Research Article

Integration and Dissemination of Sports Big Data Based on Blockchain

Li' e Wang and Fenshan Liu [ID]

P.E. Department, Yulin University, Yulin 719000, Shaanxi, China

Correspondence should be addressed to Fenshan Liu; liufenshan@yulinu.edu.cn

With the ceaseless expanding of big data and the Internet, it has more and more affected people's life. The collection and construction of information has become the front-end technology of current industrial development. News reports and self-media channels are also more extensive. As one of the sections of news reports, sports has also encountered opportunities and challenges in its dissemination. As an innovative technology, blockchain has brought new impetus to the development of sports industry. It is also driving new technological upgrades and visual experiences. Blockchain is a chain data structure that combines data blocks in a sequential manner according to time sequence and is a cryptographically guaranteed untameably and unforgeable distributed ledger. Sports communication has more development opportunities in modern life. Therefore, the purpose of this paper is to explore a new path of physical integration and dissemination based on the theory of blockchain, analyze the development and integration path in the application of blockchain technology, and explore their respective advantages and disadvantages. This article will use the research method of specific analysis of specific problems to make data comparison and draw a conclusion, to carry out theoretical innovation and exploration, so as to find a suitable model to promote the development of sports industry. The so-called "sports big data" refers to the analysis and application of data in sports scenarios. Combined with competitive sports, the significance of data analysis lies in improving the level of competition and preventing sports injuries. The research results show that sports companies using blockchain technology have increased their communication efficiency by 37%, and audience popularity has increased by 15% year on year. The decentralized and anonymous features of blockchain technology ensure the originality and enthusiasm of sports data news teams. Therefore, through the analysis of the selection of application scenes and technologies of the sports industry by the blockchain technology, combined with the characteristics of the current era, the transformation is fully absorbed and combined with a new perspective. This paper analyzes different application dilemmas and explores the development prospects, thus putting forward the implementation path of physical industry blockchain technology application.

1. Introduction

Since the reform and opening up, China's sports industry has developed rapidly. With the constant updating and upgrading of artificial intelligence, it has affected people in all aspects of production and life. Among them, in the field of sports news communication, the combination of blockchain and big data, especially the progress of visualization technology, makes news information communication more vivid and convenient to the audience. Blockchain is a momentous change in the field of message skill, which not only improves

the predictability, timeliness, and interactivity of sports news, but also greatly improves the overall development of sports big data. Sports news features include ①fierce competition; ②extensive mass; ③ strongly international; ④urgent timeliness. Sports competitions are very time-sensitive, sports news must be released as soon as possible, and the timeliness will be lost if there is a slight delay.

Blockchain has the characteristics of distributed storage, being not easily tampered with, and high credibility. The emergence of blockchain in the field of data improves the effect of intelligence, makes the operation of society more

intelligent, and also changes our cognition and life [1, 2]. With the migration of time, there have been many intelligent contracts, and blockchain technology has been used in many fields such as finance, logistics, e-commerce, culture and entertainment, and even public governance. Visa has launched Visa B2B Connect, based on blockchain technology, which provides institutions with a lower-fee, faster, and more secure cross-border payment method to process business-to-business transactions on a global scale. Through the targeted distributed data collection mode, comprehensively and completely record the information people need, ensure the authenticity of data, provide transparent supervision measures, and establish a good communication bridge between enterprises and consumers [3, 4]. With the advent of the era, the explosive growth of news makes people overwhelmed, and scientific and efficient data becomes more and more important. The establishment and development of blockchain companies have greatly accelerated the burgeoning of the industry. At the same time, the government has actively guided and formulated relevant preferential policies to promote the operation mode of blockchain marketization [5, 6]. Blockchain technology is deepening cooperation with various creative subjects, creating an all-round and innovative system of in-depth integration of production, learning, and research, and stimulating the potential of enterprises [7]. Sports industry, as a popular entertainment and competitive industry, combines the two functions of physical and mental sports and leisure and relaxation. At the same time, it has developed many industries through professional projects, which can be said to have a comprehensive impact on the whole society. Sports industry refers to the collection of the same type of economic activities and the synthesis of similar economic sectors that provide sports products to the society. Sports products include both tangible sports goods and intangible sports services. News reports on sports information often occupy the front page headlines of major media [8, 9]. In the field of sports news, the combination of data and network sports news has fully affected the dissemination of its own information, making the news industry experience significant changes from news sources to news writing methods. It also changed the current operation mode of sports industry. Sports are loved by people in their spare time, but also create a huge business opportunity [10, 11]. When the capital is gradually commercialized, the sports industry will face great challenges. The uncertainty of competitive sports leads to the sports guessing industry and sports lottery. The backstage data and odds will not be disclosed to the public, which gives the lawbreakers the opportunity to launder and embezzle money, along with other bad behaviors. In addition, it also includes insufficient number of sports talents, low quality and unreasonable structure, low level of sports equipment and facilities, and weak brands; long-term planning is difficult to implement, and the winter sports market needs to be developed. Therefore, in order to speed up the dissemination of sports data and promote the spirit of sports, blockchain technology should be used as soon as possible to integrate internal information more accurately and transparently,

innovate the sports industry application development model, and ensure the transparency and openness of transactions [12].

Along with the growing up of Internet, the information technique in the field of sports has made rapid progress. It has bid farewell to the traditional sports communication mode and is not limited to news reports. It has been more and more favored by the audience, and its market share has increased layer by layer, opening up a new era of data collection and communication. The development of sports data has also become a concern of sports theory research at the whole world. For example, at the Rio Olympics, BMW provided a motion analysis system for the USA Swimming Team to capture the underwater movements of athletes and then use professional data models to improve their swimming styles. In recent years, the study on sports industry is relatively extensive, mainly focusing on Sports Science, digital multimedia technology in the field of sports, and multiple broadcast news methods of sports events [13, 14]. There are few researches on the analysis of sports big data combined with blockchain. The number of published journals is not very sufficient, and few are published in core journals, which has not attracted enough attention [15]. The market of sports big data is constantly upgraded and updated. The state promotes the development of sports big data at the policy level and promotes the in-depth integration of Internet technology and sports industry, which also forces the research at the theoretical level. The commercialization of sports in foreign countries is earlier, and a complete industrial chain has been formed. The research on blockchain technology mode and its background has a certain basis [16, 17]. Foreign research has noticed the new business forms of e-commerce and big data development, using big data, cloud computing, intelligent hardware, and various theme apps to expand customers and improve the pertinence and effectiveness of sports marketing. Relevant domestic experts and scholars spread blockchain technology in combination with sports big data later, but the development is faster [18, 19]. At present, research shows that blockchain has many advantages and features in the field of sports have a lot of mutual integration, and there are many projects and resources of blockchain technology, which also has a diversified perspective, which provides the basis and way for the next step of blockchain implantation into sports big data platform [20, 21]. First, through blockchain technology, sports event tickets can be safely uploaded to the chain, effectively preventing ticket fraud; the second is the broadcasting rights of sports events, the intellectual property rights of peripheral products, and the right to use sports event content. In general, sports big data platform construction and application promotion have been put into operation in various platforms, and the optimization process and exposed problems are different. Theoretical research is needed to keep up with each other in time, analyze the advantages and disadvantages, put forward the development path of matching, make good use of the dominant position of blockchain technology, promote the concordance of sports enterprises and mobile Internet, and realize

multiscenario comprehensive response use. We will increase training efforts, improve training mechanisms, and create high-quality compound talents and jointly promote the rapid development of blockchain technology.

Starting from the meaning and characteristics of blockchain and big data, this paper explores the research problems of the physical training integration and dissemination based on blockchain, expounds the development characteristics, development process, and technical difficulties of blockchain technology, and mainly analyzes the difficulties and solutions in the process of sports information dissemination and collection sports to find out the rational use method and the balance base point in line with the characteristics of management science and combine the two organically. On the basis of combining the relevant theories of the logical relationship between blockchain, this paper discusses the possible problems in the burgeoning of physical culture industry and provides a reference business model for sports industry and news companies in the future. And it also gives an objective outlook on the future development direction. At the same time, in order to better play the role of sports, vigorously promote the needs of the people, and strengthen the professionalism and accuracy of information dissemination. On the basis of modern life, sport has become a part of people's life. It can not only strengthen the body and cultivate the sentiment, but also enrich our leisure life and increase the fun of life. In view of the optimized development of sports data, it is necessary to draw the similarities and differences between Chinese and western research directions through comparative advantage analysis, learn advanced experience, put forward improved methods and paths, and combine with new development methods, hoping to provide theoretical basis for the new development mode of sports.

2. Method

2.1. Core Concepts

2.1.1. Big Data. In the information age, data, as the basic resource of people's communication, naturally becomes the source of people's cultural value. The development speed of big data is faster and faster [22–24]. Big data is firstly collected in a wide range and diversified way, and then distributed computing architecture is adopted to conduct data processing and integration analysis through cloud computing, cloud storage, and other ways. Big data, or huge amount of data, refers to the amount of data involved that is too large to be captured, managed, processed, and organized within a reasonable period of time through mainstream software tools to help companies make more positive business decisions. As a matter of fact, big data not only refers to the large capacity of data, but also contains some peculiarities different from "massive data" and "very large data." With the wide application of the Internet, a large number of high-speed, diverse, and valuable features of big data have emerged. Big data not only refers to the large capacity of data, the most important is that data exists in semistructured and irregular structures. There are many

kinds of processing tools. In the virtual network world, we extract valuable news from a large amount of space and then extract its value from effective information. Big data is mainly used in all aspects today by its users' accurate positioning for the required information groups, point-to-point accurate services, and understanding the preferences of target customers and habits of high-quality marketing. Big data trends are resource utilization of data; deep integration with cloud computing; breakthroughs in scientific theories; establishment of data science and data alliances; data leakage is rampant; data management has become the core competitiveness. Although it has experienced suspicion and criticism in the process of using, it was accepted by the public and survived in the cruel Internet competition, and it is getting better and better, bringing considerable benefits to enterprises. By using big data technology, e-commerce can negotiate and trade online. Merchants' preferences, browsing time, consumption ability, and scope of customers can be seen at a glance. Through data analysis, customers can be fully understood and accurately positioned according to their consumption preferences.

2.1.2. Blockchain. Blockchain technology is a brand-new distributed infrastructure and computing method that uses the blockchain data structure to verify and store data, generate and update data, and use cryptography to ensure the security of data transmission and access [25, 26]. The former is mainly connected with the main chain and the next block, and the latter is mainly used to store all kinds of information data. Each block generates and records all kinds of information to be processed according to the time sequence. As a new information data processing module, it greatly improves the computing speed and storage space and not only saves the labor cost, but also reduces the time cost. At the same time, when blocks and chains are formed, the system will automatically generate time stamps and label data information. In this way, information can be easily shared with relevant users. The blockchains we are familiar with today are divided into three categories, and we can choose different types of blockchains according to different occasions. These three types of blockchains are public blockchains, community blockchains, and private blockchains, and they have their own advantages and disadvantages. Through the intelligent distribution, the interference and technical loopholes are reduced, and the authenticity and reliability of information are guaranteed. In the process of transmission and distribution, blockchain technology can also identify whether the information of the target user is accurate, provide warning function for the abnormal account, and prevent the user from being cheated and property loss. Blockchain technology was initially applied in the use of passwords. In order to achieve point-to-point communication, the intermediate link was omitted, the direct trading between the two sides was realized, and the trading channel was more smooth and secure. In general, with its own technical advantages and the promotion of globalization, blockchain technology is more and more in-depth development of various industries. It has changed the traditional

business model and accelerated the scientific layout of the industry, to make full use of low-cost credit creation mechanism and value transfer system to expand the use value and further promote the technological revolution, as shown in Figure 1.

2.2. Characteristics of Big Data in Sports Communication Application

2.2.1. The Relevance of Sports Communication. The characteristics of news communication are large quantity and wide angle. If only through the user's own search and identification, it will greatly increase the user's workload. The reference of big data technology can recommend suitable information in a short time by browsing preferences. The data in big data sports news increases the authority of the news; the trend of pan-entertainment reporting increases, with the sense of depth across time and space. Big data sports news can also find the potential relationship between users and information from a great quantity of complicated data, mining the relevance between data, and making priority recommendation. When the news reports sports information, using the collection of big data and intelligent matching, not only can it provide the content that the audience is directly interested in, but also it can set up links, including all the information related to the surrounding, such as competition schedule, personal information of athletes, sports technical performance, etc. By mining and analyzing a large number of data among sports communication contents, the collection of these data is established, which is easy to collect and browse. In this way, the audience can not only watch a game broadcast or sports news, but also collect all kinds of related information. The application of big data is to intelligently provide all-round needs and make things more closely linked; the audience can be more comprehensive and more able to meet the needs of the public.

2.2.2. Prediction of Sports Communication. Sports communication is an important part of mass communication. Sports communication refers to the dissemination of human sports information through mass media. The charm of competitive sports is the unpredictability of the results. However, the comprehensive quantitative analysis can improve the accuracy of prediction to the greatest extent and attract more audiences to show solicitude for relevant information. The use of science and technology to predict the results of the competition meets the audience's news expectations, departs from the traditional news sequence, and opens a new chapter of news communication. In the process of sports information dissemination, the predictability can make the hot topics of news get a benign dissemination. Through big data technology, the media can collect the sports news of the audience's attention, match the appropriate information and hot topics, control the development direction of social public opinion, and predict and correct the results. In addition, sports technology can be analyzed to predict the results of sports events, so as to attract more

spectators. In the era of new, the stronger the media's predictive ability is, the faster and more valuable information can be obtained. It has inadvertently changed our way of life and the way we view and understand things. Nowadays, sport has more commercial value in social life, and sports industrialization is more and more mature. Many enterprises can also seize business opportunities through news reports, which brings more value opportunities for the development of sports industry.

2.2.3. "Pleasant Reading" of Sports Communication. News dissemination cannot be separated from timeliness and accuracy. For a long time, the audience passively accepted the information report and had no choice. The development has changed the normal communication characteristics of sports communication and increased the initiative of the audience. It is the communication platform that provides different information to different audience groups and can also interact with the audience. The roles of the communicators and the audience can be transformed. The audience provides interesting news information and selects sports news of general interest. In addition, big data combines the artificial intelligence technology and the Internet to process the information transmission mode and increase the vividness and image rate. No matter from the appearance layout or layout data, it gives people a new feeling. The visualization chart of data brings a more humanized "pleasant reading" experience to the news report. With the combination of data visualization and dynamic graphics, the report content is more intuitive, so that the audience can easily understand the information to be mastered, to make full use of the "pleasant reading" feature to fully mobilize the audience's participation, so as to bring the audience more vivid and impressive experience.

2.3. Value and Logical Relationship between Blockchain and Sports Big Data. The intelligence explosion in the message age gives people more dazzling choices and embodies more values and utilization conditions. Big data has entered the daily life of the mobile Internet. Lately, the advanced Internet plus mobile Internet has been developing rapidly. As a fast developing industry, the sports industry has applied the big data technology, mainly in the two parts of entertainment and training competition service, occupation clubs, sports media, sports spectators, and gambling people. The four target groups are separated and fully demonstrate the use of value. Like a raging fire, China is experiencing technological change. Internet plus is taking root in various industries, providing application and data services in various fields, covering IaaS, PaaS, SaaS, and other fields. Among them, the information process of sports data dissemination is slow, but for the athletes in the sports circle, scientific training, event data storage, league organization, and management have already made full use of this technology. When sports fans watch the game, they can see not only the details of the players of both sides in the screen, but also their respective achievements. In the process of the game, the relevant statistical data is also updated in real time, which
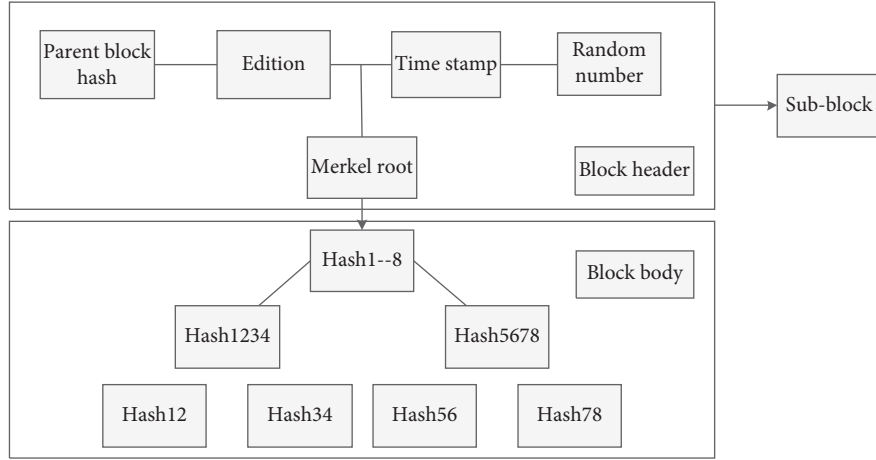
FIGURE 1: Blockchain flowchart.

enhances the experience of watching the game and improves the effect of watching the game. Sometimes you can also learn about the history and culture of teams and athletes, which are inseparable from the integration of big data. After decades of accumulation and development, many large international sports data companies, such as Amisco, SAP, and Prozone, have sprung up around the world.

$$B^{-1} * B' * D = B^{-1} * E. \quad (1)$$

Delete the lost data pieces from the coding partition and coding matrix, as shown in B' and E'. Calculate the invertible matrix of B', calculate the original message D, and complete the decoding work. The formula is as follows:

$$D = B^{-1} * E,$$

$$\begin{vmatrix} 1 & 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & B_{mm} & b_{mn} \end{vmatrix} * \begin{bmatrix} D_1 \\ D_2 \\ . \\ . \\ D_N \end{bmatrix}. \quad (2)$$

They provide information to well-known events and clubs around the world to achieve win-win business. At the same time, the precise judgment of sports gambling and key competitions is more mature and accurate because of the combination of big data technology. As a new computer application mode, blockchain, through point-to-point transmission, distributed data storage, encryption algorithm, and other functions, focuses on establishing trust and security transmission, and enhances the productivity of data integration and the confidentiality and security of data transmission. These are exactly what the sports industry needs to develop to the present, as well as sports data collection and transmission with good opportunity. Therefore, the blockchain that we are entering urgently needs the implantation and application of blockchain technology to improve the working efficiency and safety factor of big data platform and promote the innovation and application of data information technology including sports big data. By implanting blockchain technology into sports big data, we can provide more efficient, secure, and privacy data services. The main fields and directions of sports industry such as big data, the core element resource of sports industry, will become the main source of providing basic database, and the data storage, transmission, analysis, and utilization of the above fields will be very promising.

3. Experiment

3.1. Data Source.
This research has carried on the investigation and research in the universities and enterprises where the author is located. Dozens of questions have been selected based on the heightened history of physical industry, the management level, and the opportunities and challenges of blockchain technology application. At the same time, experts, journalists, students of physical education institutes, and people engaged in relevant data work with different education background, research direction, scale, and specialty are selected as the interview degenerating research programmes. The interviewees involve the basic information of individuals, including age, education background, discipline background, and professional type. A total of 200 questionnaires were issued, 187 of which were valid. The content includes the interviewees' views on the application of the technology, the intensity of blockchain mode, and the technicians' views on the integration and presentation of the two. All the experimental data sources of this study are obtained, as shown in Table 1.

3.2. Experimental Methods.
This paper adopts the methods of literature review, expert interview, questionnaire survey, etc. and combines psychology, sociology, management, etc. to make a comprehensive analysis and summary. First of all, through the method of literature research, starting from the latest concept of blockchain and its corresponding technical path, this paper carries out exploratory research on the big data platform in the field of sports, its application, and development prospects. Looking for relevant documents, thoughts, viewpoints, and works to sort out and analyze,

TABLE 1: Number and proportion of application projects in blockchain industry.

Application industry	Number of projects	Application proportion of blockchain industry/%
Finance	517	53.52
Entertainment	60	6.21
Social contact	76	7.87
Game	40	6.83
Internet of things	38	4.14
Logistics	33	3.92
Public welfare	28	3.42
Medical care	16	1.66
House property	14	1.65

more detailed and in-depth description of the current blockchain technology and big data application is the actual research situation, to explore new research directions and objectives. Second, expert interviews are used. There is no discovery without investigation; only in the investigation can the essence of the problem be further discovered, so the research method of expert interview is used in this paper. For the interview steps and content, it is mainly divided into two parts. One part is to interview professional and technical scholars to understand the current development path and innovative ideas of related technologies. The other part is to consult teachers and students of sports colleges and universities to understand the professional experience and guidance opinions of users. It also has specific analysis on detailed problems. In short, the analysis methods of experts and scholars run through the whole paper. Third, the questionnaire survey method is adopted. The author went deep into reality, investigated and studied relevant experts, scholars, and students, understood everyone's respective views on the application of blockchain technology in technological development to innovate sports big data integration and dissemination methods, understood relevant contents of technology theory, consulted experts and professors in relevant fields in the school and teachers who actually carry out technical work, carried out comparative analysis on specific problems and advantages, also exchanged and studied some relevant academic problems, then summarized their experiences in technological optimization, summarized the contents of cases, and finally extracted common problems and practices worth learning.

3.3. Experimental Purpose. With the technical advance, big data and blockchain technology have become the hot scientific frontier. More and more industries are constantly updating and upgrading, and these technologies can be used for reference to promote the efficient development of enterprises. People integrate and classify scattered information and then collect and process it through computers and the Internet to become big data resources, which are analyzed and utilized to create new values. With the increasing attention of ordinary people to sports, the attention of sports news is also increasing. After dinner, more and more sports fans use media platforms and data comparisons to discuss competitions and examine the shortcomings of existing

sports news reports. However, with the wide spread of the Internet, the ability to broadcast matches is far greater than that of traditional media. Big data is used for all-round display, which includes the broadcast of various sports activities at home and abroad. The data in the Internet is fully open and can provide all kinds of data needed by viewers themselves. Audiences can communicate with each other and express their views. The application of data has become the greatest advantage of online sports news. Applying statistical analysis of data to reports and changing the original structure of news reports is one of the first successful changes made by online sports news. At this stage, China's online news is in a vigorous development stage. Sports news sections of major websites have collected, analyzed, and utilized data and applied them to event reports. However, this method still has many deficiencies and needs further research. In the future, how to use data analysis to enhance the readability and accuracy of reports, how to make charts and data a new reading habit acceptable to the audience, and how to combine data news with visual news have become new problems that journalists need to solve.

4. Discussion

4.1. Practical Problems of Sports Blockchain Application

4.1.1. Data Security of Blockchain Technology. As a bridge between communication terminals and data, blockchain technology is naturally transparent in the transmission process and reasonably open in data storage. However, these data are easy to locate and identify, giving criminals opportunities. If they are important commercial data, they will cause incalculable losses. The account system in the blockchain uses an asymmetric encryption algorithm. Without a private key, assets corresponding to the public key cannot be used. Therefore, with the rise of blockchain technology, the security of transaction data in sports blockchain is worth paying attention to.

4.1.2. Government Regulation. In the era of change rapidly, where there is data, there is capital. Sports blockchain combines gambling and digital currency, which makes it easy to obtain illegal income. At the same time, the decentralization and anonymity of blockchain technology will bring great difficulties to market supervision. Therefore, it is necessary to strengthen the government's supervision on the basis of retaining the existing characteristics of blockchain technology.

4.1.3. Application and Promotion of Sports Blockchain. Blockchain has greatly promoted the dissemination of sports big data by virtue of its own advantages, but due to the lack of clear legal norms in some procedures, it is easy for enterprises to hesitate in the use, affecting the strong support and investment of capital. Moreover, the promotion not only needs perfect system and policies, but also relies on professional talents. Only through core management talents can the practice test be carried out and a large number of cutting-

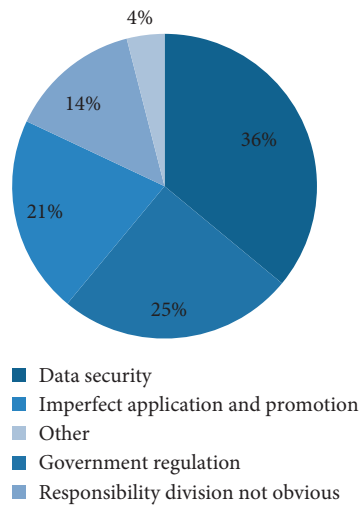Practical Problems of Sports Blockchain Application

- ■ Data security
- ■ Imperfect application and promotion
- ■ Other
- ■ Government regulation
- ■ Responsibility division not obvious

Figure 2: Practical application of sports blockchain.
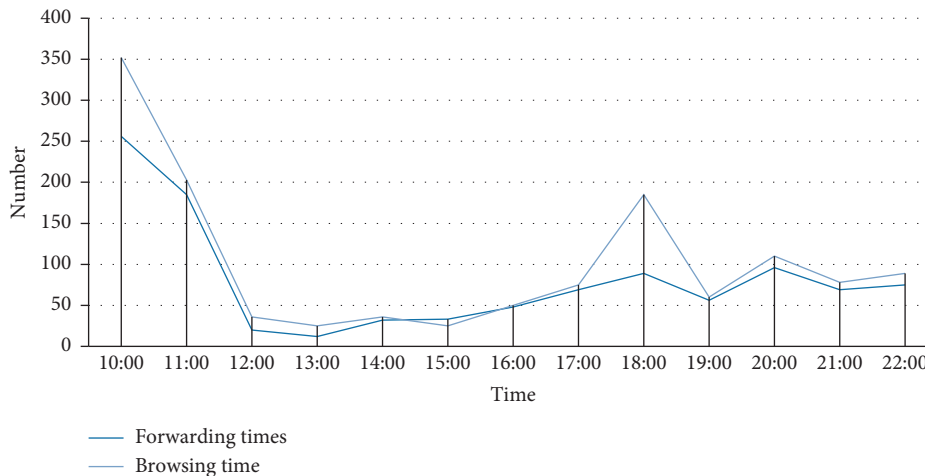

- — Forwarding times
- — Browsing time

Figure 3: Curve of times of sports information forwarding and browsing time.

edge technologies be applied to stimulate the development of sports blockchain market. As shown in Figure 2, users' habits can be fully utilized for targeted promotion.

4.2. Integrated Communication Path of Sports Blockchain

(1) Protect sports content copyright. In the information age of scientific and technological change, information, as the primary element, is of great importance. On this basis, the digital content industry has got the opportunity of rapid development, and the platform of resource acquisition and sharing is more diverse and broad. Therefore, we should pay more attention to the protection of content copyright. Sports communication relies on timeliness and originality. Only when we have the awareness of copyright at all times can we promote enterprises and even the creative enthusiasm of self-media creators. The inherent characteristics of blockchain technology can not be tampered with to confirm the right of sports content, to ensure that it will not be infringed in the course of communication.

(2) Make full use of sports information and community platform value. With the application of blockchain technology, sports communication platform is no longer the traditional broadcast report, which uses self-media and mobile terminals to stimulate a large number of sports information communities. These platforms can form a platform for users to spread information, which is greatly conducive to the sharing and innovation of sports disseminates. At the same time, with the help of blockchain to release high-quality content, the corresponding remuneration of creators can be paid, the value creation cycle can be shortened, and the community value circulation can be promoted. As shown in Figure 3, different value orientations and characteristics should also be distinguished in selection.
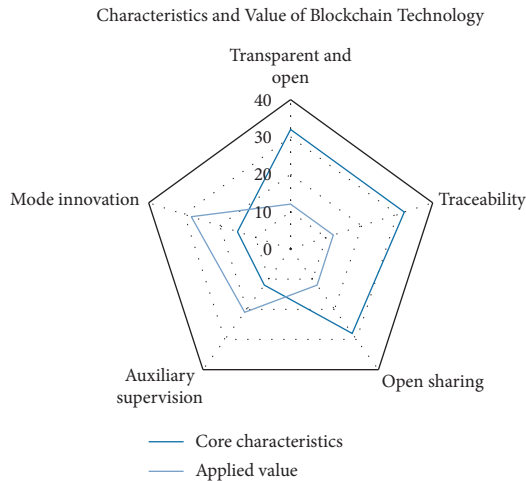
Figure 4: Characteristics and core application value of blockchain technology.
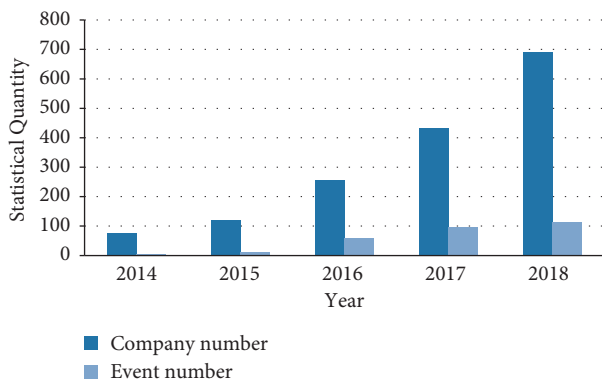

Figure 5: Change trend of number of blockchain industrial companies and financing events.

(3) Form a consensus mechanism of sports resources exchange. Regional chain technology can establish a sharing mechanism and platform between users, help the audience to have barrier-free communication, be applied to different application scenarios, build different consensus mechanisms, provide not only a perfect communication platform, but also security guarantee and effective operation of big data platform, and realize the decentralized data integration and dissemination process. As shown in Figures 4 and 5 many investment companies recognize the value of resource exchange and pay more and more attention to blockchain technology year by year.

5. Conclusion

Entering the information age, we are surrounded and influenced by data all the time. It has been refined, cut, and modularized in daily life. Similarly, as a new service industry, sports communication is also facing new model changes and challenges. Under this opportunity, we should seize the opportunity brought by big data technology, actively change the previous strategic mode, open up a new media platform, establish sports big data team, and attract professional talents, so as to broaden the new way of sports communication.

Blockchain technology has been extensively equipped in very industries in recent years. It combines the advantages of big data management to effectively carry out data analysis and user resource supply. At the same time, it can also improve the ability of sports companies to manage and resist risks. For users, of course, there are some problems and risks, which requires us to take correct measures to deal with them, make good use of the protection role of laws and regulations, take reasonable methods to compete fairly, and expand market share. Sports industry has a strong public service attribute. The development of sports big data greatly improves the influence and efficiency of sports industry. In the long run, in the near future, it is bound to promote the further communication.

The era of the value creation: We should make good use of the convenience brought by technology. Only by handling the relationship between data analysis and sports news events can blockchain technology perfectly match the sports data source and provide it to multifaceted sports enthusiasts. To grasp the communication and information integration of more international sports events, sports communication should constantly innovate thinking, break through limitations, and catch up with new trends and cutting-edge technologies. In the future, there will be more specific ways for blockchain application in sports big data field.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Acknowledgments

References

[1] R. N. Greenley, P. Jessica, R. J. W. Naftaly et al., "Sports participation in youth with inflammatory bowel diseases: the role of disease activity and subjective physical health symptoms," *Inflammatory Bowel Diseases*, vol. 24, no. 2, pp. 247–253, 2018.

[2] D. McCartney, B. Desbrow, and C. Irwin, "Post-exercise ingestion of carbohydrate, protein and water: a systematic review and meta-analysis for effects on subsequent athletic

performance," *Sports Medicine*, vol. 48, no. 2, pp. 379–408, 2018.

[3] L. E. Gomes, V. Diogo, d. S. C. Flávio Antônio et al., "Biomechanical analyses of synchronised swimming standard and contra-standard sculling," *Sports Biomechanics*, vol. 18, no. 4, pp. 354–365, 2018.

[4] F. Alenezi, L. Herrington, P. Jones, and R. Jones, "Knee valgus angle and loading across common athletic tasks; reference values and gender differences in a healthy population," *British Journal of Sports Medicine*, vol. 51, no. 4, p. 2861, 2017.

[5] R. S. Henrique, A. V. Bustamante, D. L. Freitas, G. Tani, P. T. Katzmarzyk, and J. A. Maia, "Tracking of gross motor coordination in Portuguese children," *Journal of Sports Sciences*, vol. 36, no. 2, pp. 220–228, 2017.

[6] S. M. Smith and T. E. Nichols, "Statistical challenges in "big data" human neuroimaging," *Neuron*, vol. 97, no. 2, pp. 263–268, 2018.

[7] P.-Y. Wu, C.-W. Cheng, C. D. Kaddi, J. Venugopalan, R. Hoffman, and M. D. Wang, "Omic and electronic health record big data analytics for precision medicine," *IEEE Transactions on Biomedical Engineering*, vol. 64, no. 2, pp. 263–273, 2017.

[8] B. Tang, Z. Chen, G. Hefferman et al., "Incorporating intelligence in fog computing for big data analysis in smart cities," *IEEE Transactions on Industrial Informatics*, vol. 13, no. 5, pp. 2140–2150, 2017.

[9] Y. Cheng and Y. Song, "Sports big data analysis based on cloud platform and its impact on sports economy," *Mathematical Problems in Engineering*, vol. 2021, Article ID 6610000, 12 pages, 2021.

[10] V. Gatteschi, F. Lamberti, C. Demartini, C. Pranteda, and V. Santamaria, "To blockchain or not to blockchain: that is the question," *It Professional*, vol. 20, no. 2, pp. 62–74, 2018.

[11] Z. Li, W. M. Wang, G. Liu, L. Liu, and J. He, "Toward open manufacturing: a cross-enterprises knowledge and services exchange framework based on blockchain and edge computing," *Industrial Management & Data Systems*, vol. 118, no. 1, pp. 303–320, 2018.

[12] Z. Wang and D. Zhu, "Sports monitoring method of national sports events based on wireless sensor network," *Wireless Communications and Mobile Computing*, vol. 2021, Article ID 5739049, 13 pages, 2021.

[13] T. Zhou, X. Li, and H. Zhao, "Med-ppphis: blockchain-based personal healthcare information system for national physique monitoring and scientific exercise guiding," *Journal of Medical Systems*, vol. 43, no. 9, p. 305, 2019.

[14] R. Xu, Y. Chen, E. Blasch, and G. Chen, "Exploration of blockchain-enabled decentralized capability-based access control strategy for space situation awareness," *Optical Engineering*, vol. 58, no. 4, p. 1, 2019.

[15] P. Fairley, "Blockchain world - feeding the blockchain beast if bitcoin ever does go mainstream, the electricity needed to sustain it will Be enormous," *IEEE Spectrum*, vol. 54, no. 10, pp. 36–59, 2017.

[16] K. Sharma, A. Shankar, and P. Singh, "Information security assessment in big data environment using fuzzy logic," *Journal of Cybersecurity and Information Management*, vol. 5, no. 1, pp. 29–42, 2021.

[17] A. Dorri, F. Luo, S. S. Kanhere, R. Jurdak, and Z. Y. Dong, "Spb: a secure private blockchain-based solution for distributed energy trading," *IEEE Communications Magazine*, vol. 57, no. 7, pp. 120–126, 2019.

[18] M. Nasir and A. N. Al-Masri, "Multi-source heterogeneous ecological big data adaptive fusion method based on symmetric encryption, fusion," *Practice and Applications*, vol. 5, no. 1, pp. 8–20, 2021.

[19] N. Z. Aitzhan and D. Svetinovic, "Security and privacy in decentralized energy trading through multi-signatures, blockchain and anonymous messaging streams," *IEEE Transactions on Dependable and Secure Computing*, vol. 15, no. 5, pp. 840–852, 2018.

[20] C. E. Viktoria, W. M. Langer, and F. Richter, "The olympic games as a news shock: macroeconomic implications," *Journal of Sports Economics*, vol. 19, no. 6, pp. 884–906, 2018.

[21] E. L. Gill, M. C. Christensen, and A. G. Pérez, "The sale of the atlanta hawks: is it racism or white ownership playing the race card?" *Journal of Sports Media*, vol. 12, no. 1, pp. 113–140, 2017.

[22] S. Rajendran, O. I. Khalaf, Y. Alotaibi, and S. Alghamdi, "MapReduce-based big data classification model using feature subset selection and hyperparameter tuned deep belief network," *Scientific Reports*, vol. 11, no. 1, Article ID 24138, 2021.

[23] Q. Liu, S. Sun, B. Rong, and M. Kadoch, "Intelligent reflective surface based 6g communications for sustainable energy infrastructure," *IEEE Wireless Communications Magazine*, vol. 28, no. 6, pp. 49–55, 2020.

[24] N. Metawa and S. Metawa, "Internet financial risk early warning based on big data analysis," *American Journal of Business and Operations Research*, vol. 3, no. 1, pp. 48–60, 2021.

[25] O. I. Khalaf and G. M. Abdulsahib, "Optimized dynamic storage of data (ODSD) in IoT based on blockchain for wireless sensor networks," *Peer-to-Peer Networking and Applications*, vol. 14, no. 5, pp. 2858–2873, 2021.

[26] A. K. Singh, A. Anand, Z. Lv, H. Ko, and A. Mohan, "A survey on healthcare data: a security perspective," *ACM Transactions on Multimedia Computing, Communications, and Applications*, vol. 17, no. 2s, pp. 1–26, 2021.