Development Trend of the Integration of Artificial Intelligence and Sports Industry

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Abstract: Artificial intelligence has slowly become the focus of research in various countries, and the application of artificial intelligence has become more and more extensive, and it can be seen in more and more industries. However, the application of artificial intelligence technology to the sports industry is still an attempt with unpredictable results, but it will be a bold attempt. In addition, in the process of the integration and development of artificial intelligence and the sports industry, there must be some problems. This requires researchers and staff to have enough patience to solve these problems, and through joint efforts to continuously improve, make artificial intelligence and sports the integrated development of the industry is more stable. This paper adopts a combination of empirical analysis and theoretical analysis, systematically researches the current status of the development of the sports industry with artificial intelligence, and analyzes the development trend of this new type of sports industry. The results of the experiment show that the market size of China's artificial intelligence sports education and the growth rate of the number of users have both remained above 20%, which has doubled in just four years, showing the rapid development of it. It proves from the side that the unique environmental advantages and sufficient talent advantages of the artificial intelligence sports industry have laid a strong human resource foundation for the sports industry in the central plains urban agglomeration; the artificial intelligence sports industry has a wealth of traditional characteristic sports industry projects, and is the development of the artificial intelligence sports industry provides a rich resource base for the sports industry.

Key words: Artificial Intelligence, Sports Industry, Integrated Development, Development Trend

1. Introduction
The sports industry has become the most active and fastest growing industry among many entertainment industries. The sports industry plays an important role in promoting economic growth and has become the new favorite of commercial capital [1-2]. The sports industry not only promotes
the rapid economic growth of developed countries, but also promotes the improvement of other industrial structures, provides employment opportunities for many people, and reduces the burden of national construction [3]. To solve the already developed sports industry to a certain extent, studying the development trend of artificial intelligence and the sports industry has become one of the current research focuses [4].

The information processing technology of artificial intelligence has been penetrated on different scales in people's lives. This shows that to a large extent artificial intelligence can provide the necessary conditions for the orderly development of information processing. The combination of the sports industry and artificial intelligence is completely conducive to its development [5]. The sports industry conducts scientific analysis through artificial intelligence statistical analysis, data mining, and mechanical learning techniques. Just like using artificial intelligence to fundamentally solve the live broadcast of sports events, it is like learning knowledge to understand the situation of various sports events [6-7]. I personally think that if data methods and analysis methods are used reasonably and artificial intelligence is truly integrated into the sports industry, it will be an influential achievement [8]. In the continuous use and exploration, people have experienced the healthy exercise practiced by the sports industry and felt the huge potential contained in it. At the same time, due to the rapid development of the sports industry, many problems have been exposed and the development of the sports industry has been restricted. The entire industry urgently needs to find new growth points to further overcome bottlenecks and bottlenecks and make full use of it, so as to continue to maintain the current development speed [9-10].

This article first gives a brief overview of artificial intelligence, introduces the development stages of artificial intelligence, and then introduces the concept of the sports industry. At the same time, this article uses the literature data method and empirical analysis method to analyze the sports industry and sports event consumers in the sports industry in the past five years. The experimental results prove that the integration of artificial intelligence and the sports industry has formed a certain scale. According to the data surveyed in this experiment, it can be proved that the integrated development of artificial intelligence and the sports industry will develop in a better direction, which can drive economic development and people The strengthening of physical fitness.

2. Overview of UAV and Fuzzy Control Theory

2.1 Artificial Intelligence

According to the development level of artificial intelligence technology, the industry divides it into: special artificial intelligence, general artificial intelligence and super artificial intelligence. From the overall stage of global technology, artificial intelligence is currently in the stage of local dedicated intelligence. The special intelligence stage mainly solves specific problems in the vertical field. Currently, there is no general intelligence that can solve multiple problems in multiple fields at the same time. The industry is still uncertain whether or when super artificial intelligence will appear. According to the development stage of artificial intelligence technology, the industry divides it into: perception intelligence stage and cognitive intelligence stage. From the perspective of technological maturity, artificial intelligence is currently in the stage of perceptual intelligence, in a period of rapid development of perceptual intelligence.

One of the underlying principles of artificial intelligence is BP nerve, and its algorithm training related expressions are:

Hidden layer activation function $f$:

$$f(x) = \frac{1}{1 + e^{-x}}$$  \hspace{1cm} (1)

Hidden layer output $H$:
\[ H_j = f(\sum_{i=1}^{n} \omega_i x_i - a_j), j = 1,2,\cdots,l \]  

(2)

Forecast output \( O \):

\[ O_k = \sum_{j=1}^{l} H_j \omega_{jk} - b_k, k = 1,2,\cdots,m \]  

(3)

Calculate the prediction error \( e_k \), \( Y_k \) is the expected output:

\[ e_k = Y_k - O_k, k = 1,2,\cdots,m \]  

(4)

Weight update:

\[ \omega_{ij} = \omega_{ij} + \eta H_j (1-H_j) x(i) \sum_{k=1}^{m} \omega_{jk} e_k, i = 1,2,\cdots,n \quad j = 1,2,\cdots,l \]  

(5)

\[ \omega_{jk} = \omega_{jk} + \eta H_j e_k \quad i = 1,2,\cdots,l \quad k = 1,2,\cdots,m \]  

(6)

2.2 Sports Industry

In order to scientifically define the concept of the sports industry, we must first clarify that cultural economy is a key feature of the sports industry, because this position clearly shows that the sports industry is a product of the interaction and integration of culture and economy, and pure cultural or economic views cannot absorb the sports industry. The whole picture. Secondly, the sports industry is an integral part of the cultural economy, a new form of the cultural entertainment industry, and a concentration of economic behaviors with similar characteristics. The so-called sports industry refers to the sum of production, management and social service departments that meet the needs of consumers and other sports industries. To name a few, this is not an industry. It is an industrial group that provides all kinds of sports goods and services to the society. The development of the sports industry not only meets people's physical conditions, but also plays a practical role in adapting to the industrial structure, expanding domestic demand and developing. Promote the development of related industries. At the same time, it provides people with a large number of employment channels and job opportunities, which also continuously improves people's quality and quality of life.

2.3 SWOT Combination of Artificial Intelligence Sports Industry

The SWOT analysis method is a strategic analysis method that evaluates and analyzes the advantages and disadvantages, opportunities and threats of the analyzed objects in detail and draws conclusions. Through the organic combination of internal resources and external environment, we can clearly determine the advantages and disadvantages of the resources of the analysis object, understand the opportunities and challenges we face, and adjust methods and resources at the strategic and tactical levels. Ensure the implementation of the analysis object. Reach the goal to be achieved.

a. The sports market is unbalanced and the overall sports consumption level is limited

Recently, the main industry of artificial intelligence sports has lagged behind, lack of well-known sports brand enterprises, and sports industry clusters have not yet appeared. Compared with some developed cities, the difference is far. The successful experience of developed areas at home and abroad shows that only when residents' passion for sports consumption is released, the sports market will be active, and the sports industry will be able to gain space and stage for rapid development.

b. The development of basic sports facilities in stadiums is lagging behind
Sports venues are the foundation and material foundation for the development of the sports industry. The development of the sports industry must be based on space. Sports facilities are the infrastructure in the field of sports. They not only play a vital role in the development of competitive sports and mass sports, but also are the precious resources of China's sports industry and the foundation and material for the development of the sports industry. Both the competitive performance industry and the fitness and leisure industry are inseparable from sports facilities. Sports facilities provide the community with services such as fitness and leisure, competition performances and physical education, which shows the importance and foundation of the development stage of the sports industry. A special survey of sports and related industries shows that the utilization rate of large-scale stadiums in various places is very low. The main consideration at the beginning of the construction of many large-scale stadiums is to meet the purpose of hosting large-scale sports competitions and sports training, and rarely consider the issue of external operation and development after the game. The function of stadiums is relatively single. In addition, the lack of follow-up funds for large stadiums makes it difficult to carry out repairs and maintenance.

c. Expansion and intervention of related industries such as cultural industries

It can be seen from the current situation of the artificial intelligence sports industry that the current market system of the artificial intelligence sports industry is not perfect, the product quality needs to be improved, the supply of sports is seriously insufficient, and the demand is seriously unbalanced. In terms of product supply, cultural industries and other related industries have a high degree of substitution for sports products.

3. Experimental Design

3.1 Research Method

a. Literature method

This article first uses the method of inquiring literature data, inquiring about relevant domestic and foreign data according to the research purpose, and sums up the relevant theories of the integration and development of artificial intelligence and the sports industry, and then analyzes the data collected by the survey on the sports industry in province X over the past 5 years.

b. Positive analysis

In the experiment process, combined with empirical analysis of the status quo of the artificial intelligence sports industry, SO-WT analysis was carried out to get the development direction of the artificial intelligence sports industry, and put forward corresponding ideas for its development trend.

3.2 Experimental Design

a. Research object

This article takes the current situation of the artificial intelligence sports industry as the research object.

b. Experimental steps

This article first analyzes the current situation of the artificial intelligence sports industry, and then analyzes the data collected from the survey, and finally obtains the development ideas and trends of the artificial intelligence sports industry.

4. Analysis and Discussion of Experimental Results

4.1 Development Status of Artificial Intelligence Sports Industry

In order to fully grasp the development status of the artificial intelligence sports industry in X province, we conducted a data survey on most of the sports industry in X Province. Since my country hosted the Beijing Olympics, the artificial intelligence sports industry has only improved a little, but the overall situation is still not so ideal. Therefore, we mainly analyze the sports event industry, the sports fitness
and entertainment industry and the stadium industry.

(1) Industry Analysis of Sports Events

Since my country hosted the Beijing Olympics, the artificial intelligence sports industry has seen a slight improvement, and the competition performance market system composed of comprehensive competitions and individual competitions of various events has been initially formed. In recent years, sports events have made great progress in terms of quantity, competition level and quality.

**Table 1. Data analysis table of sports events in the past five years**

| Year | International competition | National competition | Provincial competition | Municipal competition | Total |
|------|--------------------------|----------------------|-----------------------|----------------------|-------|
| 2016 | 0                        | 1                    | 7                     | 13                   | 21    |
| 2017 | 1                        | 3                    | 11                    | 18                   | 33    |
| 2018 | 1                        | 3                    | 16                    | 25                   | 45    |
| 2019 | 2                        | 4                    | 19                    | 33                   | 58    |
| 2020 | 3                        | 6                    | 24                    | 41                   | 74    |

**Figure 1. Map of the number of matches in the past five years**

It can be seen from Table 1 and Figure 1 that by comparing the sports event data in the past five years, it can be seen that in recent years, the number of sports events in province X has increased significantly, especially in international competitions. In addition, the number of athletes and spectators participating in the competition has also increased to varying degrees, which also shows from different angles that the level and influence of the competition are gradually improving. In particular, it is worth noting that as far as the development of market activities is concerned, revenue has grown very rapidly, among which sponsorship revenue is impressive. Through eternal comparison, the performance in the sports event market in recent years is worthy of recognition, and the results are also extremely amazing. There are still many shortcomings in the overall quality, scale and structure of sports events, but the growth rate is satisfactory.

(2) Consumer analysis of sports events

The scale and quality of sports event consumers is one of the objective conditions for shaping the sports event market. With the continuous improvement of the sports event market and the
improvement of the level of sports events, the consumer group of sports events is also growing, as shown in picture 2.

![Number of Visitors in the past five years](image)

**Figure 2.** The number of visitors in the past five years

It can be seen from Figure 2 that the number of spectators at sports events has been increasing, and their consumption levels have also increased. Even foreign spectators have also increased, forming a huge event consumer group. This also proves from the side that the integration of artificial intelligence and sports industry has formed a certain scale. According to the data surveyed in this experiment, it can be proved that the integration of artificial intelligence and sports industry will develop in a better direction, which can drive economic development and the physical fitness of the masses is strengthened.

4.2 Market scale analysis of artificial intelligence sports industry

Since the development of the sports industry varies from place to place, more sports industries are generally distributed in first-tier cities, and second- and third-tier cities have great demand for the sports industry. Therefore, when the artificial intelligence sports industry sprouted in China, it received widespread attention. Various artificial intelligence sports industries quickly completed the transformation of the internet, and absorbed a large amount of investment in a short period of time, making it the first batch of people to eat crabs and achieving leapfrog development. This paper collects and analyzes the market size of the artificial intelligence sports industry in the past five years. The results are shown in Figure 3.
Figure 3. Artificial Intelligence Sports Industry Market Scale Analysis Chart

The growth rate of the market size of artificial intelligence sports education in China has remained above 20%, which has doubled in just four years, showing the rapid development of it. At the same time, the sports industry has accelerated the transformation of the internet, and has begun to try the online and offline combination model, while the internet giants have used their accumulated rich customer resources to quickly build various sports live broadcast platforms and enter the sports market.

5. Conclusions

The overall development of the artificial intelligence sports industry is still not ideal. The sports competition performance industry, the sports fitness entertainment industry, and the stadium industry have developed relatively well. Others such as the sports intermediary industry, the sports media industry, and the sports training industry have developed relatively slowly and have relatively high output value. Low. Trends of artificial intelligence sports industry exhibition: first, to build a regional sports brand; second, to fully develop the sports event industry and improve the sports competition performance market; third, to build a sports industry cluster; fourth, to build sports industry base.

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