Transformation of Competitive Sports Based on Artificial Intelligence

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Abstract. In recent years, great achievements have been made in China’s sports industry. Meanwhile, the development of the sports industry is just unfolding. The overall scale of China's sports industry is expanding and demonstrating a rapid development speed, which has provided strong support for the robust development of the national economy. In the context of artificial intelligence (AI), China's policy support for the sports industry is more and more vigorous day by day. With the upgrading of the sports industry consumption, the sports industry will have a new momentum of development and transformation. In this paper, the current situation of the sports industry development in China is briefly introduced. The new changes in the sports industry development in China are preliminarily analyzed from the perspective of AI to explore the cultivation of the sports industry development momentum in China in the context of AI and provide a reference for the development of the sports industry.

Keywords: Artificial Intelligence, Sports Industry, Momentum Cultivation

1. Introduction
In the new era, China is deepening its artificial intelligence (AI). AI provides innovative ideas for the development of China's sports industry[1-2]. From the perspective of policy, we should guide the deployment of the sports industry to achieve consumption upgrading and focus on innovation and expansion of effective supply[3-4]. From the perspective of AI, China's the sports industry should effectively grasp the opportunities, effectively expand the new changes in the development of the sports industry, and effectively cultivate the development momentum of the sports industry, so as to further achieve sound development of the sports industry. The sports gambling industry can effectively raise funds[5-6]. Currently, China's sports lottery business is expanding the actual scope of its business impact, accelerating the excellent development of the sports lottery industry, showing a sound
development trend. The total amount of public welfare funds has increased greatly year by year, which directly provides many jobs for the society. At the same time, the rational use of public welfare sports lottery funds in China has adequately trained many professional sports talents, effectively improved the actual level of holding large-scale sports events in China, and achieved the active improvement of sports infrastructure.

The living standard of the people in our country has been dramatically improved, the material life is increasingly abundant, and the people's sports consciousness and health consciousness are increasingly strengthened, which has promoted the excellent development of the sports fitness industry and sports entertainment industry. The development of yoga, aerobics, and various ball games entertainment activities is in full swing, showing a sound development trend, promoting the sports industry to expand its actual scale. At the same time, the concept of national fitness is increasingly popular, the actual number of sports training-related institutions is increasing, and all kinds of sports infrastructure is improving, which speeds up the sound development of sports fitness and entertainment industry.

2. New changes in the development of China's sports industry from the perspective of artificial intelligence

After the eighteen Congress, general secretary Xi Jinping put forward the “four comprehensive” strategy based on the real demands of China's national economic and social development, that is, “building a moderately prosperous society in an all-round way, deepening the reform in an all-round way, comprehensively promoting the rule of law, and strictly administering the party in an all-round way”. The effective implementation of the strategy can promote the modernization of the existing governance system and enhance the governance capacity of our country. It can also achieve the effective improvement and scientific innovation of various systems and promote the good innovation of the sports industry system. Currently, many factors will restrict the sound development of the sports industry. For example, the lack of close connection between the sports industry and related surrounding industries leads to the lack of good coordination in the relevant system of the sports industry, The lack of effective leading of administrative power to the sports industry, the lack of standardized and orderly market competition, the lack of systematic and perfect legal system and relevant supporting measures and other factors will also hinder the sound development of the sports industry. The shortcomings of the system are difficult to effectively restrict and regulate the sports industry, which leads to a lack of order in the development of the sports industry.

The Internet has made great achievements in development. With its remarkable advantages in technology application, the Internet covers many application fields. Internet plus has increasingly become an important trend in the development of the times. “Internet plus” effectively breaks the inherent barriers between industries, providing the possibility of close integration among industries and realizing the transformation of lifestyle. In the context of “Internet plus”, cross-industry cooperation and integration among sectors are increasingly strengthened. In the new era, China has increasingly attached importance to and enhanced the development and application of Internet technology and implemented the big data plan from the national level. “Internet plus” will effectively promote the sports industry to speed up cross-industry cooperation. There are two main modes of the sports industry, one is viewing mode, the other is participation mode. People mainly watch
competitive sports and participate in mass sports. The two the sports industry models have different degree of imbalance between supply and demand, and lack of effective channels of real-time communication between supply and demand. Under the “Internet plus” and related technical support, the two suppliers can achieve excellent real-time communication and effectively promote the balance between supply and demand. At the same time, all kinds of personalized and private sports consumption patterns gradually increase, which can effectively drive the significant growth of all types of sports industry consumption. In addition, from the policy level, China has clearly and scientifically deployed the cross-industry convergence relying on the Internet plus. In practice, the sports industry is increasingly presenting the trend of “Internet plus”, and gradually strengthens the effective penetration of all aspects of the sports industry chain. It can effectively link various links of the sports industry chain through diversified channels and targeted solutions, not only promoting the sound development of all kinds of Internet plus sports e-commerce platform. It can also support the application and promotion of the “O2O” business model combining online and offline. The cross-border integration of the sports industry, cultural industry, real estate industry, tourism industry, and medical industry are increasingly common.

Where the observation is preprocessed, all the curves are obtained, \(X_1(t), L, X_n(t), t \in \Gamma\). Then, descriptive analysis can be used to analyze the basic characteristics of data change form for in-depth analysis.

The descriptive analysis of data is mainly conducted by means, variance, correlation coefficient, etc. the first two are the basis of all function types, and the mean function is shown as follows:

\[
\bar{x}(t) = \frac{1}{n} \sum_{t=1}^{n} x_i(t), \forall t \in \Gamma
\]  (1)

Similarly, the variance function reflects the standing point variance of the function, which is shown as follows:

\[
VarX(t) = \frac{1}{n-1} \sum_{t=1}^{n} [x_i(t) - \bar{x}(t)]^2, \forall t \in \Gamma
\]  (2)

The covariance function is as follows:

\[
covX(t_1, t_2) = \frac{1}{n-1} \sum_{t=1}^{n} [x_i(t_1) - \bar{x}(t_1)][x_i(t_2) - \bar{x}(t_2)], \forall t_1, t_2 \in \Gamma
\]  (3)

Hence, the correlation function is as follows:

\[
corrX(t_1, t_2) = \frac{covX(t_1, t_2)}{\sqrt{VarX(t_1)VarX(t_1)}}, \forall t_1, t_2 \in \Gamma
\]  (4)

In the new era, China is committed to strengthening the construction of new urbanization and emphasizes the principle of people-oriented in the construction of new urbanization. In the process of new urbanization, population urbanization will vigorously promote social transformation. For the national policy, the new urbanization is bound to become a new direction, will have a considerable impact on the future development of the sports industry, and effectively promote sports demand. The essence of the new urbanization lies in the urbanization of the population, which can achieve the
creation and consumption of the sports industry and related services. The new urbanization can effectively increase the actual demand of the sports industry, realize the in-depth exploration of the development potential of the sports industry, increase the sports investment, realize the effective increase of the potential sports consumer groups, and realize the effective expansion of the undeveloped reform of the sports industry.

3. Development momentum cultivation of the sports industry in China from the perspective of AI

In the new era, China attaches great importance to the development of the sports industry and has increasingly strengthened policy support. However, the system reform involved in the sports industry has not been effectively deepened, and all kinds of relations, such as the relationship between government and enterprise, the relationship between government and capital, and the relationship between government and society, need to be further regulated and adjusted, which results in varying degrees of multiple sports resources failing to exert their full effect in the market. In this regard, the relevant government departments should take measures with strong pertinence and effectiveness to effectively cultivate the sports market and activate various sports resources.

It is necessary to strengthen the development and training of reserve talents resources of competitive sports in colleges and universities and emphasize the development strategy of reserve talents of “highlighting key” projects. Changing the traditional management mode, making full use of the teaching mode in Colleges and universities, making flexible use of the construction of flexible learning system, and combining with professional sports training, the cultivation of talented athletes in two aspects can not only improve their cultural quality, but also improve their sports level from a professional perspective.

Table 1. Sources of competitive sports talents in Colleges and Universities

| Source of athletes                                      | Number | Percentage (%) |
|--------------------------------------------------------|--------|----------------|
| Athletes in service of the provincial professional team| 54     | 10.8           |
| Retired athletes                                      | 81     | 16.3           |
| Sports school athletes                                | 206    | 41.4           |
| Athletes in traditional school of Physical Education   | 146    | 29.3           |
| Ordinary college students                            | 11     | 2.2            |

The number of college competitive sports coaches aged from 36 to 55 accounts for the vast majority of the total number, which shows that colleges and universities keep a relatively stable state of the introduction of coaches and the retirement and resignation of elderly coaches, and the number of coaches aged from 36 to 46 is the majority, that is, the number of young and middle-aged teachers is dominant, which shows that college coaches are full of vitality and belong to the backbone of the whole coach team. With the improved teaching over the years, there will be a lot of room for coaches of this age to grow and play. The statistical results are shown in Table 2.

Table 2. Age of college coaches

|                  | Greater than 55 | 46-55 | 36-46 | 26-46 | Less than 26 |
|------------------|-----------------|-------|-------|-------|--------------|
| Number           | 3               | 16    | 24    | 5     | 0            |
| Percentage       | 6.3             | 33.3  | 50    | 10.4  | 0            |

It is necessary to explore the potential demand of sports consumption, strengthen the policy guidance, enhance the actual ability of economic payment, strengthen the top-level design at the
national level with the help of relevant policies and supporting measures with strong operability, and strengthen the effective implementation of each plan. We should guide the people's sports consciousness and consumption concept, increase sports consumption publicity by relevant government departments, guide all sectors of society to realize the significance of sports and promote the transformation and upgrading of the sports industry.

4. Conclusion
In conclusion, the new transformation of China's the sports industry from the perspective of AI is embodied in the “Four comprehensive” strategies promoting the institutional innovation of the sports industry, the “New normal economic situation” promoting the optimization of the sports industry structure, the “Internet +” promoting the cross-industry cooperation, and the “new urbanization” promoting the sports demand. In this regard, it is necessary to strengthen the dynamic cultivation of the development of China's the sports industry by cultivating the sports market and activating the relevant sports resources effectively, deepening the reform of the sports industry system and enabling social capital, guiding the concepts of sports consumption and driving the industrial upgrading, and enhancing the practical cultivation of the relevant talents of the sports industry.

References
[1] Gholamhossein Eslamizadeh, & Ramin Barati. (2017). Heart murmur detection based on wavelet transformation and a synergy between artificial neural network and modified neighbor annealing methods. Artificial Intelligence in Medicine, 78, 23-40.
[2] Junliang Xing, Haizhou Ai, Liwei Liu, & Shihong Lao. (2011). Multiple player tracking in sports video: a dual-mode two-way bayesian inference approach with progressive observation modeling. IEEE Transactions on Image Processing, 20(6), 1652-1667.
[3] Yanshuai Xu, Nan Jiang, Yaguang Zhang, Min Wang, & Jianmin Tao. (2017). A snp in the promoter region of thevvmyba1 gene is responsible for differences in grape berry color between two related bud sports of grape. Plant Growth Regulation, 82(3), 1-9.
[4] FeiYue Wang. (2011). Social media and the jasmine revolution. IEEE Intelligent Systems, 26(2), 2-4.
[5] Yiyuan Li, Jianhui Xiao, Jiajie Wu, Jialei Duan, & Xiuying Kong. (2012). A tandem segmental duplication (tsd) in green revolution gene rht-d1b region underlies plant height variation. New Phytologist, 196(1), 282-291.
[6] Liu, Shumin, Chen, Jiajia, Chang, Chip-Hong, & Ai, Ye. A new accurate and fast homography computation algorithm for sports and traffic video analysis. IEEE Transactions on Circuits & Systems for Video Technology, 1-1.