A Feasibility Study on Improving the Quality of Sports Competitions Based on Big Data Analysis

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Abstract—With the development of China's sports power development strategy, the quality of sports competitions also needs to be further improved. Only in this way can we better play its role in promoting sports and sports. The application of big data technology is an important way to improve the quality of sports competitions. Big data technology can not only comprehensively mine and collect sports competition data, but also perform objective, comprehensive and efficient analysis and processing of massive technologies. This will not only provide better protection for athletes, but also provide spectators with a better watching experience, thus laying a good foundation for comprehensively improving the quality of sports competitions.

1. INTRODUCTION

With the development of China's network information technology and big data and other emerging technologies, the scope of its application continues to expand, and it has greatly changed the traditional development model in many fields. In recent years, China has put forward the development goals of strengthening the development of sports and building a sports power. China should also actively use new information technologies such as big data in sports competitions. In this way, sports competitions can not only promote the development of China's sports competitions, but also provide spectators with more ornamental events that can fully reflect the spirit of sports competitions on the basis of rapid data mining and statistical analysis. Big data technology will be more and more widely used in sports competitions [1]. Meanwhile, the application of big data analysis technology in international sports competitions is becoming more and more popular. This shows that big data technology not only has high feasibility and application value in sports competitions, but also an important trend in the development of the sports industry.

Figure 1. China's Sports Industry Growth Forecast
2. A Feasibility Study on Improving the Quality of Sports Competitions Based on Big Data Analysis

2.1. The Important Role of Big Data Technology in Sports Competitions

2.1.1. Application of Big Data Technology can Analyze Athletes' Injuries

In the process of sports competitions, once an athlete is injured, it will not only affect the athlete's competitive performance, professional development and sports life, but also lead to a decline in the excitement of the sports competition, which is not conducive to the healthy development of sports competitions. The application of big data technology can dynamically monitor the status of athletes, understand their physical conditions in time, and perform scientific analysis and judgment based on the collected data information to prevent athletes from being injured during sports competitions. In practice, the application of big data technology can wear some intelligent sensor devices for athletes to monitor various physical index data of athletes, and make objective, accurate and scientific judgments on these data information. In this way, corresponding training and competition arrangements can be made according to the actual physical conditions of the athletes, ensuring that the athletes can participate in sports competitions in the best condition. This not only protects the athletes, reduces the probability of athletes being injured in sports competitions, but also increases the viewing of sports competitions, so that the quality of sports competitions is comprehensively improved.

2.1.2. Application of Big Data Technology can Help Athletes Improve their Competitive Ability

In order to achieve better results in sports competitions, athletes need to constantly break through their own limits and comprehensively improve their sports and competition capabilities. This is also an important way to improve the quality of sports competitions. The application of big data technology can help athletes and coaches accurately grasp the sports data of athletes in the course of sports competitions, and objectively analyze them based on relevant sports science theories, and give corresponding improvement suggestions [2]. In the actual application of big data technology, it can set up sensor devices in the corresponding position of the competition field according to the specific selection of the competition in sports competitions, and use chip technology to monitor the explosive power, speed, endurance, etc. of athletes in sports competitions. Movement data is collected, stored and transmitted. In this way, the coach can better and accurately grasp the actual situation of the athletes so as to adjust the tactical arrangements of the athletes in time to help the athletes achieve better competition results. Meanwhile, this can also make sports competitions more exciting and enjoyable, which plays an important role in improving the quality of sports competitions. Taking the match between Brazil and Italy in the World Cup as an example, according to the big data analysis results, it is found that Brazil has an advantage over Italy in terms of overall team strength and explosive power and other technical statistics. Hence, the Brazilian team adopted the strategy of arranging players in the half-court and deploying three offensive players, which well took into account the needs of both offensive and defensive ends in the game, thus achieving an ideal game result. The audience can also better feel the charm of sports competitions from watching the game. As a result, the analytical capabilities of big data technology play an important role in comprehensively improving the quality of sports competitions.

2.1.3. Application of Big Data Technology can Help Viewers Fully Understand Sports Competitions

In sports competitions, the analysis ability of big data technology is also an important technical means to help fully understand sports competitions. It can help the audience to conveniently obtain sports competitions and understand relevant data to meet the needs of the audience to watch sports competitions. Spectators in the new era have higher requirements for the professionalism of data analysis when watching sports competitions. On the basis of traditional on-site commentary to obtain event information, the audience also requires a more detailed understanding of the athletes' game strategies, tactical arrangements, etc., in order to predict the results of the game [3]. The analytical
capabilities of big data technology can better meet the actual needs of the audience for watching sports competitions in the new era. Taking the presentation of football match data as an example, viewers can use big data technology to collect information on the past records of participating team players and the personal abilities of participating players, especially star players. Afterwards, the audience can analyze the differences in the comprehensive abilities of the participating players in the free kick, acceleration ability, balance ability and jumping ability by using the analysis ability of big data technology. In addition, the audience can use the database information of big data technology to review the past record, thereby helping the audience to enhance the accuracy of the prediction of the game results.

2.2. Application Practice of Big Data Analysis Ability in Improving the Quality of Sports Competition

2.2.1. Application Practice of Big Data Analysis Ability in Football World Cup

With the maturity of big data technology and the continuous expansion of application fields, its application in sports competitions has become more and more extensive, which has greatly improved the quality of sports competitions. In the 2018 Football World Cup, the analysis capabilities of big data technology were used in the Russian World Cup to conduct a comprehensive analysis of the entire game. Through analysis, we found that the age of the main players in this World Cup competition is mainly concentrated in the 24-33 age group. It shows the characteristics of normal distribution. At the same time, we also found that although most of the participating players are between 24-33 years old, there are still some players over 40 who are active on the field. This shows that the sports life span of players in the new era has been extended [4]. Furthermore, the analysis of the World Cup winning country data can help the audience to enhance the accuracy of predicting the final winning team. According to statistics, a total of 9 countries have won the World Cup. Brazil is the country with the most World Cup victories, with 5 championships. This makes spectators more inclined to predict that the Brazilian team will win the game. Through big data specific to the analysis of the match between Brazil and Italy, we found that the two teams adopted very different deployment strategies.

Big data analysis shows that Brazilian players have advantages over Italian players in terms of scoring ability, shooting power and overall technical level. However, Italian players are more stable than Brazil in terms of stability. Coaches can score and evaluate participating players based on the results of data analysis. Based on the analysis of the scoring results, we found that the Brazilian team's players have achieved an overall score of about 80 points, and the team's overall strength is relatively strong. When analyzing the scores of the Italian players, we found that the strength gap between their team members is more obvious. The two participating teams combined the results of big data analysis to make their own strategic deployments. Among them, the Italian team players are mainly concentrated in the center line and leave 4 defenders in their own half, and 2 offensive players are mainly active in the opponent's half, thus forming its offensive and defensive system. The Brazilian team deployed 3 offensive players and concentrated on the half court, using a tactical arrangement that took both offense and defense. The tactical arrangement based on big data analysis makes the game more exciting. This greatly improves the quality of sports competitions.

2.2.2. Application Practice of Big Data Analysis Ability in Tennis Match

Tennis matches are highly professional and attractive events in sports competitions. The analytical capabilities of big data technology also play an important role in improving the quality of tennis matches. Through the application of big data technology, we can conduct more efficient and accurate analysis of various technical indicators in tennis matches. In a tennis match, the use of big data technology can comprehensively collect various technical indicators such as the number of rounds in the game, the winning points and the player's serving speed, and conduct scientific analysis and judgment on them. This helps athletes to accurately grasp their own situation and skills, improve the accuracy of serve, and give full play to their own characteristics to adjust training and competition arrangements and improve competition performance. For example, when we conducted big data
analysis in a women's singles match in a tennis match, we found that when a player's return score reached more than 28%, his winning rate could be greatly improved [5]. The analysis capabilities of big data can not only help players adopt more effective tactics, but also improve the viewing of sports competitions. This has significantly improved the quality of sports competitions.

2.2.3 Application Practice of Big Data Analysis Ability in Basketball Match
Basketball game is an early application of big data analysis capabilities in sports competitions. Especially in the NBA games, big data technology will be used to count the scores of all participating players after each game, and detailed analysis and records of their scores, rebounds, steals, assists, fouls and other technical data In order to fully analyze the event. The use of big data analysis capabilities can not only present the technical indicators of all players during the game, but also analyze their technical characteristics so that the coach can make corresponding tactical arrangements and give full play to the players' technical advantages. Using the analytical capabilities of big data technology can more accurately understand that a player is more inclined to right or left when breaking through the main offensive methods of different players in the basket. In consequence, when a player who is accustomed to shooting while holding the ball on the left and breaking through with the ball on the right holds the ball, his opponent should adopt a corresponding defensive strategy based on the results of big data analysis. Otherwise, it is often difficult to accurately grasp the characteristics of each player by visual observation alone, and some players may have demonstrated better defensive abilities in the game. Therefore, the coach may assign the player as a defender. However, the analysis ability of applying big data can find that the player actually has the advantage of jumping ability. In this way, the coach can adjust the player's position based on the big data analysis results. Big data analysis capabilities not only can help players understand the characteristics of themselves and their opponents, reasonably determine training priorities, and improve game tactics, but also can objectively enable the quality of sports competitions to be comprehensively improved.

2.2.4 Application Practice of Big Data Analysis Ability in Sports Competition Injury and Training Control
Using the analysis ability of big data technology can more accurately analyze the positions where athletes are more prone to sports injuries during sports competitions. In this way, we can make corresponding adjustments to the competition training plan based on the analysis results. For example, in sports competitions such as tennis matches and basketball matches, athletes are more likely to have sports injuries to their wrists or ankles. As a result, the coach can focus on these areas during training to strengthen the training, in order to achieve the purpose of enhancing the athlete's ability and reducing injuries. Simultaneously, the coach can also adjust the competition strategy according to the athlete's physical condition, and adjust the tactical strategy in time to obtain better competition results in the case of an athlete's injury.

2.2.5 Application Practice of Big Data Analysis Ability in Sports Competition Watching
The charm of sports competitions comes from the attractiveness of sports and sports competitions. Their excitement, exciting competition atmosphere and sportsmanship have attracted a large number of spectators to watch sports games and participate in sports. With the improvement of the quality of the Chinese people, people have put forward more professional requirements for sports competition data when watching sports competitions. The audience not only requires sensory enjoyment when watching sports competitions, but also requires the ability to understand the essence of sports competitions. The use of big data technology analysis capabilities can help the audience to understand more clearly the objective information of the game, tactics and strategy, teamwork, etc., so that the audience can understand the sports competition from a deeper level. This is of great significance for improving the quality of sports competitions.
3. EFFECTIVE WAYS OF APPLYING BIG DATA TECHNOLOGY IN SPORTS COMPETITION

3.1. Strengthen the Research and Development of Big Data Analysis Software Technology
In order to make the analytical capabilities of big data technology more fully utilized in sports competitions, we must master massive data sources. We must not only be able to effectively capture data, but also be able to process and analyze massive amounts of data. This requires relevant technical personnel to strengthen the construction of data grids and increase the depth of data collection for sports competitions. In the meantime, we should build a foundation for a sports competition data platform with a higher professional level, and strengthen the research and development of data analysis and mining and analysis tools. This will help improve the native second-level response speed of sports data to realize in-depth mining of massive data and broaden the channels of data information sources. Thereby the quality of sports competitions has been further improved.

3.2. Strengthen the Training of Data Analysis talents for Professional Sports Competitions
The analysis ability of using big data technology in sports competitions requires the participation of network computer technology talents and professional sports competition talents. Only the coordination of multiple entities can give full play to the role of big data technology. Hence, the training of talent teams is an important foundation for realizing the application of big data analysis ability in sports competitions. Therefore, we must actively introduce computer programming, big data analysis, and sports talents with high comprehensive qualities. Moreover, we must strengthen technical training to help them grasp advanced technical methods and development concepts in time to promote the improvement of the quality of Chinese sports competitions.

4. CONCLUSION
With the policy of vigorously developing sports in our country, sports competitions have ushered in huge development opportunities. As a result, sports competition workers should actively adapt to the requirements for data analysis capabilities in the era of big data, actively use big data and other advanced network information technologies, and boldly carry out technological innovations. This will help to continuously expand the application scope of big data technology analysis capabilities, help athletes reduce injuries and provide a reliable reference for coaches' tactical arrangements. Simultaneously, this can also provide users with a more colorful visual experience, enhance the charm of sports competitions, and improve the quality of sports competitions, thereby promoting the modern development of China's sports industry.

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