

Analyze the Development of Modern Sports Industry based on Big Data

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Abstract: The rapid development of modern society, the rapid development and innovation of science and technology ushered in the arrival of the era of big data information, big data information has had an important impact on people's lives. Big data information has penetrated into the development of the sports industry, has a profound impact on the sports industry, and is an important force for the reform of the sports industry. Based on this background, the purpose of this study is that big data information can bring more value to the sports industry, promote the development of the sports industry, and improve the technology development of the sports industry. The research idea of this paper is to study and analyze the current situation of the development of the sports industry by means of theory and practice, analyze the application of big data technology in sports competitions, and analyze the data storage technology and data security risks, so as to provide theoretical guidance and technical support for the development and innovation of China's sports industry. According to the research results in this paper, the proportion of people aged 20 and above in China who have ever consumed sports is 39.9%, and the total output value of China's sports industry in 2019 exceeded 30 trillion yuan (an increase of 30.03% over last year). However, big data information has both opportunities and challenges for the development of the sports industry. A large number of data collection and analysis provide a guiding theory for the development of the sports industry and promote the development and progress of the sports industry. The security hidden danger of the storage of a large number of data information is also a huge challenge to the development of the sports industry.

1. Introduction

With the arrival of the era of big data information, China's data information resources have developed rapidly and have penetrated into all aspects of people's lives [1]. Big data information to the influence of the sports industry, promote the change of the sports industry, a large amount of data collection, statistics, analysis and so on to bring huge opportunities for development of the sports industry and big data is also very deep influence on competitive sports and competition practice, scientific development provides power to the health of the sports industry, promote the coordinated development of the sports industry level [2]. Under the background of the era of big data, the key factor for the development of sports industry is how to select favorable information for its own development and improve its own competitiveness [3]. In order to adapt to the new environment brought by the information technology of big data, China's sports industry should bravely welcome the arrival of the era of big data and research out a path suitable for China's sports development and innovation [4].

The present situation of the development of China's sports industry shows diversified development characteristics. With the penetration of science and technology into the sports industry, China's sports industry is gradually expanding in terms of the trend of science and technology and the scale of the sports industry. In particular, the investment of big data information technology provides new development opportunities for the development of the sports industry [5]. However, there is a lack of communication and cooperation in China's traditional sports industry, and the information exchange and sharing is less, which makes it more difficult to develop in tandem with

the subjects outside the industry [6]. In foreign countries, the development of sports industry is more advanced. In the field of sports science, the development of high mobility and accessibility of data is far ahead. As early as a few years ago, developed countries have established a special data website, from which professional sports industry data can be obtained. They have already applied the big data information technology to the sports industry to promote the development of the sports industry. However, the problem of massive data storage and security risks has always been a problem in the era of big data [7-8].

Big data information technology brings many opportunities to the development of sports industry and promotes the healthy and rapid development of sports industry. However, it also brings many challenges. The openness and mobility of data are severe challenges for the development of China's sports industry [9]. Sports industry under the background of big data, how to grasp the use of big data information advantage of the rapid development and how to avoid the large data of information disclosure, in order to make up for the big data and analysis of the advantages and disadvantages of the sports industry, based on the method of empirical analysis research data on the advantages and disadvantages of the effects and countermeasures of the sports industry and provide the correct theoretical guidance for the development of sports industry and the scientific basis for [10].

2. Theoretical Analysis of Big Data Operation

2.1 Big Data Information Technology Theory

The capacity of big data information technology is huge. For example, Baidu search provides more than 1.6 petabytes of information in the home page navigation every day, and the search requests are processed more than 6 billion times every day. There are various types of data, including a large number of web logs, audio, video, pictures, geographical location information, etc. Big data can process information quickly and efficiently to meet online or real-time data analysis needs. Big data information technology is characterized by low value density. For example, 1~2s data can be used to make a video. In the sports industry, it is necessary to collect and analyze a large amount of relevant data for sports products, sports competitions and sports training, so as to provide personalized services. According to the results of big data analysis, we will constantly promote the optimization and upgrading of products and consumer services, and promote the healthy development of the sports industry. The traditional technical architecture has been unable to efficiently process a large amount of data information, if a huge amount of information can not be efficiently processed, it will bring energy and economic loss. The era of big data has put forward new requirements on human beings' ability to control data, but also provides greater space for human development.

2.2 Modern Sports Industry Theory

The rapid development of the economy has turned people's attention to mental and physical health. These changes have promoted the development of China's sports industry, which has been expanding in scale. With the large investment and coverage of science and technology, China's sports industry has gradually improved in backward industrial operation, low level of market operation and unreasonable industrial structure. The total output and added value of China's sports industry in 2019 are shown in Table 1. In terms of sports competition, big data is used to select and train athletes, so as to improve the scientific level of competitive sports. However, the development level of China's sports industry modernization is relatively low, and the application of big data information technology in the sports industry has not yet reached the mature stage, so it is necessary to further explore the advantages and opportunities brought by big data information technology for China's sports industry.

Table 1. Total output and added value of China's sports industry in 2019

Name of sports industry category	Total amount (\$one hundred million)		Structure (%)	
	Total output	Added value	Total output	Added value
National sports industry	30274.3	9922.6	100	100
Sports management activities	339.1	167	1.4	2.3
Sports competition performance activities	256.1	102	0.8	0.8
Sports fitness and leisure activities	397.2	129.3	1.7	2.6
Sports venue services	986.2	558.1	4.9	8.1
Sports intermediary service	102.1	40.1	0.4	0.5
Physical training and education	358.7	193.2	1.5	3.2
Sports media and information services	201.1	80.8	0.5	0.9
Other sports-related services	401.1	197.9	1.8	2.3
Sporting goods and related products manufacturing	22388.2	6788.4	65.6	50.1
Sports goods and related products sales, trade agents and rental	4588.3	1567.4	20.7	28.4
Construction of sports facilities	256.2	98.4	0.7	0.8

According to Table 1, the total output value of China's sports industry in 2019 exceeded 30 trillion yuan (an increase of 30.03% over last year), and the added value reached 992.2 billion yuan. It can be seen from the table that the structure of China's sports industry has been significantly optimized.

3. Experimental Investigation Objects and Methods

3.1 Experimental Investigation Objects

This paper takes the sports industry path of big data as the main research object. Committed to the use of big data thinking to build a variety of ways to develop the sports industry, so as to constantly improve the development of the sports industry.

A total of 1500 people of all ages were selected for the survey sample. Most of the survey samples were conducted through online survey, while some people who don't often use the Internet were investigated through offline survey. The attribute information of the specific sample is shown in Table 2.

Table 2. Survey sample attribute information

Age information			Survey method
Age structure	Sample size	Proportion	
20-29years old	324	21.60%	All online
30-39years old	286	19.07%	All online
40-49years old	278	18.53%	All online
50-59years old	277	18.47%	Online and offline
60-69years old	179	11.93%	Online and offline
Over 70 years old	156	10.40%	All offline

3.2 Experimental Investigation Methods

(1) Literature review

This paper conducted a literature search on key academic platforms, and there were 4,987 relevant literatures. Through the research and analysis of these literatures, the interpretation of methods and knowledge points, the understanding of the development of big data, and the

discussion of relevant contents of the sports industry, this paper attempted to build a sports industry path based on big data.

(2) Qualitative analysis

According to the attributes and characteristics of the information technology of big data, this paper studies the law of its development. By describing and explaining the knowledge and operating conditions related to big data information technology, this paper studies the thinking and construction of sports industry path of big data information technology according to the theoretical basis of big data information.

(3) Expert consultation method

Through the in-depth understanding of relevant knowledge of professors in relevant fields, the views and opinions of professors are summarized and sorted out, and based on the scientific and systematic theoretical knowledge and methods, logical reasoning and induction are carried out, and a series of relevant theoretical basis is obtained.

4. Survey Results and Analysis

4.1 Opportunities for the Development of Sports Industry under the Background of Big Data

(1) Create more value for the sports industry

Big data to our country sports industry development in the industry, integrate and analyze the relevant data and information, to extract the important information resources, such as in sport, the training method and athletes training practice and so on a large amount of data collection and analysis, to extract the scientific theoretical data, promote the theory of training, training methods, theory and practice of change.

(2) Promote the development of sports communication

With the advent of the era of big data, there are so many ways to the spread of sports, such as the transmission of video class, people can receive the sports information anytime and anywhere, the development of network broadcast but also attract the attention of the public, according to the audience's affection and interest to develop a sales plan, promoting the dissemination of sports, the spread of the media and cooperation with the enterprise resources sharing at the same time.

(3) Accelerating the scientific and technological research of the sports industry

China's sports industry development science and technology content is low, so the development of the sports industry hovering in the primary level of development. The arrival of big data accelerates the process of science and technology of the sports industry. The information technology of big data is more rapid and convenient in data collection, improves the quality and efficiency of sports research, and promotes the healthy development and progress of the sports industry.

4.2 Challenges to the Development of Sports Industry under the Background of Big Data

(1) Data security is an important challenge

Under the background of big data, data security is an important challenge for the development of China's sports industry. The huge development of data information means that data security is becoming more and more important, such as the snowden incident of information security leakage. In the process of collecting a large amount of data, it is easy to reveal the personal privacy of this case, threatening the personal interests of consumers. For example, in the fitness industry, especially in the case of imperfect laws and regulations, there is a great risk of consumer information disclosure, so the security of data information is an important challenge for us at present.

(2) Lack of consumption motivation in the sports industry is an important challenge

China has a large population and the scale of sports industry is constantly expanding, but the proportion of sports population in China is relatively small, and people have narrow channels to receive sports resources. The survey results of sports information channels for people aged 20 and above in all age groups are shown in Table 3. As can be seen from the table, TV and radio are important channels for people to obtain sports resources, followed by the Internet. The spread of the Internet is concentrated in the relatively young groups, and people over the age of 60 basically do

not get information from the Internet.

Table 3. Percentage of people aged 20 and above who have access to sports information channels (%)

Age	20-29	30-39	40-49	50-59	60-69	Over 70
Books, newspapers	13.7	14	12.9	19.3	15.7	10.7
Television and radio	35.2	40	61.2	55.5	54	37.4
Internet	40.8	29.5	7.1	1.2	0.5	0.1
School education	2.2	0.5	0.1	0.3	0.2	0.1
On-site observation	0.4	0.5	0.1	0.7	0.5	10.5
Socialize	1.3	1.6	1.9	1.7	1.6	4.3
Others	0.7	1.6	1.2	1.1	1.3	0.9
Never pay attention	5.7	12.3	15.5	20.2	26.2	36

Big data information can not fully extract the analysis and mining of sports data, which is also an important reason for the lack of sports consumption motivation. It is unable to accurately locate and divide the market in various fields of sports industry. The investigation results of sports consumption projects for people over 20 years old are shown in Figure 1. As can be seen from Figure 1, the consumption structure of the sports industry is not balanced. The proportion of people aged 20 or above in China who has ever consumed sports is 39.9%, and the main consumption item is sportswear, accounting for 93.89%. The proportion of people watching games is only 6.67%, and the proportion of venue rental is 10.33%.

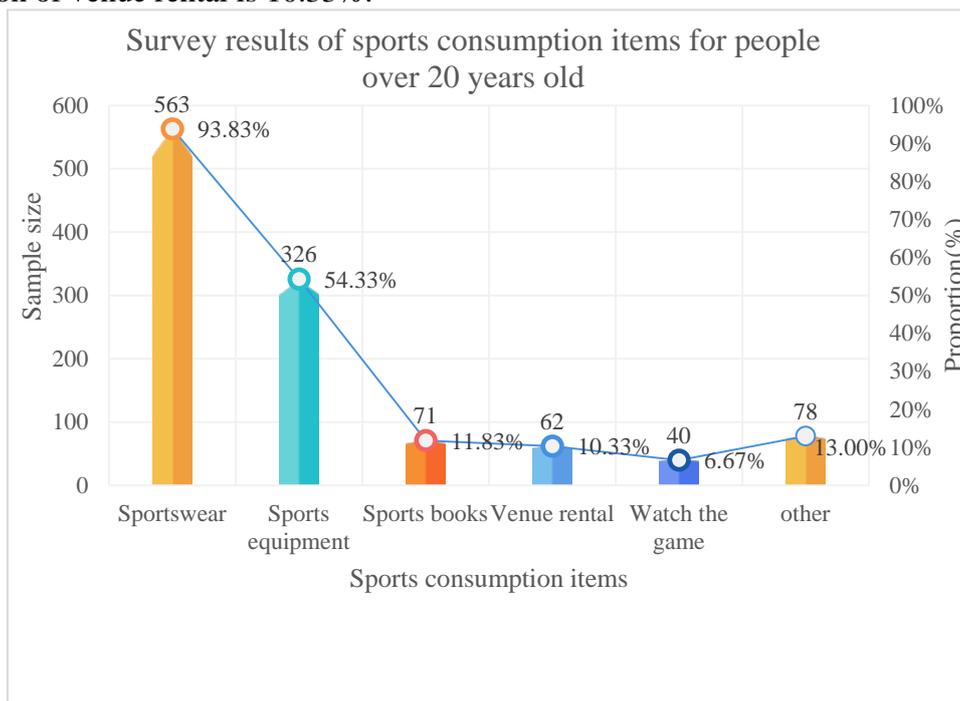


Figure 1. Survey results of sports consumption items for people over 20 years old

(3) Foreign companies bring great pressure to local enterprises

With China's opening up to the outside world and economic growth, foreign companies have fierce competition for products in all areas of the Chinese market, especially in the sports industry. In terms of technological innovation and big data development, local enterprises are at a disadvantage. At the same time, the lack of talents makes the development of local enterprises face major challenges.

4.3 Countermeasures for the Development of Sports Industry under the Background of Big Data

(1) Strengthen information security prevention and personnel training

We will strengthen oversight over information leaks and protect the privacy of consumers. Relevant policies on network information maintenance need to be improved by the state as soon as possible. Enterprises should also maintain consumer information with the attitude of the person in charge and protect the interests of consumers. At the same time, it is also necessary to cultivate talents of big data information technology, cultivate high-end talents, build high-quality teams, improve the current situation of lack of talents, and promote the development of the sports industry.

(2) To understand the needs of customers and promote the balance between the supply and demand of the sports industry

The core price function of big data lies in the integration and analysis of data information, so that suppliers can understand the market dynamics understand the needs of consumers and meet the needs of different groups. Accelerate the establishment of the data structure, realize the establishment and update of the latest data, provide an efficient and fast database for the sports industry market, reach a state of balance between supply and demand, and realize the healthy development of the sports industry.

(3) Resource sharing and collaborative development

The characteristics of big data require data sharing to form a cooperative operation relationship, so as to establish a situation of resource sharing and win-win cooperation between sports industries or related industries. The sports industry should establish the awareness of open sharing and coordinated development. The coordinated development of the sports industry should not only pay attention to the inside of the sports industry cooperation, such as sports industry, sports media, sports goods manufacturing industry such as the data between the synergy, also should attach importance to the sports industry and external cooperation of the subject, such as sports and medical institutions to cooperate, an operator can not only expand the range of sports products, and can reduce the burden of sports operators training medical talents, saving the cost of r&d.

Conclusion

The development of the era of big data information technology has brought a great impact on the real society, made a great contribution to the reform and development of enterprises, improved the speed of enterprise development, and improved people's cultural life. Big data information technology has brought the sports industry the opportunity of rapid development, but also faced with the importance of information security challenges at the same time, we should strengthen the cultivation of the talent team, increase the input of science and technology, and completes the industry development planning, enhance enterprise competitiveness, implement data processing and information security work, promote the health of the sports industry in China.

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References

- [1] Lv C. Application and optimization of lifelong sports model in university physical education based on big data analysis [J]. Boletin Tecnico/technical Bulletin, 2017, 55(14):339-345.
- [2] Song W, Xu M, Dolma Y. Design and Implementation of Beach Sports Big Data Analysis System Based on Computer Technology [J]. Journal of Coastal Research, 2019, 94(sp1):327.
- [3] Morgulev E, Azar O H, Lidor R. Sports analytics and the big-data era [J]. International Journal of Data ence and Analytics, 2018, 5(4):213-222.
- [4] Yu L. Cloud storage-based personalized sports activity management in Internet plus O2O sports community [J]. Concurrency and computation: practice and experience, 2018, 30(24):e4932.1-e4932.10.

- [5] Xiao-Wei X. Study on the intelligent system of sports culture centers by combining machine learning with big data [J]. *Personal and Ubiquitous Computing*, 2020, 24(1):151-163.
- [6] Sheng Z, Zhirong L, Shimei W, et al. An optimization approach for analyzing construction element of new rural sports culture in Jiangxi based on big data platform [J]. *Revista De La Facultad De Ingenieria*, 2017, 32(9):247-253.
- [7] Q. Ma, L. Liu, Y. Xie. Research on the physical education teacher training system in sunshine sports based on big data platform [J]. *revista de la facultad de ingenieria*, 2017, 32(4):780-787.
- [8] Kaiyan H, Qin W. The development and popularisation of network platform of college sports venues in intelligent manufacturing [J]. *International Journal of Reasoning-based Intelligent Systems*, 2018, 10(1):20-25.
- [9] Su X. Analysis of the development prospects of rural tourism e-commerce system under the background of big data [J]. *Revista de la Facultad de Ingenieria*, 2017, 32(9):492-499.
- [10] Rein R, Memmert D. Big data and tactical analysis in elite soccer: future challenges and opportunities for sports science [J]. *SpringerPlus*, 2016, 5(1):1410.