Analysis of the Influence of Big Data Background on the Spread of Large-Scale Sports Events

Tieniu Xia¹,*

¹Physical Education Research Department, Xinjiang University, Xinjiang Urumqi, 830046, China

*Corresponding author e-mail:xiatn027@xjun.edu.cn

Abstract: With the advent of the era of shallow reading and the popularity of smartphones, people are becoming more and more interested in schema reading, and data visualization has gradually become an ideal way to present news. While the scope of influence and attention of large-scale sports events are continuously expanding and improving, the application of data visualization in the communication of large-scale sports events is also increasing, and the visual communication method with strong data news appreciation is gradually being recognized by the audience. Then, does the development status of China's large-scale sports events meet the needs of the country and the people? What kind of scale and system of large-scale sports events does China need? This paper applies the questionnaire survey method to analyze the impact on the spread of large-scale sports events under the background of big data. It is concluded that although China's GDP in 2019 has reached the third level in the world, other indicators lag behind other countries, especially the GDP per capita and the GDP of the sports industry are only 0.7%. This shows that the scale of China's sports industry is still small.

Keywords: Big Data, Large-Scale Sports Events, Data Visualization, Questionnaire survey

1. Introduction
According to the relevant survey of Internet Data Center, the data on the Internet alone can double every two years, and so far more than 95% of the data in the world has only been generated in recent years. Due to perception technology development, they will be more deeply penetrate into various kinds of instrument or equipment, at any time measurement and convey or produced by the human nature itself to generate huge amounts of data information, which makes the data rapidly expand, in the future we will have been in this kind of "big data" environment, can not use "data" personal or group will struggle in the society in the future. And as people's living standards continue to improve,
sport is slowly becoming one of the themes of this data age.

Regarding big data, many expert teams have carried out a series of researches. Unanue And W believe that in the era of big data, sports communication has the following changes: First, the forms of sports communication and the ways of data communication are diversified. Second, real-time feedback is established and public opinion is predicted. Thirdly, the modes and carriers of sports communication present diversified development trend. Fourth, the wide application of big data technology has created the “we media” era of sports communication [1]. David believes that “sports events take human sports as the carrier, and games are used to determine the winners and losers. Considering the final ranking of the public, major events that participate in the self-regulated allocation of resources, or simply the existence or trade of resources that exist or may be allocated, and special events that have the final ranking [2]. Some experts on large-scale sports events put forward the combination of competitive sports data and visualization, and proposed the visualization of the stadium to help fans understand the game situation in a visual way, and help coaches and game analysts understand the details of the game and the realization of teams and players [3]. Taking the visual chart of sports events as the object of study, this paper introduces the visualization methods suitable for the presentation of sports events. Throughout the studies of these scholars, they still rarely mention the application of big data in large-scale sports.

In the era of big data transmission of large sporting events as the research object, through the technology of data about the present situation of sports public service supply of information, further analysis of the current large supply of sports audience has access to what information, as well as the audience need what kind of sports public service information, analysis of factors influencing the sports information of public service satisfaction, combined with the advantage of big data, put forward the corresponding suggestion.

2. Method

2.1 Big Data

The advent of the era of big data is the inevitable result of social development, but also brought great changes to human society, while humans enter the "era of" big data of time is very short, many industries and personal understanding of the big data is still in the relatively shallow level, but all aspects of social life because of the "big data" changes are apparent, new characteristics gradually clear, and the people of the traditional thinking, method of work put forward new requirements, enable people to be able to "era of" big data generated by the social various aspects the new changes and trends are foreseen and grasp of science. With the development of mobile communication technology, cloud storage, cloud computing and other high technologies, the field of data application is becoming more and more extensive and the forms of application are becoming more and more diversified [4]. The Us Internet Data Center has predicted that as big data becomes more widely used, information data on the Internet will grow at a rate of 50% per year. World-renowned information consulting agencies define big data and its technologies as a new technology architecture that can capture, discover or analyze data at high speed to gain value from large volumes. The research on big data has reached an unprecedented height, and the research enthusiasm of scholars in the industry is also quite high. However, despite the phenomenon of big data craze and related theoretical research has become the focus of research, it is undeniable that there are many differences in the cognition of big data up to now [5].

The development and application of cloud computing technology has set up a basic platform for big data and made it possible for big data to move from theory to reality. First of all, cloud computing technology can promote different industries to accelerate the process of intelligence, which is the basis for the "blowout" development of data volume. Secondly, on the basis of the amount of data accumulation, must through scientific processing and analysis in order to realize the value of the data, it's for distributed file systems, database technology and intelligent data analysis, data storage and processing technology is put forward higher requirements, and the development of cloud computing
technology just laid the foundation to solve the technical problems. Cloud computing can enrich the way of data collection, reduce the cost of data processing and improve the efficiency of data utilization. It is for this reason that massive "basic data" can be transformed into "useful information" after scientific processing and realize the real value of big data. Therefore, it is the technology that can be regarded as an extension of cloud computing technology [6].

2.2 Large-Scale Sports Events
In the context of economic globalization, all parts of the world are like a whole, but also like competitors, especially in the aspect of economic competition. National economic competition is more reflected in the competition between cities. More than ever, cities need to take a global perspective, to discover and harness new resources; At the same time, the city is more than ever need to know more and create the local resources, to develop comparative advantages, enhance the competitiveness of large comprehensive sports events refers to a special event competition products and related services, for national army big impact, and the overall economy of the city, and around the world and the general scope of the media have a huge echo. Large-scale comprehensive sports events have the following characteristics: the event has the largest scale, the highest level, a large number of participants and participants; Wide range of events involved and high complexity; It has a great impact on the political, economic, social, cultural, tourism and urban infrastructure construction of the host country and city [7].

The holding of large-scale comprehensive sports events often involves all aspects of politics, economy, society and culture, which requires huge human and material input to successfully operate. If the government simply organizes the events, huge financial burden will be incurred [8]. As one of the protagonists in the process of urban development, large-scale sports events play the role of urban marketing. At the same time, the city also provides strong financial support for the sports events, a large and loyal consumer group, high-end media and various required sports event operation and management talents, to ensure the success of the sports events.

2.3 Theoretical Basis of System Dynamics
System dynamics is an interdisciplinary subject that studies information feedback systems, cognitive systems, and system problem solving. In this paper, the whole marketing process of sports products is discussed as a system, while the exchange between marketers and consumers is regarded as a closed and acceleration-free system [9]. According to the internal dynamic principle in the system dynamics theory, if we want to change an inertial system into an open system with acceleration, we can use the following formula:

If A1 and A2 represent the acceleration of two objects, F1 and F2 represent the external force acting on two objects, then there is:

$$\frac{a_1}{a_2} = \frac{F_1}{F_2}$$  (1)

This formula shows that when the mass is the same, the acceleration of an object increases with the increase of the external force acting on it, that is, the greater the external force, the greater the acceleration. The sports product marketing system is also a nonlinear system. By introducing this conclusion into the system, it can also be explained that the exchange speed of sports products depends on the marketing system of sports products and the external force acting on it [10].

The formula for the relationship between acceleration and mass. If m1 and m2 are the masses of the two objects, then:

$$\frac{a_1}{a_2} = \frac{M_1}{M_2}$$  (2)

This shows that the acceleration of two objects with the same force is inversely proportional to the mass. In sports product marketing system, we can understand that the acceleration of internal structure development of marketing system is inversely proportional to the size of marketing system.
3. Experiment
Data in order to understand the big impact on the spread of the large-scale sports event, design the data under the background of large-scale sports events spread give audience needs questionnaire, using electronic questionnaires to be issue, in the form of questionnaire statistical results: a total of 500 copies, eliminate invalid 60 questionnaires, recycling effective questionnaire 440, the issuance of questionnaires and recycling work done by himself, to ensure that the content of the questionnaire in detail.

4. Discussion

4.1 Characteristics of The Competition System of Large-Scale Sports Events in China
In recent years, the more and more large-scale sports events are held in China, the larger and larger the scale is. The number of large-scale sports events held in China at different time periods from 2001 to 2018 is shown in the figure.

![Figure 1. Chart of the number of large-scale sports events held in China at different time periods](image)

As is shown in Figure 1, with the development of The Times, the number of large-scale sports events held in China is constantly increasing. The political goal of any event organized by a trade association is to surpass the previous one in scale. Regardless of the number of participants or the event will be more than one session, "only big not to do" has become the host city before the attractive advantages of bidding for the event, this trend continues to spread.

4.2 World Cup Goal Time Distribution Diagram Based on Big Data
In the era of new media with huge amount of information, the news reports of large-scale sports events have information spread in various forms of media and reports. For World Cup news coverage, data news is not only a powerful supplement to news coverage in the form of game preview, match report and post-match commentary, but also provides readers with practical advice from more novel perspectives, and this information is presented in a visual form.
As can be seen from Figure 2, the World Cup based on big data takes 5 minutes as a time interval, and presents the distribution of goals in the regular 90 minutes plus the extra time, a total of 120 minutes, in a graph, which also includes the stoppage time in the first and second half and the extra time. Readers who are "non-fans" can clearly see which periods score more and allocate their attention to the game.

4.3 Investors in Major Sports Events in China

Sponsors of sports events are also important investors of large sports events in China, especially under the socialist market economy system, sponsors of sports events are more important investors. In recent years, sports lotteries have provided some of the funds for sports events held at home and abroad.

Table 1. Statistical Table of Sports Lottery Public Welfare Fund Funding Large-Scale Sports Events

|                  | 2012 | 2013 | 2014 | 2015 | 2016 |
|------------------|------|------|------|------|------|
| Holding large domestic events | 3303 | 3500 | 4020 | 4500 | 5000 |
| Holding major international events | 896  | 900  | 1000 | 1200 | 1230 |

As can be seen from Table 1, the amount of sponsorship has been increasing year by year. Objectively speaking, sponsors and sports events have a symbiotic relationship. Sponsors sponsor sports events with money or in kind to enhance their product awareness and corporate influence. In turn, sports events obtain funds and materials needed to hold them through sponsorship. For the organizers of sports events, sponsors are an important guarantee for the successful operation of sports events. Event sponsors not only provide a large amount of funds and materials needed for sports events, but also invest a large amount of human, material and financial resources in the promotion and promotion of sports events.
4.4 Economic Functions of Large-Scale Events Based on Big Data

The holding of large-scale sports events in various countries promotes the rapid development of the sports industry, and the sports industry formed by large-scale sports events in some countries has become the new economic pillar industry for the development of many countries.

| Table 2. GDP Ranking of Countries in 2019 |
|------------------------------------------|
| country      | Gross domestic product (unit: trillion) | Per capita GDP (dollar) | Proportion of sports industry in GDP |
|---------------|-----------------------------------------|-------------------------|---------------------------------------|
| 1 USA         | 15                                      | 50000                   | 3%                                   |
| 2 JAPAN       | 5                                       | 40000                   | 2%                                   |
| 3 CHINA       | 4.9                                     | 3300                    | 0.7%                                 |
| 4 Germany     | 4                                       | 44000                   | 1.9%                                 |

As can be seen from Table 2, although China's GDP in 2019 has reached the third level in the world, other indicators lag behind other countries, especially the GDP per capita and the GDP of the sports industry are only 0.7%. This shows that the scale of China's sports industry is still small. The holding of large-scale sports events seeks economic interests first and political interests second. The economic function of large-scale sports events is its main function.

5. Conclusion

In the research on the communication of large-scale sports events in the era of big data, we have seen the trend of the development and change of the market of large-scale sports events in the future, and grasped the new characteristics of the competitive environment faced by TV media. After the arrival of the era of big data, it brings a new test to how to realize the innovative development of TV media, and the communication strategy is just one of the links that can effectively combine large-scale sports events with big data. Establish a perfect evaluation system database. Through the establishment of indicators, it relies on big data technology to provide data support for evaluation marketing. Set up a special "data" marketing evaluation agency. The evaluation of marketing effectiveness is a very complex project, which needs to be comprehensively evaluated from various fields. It requires all kinds of highly professional technicians to complete the evaluation together. However, this kind of experts should make every effort to evaluate the benefits of "data" marketing in a timely and accurate manner, and directly make the decision and formulation of marketing strategies for marketing sports products. Therefore, it is necessary to establish a "data" marketing evaluation organization in order to gather all kinds of experts in different fields together and complete all-round and timely evaluation of benefits. In this way, the evaluation of marketing benefits can be carried out more efficiently. Rely on all kinds of professional science and technology personnel, do a good job of evaluation. Rely on experts, scholars and relevant evaluators from all walks of life to carry out professional research on the index system, evaluation methods and evaluation principles of marketing effectiveness. The researchers evaluated each field in a comprehensive manner.

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