor analysis as the data analysis method, evaluating the data's validity level through indicators such as KMO value, communality, variance explained, and factor loading coefficients. As shown in Table (4-2): the communality values for all research items are above 0.4, indicating that the information from the research items can be effectively extracted. Additionally, the KMO value is 0.671, which is greater than 0.6, suggesting that the data can be effectively extracted.

效度分析结果 因子排序						
名称	因子1	因子2	因子3	因子4	因子5	共同度(公因子方差)
职业	0.173	0.487	0.197	0.501	0.040	0.559
性别	0.234	0.062	-0.001	-0.183	0.662	0.530
年龄	0.143	-0.141	-0.002	0.767	0.016	0.629
是否了解体育赛事	0.311	-0.441	-0.079	0.321	0.319	0.502
赛事的帮助程度	-0.042	-0.047	0.748	0.245	-0.087	0.632
关注的赛事	-0.109	0.043	0.800	-0.037	-0.057	0.658
赛事数据接受程度	0.749	0.011	-0.080	0.221	-0.020	0.617
获取数据途径	0.223	-0.022	0.596	-0.442	0.013	0.602
哪些主体发挥重要作用	0.236	0.840	0.076	-0.044	0.163	0.795
保护隐私信息是否重要	0.863	0.058	-0.015	-0.039	-0.007	0.750
是否应该界定数据商业化	0.620	0.052	0.186	0.254	0.123	0.502
数据商业化的好处	0.277	0.051	0.243	-0.068	-0.624	0.532
公众可采取的行动	0.232	0.750	-0.168	-0.059	0.091	0.657
组织方可采取的行动	0.629	0.378	-0.087	0.150	-0.139	0.588
规范数据商业化	-0.078	0.287	0.065	0.302	0.556	0.493
突破伦理边界行为	0.864	0.133	0.007	-0.020	0.000	0.784
应该遵循怎样的伦理准则	0.793	0.163	-0.027	-0.126	0.012	0.671
特征根值(旋转前)	4.307	1.845	1.732	1.510	1.086	-
方差解释率%(旋转前)	25.333%	10.853%	10.188%	8.882%	6.387%	-
累积方差解释率%(旋转前)	25.333%	36.186%	46.374%	55.257%	61.644%	-
特征根值(旋转后)	3.917	2.007	1.747	1.488	1.321	-
方差解释率%(旋转后)	23.043%	11.805%	10.277%	8.750%	7.769%	-
累积方差解释率%(旋转后)	23.043%	34.848%	45.125%	53.875%	61.644%	-
KMO值			0.671			-
巴特球形值			544.698			-
df			136			-
p值			0.000			-

备注：表格中数字若有颜色：蓝色表示载荷系数绝对值大于0.4，红色表示共同度(公因子方差)小于0.4。

Figure 4-1 Validity test

(3) Reliability test

Reliability testing is a step to verify the accuracy of measurement questions reflected in the questionnaire. In this study, the relevant content of the questionnaire was imported into SPSS for analysis, yielding results as shown in Table (4-3). From the table, it can be seen that the reliability coefficient is 0.735, which is greater than 0.7, indicating that the reliability quality of the research data is very good. Regarding the " α coefficient for deleted items," the reliability coefficient does not significantly increase when any item is removed, suggesting that items should not be deleted. In summary, the reliability coefficient of the research data is above 0.7, comprehensively indicating high reliability quality, making it suitable for further analysis.

Cronbach信度分析-简化格式		
项数	样本量	Cronbach α 系数
17	100	0.735
样本缺失情况汇总		
项	样本数	占比
有效样本	100	100.0%
排除无效样本	0	0.0%
总计	100	100%

Figure 4-2 Reliability test

4.3 Field method

Due to research needs, on-site investigations were conducted at events such as the "Shihezi University Club Campus Basketball League" and the "Shihezi City Shicheng Basketball League." Discussions were held with event organizers and relevant staff to explore some prominent issues concerning the ethical and moral aspects of commercializing sports event data, and opinions were collected for summarization.

5. Research results and analysis

5.1 Analysis of the current situation of commercial operation of national sports events

5.1.1 Fund analysis

The hosting of sports events requires a massive investment of human, material, and financial resources, making the analysis of funding sources and their allocation particularly crucial. The inherent commercial and market value of sports events is worth delving into deeply^[4]. Currently, there are five main sources of funding for large-scale sports events: "First, special allocations from central and local government finances; the General Administration of Sport of China annually allocates funds through its budget to support international and national-level competitions, such as the National Games and Asian Games; second, corporate sponsorship and commercial partnerships, primarily in the form of event naming rights and product placements, like global Olympic partners (such as Anta and Yili); third, market-based income, including ticket sales and merchandise sales, and broadcasting rights revenue; fourth, participation from social capital, operating through private equity funds and venture investments, with notable examples being marathon event management companies securing hundreds of millions in financing; fifth, international organization and event licensing, where international sports organizations support FIFA, the International Olympic Committee, and others by providing operational subsidies to host countries, such as the 2023 Asian Cup receiving \$12 million in funding support from the Asian Football Confederation."

According to data from the General Administration of Sport of China, the Beijing Municipal Finance Bureau, and industry research, the funding ratio is derived by combining core channels such as lottery public welfare funds, commercial sponsorships, and market-oriented income (see Figure 5-1). As shown in the figure, government fiscal allocations and sports sponsorship collaborations dominate, accounting for 42% and 31% of the total, respectively. Through on-site interviews and conversations with staff involved in major events, it was learned that large-scale events (such as the Asian Games and National Games) have public product attributes and undertake social functions such as promoting mass fitness and enhancing city images^[5]. Therefore, the government urgently needs to increase financial support, and in some areas, the hosting of sports events is included in local government performance evaluation indicators.

And companies engage in business collaborations due to top-tier sports events, such as the UEFA European Championship and the FIFA World Cup. These events have extremely high global traffic, providing businesses with cost-effective exposure opportunities. For example, after Hisense sponsored the European Championship, its overseas brand awareness increased from 37% to 54%, while vivo leveraged event marketing to boost its domestic market share. In summary, all these situations demonstrate that major sporting events play a significant role in promoting cities and boosting businesses through their commercial value. However, other aspects like market revenue, international support, and capital participation account for relatively smaller proportions, possibly because the economic benefits and market effects of sports events on these areas are not as significant as those for governments and businesses. Nevertheless, we can still observe the substantial economic and commercial benefits brought by major sporting events

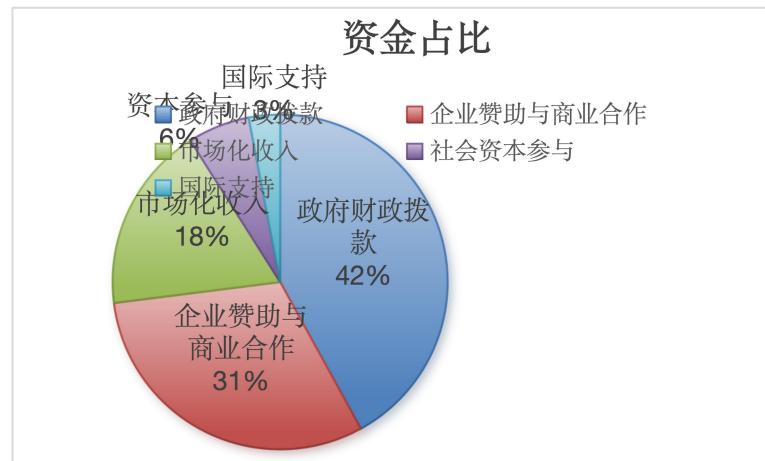


Figure 5-1 Commercialization of sports events by capital

5.1.2 Correlation analysis of ethical behavior in sports events

This study explores the relationship between ethical boundary behaviors and ethical moral awareness in large-scale sports events based on the questionnaire items, as shown in Figure (5-2). The analysis was conducted using SPSS correlation analysis, based on the results of Spearman correlation coefficients. The Spearman correlation coefficient is a non-parametric statistic used to measure monotonic relationships between two variables. It measures the monotonic relationship between variables without being constrained by data distribution. * indicates $p < 0.05$, ** indicates $p < 0.01$; the lower the significance level, the more reliable the association between variables.

The behavior of crossing ethical boundaries is significantly positively correlated with the "acceptance of event data" ($r = 0.682^{**}$), indicating that the higher the acceptance of event data, the greater the likelihood of crossing ethical boundaries. This may be because high acceptance encourages entities to actively attempt commercial applications of data while overlooking ethical constraints during the process. It is also significantly positively correlated with "whether privacy protection is important" ($r = 0.700^{**}$), suggesting that in the context of commercializing event data, there is a conflict between the high attention to privacy protection and actual commercial interests, leading entities to more easily cross ethical boundaries in pursuit of profit. It is significantly positively correlated with "what ethical principles should be followed" ($r = 0.734^{**}$), implying a complex relationship between a clear understanding of ethical principles and the behavior of crossing ethical boundaries. This could mean that the clearer the understanding, the more likely one is to detect the existence of such behaviors in practice, or it may stem from the conflict between principle constraints and commercial interests, which generates the motivation to cross ethical boundaries.

The correlation between standardized data commercialization and the "degree of assistance from competitions" ($r = 0.023$) and "ethical guidelines that should be followed" ($r = 0.152$) is not significant, indicating that the degree of assistance from competitions and ethical guideline awareness have a weak direct impact on standardized data commercialization. However, it is significantly related to "occupation" ($r = 0.207^{*}$), suggesting that occupational factors influence the perception of standardized data commercialization. Different occupations face different issues and needs in data commercialization practices, leading to varying understandings and expectations of standards.

The public's willingness to participate in actions is significantly positively correlated with their acceptance of event data ($r = 0.272^{*}$), indicating that the higher an individual's acceptance of the commercialization of event data, the stronger their awareness of actively participating in related matters. This demonstrates that cognitive acceptance can directly influence behavioral participation tendencies. Further analysis reveals a significant positive correlation between public action willingness and the importance placed on privacy protection ($r = 0.333^{**}$), reflecting that groups with strong privacy awareness are more likely to take concrete actions to protect their data rights. This behavioral motivation may stem from a proactive defense mentality towards personal information security.

In the dimension of organizational action cognition, professional characteristics show a significant positive correlation with expectations for organizational actions ($r = 0.293^{**}$). Different occupational groups exhibit significant differentiation in their expectations of organizational responsibilities in data commercialization due to differences in role positioning and interest demands. Additionally, organizational action cognition is highly positively correlated with the acceptance of competition data ($r = 0.500^{**}$), emphasis on privacy protection ($r = 0.410^{**}$), and clarity in ethical standards ($r = 0.445^{**}$). This indicates that the higher the recognition of data value, the stronger the focus on privacy protection, and the clearer the understanding of ethical norms, the more intense the expectation for organizations to play a governance role. This finding highlights the pivotal position

of organizations in the ethical governance of data commercialization, and their action strategies must fully consider the cognitive differences and interest demands of diverse stakeholders.

The aforementioned correlation analysis reveals the interactive mechanisms of various influencing factors in the commercialization of sports event data. It not only provides a quantitative basis for analyzing the core contradictions of ethical governance but also points the way for subsequent policy design. For example, differentiated ethical education programs can be designed based on the cognitive characteristics of different professional groups. At the same time, by strengthening the connection between public awareness and organizational actions, a governance pattern of collaborative co-governance among the government, enterprises, and the public can be constructed, thereby enhancing the relevance and effectiveness of the ethical governance system.

Spearman相关-标准格式								
	是否了解体育赛事	赛事的帮助程度	职业	数据商业化的好处	赛事数据接受程度	保护隐私信息是否重要	应该遵循怎样的伦理准则	是否应该界定数据商业化
突破伦理边界行为	0.184	0.118	0.226*	0.185	0.683**	0.700**	0.734**	0.442**
哪些主体发挥重要作用	-0.162	0.031	0.345**	0.063	0.259**	0.300**	0.396**	0.319**
规范数据商业化	0.047	0.023	0.207*	-0.169	-0.010	0.105	0.152	0.146
公众可采取的行动	-0.010	-0.078	0.180	0.043	0.272**	0.333**	0.319**	0.236*
组织方可采取的行动	0.059	0.002	0.293**	0.229*	0.500**	0.410**	0.445**	0.349**

* p<0.05 ** p<0.01

Figure 5-2 Correlation analysis of data commercialization



Figure 5-3 Visualization analysis of data commercialization

5.1.3Satisfaction survey of large sports events

With the holding of the Shihezi University Club Campus League and the Shihezi City Stone City League, a sampling satisfaction survey was conducted among participants regarding the event operations, venue facilities, control of ethical boundaries at the venue, and service provided by event personnel. First, in terms of event operations, registration and referee evaluations were mentioned most frequently. Due to the large number of participants and spectators in basketball games, each day; match groups exceed 30, with relatively small venues, leading to generally chaotic on-site work; additionally, referee evaluations were also a major source of dissatisfaction for many participants, with concerns over the fairness of refereeing being highly prominent, as biased referees who favor certain players are not uncommon. Secondly, issues with the waiting area for spectators were highlighted. Sports events typically take place in gymnasiums, where most secondary halls remain unused year-round. The facilities in these waiting areas are rudimentary, while the rest areas often see participants placing boxes, uniforms, food, and other items on the ground. Moreover, numerous family and friends visit before the game, further crowding what was already a limited space.

In terms of audience satisfaction, the main aspects chosen are: match quality, venue environment, venue consumption, event organization, and services. Regarding the quality of the matches, respondents unanimously stated that the players in the basketball league have high competitive levels. The opening ceremony's invited opening match was particularly spectacular, enhancing the excitement of the event and allowing spectators to enjoy the performances of top athletes while watching intense and thrilling games. However, in terms of audience behavior, satisfaction is not high, mainly manifested in littering and frequent indoor smoking. Although there are clear no-smoking signs and designated smoking areas within the venue, uncivilized behavior still occurs.

5.2Ethical challenges of commercial operation of sports events

5.2.1The ethical and moral social impact of the competition is insufficient

The influence of sports events in our country is undoubtedly very strong. Under the backdrop of nationwide fitness, the public and society's demand for sports is increasing day by day, and there is a huge expectation from all sectors of society for sports events. However, the ethical issues exposed in the operation of sports events have not received enough attention^[6]. Compared to other industries, each has its own ethical mechanisms and complete, reasonable laws and regulations that can effectively regulate moral behavior within the industry. For example, in the 2024 Sun Yang biometric data case, the Swiss Federal Court first used a "data contribution" quantification model, determining that the club owned 67% of the data property

rights, while the athlete received only 33% of the personal rights compensation. Although this quantitative division mechanism is innovative, it fails to address the distribution of benefits from secondary data development, thus failing to provide athletes with corresponding benefits. Precisely because there is too little attention paid to the rights and ethical issues related to sports professionals, more and more athletes, sports professionals, and sports enthusiasts are suffering losses^[7]. The market potential of sports events is enormous, and their commercial operations are no less impressive. The main issue is that not enough people have paid attention to the ethical and moral problems behind the commercialization of sports event data, which prevents them from making a significant impact on society.

5.2.2 The lag of legal regulation

The ambiguity in the ethical and moral boundaries of major sports events, along with the lack and lag of relevant laws, indirectly leads to the infringement of rights and interests of many people in various industries. For example, the data platform built by Alibaba Cloud for the Asian Cup, due to its core servers being located in Singapore, prevented domestic regulatory authorities from conducting real-time audits. The current "Measures for the Security Assessment of Cross-border Data Transfer" requires important data to be stored locally, but the list of "important data" does not yet cover the sports sector. As a result, when the health data of athletes from the Hangzhou Asian Games was transferred abroad, it was completed through a "self-assessment of security," leaving potential privacy risks.

5.3 The governance path of commercial operation

5.3.1 We will improve laws, regulations and policies

In the current commercialization of sports event data, the existing legal system lags significantly in defining data ownership, circulation rules, and rights protection. A clear and comprehensive legal framework has yet to be established, leading to ambiguous ethical boundaries in data development. To address this, it is necessary to clarify the scope of rights and obligations through systematic legislation, laying an institutional foundation for ethical governance. In terms of specialized legal construction, the legislative process in the field of sports data should be accelerated, building a legal norm system centered on the "Sports Data Law," covering the entire process from data collection to use and trading. A multi-dimensional liability system should also be constructed to achieve organic integration of civil compensation, administrative regulation, and criminal accountability: at the civil liability level, a punitive compensation mechanism should be established, increasing economic penalties for serious infringements such as intentional disclosure of athletes' medical data and unauthorized trading of user biometric data, beyond mere compensatory damages; at the administrative supervision level, the authority of sports administrative departments to review data compliance should be granted, establishing a full-process regulatory mechanism of "pre-filing — mid-process supervision — post-tracing," imposing tiered penalties on market entities based on the severity of violations, including fines, suspension of operations, and market entry bans, to strengthen the hierarchical nature of administrative regulation; at the criminal law level, the elements for criminalizing acts such as data monopolies, systematic data tampering, and large-scale privacy breaches should be clarified, enhancing the deterrent effect of criminal law on data crimes through the publication of typical judicial precedents. This three-dimensional legal regulation framework aims to define the ethical boundary of commercialization of sports event data through clear definition of rights, strict allocation of responsibilities and precise implementation mechanism, realize the governance upgrade from "ethical self-discipline" to "institutional heteronomy" in data development and utilization, and provide rigid legal guarantee for sustainable development of the industry.

5.3.2 Strengthen industry self-discipline and ethical norms construction

The improvement of industry supervision mechanisms is a crucial support for the ethical governance system. Industry organizations need to establish regular review and evaluation mechanisms to implement systematic oversight of data commercial activities by market entities: through real-time monitoring of data flow trajectories using big data technology, combined with professional reviews from expert committees, multi-dimensional risk identification models should be constructed to accurately pinpoint potential ethical risks such as excessive data collection and privacy computation violations. In designing punishment mechanisms, a tiered punishment system should be established, implementing differentiated measures based on the nature and severity of violations: minor offenders should receive industry-wide criticism and be included in credit records; severe cases should face suspension of membership or restrictions on market access, forming a gradient constraint system of "warning-restraint-elimination." At the corporate governance level, it is encouraged for data operators to set up cross-disciplinary ethics review committees composed of legal experts, ethicists, and technical engineers, conducting comprehensive ethical risk assessments at the project initiation stage. The review content covers core dimensions such as the legality of data ownership, algorithmic fairness, and the effectiveness of privacy protection measures, ensuring that business activities comply with ethical norms from the source through a preemptive assessment mechanism. The construction of this supervisory system aims to deeply integrate ethical responsibility into corporate data strategies: external industry supervision creates compliance pressure, which is then transformed into internal governance momentum through internal review mechanisms, ultimately building a closed-loop management model of "prevention-identification-handling-improvement," serving as a safeguard provide institutional guarantee for the sustainable development of sports event data industry.

5.3.3 We will promote technological innovation and application

In the ethical governance framework for the commercialization of sports event data, technological means form the foundational support system that solidifies ethical boundaries. Its core function lies in achieving the code-based transformation and automated enforcement of ethical rules through technological innovation, thus forming a new governance model of "technology-empowered ethics." First, a data security technology system can be established to build a comprehensive security architecture covering the entire lifecycle of data. Second, in blockchain application scenarios, the zero-knowledge proof mechanism can be utilized to achieve the governance effect of "data usable but not visible": during the execution of smart contracts, only necessary compliance proof information is provided to the verifier, avoiding the risk of leaking original data content; at the same time, distributed ledger technology records the entire trajectory of data operations, providing technical support for transparent traceability and ethical review of data flow, thereby constructing an automated governance environment based on technological trust. This technical governance paradigm transforms abstract ethical principles into executable technical rules, achieving "process controllability, risk measurability, and responsibility traceability" through the collaborative application of layered encryption systems, smart contract mechanisms, and privacy computing technologies, thus providing a robust technical guarantee for the ethical boundaries of sports event data commercialization.

6. Research conclusions and suggestions

6.1 Research conclusion

This study focuses on the ethical boundaries and governance paths of commercializing sports event data. Based on multidimensional analysis, it finds that while the value of data elements is being unleashed, this field faces multiple governance challenges, including data privacy risks, imbalanced rights distribution, and technical ethical challenges. The core contradiction stems from the ambiguity in defining data ownership, insufficient provision of ethical norms, and structural lag in technical governance capabilities.

Legal construction is the institutional foundation of ethical governance. By enacting specific legislation to clarify the ownership allocation, circulation rules, and rights and obligations of entities in sports data, a legal framework is established that includes the principle of minimal necessary collection, purpose limitation, and full-cycle security protection. This provides rigid constraints for delineating ethical boundaries. It is particularly important to establish differentiated rights definition rules for different types of data, such as athletes' biometric data and audience behavior data, effectively balancing the value conflicts between commercial development and rights protection, and avoiding governance vacuums caused by the absence of legal regulation. The industry self-regulation mechanism forms an intrinsic regulatory system. Sports industry organizations can develop detailed ethical guidelines, establish tiered supervision mechanisms, and promote the construction of corporate ethics review committees to form governance paradigms that align with industry characteristics. This flexible governance model not only respects the laws of data economic development but also encourages commercial entities to embed ethical responsibilities throughout the entire process of data collection, analysis, and application, addressing the lag in legal regulation and the instrumental rationality flaws in technical governance, achieving an intrinsic unity between business goals and ethical requirements. Technological empowerment opens up innovative pathways for governance. By leveraging encryption algorithms, blockchain technology, and smart contracts to build a technical protection system covering the entire data lifecycle, abstract ethical principles can be transformed into quantifiable code rules, enabling transparent traceability, automated compliance checks, and intelligent risk warnings in data circulation. Technological governance not only enhances the practical operability of ethical boundaries but also provides technical support for addressing new ethical issues such as algorithmic discrimination and data monopolies through real-time data monitoring and dynamic response mechanisms. The collaborative linkage of the three-pronged governance system, which includes the rigid constraints of legal regulation, the flexible adjustments of industry self-discipline, and the intelligent empowerment of technological governance, collectively form a systematic solution to the ethical dilemmas in the commercialization of sports event data. This multi-dimensional governance framework not only focuses on top-level institutional design but also emphasizes technological innovation. It simultaneously activates the intrinsic governance motivation of industry entities, providing a viable path for the dynamic balance between the value realization of data elements and ethical constraints.

Through the aforementioned relevant studies, it can be understood that with the gradual completion of major sports event systems across the country in recent years, the expansion of media support, and a surge in participant numbers, the ethical boundaries of data commercialization in sports events have become more pronounced.

Although China's sports industry is currently thriving, interviews and surveys with event sponsors and staff reveal that among participants, dissatisfaction with the event mainly stems from referee decisions and ethical issues on the field; from the audience's perspective, the main areas of dissatisfaction focus on spectator behavior, such as littering and indoor smoking. Therefore, from a long-term development perspective, the constraints on ethical boundaries during the commercialization process of events are more beneficial for their growth. In summary, the main issues concerning the ethical boundaries of data commercialization in sports events include: the lag in laws and regulations related to sports ethics, the need for better mechanisms to ensure the commercial operation of events, the lack of moral standards among athletes, spectators, and staff, and the need to enhance the dissemination of sports culture.

6.2 Propose

Based on the research conclusions, in the context of "comprehensive fitness", sports events have been paid more and more attention by the general public and the whole society. In combination with the trend of digital transformation of sports industry and the demand for market reform of data elements, the following optimization paths are proposed:

(1) The construction path of interdisciplinary collaborative ethical governance theory system

Based on the logic of interdisciplinary integration in knowledge production, we integrate theoretical resources from multiple disciplines such as law, sports ethics, and data science. We introduce the transaction cost analysis framework of institutional economics and the value-sensitive design theory of information ethics to construct a theoretical framework for sports data ethics governance that is adapted to local conditions. For cutting-edge scenarios like the application of AI referee systems and the confirmation of virtual data rights in metaverse events, we employ case analysis and field research methods to identify new ethical risks such as algorithmic decision transparency issues and disputes over the ownership of virtual identity data, establishing a dynamic governance rule system. It is recommended to establish an interdisciplinary center for sports data ethics research at universities and research institutions, promoting deep integration between theoretical research outcomes, technological innovation practices, and policy-making needs through collaborative efforts by interdisciplinary teams, thereby providing academic support for the construction of governance systems.

(2) Build a governance system that integrates localization and internationalization

Using the comparative method to study paradigms, systematically review the special protection rules for sports data under the EU's General Data Protection Regulation and the data governance practices of American professional sports leagues. In conjunction with the legislative spirit and institutional design of China's Data Security Law and Personal Information Protection Law, establish a data governance system that aligns with international standards while reflecting Chinese characteristics. In the field of cross-border data flow, draw on the APEC Cross-Border Privacy Rules framework to formulate detailed guidelines for the security assessment of sports data transfers, establish a data classification management and whitelist system. Under the premise of safeguarding data sovereignty and security, promote the global circulation and value sharing of sports data elements, enhancing China's influence in the formulation of international sports data governance rules^[8].

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References

- [1] Wang Yong. Research on Collaborative Governance System of University Grassroots Academic Organizations [D]. Southwest University, 2023.DOI:10.27684/d.cnki.gxndx.2023.003732.
- [2] Zhu Kaidi. Research on the Deep Integration of Competition Performance Industry and Sports Media Industry in the Digital Era [D]. Beijing Sport University, 2021.DOI:10.26961/d.cnki.gbjtu.2021.000560.
- [3] Wang Qi. Research on Archive Protection and Development of Large-scale Sports Events [D]. Chengdu Sport University, 2024.DOI:10.26987/d.cnki.gcdtc.2024.000318.
- [4] Chen Gaopeng, Wang Xin, Li Yue. Interactive Mechanisms and Model Innovation of Governance in Rural Sports Events in China —— Based on the Value Governance Analysis Framework [J]. Journal of Shanghai University of Sport, 2024,48(05):11-26.DOI:10.16099/j.sus.2023.10.05.0001.
- [5] Feng Jiafu. Research on Collaborative Governance of Mass Sports Events in China [D]. Shanghai University of Sport, 2021.DOI:10.27315/d.cnki.gstyx.2021.000018.
- [6] Song Na, Guo Qing. A Study on the Effectiveness of Online Public Opinion Response Strategies for Major International Sports Events in China under Ambiguous Crisis Responsibility —— An Exploration Based on Situational Crisis Communication Theory (SCCT) [J/OL]. Journal of Sports Science, 1-15[2025-04-26].<https://doi.org/10.15877/j.cnki.nsic.20250417.002>.
- [7] Promotion. Sports Disputes and Their Resolution Mechanisms from the Perspective of Conflict of Interest [D]. Nanjing Normal University, 2015.
- [8] Chen Jingjing. Research on the Historical Evolution and Future Trend of China's Public Diplomacy in Sports [D]. Northeast Normal University, 2024.DOI:10.27011/d.cnki.gdbsu.2024.000008.