Modeling and Analysis of Massive College Sports Data Based on Cloud Computing

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Abstract. With the advantages of cloud computing in the process of education and teaching practice in China gradually highlighted, it is increasingly urgent to use cloud computing to promote technological change in education and promote educational modernization with educational information. This paper introduces the problems existing in the construction of sports information resources in Colleges and universities. This paper discusses the impact of cloud computing on college sports information resources and the new opportunities brought by cloud computing. Finally, the paper puts forward some suggestions on the construction of sports information resources in Colleges and universities. The results show that the passing rate of freshmen, sophomores, juniors and seniors is 13%, 20%, 22% and 45%, respectively. The pass rate of high school physical education is the highest, the pass rate of freshman physical education is the lowest, and the pass rate of sophomore physical education is lower than that of junior middle school physical education.

Keywords: Cloud Computing, College Sports, Data Analysis, Modeling

1. Introduction

With the continuous progress of, computer an indispensable part of our life. Technological progress has led to the diversification of sports data and applications. Among them, integrated sensors, big data and cloud computing are the most attractive. The combination with social media enables users to share their sports data and expand their networks. In the research, the approximate solution is obtained through an advanced mathematical model. For large sports database users to find more accurate matching model.

With the continuous development of information technology, many experts have studied the university sports data. For example, some domestic teams have studied the new model of College Physical Education Based on cloud computing. They have added two indicators of students' extracurricular sports participation and changes in students' physical fitness. Based on cloud computing technology, students are divided into different classes and groups according to their physical fitness. A system and method for collecting motion data are disclosed, including measuring data corresponding to the identification, motion, position or condition of at least one motion participant on one or more sensor modules installed, attached or embedded on at least one motion participant, broadcasting from one or more remote sensors installed on at least one motion participant,
and transmitting data on at least one sensor module. A hierarchical model is attached or embedded in the participants to separate different tasks and concerns, so as to design a data model for context aware applications. These layers will be discussed along the nexus approach, which aims to support large-scale mobile applications through the federated context model. In addition, the related methods are described and compared. This paper expounds the aided training system in improving the training service architecture and intelligent effect, and the resources of different regions, balanced and unequal status information [1]. Some experts have studied the big data application. It is feasible to apply big data to college physical education teaching evaluation. Using big data method, this paper analyzes the application and optimization of lifelong sports model in college physical education. From the perspective of ecology, this paper makes a comprehensive reflection on the current college physical education teaching mode, in order to reform and improve the current physical education teaching mode. Combined with clustering to store and analyze particle motion data, combined with data processing algorithm and quantitative transformation algorithm of various physical quantities, a solution of motion health monitoring based on group characteristics is proposed. Through the targeted matching and comprehensive analysis of competitive sports cases, as well as the change mode of big data, the changes of competitive sports big data are intuitively presented, and the scientific understanding of the changes of competitive sports big data is formed. The binary Poisson model and its extension are considered to replace the independence assumption. The model considers the correlation between two scores, which is a reasonable assumption in the competitive sports of two opponents, and discusses the influence of introducing even micro correlation [2]. Some experts have studied the smart campus. Combined with the characteristics of mathematical statistics and case analysis, the questionnaire was compiled. Through literature review and interview, this paper explores and analyzes the connotation and characteristics of PE Teachers' teaching wisdom and explores the factors that influence the generation of PE Teachers' teaching wisdom and Internet plus teaching wisdom. Through advanced information technology, a multimedia teaching management system is designed and implemented. Design the technical architecture of the system, describe the logical structure and details of the system at the software level; design the sequence diagram and database for some representative functions respectively in the form of E-R diagram and W table structure. In the implementation of the system, the implementation environment of the system is introduced, the key codes of some functions are introduced, and the representative implementation interface is given. This paper constructs the overall framework of the optimal allocation of college sports resources under the mode of sharing economy. Using the methods of questionnaire survey and mathematical statistics, this paper analyzes the willingness to use the economic platform of sports resource sharing in Colleges [3]. Although the research results of college sports are quite abundant, there are still some deficiencies in the cloud computing modeling and analysis of massive college sports data.

In order to study the cloud computing modeling and analysis of massive university sports data, through the research of cloud computing, the data storage structure of scattered point set is found. The results show that cloud computing is conducive to college sports data modeling.

2. Method

2.1 Cloud Computing

(1) Cloud computing

Relying on cloud computing and cloud computing technology, cloud computing industry will form an important resource sharing platform [4]. Through the mobile Internet, we can obtain the required infrastructure, software, platform or application, which is a way of delivery and use of IT resources or information services [5]. In the cloud computing mode, all resources and data have developed a unified specification and standard [6], which brings great convenience for the storage and distribution of resources and data, especially for sharing [7]. A flexible cloud service can form a resource pool, charge for the services it can provide, and provide different needs for everyone. Due to these
convenient features of cloud computing, colleges and universities can flexibly build their own sports information platform. Many data are the real feedback of school functions, the effective information response of school activity crowd to school management and teaching, and the important reference information for school administrators to control the school [8]. The object provided by the programming mode is the user who needs to use the services of cloud computing for development. The user writes the application through the appropriate programming mode to achieve the preset purpose or provide services, so the programming mode in cloud computing should be as simple and convenient as possible. It is better to make the complex parallel execution and task scheduling transparent to programmers, so that programmers only need to focus on business logic. The control of vitalization environment is strictly in the hands of cloud computing service providers. A group of related files are merged into a large file in the client, which reduces the number of files from a macro perspective. Index information is built in the large file to locate the location of the original file in the merged file quickly.

(2) Big data

Big data system is a huge system integrating data collection, sorting, storage and application [9]. Compared with the update speed of cloud platform related data of management system, the read-write frequency is further accelerated, and the read-write interface of network cloud big data is optimized, which is the basic feature of cloud computing. Cloud computing reconfigures hardware resources, software resources and service resources through vitalization technology, and allocates them to each user in a more reasonable way [10]. Users can rent cloud computing related resources according to their actual needs. Resource management is responsible for maintaining the dynamic balance between cloud computing resource nodes, monitoring and counting the use of resources, detecting and recovering the faults between nodes; security management task is responsible for the overall security of all cloud computing facilities, including comprehensive protection management, access authorization management, identity authentication management and security audit management. Therefore, in the process of building the cloud computing management system, we need to realize the column processing and storage operation of the table through the column storage mode. We must rely on massive data processing technology and efficient tools. These data also show the distribution characteristics. Through the role of contextualization technology, cloud platform can achieve flexible expansion. Through big data, specific algorithms are used to discover information and knowledge from data. The information obtained is unknown in advance, but it must be valuable. The specific information may be expressed in the form of patterns, rules, constraints, concepts, etc.

2.2 Scatter Point set of Data Storage Structure

This paper analyzes the storage structure of massive university based on the information of the initial features, this paper uses the directional big data mining clustering method to analyze and calculate the distributed scattered point set of university sports data, and the results are shown in the formula (1):

\[ S = (U, A, V, f) \]  

Let \( x(n) \) be the time-frequency sampling information feature of mass sports data in colleges and universities. The formula shows the input model of motion data to be mined (2):

\[ g(t) = \frac{1}{\sqrt{\pi \Delta_t^2}} \exp\left(-\frac{t^2}{2\Delta_t^2}\right) \]  

(2)

By calculating the scatter set of sports data storage structure, the scatter distribution set is expressed by formula (3):

\[ u(t) = A \exp(f2\pi\phi t) + u \]  

(3)
Kendall-w coefficient was used. Kendall w coefficient, also known as Kendall harmonic coefficient, is usually used to express the correlation degree of multi-column rank variables. The calculation formula is shown in equation (4):

\[
\lambda_{\text{max}} = \frac{1}{n} \sum_{i} \left( \frac{(Aw)_i}{w_i} \right)
\]

\(4\)

3. Experience

3.1 Experimental Object Extraction
Research object refers to the person or thing to be evaluated, also known as the subsystem of evaluation object, which is the object of evaluation practice and cognition. This research takes the gymnastics training base construction of physical education major as the evaluation object. The gymnastic training base for sports majors is an important place for gymnastic training of sports majors. The construction quality of gymnastic training base will directly affect the effect of gymnastic training. In the process of the construction of gymnastic training base for sports majors, through the guidance, inspection, encouragement, identification, feedback and improvement of the evaluation index system for the construction of gymnastic training base for sports majors, we can reduce detours, save costs and improve efficiency.

3.2 Experimental Analysis
The construction of gymnastic training base for Physical Education Major: the first part is teaching support and preparation before teaching. Teachers need to conduct pre-analysis, instructional design, model building, etc., and finally issue an announcement to inform and guide students to complete the platform registration, so as to prepare for the course learning. Students need to complete the platform registration and notice reading tasks. The second part is the exploration part, which belongs to pre-class activities and is carried out online. The main activities of students are autonomous learning, exchange and discussion, participation in evaluation, etc., while the activities of teachers are corresponding to them, such as guiding students, assisting learning, qualification examination, etc. At this time, teachers and students are generally in the cognitive stage in teaching activities. The third part is the part of answering questions, which belongs to the entity classroom teaching, in the form of face-to-face teaching. The ultimate goal of network teaching is to serve the physics classroom, so in face-to-face teaching, we can use teaching, heuristic, discussion and other methods to promote the communication between teachers and students, and obtain emotional support and learning method support. Fourth, the consolidation and expansion part, which belongs to extracurricular activities, is carried out in the form of network. After the end of task driven teaching activities, students and teachers reflect and discuss according to the past learning behavior and teaching behavior, and jointly complete the sublimation of knowledge and self.

4. Discussion

4.1 Motivation and Frequency of Students’ Participation in Basketball
Table 1. A, B, C, D four college basketball players grade situation

| school | Proportion |
|--------|------------|
| A      | 26%        |
| B      | 21%        |
| C      | 17%        |
| D      | 37%        |

To a certain extent, the enrollment policy and mechanism of college basketball team can provide support for improving the technical level of basketball and the comprehensive competitive ability of
athletes. The level of college basketball team members can also reflect the development of college sports team. The level of excellent basketball players in four universities (a, B, C and D) is investigated. The statistical results are shown in Table 1.

It can be seen from the above that 26% of the basketball players in school a are rated as excellent, 21% of the basketball players in school B are rated as excellent, 17% of the basketball players in school C are rated as excellent, and 37% of the basketball players in school D are rated as excellent. The specific results are shown in Figure 1.

![Figure 1. A, B, C, D four college basketball players grade situation](image)

It can be seen from the above that the highest proportion of excellent basketball players in D school is 37%, and the lowest proportion of excellent basketball players in C school is 17%.

4.2 Data of Learning and Engineering System -- Grasp the Situation of Rewards and Punishments of students' Sports Achievements

It can be seen from the above that the highest proportion of excellent basketball players in D school is 37%, and the lowest proportion of excellent basketball players in C school is 17%.

| grade   | Freshman | Sophomore | Junior | Senior |
|---------|----------|-----------|--------|--------|
| percentage | 13%      | 20%       | 22%    | 45%    |

It can be seen from the above that the passing rate of freshman sports is 13%, the passing rate of sophomore sports is 20%, the passing rate of junior sports is 22%, and the passing rate of senior sports is 45%. The results are shown in Figure 2.

![Figure 2. Passing rate of students in each year](image)

The passing rate of physical education is lower than the passing rate of the top four and the passing rate of the top three.
5. Conclusion

With the development of information technology, Internet technology and communication technology, the traditional, single and passive service mode has been unable to meet the needs of the information age. Cloud computing technology is the most advanced information technology, which can be integrated with university library sports resources to achieve maximum information sharing and provide better services. The university sports management system based on computer makes the university sports management more information, standardized and standardized. Information storage and processing based on cloud computing provides convenience for colleges and universities to read massive data. In view of the complexity and large amount of data of College temporary sports management, the college sports auxiliary management system based on Browser / server architecture has the characteristics of sociability and universality.

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