Design of Sports Training Management System Based on Big Data Analysis

Jianjun Cheng

Jiangxi Vocational Technical College of Industry & Trade, Nanchang, Jiangxi, 330038, China

Keywords: Big data analysis; Physical training; Management system

Abstract: On the whole, the people's physical quality in our country has shown a certain downward trend, and the indicators presented by different age groups are also different. According to the statistics of relevant parties, the overall physical quality of our country's citizens has shown a downward trend, among which the downward trend of college students' physical quality is the most serious. There are still many shortcomings in the traditional sports training schedule planning system, especially the system terminal is difficult to timely and accurately process and analyze big data, resulting in slow implementation, which hinders the development of training schedule planning. Due to the uneven residual level of physical education teachers, they have a strong personal subjective consciousness when making physical training plans and methods, and they can't effectively make targeted and scientific plans and methods according to students' personal physical qualities, which leads to students' low active participation in physical training, and the training effect is not obvious. This paper aims at improving the current problems in physical training management, and designs a physical training management system in this paper, which can significantly improve the timeliness and reliability of data information processing, thus providing effective guidance for students' training planning.

1. Introduction

With the vigorous development of national fitness activities, people's life concept has changed greatly. In some large and medium-sized cities, consumption for health has become a fashion to improve the quality of life in the new era. On the whole, the physical fitness of our people has shown a certain downward trend, and the indicators presented by different age groups are also different, which can be roughly divided into four stages: the childhood stage, the youth stage, the middle-aged stage and the elderly stage. According to relevant statistics, the overall physical fitness of Chinese citizens has shown a downward trend, among which the decline of college students' physical fitness is the most serious [1]. The traditional sports training schedule planning system still has many shortcomings, especially the system terminal is difficult to timely and accurately process and analyze big data, resulting in slow implementation, which hinders the development of training schedule planning.

Due to the uneven level residuals of physical education teachers, their personal subjective consciousness is relatively strong when formulating physical training plans and methods, and they can not effectively formulate scientific plans and methods based on the students' personal physical quality, which leads to the students' active participation in physical training is not high enough, and the training effect is not obvious, which restricts the effective development of students' physical quality to a certain extent [2]. The multi sports training management system is used to record students' daily sports training information data. Use the multi frequency data processor in the two-dimensional technology to adjust the system, read the corresponding training scores of the students in the buffer zone, change the set value of the number of bits in the buffer zone, decompose the problems to be handled into several sub problems such as physical fitness evaluation, training plan arrangement, training time arrangement, etc. according to the rules of the knowledge base and cooperation, and then submit these sub problems to the physical fitness evaluation function, training plan arrangement function training schedule function which can not only be used as the basis for teaching quality records and teaching evaluation, but also can excavate internal relations and laws from massive data, Deeply analyze the causes of teaching quality and effect, create scientific data

guidance for teaching management decision-making, with strong accuracy and timeliness, and diversified output results, so it is favored in the intelligent planning of training progress [3-4].

This paper aims to improve many problems in the current sports training management, and designs a sports training management system in this paper. After the system obtains user data, managers can make decisions on the data, and send the data to other systems through the big data exchange platform[5]. Based on big data analysis, help them develop scientific and effective sports training plans and training methods that meet the needs of college students.

2. Design, Supervision and Management of Sports Training Management System

Big data model is realized based on massive data collection and analysis. Therefore, collecting data is a necessary link to build an intelligent model in athletes' training. According to the characteristics of students' sports training management, it is the basic function of information management system to collect students' sports data. For the sports training management system, the training management structure is very important, which needs to be comprehensive, stable and easy to control [6-7]. First, establish a comprehensive system function module structure. After obtaining the basic data, the system will classify the data and integrate the data resources. According to this idea, the overall architecture diagram of the sports training management system as shown in Figure 1 can be obtained.
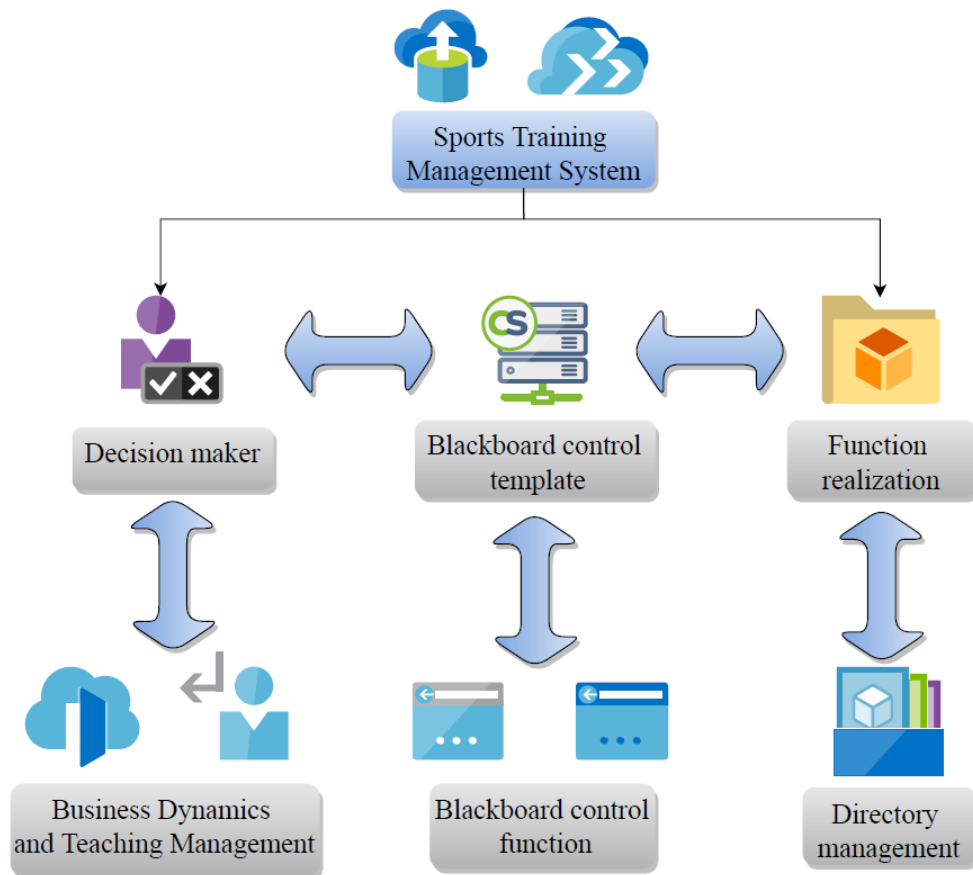

Figure 1 Physical training management system architecture

It is necessary to establish basic functional modules in sports management system to help users use related functions more conveniently. The design modules are mainly divided into four categories: login module, user basic information module, training plan making module and training result management module. Firstly, the functions in the system are used to construct. After the data is obtained, the system needs to process the obtained data. The training database stores basic data such as age, gender, weight, heart rate at rest, exercise cycle, exercise time, sports events, history of sports injuries and so on [8]. The training database stores data such as maximum heart rate, calories

consumed during exercise, exercise time, exercise amount, lactic acid accumulation during exercise, weight of muscles and bones during exercise, etc. To realize data classification and decision management based on data, etc. In the system, data structure management is based on big data dimension modeling, which includes data clustering, collection of sports data sources, storage and query of historical data, etc.

While supervising students' sports data, effective management should also be given. At present, most college sports only exist in physical education courses. In fact, through the information management system, the classroom can be extended to students' daily life. The sports training management system designed based on big data has two obvious advantages: First, it uses relational database storage mode to complete the conversion of sports related data to database, and retains the semantic features and related features of massive original data, which is the basic guarantee for fully mining the value of sports teaching information. The supervision end of the system mainly realizes the management of students' information, the viewing of students' physical exercise data and the release of tasks, etc. Its functional architecture diagram is shown in Figure 2.
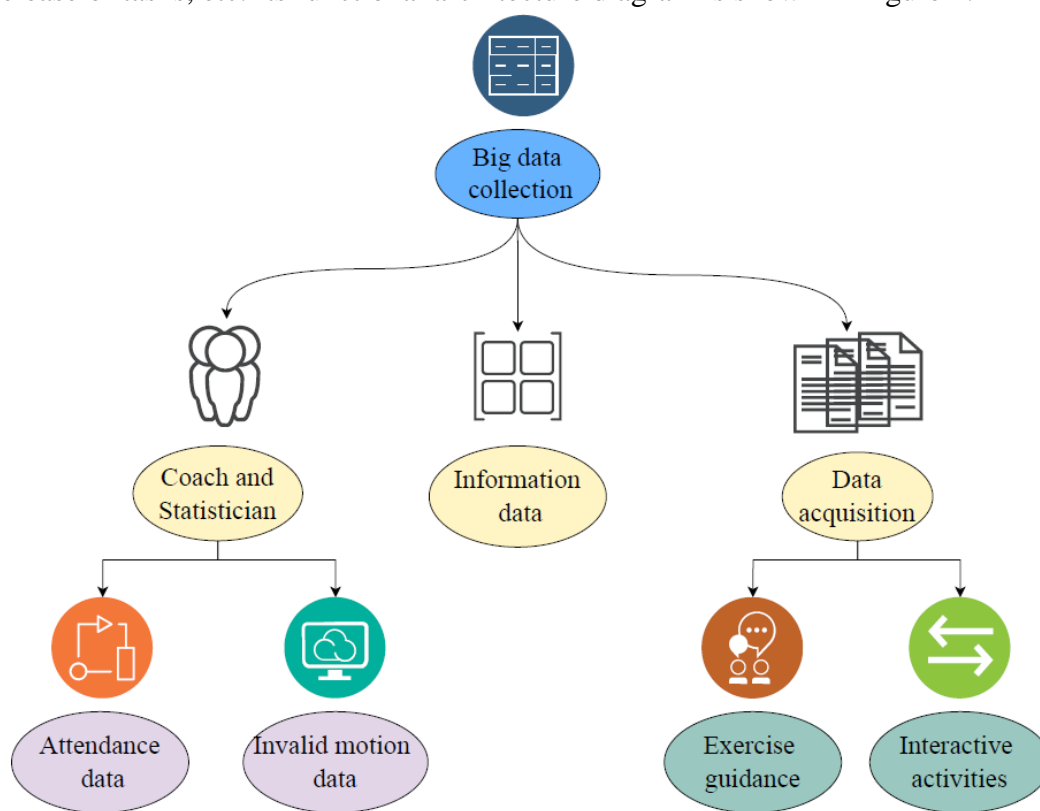

Figure 2 Functions of sports training supervision terminal

With the help of the system, students' exercise time can be flexibly managed. At the same time, students' exercise amount and intensity can also be managed through data analysis. When students are playing sports, supervisors should release sports tasks according to their sports data. Based on big data analysis and implementation of interaction between decision-makers, the interface can obtain the habits, hobbies, habits and other main characteristic information of decision users according to the changes of the active detection environment during the implementation of interaction, so as to provide the best user interface when making decisions, and provide decision users with unified ideas to assist decision-making [9-10]. Due to the uneven level residuals of physical education teachers, their personal subjective consciousness is relatively strong when formulating physical training plans and methods, and they can not effectively formulate scientific plans and methods based on the students' personal physical quality, which leads to the students' active participation in physical training is not high enough, and the training effect is not obvious, which restricts the effective development of students' physical quality to a certain extent.

3. System test

3.1. Test process

In the sports training management system, the object-oriented model is used to represent the model base, and several model pairs can be regarded as an object for storage and management, and the interface matching with the knowledge base system is provided. This time mainly tests which is set as the test training group, ensure that both groups of systems are in stable operation state and there are no other influencing factors, and start the test. When working, there will be many rules that meet the corresponding conditions. At this time, we will extract the rule with the highest weight coefficient for reasoning, so as to solve the conflict phenomenon of the matching problem. When the production rules are stored, the new rules generated in the decision-making process are also stored in the knowledge base.

The multi sports training management system is used to record students' daily sports training information data. Use the multi frequency data processor in the two-dimensional technology to adjust the system, read the corresponding training scores of the students in the buffer zone, change the set value of the number of bits in the buffer zone, decompose the problems to be handled into several sub problems such as physical fitness evaluation, training plan arrangement, training time arrangement, etc. according to the rules of the knowledge base and cooperation, and then submit these sub problems to the physical fitness evaluation function, training plan arrangement function Training schedule function. Through the calculation of sports training management system, the test results are obtained. Under the same environment, the traditional training group was also tested and the corresponding results were obtained, and then the results of the two groups were compared.

3.2. Test result

Big data analysis has carried out the intelligent design of sports training management system, and through the simulation of the use environment, through the cross-compilation control of the system, different training operations and management controls have been incorporated into the framework. Based on big data analysis and implementation of interaction between decision-makers, the interface can obtain the habits, hobbies, habits and other main characteristic information of decision users according to the changes of the active detection environment during the implementation of interaction, so as to provide the best user interface when making decisions, and provide decision users with unified ideas to assist decision-making two groups of test results are obtained by testing the contents of Chapter 3.1, and the two groups of results are compared as shown in Table 1. As can be seen from Table 1, under the training management of the traditional system, the feedback rate of achievement information is only about 0.7, which is not ideal. However, with the assistance of the training system of the test group, the feedback rate of students' achievement information is kept at about 0.8, so the system of the test training group is more practical.

Table 1 Physical training management system test

Frame number	Traditional data group		Training group	
	Accuracy of error correction	Information feedback rate	Accuracy of error correction	Information feedback rate
200	66.45	0.512	82.14	0.823
400	70.23	0.702	75.23	0.721
600	78.45	0.789	88.25	0.898

The multifunctional database is established in the system, and the information of athletes' training demands is collected through data feedback. The server can quickly count and respond in time, and the data is stored in the server-side database, so as to realize the intelligent progress collection. By checking the students' daily sports data, we can judge whether the students' physical training is qualified. Thereby realizing the flexible management of students' physical training. With the help of the system, students' training time can be flexibly managed, and at the same time, students' exercise amount and intensity can be managed through data analysis. You can query and

obtain the required data information resources in the database, which further improves the comprehensiveness of the sports training system and finally realizes effective system management.

4. Conclusions

In a word, the traditional athlete training schedule planning is based on manual mode, which consumes too much human resources, and the process is too complex. For this, this paper proposes a research on sports training management system based on big data analysis. The design of sports training management system can make scientific and effective training plans tailored for students, which has certain application value in learning sports training management. The sports training database stores the user's maximum heart rate during exercise, calories consumed during exercise, exercise time, exercise volume, lactic acid accumulation during exercise, weight of muscles and bones during exercise and other data to achieve data classification and decision-making management based on the data. In the system, data structure management is completed based on big data dimension modeling, which includes data clustering, collection of sports data sources, storage and query of historical data. According to the data processing requirements, a data management architecture is constructed to achieve the data management of the system. According to the requirements of the supervisor, the overall architecture of the supervision end is designed, which is structured using the functions in the system. After obtaining the data, the system needs to process the obtained data. The sports training database stores the user's basic data such as age, gender, weight, resting heart rate, exercise cycle, exercise time, sports events, and sports injury history. This paper discusses the management method of using big data to analyze sports training time, training amount and training intensity.

References

[1] Wang H. College Physical Education and Training in Big Data: A Big Data Mining and Analysis System[J]. Hindawi Limited, 2021, 19(7):46-62.

[2] Zeng Q. Research on the Application of Big Data Analysis Auxiliary System in Swimming Training[J]. 2021, 33(7):11-27.

[3] Deng H, Wang J. Design of real-time data analysis system for physical training based on data mining technology[J]. Journal of Physics: Conference Series, 2021, 1982(1):012206-012219.

[4] Li C, Cui J. Intelligent Sports Training System Based on Artificial Intelligence and Big Data[J]. Mobile Information Systems, 2021, 21(1):1-11.

[5] Xin L I. Big Data Analysis Research and Practice Based on Training Business Change[J]. Journal of Tianjin Vocational Institutes, 2019, 67(30):25-48.

[6] Qiu H, Liu C, Zhang X. Intelligent Design of Tennis Player Training Schedule Based on Big Data of Complexity[J]. 2021, 67(20):31-45.

[7] Niu S, Zhao H B. Design and Development of Military Physical Fitness Evaluation System for Chinese Recruits Based on Big Data Technology[J]. Journal of Inner Mongolia University(Natural Science Edition), 2019, 33(11):26-37.

[8] Li Q, Kumar P M, Alazab M. IoT-assisted physical education training network virtualization and resource management using a deep reinforcement learning system[J]. Complex & Intelligent Systems, 2022, 8(2):1229-1242.

[9] Hu S, Huang M. Design and Implementation of Vocational Education Cross Border E-Commerce Comprehensive Training System Based On Big Data Analysis[J]. Journal of Physics: Conference Series, 2021, 1881(3):032037-032064.

[10] Jin, Yin, Xiao-qiu, et al. Study on safety mode of dragon boat sports physical fitness training based on machine learning - ScienceDirect[J]. Safety Science, 2019, 120(28):1-5.