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Development Status of Hakka Traditional Leisure Sports Industry Based on Big Data

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Abstract: In the 21st century, with the rapid development of China's economy, people's awareness of health is increasing, and the national fitness movement is deeply rooted in the hearts of the people. Sports consumption has become an indispensable part of people's daily consumption. In recent years, with the development of sports consumption, the huge population base makes the development of China's sports industry (SI) has been qualitatively improved. Based on big data (BD) technology, this paper analyzes the development status of Hakka traditional leisure SI. Based on the fact that the development of Hakka traditional leisure SI is random and time-varying. Therefore, this paper investigates and analyzes the current situation and market structure of Hakka traditional leisure SI from sports, sociology and economics, finds out the existing problems by using BD technology, and puts forward improvement measures and countermeasures, so as to promote the healthy and sustainable development of leisure SI market. Nowadays, leisure sports has become an important part of residents' life, but there are still many puzzles in the development of leisure SI and its market structure. The relative theoretical research lags behind, which limits the development of China's leisure SI. Therefore, how to analyze the BD algorithm in theory is particularly important, BD the introduction of the algorithm can better find and improve the problem. The experimental results show that the development status of Hakka traditional leisure SI based on BD explored in this paper analyzes the impact of residents' Sports Health on the expenditure of sports consumption increased by about 55%.

1. Introduction

As a social and cultural phenomenon, universal leisure is closely related to the development of social civilization and people's pursuit of high-quality life [1]. As an important way of human

leisure activities, sports is an inevitable demand for people to advocate nature, return to self, care for life, and pursue the balance of physical and mental health. It is also the result of people's pursuit of higher quality of life and spiritual enjoyment after certain material living conditions are met [2]. Over the years of reform and opening up, China's productivity level has increased rapidly, the economy has developed rapidly, and people have more leisure time while the economic conditions have improved [3]. "Money" and "leisure" provide people with material basis and time guarantee for leisure activities. With the spread and penetration of the idea that "it's better to invite people to eat than to sweat", more and more people begin to realize the importance of leisure, and begin to actively pursue a healthy lifestyle and participate in various leisure sports activities [4].

Under the current background that our country is actively promoting the national movement, the popularization of BD technology makes the most effective way to realize the organic integration of BD technology and investigation and analysis is to build an artificial intelligence analysis system to analyze human movement [5-6]. Domestic scholars Zhu and Zicheng believe that market structure refers to the composition of market entities and their mutual relations; second, they believe that market structure is the composition of market relations and their determinants. This concept is mainly derived from the market structure theory of modern industrial organization, and market structure as the central content of theoretical research on industrial organization [7]. Foreign scholar Samuel Y believes that market structure refers to the characteristics and forms of enterprise market relations. The common characteristics of market relations are competition and monopoly. The characteristic of market organization that has a strategic impact on the degree of competition and price formation in the market is the market structure. The market structure reflects the concept of market competition and monopoly relations [8]. Chinese scholars are getting deeper and deeper in the research scope and depth of the leisure SI. However, compared with developed countries, they still need to expand their research perspectives, methods, and content. The SI should learn from foreign developed regional models [9-10].

In this paper, leisure sports major is attached to either social sports major or sports economy or management major. It has not been established independently. Leisure sports major as a major with great development potential and bright market prospects. Put forward the improvement measures and Countermeasures to promote the healthy and sustainable development of leisure SI market. Leisure sports has become an important part of people's life, but there are still many puzzles in the development of leisure SI and its market structure. The relative theoretical research lags behind, which limits the development of China's leisure SI. How to analyze it in theory is particularly important; and facing the new challenges of the development of Hakka traditional leisure SI. It is worth pondering how to seize the opportunity, develop better and faster, and make contributions to the development of Hakka traditional leisure SI and the overall social and economic development.

2. Development Status of Hakka Traditional Leisure SI Based on BD

2.1. Literature Method

This paper will refer to the development of SI and leisure SI, relevant policies, market structure and other related literature, as well as the cultural industry, tourism industry and other articles close to the SI, at the same time, refer to the relevant economic theory to analyze the development of SI.

2.2. Investigation and Interview

According to the purpose and content of this study, this paper investigates the traditional leisure

SI of Hakka to understand the production, operation and development of these organizations; at the same time, it interviews experts in related fields and decision-makers of government departments to listen to their opinions and suggestions on the research issues and obtain the objective understanding and basic judgment of the research issues.

2.3. Mathematical Statistics

According to the local sports bureau survey of the relevant SI statistics and visit survey of the relevant information, the Hakka traditional leisure SI structure empirical analysis, the empirical analysis of the conclusions are summarized.

2.4. Basic Principles of BD Mining Algorithm

The BD mining algorithm is based on the topological principle of BP network. It replaces the transfer function nodes in the hidden layer with the mining algorithm. The basic principle is the same as that of BP network. When the signal propagates from front to back, the error will be reduced row back propagation, the gradient correction method is used to modify the network weights and mining algorithm parameters again and again, so that the predicted value of BD mining algorithm gradually reaches the expected output. Suppose h is the output value of hidden layer, y is the prediction output of output layer, yn is the expected output, and ω is the prediction output of output layer $\omega_{ij}$is the weight of the connection between the input layer and the hidden layer ϖ_{jk} is the weight from hidden layer to output layer, h_j is the wavelet basis function, a is the expansion factor of the function, B is the translation factor, l is the number of hidden layer nodes, M is the number of output layer nodes, e is the prediction error, and η is the learning rate

Wavelet basis function:

$$y = \cos(1.75x)e^{-x^2/2} \tag{1}$$

Calculate the hidden layer output value:

$$h(j) = h_j\left(\frac{\sum_{i=1}^{k} w_{ij} - b_j}{a_j}\right) \qquad j=1,2,3..... \tag{2}$$

Calculation output layer prediction output:

$$y(k) = \sum_{i=1}^{l} \omega_{ik} h(i) \tag{3}$$

Prediction error:

$$e = \sum_{k=1}^{m} yn(k) - y(k) \qquad k=1,2,....,m \tag{4}$$

Network weight correction and function coefficient correction

$$\omega_{n,k}^{(i+1)} = \omega_{n,k}^{i} - \eta \frac{\partial e}{\partial \omega_{n,k}^{(i)}} \tag{5}$$

Overview of algorithm training steps:

Step 1: Network initialization. Random initial assignment of the expansion factor, translation factor and connection weight between network layers of the mining algorithm, and select the network learning rate, set the number of nodes in the input layer, output layer and hidden layer according to the task.

Step 2: Sample classification. The data set is appropriately divided into two parts for training and

testing, the training set is used for network training, and the test set is used for testing the training effect of the network.

Step 3: Forecast output. Input the training data into the constructed network, calculate the predicted value according to the output expression of the output layer, and compare it with the expected output to get the error value.

Step 4: Weight correction. According to the error value, the weight of the network and the relevant parameters of the mining algorithm are revised again and again, with the goal of the predicted output of the network gradually approaching the expected value.

Step 5: Determine whether the algorithm stops running according to the set error value. If it does not stop, return to step 3 to continue the iteration.

3. Experimental Study on the Development of Hakka Traditional Leisure SI Based on BD

3.1. Development Status of Leisure SI

In this paper, the development of Hakka traditional leisure SI has the characteristics of random and time-varying. The current situation and market structure of Hakka traditional leisure SI are investigated and analyzed, and the existing problems are found out by using BD technology. The improvement measures and countermeasures are put forward to promote the healthy and sustainable development of leisure SI market.

3.2. Experimental Process

By using the methods of investigation, interview and research, this paper analyzes the development status of leisure SI in Wuhan, investigates the development structure of Hakka traditional leisure SI, and finally analyzes and processes the data.

4. Experimental Analysis on the Development Status of Hakka Traditional Leisure SI Based on BD

4.1. Development Status of Leisure SI

Leisure SI covers all the services provided by all social strata for leisure sports, as well as the sum of production and business activities generated by these services. It includes sports service industry, such as sports fitness and entertainment industry, sports competition and performance industry, sports tourism industry, sports media industry, e-SI, etc., as well as leisure sports manufacturing industry, leisure sports trade industry and other related industries. This paper analyzes the development status of Hakka traditional leisure SI. The results are shown in Table 1 and figure 1.

Table 1. Development of Hakka traditional leisure SI

Industry category	Total output	Added value	number of people employed
Hakka traditional leisure sports service industry	164000	106000	12818
Hakka traditional leisure sports goods industry	398900	251600	35781
Hakka traditional leisure sports building	56400	30800	1212
total	619300	388400	49811

It can be seen from Figure 1 that the added value of Hakka traditional leisure sports service industry, which is closely related to Hakka traditional leisure SI, is 106000 yuan, accounting for 26.2% of the total added value of Hakka traditional leisure SI, and the number of employees accounts for 26.6% of the total number of employees in the SI, Although the sports service industry has not formed a pillar advantage, its function as a core industry has been highlighted.

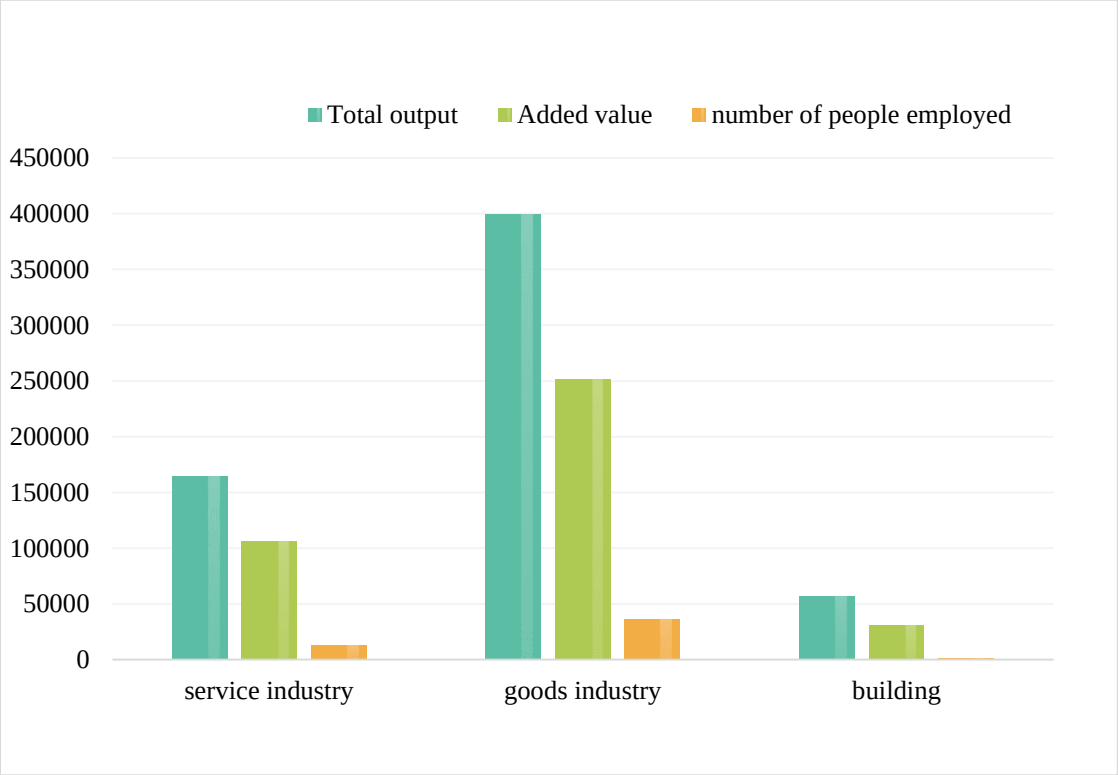

Figure 1. Index chart of Hakka traditional leisure SI development

4.2. Change of People Likes for Sports Consumer Goods

In this paper, a group of people use sports consumer goods for physical exercise, under the same conditions, let B group of people do not use sports consumer goods for a month of exercise. In the process of the experiment, the physical condition of the experimenters was investigated every five days, and the changes of their love for sports consumer goods were counted. We visualized the changes of people's preference for sports consumer goods in group A and group B, and fitted the curve according to the mean value. As shown in Table 2 and Figure 2.

Table 2. Physical condition of the experimenters was investigated every five days

Time	After 5 days	After 10 days	After 15 days	After 20 days	After 25 days	After 30 days
Group A	50%	55%	63%	75%	81%	86%
Group B	50%	51%	54%	60%	63%	69%

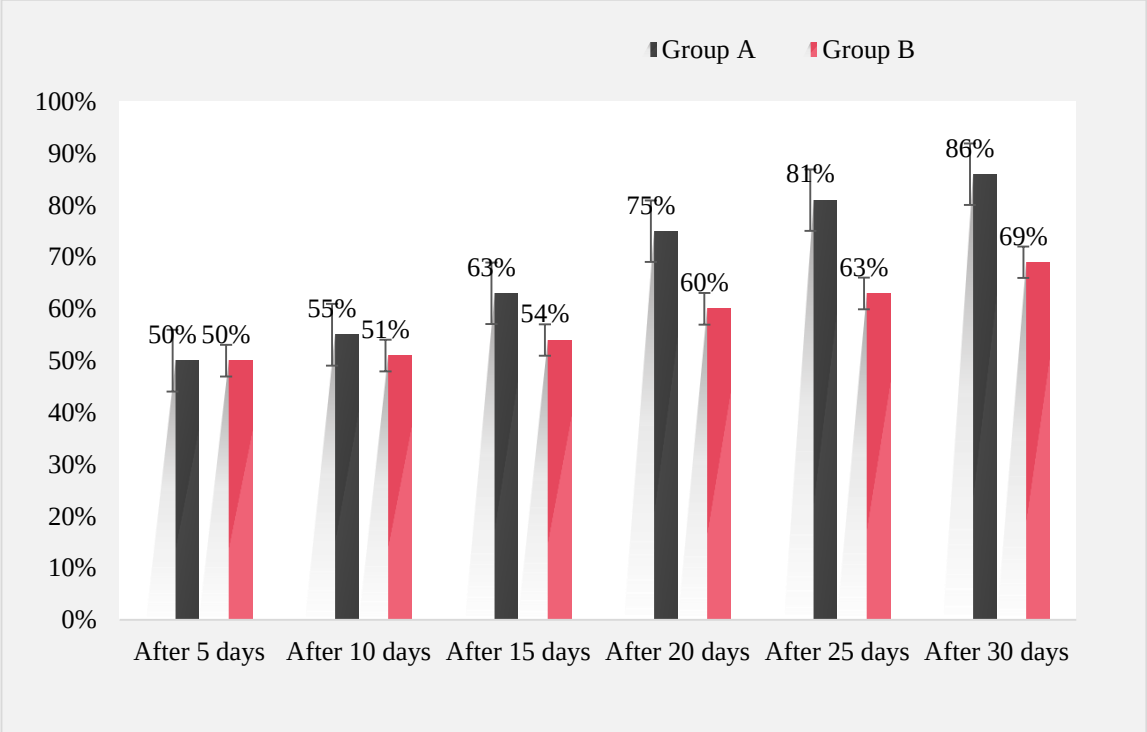

Figure 2. Changes of elderly liking for computer learning

As can be seen from the experimental results, that the fitting effect is better in the prediction of the first 25 days' data. The experimental results show that the development status of Hakka traditional leisure SI based on BD explored in this paper analyzes the impact of residents' Sports Health on the expenditure of sports consumption by about 55%.

5. Conclusion

Leisure sports, as an important part of leisure activities, is the product of economic and social development to a certain stage; when the era of BD sweeping the world, data has become the core resource of media industry operation. However, because the formation, emergence, evolution and change of the media industry, especially the new media industry, are closely related to digital technology, so in this new era, the representative statistical data, analysis, visualization and other technologies will inevitably have a great impact on the whole media industry. In this context, the ecosystem bred by BD includes many contents, such as output data, storage data, data sharing, retrieval, analysis, mining, visualization, etc. However, the business needs in different links develop and give birth to more technical models, means, methods, etc., and innovate production, operation, marketing, reform and opening up the establishment of the market economic system has created the necessary material basis, institutional conditions and market opportunities for the development of China's leisure SI. The people's demand for various leisure sports, such as fitness and entertainment, sports events viewing and sporting goods consumption, is growing. The scale of leisure SI is constantly expanding, and it has shown great achievements in expanding domestic demand, promoting economic growth and employment strong driving role and great development potential. This paper analyzes the development and market structure of leisure SI by means of literature, interview and mathematical statistics.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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