Opportunities, challenges and Countermeasures for the development of China's sports industry in the era of big data

Hao Liu
Huanggang Normal College Institute of Physical Education, Hubei,438000, China

Abstract: Opportunities faced by China's sports industry in the era of big data are as follows: the mining and analysis of big data creates more value for the sports industry; promotes the coordinated innovation and development of sports industry clusters; and accelerates the technological progress of the sports industry. This is both an opportunity and a challenge for the sports industry. At present, the following problems still exist in sports industry: lack of human resources to complete advanced data management and development in sports industry; difficulties in data storage in sports industry; inadequate depth of data mining in sports industry; difficulty in guaranteeing user information and privacy; strong competitiveness of foreign-funded enterprises to domestic enterprises. Some countermeasures are put forward, such as solving the problem of sports big data storage, improving the ability of big data processing and service, introducing advanced data processing manpower, building scientific research team, protecting personal privacy, and doing a good job of sports industry collaborative innovation research.

1. Introduction
The industrial revolution led by steam engine in the 19th century ended the era of manual labor and accelerated the progress of human civilization. The computer-led technological revolution in the 20th century has promoted the process of network dramatization and greatly changed the way of human life. Nowadays, with the popularity of mobile Internet, Internet of Things, cloud computing and other network channels, as well as the popularity of QQ, blog, Weixin, Facebook and other network communication methods as a symbol of the big data era, the massive amount of data generated every day is changing people's lifestyle and consumption experience.

2. Characteristics of big data Era
Big data, as a hot research topic, has the following 4V characteristics: Firstly, volumes are huge. The volume of data jumped from the TB level to the PB level. Secondly, data categories (variety) are numerous. Data comes from varieties data sources, types and formats which break through the previously defined structured data category, including semi-structured and unstructured data. The actual value lie in the data (value) is quite insufficient. Taking video as an example, the data that may be useful in continuous monitoring is only 1~2 s [1].

3. Opportunities for China's sports industry in the era of big data
Big data is gradually showing influence in every field of society. The Dickinson Global Institute reports in its Big Data: The Next New Areas of Innovation, Competition and Productivity that "big data" in the U.S. health care industry can create $300 billion a year, more than twice as much as Spain spends on health care; and in European public administration, the big data is equivalent to about 2% a year.
The value of 50 billion euros is higher than Greece's GDP; the use of global personal location data can create $600 billion in consumer value; the "big data" can also increase the operating profits of retailers by 60%. In addition, some companies use social networks such as Facebook, Twitter, QQ, to collect a large number of relevant data, providing the possibility for product improvement, but also to achieve large data marketing. For more details please see the figure 1 and figure 2 [2].

3.1. Create more value for sports industry
Unlike cloud computing and Internet of Things (IOT) data storage and acquisition, the focus of big data is how to mine valuable data, integrate and analyse relevant data information, and ultimately make it a valuable resource for enterprises or managers.
In addition, timely access to the valuable data information can enable enterprises and managers to timely grasp the current market demand situation, understand consumer demand hobbies and consumer trends, market segmentation more accurately, so as to produce products in line with consumer wishes. It can be imagined that in the near future, it will be possible to produce "privately tailored" products for consumers [3].

3.2. Promoting the coordinated development of sports industry
At present, China has set up six national sports industrial bases, and the sports industrial clusters have basically formed. However, in the clusters, sports and related enterprises lack cooperation and communication with universities, scientific research institutions, professional social network analysis companies, and so on. Under the background of large data, sports enterprises cannot only reduce investment in scientific research, but also obtain information from other enterprises. Universities and scientific research institutions can transfer talents for them, so that the theoretical results can be directly applied to sports enterprises, and enhance the ability to transform their scientific research results. In order to obtain more orders and expand their business, collaborative innovation is a win-win process. For example, IBM has acquired SPSS, Mezzanine, Open Pages and Algorithm in the past three years to better develop sports events. Therefore, collaborative innovation is an inevitable choice for sports enterprises in the context of large data [4].

4. Challenges to China's sports industry in the era of big data

4.1. Storage of big data
With the rapid development of mobile Internet, Internet of Things and cloud computing, all kinds of unstructured and semi-structured data such as video, audio, social and so on are growing rapidly, and TB data may be produced every day. According to Terra's statistical analysis, Boeing 737 aircraft can produce 240 TB of sensor data in a six-hour flight, which poses a higher challenge to the management of traditional databases (traditional databases cannot handle TB-level data, let alone high-level data analysis). According to the IDC research report: by 2020, the capacity of global information database will reach 40 NB, which is nearly 15 times that of 2.8 ZB in 2012, but the existing storage technology has been difficult to cope with. Take the sports competition performance market as an example. There are thousands or even tens of thousands of spectators in every game. There are also viewers watching the live broadcast on TV [5].

4.2. Deep analysis and mining of data
The key to using large data is not how to store massive data, but how to analyse and process massive data information. In the field of sports industry, it is how to use scientific and technological means to analyse and mine the valuable data from a large number of video, audio and dynamic unstructured data information. In the Internet age, the application of social network analysis technology is more important to the real-time analysis and acquisition of large data of sports industry, that is, flows processing. Unlike traditional batch processing, stream processing is real-time; storing a large amount of information while doing stream processing is the key to using large data. Timely access to useful information and feedback to users, will have a huge impetus to the development of the sports industry, but also put forward higher requirements for sports enterprises.

5. Countermeasures for the development of China's sports industry in the era of big data

5.1. Solve sports big data storage problem
The government should take the lead in formulating relevant planning and development policies as soon as possible in view of the characteristics of large sports data, encouraging scientific research institutions or enterprises to carry out relevant research and develop storage equipment, according to the current situation, the sports industry should strive to improve its scientific research capability and
meet challenges.

5.2. Do a good job of large data processing services
First, we should collect data as much as possible, then analyze and process the data through smart phones, and finally provide information to users. After data processing, users will be provided with accurate information as soon as possible. Second, the analysis and processing of big data should be fast; otherwise the opportunity for users will be missed. For example, Ray Henry Berg and his team, from Both Allen Consulting, refined a data model based on Major League Baseball data, which, on the basis of multiple cross validations, can predict in real time what a pitcher is going to throw and when, with an accuracy of 74.5%.

6. Conclusions
Sports industry should actively take advantage of the opportunities brought by the era of big data. The enterprises in this field should increase investment in science and technology, make a mature plan about industry development. The laws and regulations for big data service should also be set up and followed as soon as possible. The enterprises also have to expand its own business in time, strengthen collaborative innovation research of big data processing, and provide users with timely and satisfactory sports products and reliable service. In addition, we should take the initiative to overcome the challenges brought to the sports industry in the era of big data according to China's reality.

References
[1] Wang Penning. Opportunities, Challenges and Countermeasures for the Development of Sports Industry in the Age of Big Data [J].Contemporary Sports Science and Technology, 2018, 8 (01): 191-192.
[2] Ye Mingus, Sun Xiaoping. Opportunities and Implementing Strategies for the Development of Sports Industry under the Background of Big Data [J].Journal of Beijing Printing Institute, 2018, 26 (01): 112-114.
[3] Bhang Pyongyang. Opportunities and challenges in the development of China's sports industry in the era of big data [J]. college entrance examination, 2017 (06): 217.
[4] Li Bi, He Intense. Development Strategy of Competitive Sports System Adaptation in Big Data Era [J].Journal of Capital Institute of Physical Education, 2015, 27 (02): 156-159.
[5] Chang Jingo Nan. Influence of big data era on sports communication [J]. Journal of Wuhan Sports Institute, 2014,48 (07): 16-20.