

Design and Implementation of University Sports Network Management System

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Abstract: The management of university sports performance at present, involving many students in semi manual mode are repetitive and error prone, and the network is conducive to improve the efficiency of management, is conducive to the movement performance of the sharing of resources, development of network management system of university sports performance imperative. This paper introduces the design idea, main functions and key technologies of the university public sports network management system. This paper first introduces the research background, research status at home and abroad, the theory gives the project development and the use of Web technology and data mining, and then the user needs a detailed analysis, combined with the demand, the system's data flow analysis; secondly, the system architecture and database design are discussed in detail, according to the implementation method of motion the performance management of each functional module, and discusses the application of data mining in the system; finally, the test program is given and verified the correctness of the system function. The combination of decision tree ID3 algorithm based on motion, student test scores, the data mining and analysis, for the formation of information teaching materials of students' physique characteristic value, provides important reference data, so as to improve the teaching quality of physical education requirements.

1. Introduction

Along with the widening reform of the education system and education mode, the society is becoming more and more comprehensive and physical requirement of high-quality talent, students can not only get good grades, also requires good physical fitness, so that we can work in the future. Therefore, more and more attention has been paid to the teaching of physical education, and the Ministry of education has also developed a series of training standards and performance standards for the education curriculum. Physical examination is also included in the student's academic performance, as part of the comprehensive quality of students. In the physical fitness test, mainly includes two aspects: Students' body shape and body function. For different physical exercise, there are different ways of training and test methods, such as running, usually with the length of time or location of the location, minutes[1], seconds or meters. These results should be used to indicate the score, to be included in the total score of the exam, so usually students in the completion of these courses, education is responsible for these sports scores in accordance with the relevant standards of the state to be converted. But because of many students, at the same time, the sports curriculum contains a lot of content, the data involved very much, the teacher should be the data conversion, then these data will be input to the educational system in the process, the workload is very large, and this process requires teachers to be done manually, so that the work efficiency is low. This also restricts the development of physical education to a certain extent. Therefore, according to the actual situation of physical education, the urgent need to have a system to let the teachers from repeated complex data statistics and analysis, to solve the practical problems faced by universities, make the work easier, so teachers focus more on the subject of the summary and the improvement of performance. So as to give full play to the guiding role of teachers in students, improve the quality and effect of teaching. A few years ago, the sports curriculum has been added to the students' teaching, but many schools do not pay attention to the sports teaching, many students think that physical education is to let everyone

play the course, on their own to relax too much. Teachers also think that this is just a form, there is no idea of how to put on a good physical education. Therefore, led to a large number of students poor physique, only to learn the whole day[2]. Later, there are a large number of relevant parties to collate data, from these data can be clearly seen, the students' physique is a downward trend every year. From then on, Chinese government began to attach importance to the students' physical education curriculum, and held related meetings, the sports teaching as the key to discuss, put forward the school not only pay attention to quality education, but also need to pay attention to the healthy growth of students and students' health, but also explicitly pointed out that, if not to look at the health of the students quality education, the education policy is empty, there is no better to rely on[3].

2. Key technologies involved in the system

2.1 Analysis of data mining technology.

The development speed of computer technology and network technology is obvious to all. Data mining technology abroad is also very early, second only to the internet. In particular, some large foreign enterprises, according to the needs of enterprises to establish their own data mining system, making the performance of the enterprise has a significant rise. At the same time, some of the database developers are also following the design of these enterprise data mining technology and its application in the database, and the design of these databases to sell to the major enterprises. The related data mining systems developed by foreign countries have brought great economic benefits for the enterprise in the practical application. But the field of data mining technology is mainly used to remain in the enterprise, focus on the initial research on data mining technology is proposed and discovery method, and with the development of computer industry, data mining research focus is changing, now more applications and methods of innovation on system integration at the same time, to achieve a variety of technology. In foreign countries there are many university management applications to data mining technology, but more theoretical research, the actual application or a few. In the domestic research on data mining technology, is about in the middle of 1990s. At this time, it is only a study of relevant technical framework[4], for the actual use or a few. At that time our data mining technology research is focused on the discovery method, with the development of data mining technology, the focus of research has shifted, now is more application in the application process, stressed that the strategy and technology integration etc.. However, China's current data mining technology research, mainly based on academic research, in the real life of the application is still in the initial stage. There are a large number of data mining technology in the University, many researchers have noticed this feature, and started the research of data mining technology in University. The application field of data mining technology has been greatly expanded. Zhang Ling scholars also conducted in-depth research on the mining technology, ID3 algorithm is proposed, the management data of educational administration in Colleges and universities of mining analysis, find the relations between the curriculum in order to provide reference data for decision-making of universities. Scholar Wang Bing through years of research, put forward the idea of the strategy, the previous various mining technology comprehensively, and use the results of the library, in order to provide better decision-making scheme for colleges and universities, and the use of statistical analysis method, for different conditions of the subjects performance query and analysis operations, and at the same time production related tables and analysis performance analysis report, make convenient for teachers to teaching decision[5]. Data mining technology schematic diagram shown in Figure 1.

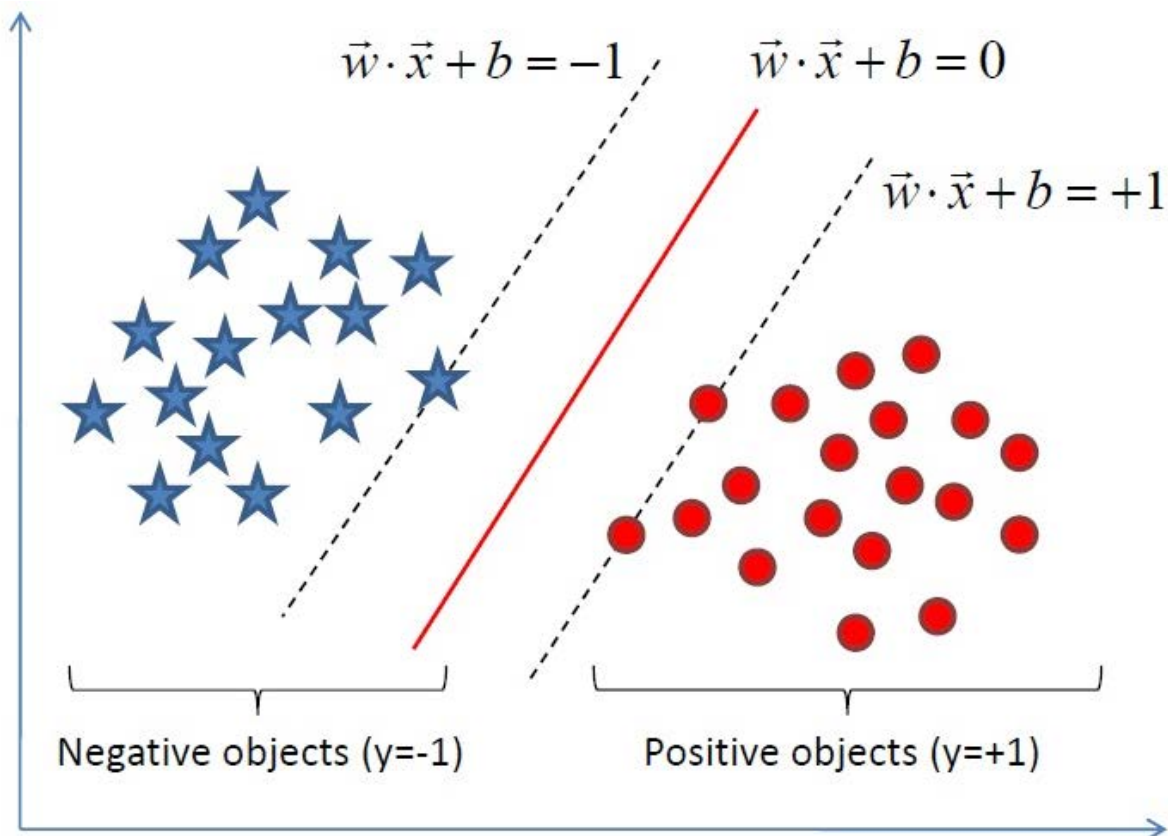


Fig.1 Sketch Map of Data Mining Technology Application

2.2 ASP.NET technical analysis.

The .NET technology, the software market is the emergence of a wave of .NET application design, many software developers are using this software technology, and improve some of the shortcomings of traditional technology in a certain extent, whether the development efficiency and software effect, have more than ever. Soon became the mainstream of the market software development technology, get everyone's favorite. Especially when the combination of .NET technology and HTML application, its function and performance have been greatly improved, but also an important progress in the history of software development. Sports performance management system is the development of this technology, the following is a detailed introduction of ASP.NET technology. ASP.NET is an evolution based on ASP technology[6], a new technology combining ASP and .NET technology and the technology is mainly used to design dynamic pages, it has the advantages of various technologies, but are not limited to these advantages, is a kind of technology is currently the most commonly used software market the possession of a large market share of sales. ASP.NET technology is developed by the United States Microsoft Corp should be the needs of the consumers, which is based on .NET platform design, the technology is more used to build dynamic web pages, some software is also dependent on the network manufacturing. Is the most direct network brings people convenience, the Internet, a lot of people to avoid repetitive work, to extricate from the arduous work, but also through the computer in the network world soar, surfing the Internet, learning and work, can also entertainment in the network world. It has played an important role in improving people's living standards. The three layer structure of ASP[7].NET which is usually called .NET three layer architecture, the application layer is divided into: user layer, business logic layer and data access layer, the three layer division improve the rate and efficiency of data processing system. The method of using three layer architecture to develop the system, mainly because this way can make the three application layer can focus on their tasks, and the application is relatively simple, usually only need to change a small amount of code can be used for other applications on the server, the structure is relatively more flexible. And the performance is relatively strong. The three layers of independent

processing tasks, through the related interface connection, processing speed is faster[8], but also improve the efficiency of software development, convenient system management and maintenance of the late. The schematic diagram of the ASP.NET three layer structure is shown in Figure 2.

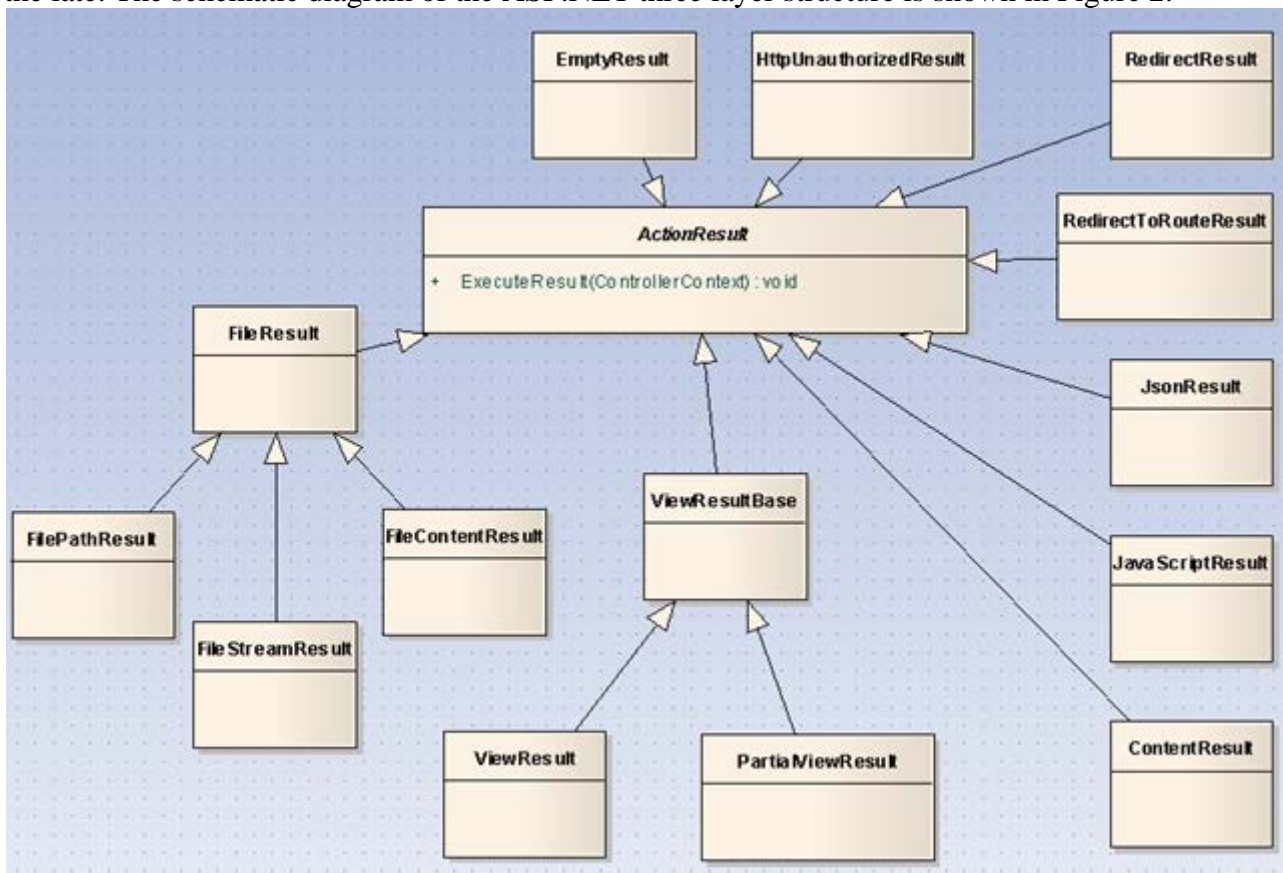


Fig.2 Schematic Diagram of Asp.Net Three Layer Structure

3. Summary of decision tree theory.

Decision tree is used to classify all the data in the form of tree model, and the process of classification is from the root node to the branch node, which needs to be tested on each node. And the natural tree is similar to that of the corresponding natural tree roots here we call the decision tree root node, the root node that is the set of all the branches of the corresponding data; decision tree natural tree in the internal nodes, or called for the non leaf node in the decision tree, and it refers to the attribute to be the classification of objects; the branch node corresponding to decision tree branches in the tree, the branch node actually indicates a split data, a possible value is a property; and natural tree leaves in the decision tree, we called a leaf node or node state, which is the classification results finally, it is showed that the object of the class is not re segmentation. Therefore, we can be the form of decision tree all the branch node is regarded as a very large data set, and the decision tree of all non leaf node is the corresponding attribute data collection, all the leaf nodes is what we want to get results, namely class division. Decision tree types can be varied[9], the determinant type as a branch of each node in the decision tree, because a node can correspond to one or more branches, according to the number of branches of different types are different, if the branch corresponding to a node two, the decision tree is of type the two fork tree, if there are three nodes, that is the triple tree so the number of nodes in different types of decision. The previously described, the decision tree is the role of the user for data classification, classification results eventually is uncertain, there may be two kinds, also there may be multiple categories, two categories corresponding to the two tree, also known as the Boolean decision tree, decision tree of this type is out it can be used very easily to disjunctive way to express some of the biggest advantage. Recursively using the decision tree is usually from top to bottom, when the test will first compare the attributes corresponding to all nodes

in the decision tree, judge each branches of these nodes below in the comparison process, at the same time will find a path through the direct path to a leaf node[10], finally obtains the need conclusion. The schematic diagram of decision tree is shown in Figure 3 and 4.

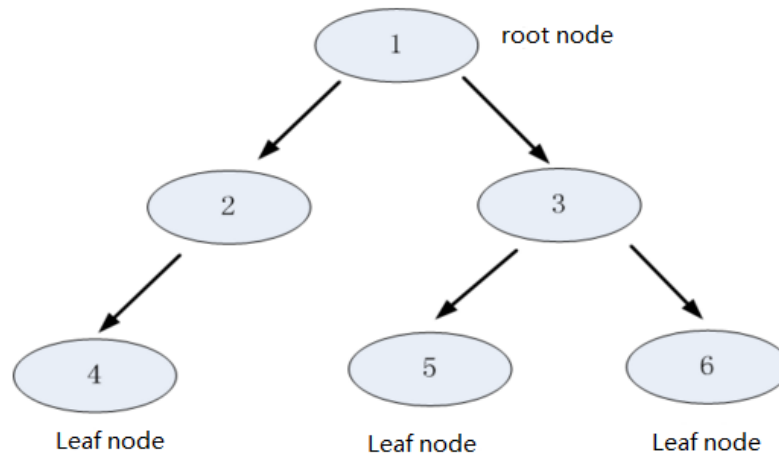


Fig.3 Tree Structure of Decision Tree

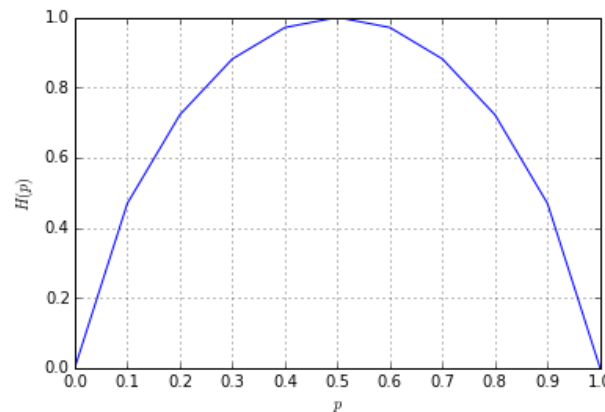


Fig.4 Sketch Map of the Correct Rate of Decision Tree

4. System requirements analysis

4.1 An overview of demand analysis.

Requirement analysis is the first step in the development of software, and it is the prerequisite and foundation of all the work. The reason to carry on the demand analysis, is the hope that through the demand analysis to inform the designer, the target system to do what, need to complete what kind of function and performance, to meet the needs of users. There are a lot of demand analysis includes the content, including the feasibility analysis of the target system, including the analysis of function requirement analysis and performance requirements of the target system, each tiny link must be taken into account. Demand analysis is detailed on the language exchange and communication through the analysis of personnel and target users, to understand the real needs of users, users want development to design a kind of what kind of software, hope that using this software brings a kind of what kind of convenience to them, this is most concerned about the user, is the most decisive factor important in software development[11], the software can directly determine the future development. Therefore, developers have to look at the importance of demand analysis. After demand analysis, to the needs of users will record and form certain documents in the document, with that demand of target users, lists the function and performance requirements of concrete, also presented the relevant data flow diagram, in order to design a more intuitive understanding of the information, development convenient later.

4.2 System functional requirements.

The design goal of the system is based on data mining technology, detailed communication and discussion by higher vocational colleges and professional sports teachers for all kinds of problems in the process of sports performance management work, puts forward the design and development of sports performance management system, through the application, to solve the current sports management work in the face of the problem, will be free of physical education teacher from the past busy work, realize the automation and information of sports performance management work. (1) the target system has three kinds of users: administrators, teachers, students. These three types of users have different system operating rights, the implementation of different operations. Log in sports performance management system, will first require users to enter their account and password, the system will be judged on the information, to test whether is operation users, log on to the system can perform the corresponding operation and authority. (2) the content of the sports test is a lot of, the physical education curriculum will involve a number of projects, that is, the test will include a number of test categories. In the calculation, the first total score is set to 100 points, and then different test categories can be set to a different proportion of the score, the proportion of all types of scores added to 100%. The target system needs to complete the function are: test category add, modify, delete, etc., but also need to be able to set the weight of different types. (3) in the new test set to delete operation related types, can be made by a new test items are respectively arranged in each of the following types of test functions, but also to carry out related operation on the modify and delete functions. For different test items also need to set the proportion of the weight of the score, in order to get the total score. (4) the system should provide users with the relevant features of sports test scores, including the results of the operation, delete operations and related inquiries and export functions. At the same time, the target system should also be batch input to achieve student test scores, physical teaching teachers can use Excel form software batch import test results, modifications can be directly in the Excel can be completed after modification can be uploaded to the system on it. (5) in the score calculation of overall student achievement, will involve calculating two weighted average, the two are: weight the various physical test items on average; the calculation of the average weighted score, first of all the various physical test items according to the weight ratio calculation, obtained the various project achievements then the proportion of the total score; the situation according to the types of testing, calculated for each type of scoring and the sum of the total score by sports test[12].

In the process of analysis of the function of the system in common use case diagram that the way to represent the relationship between the user and the function, through the use case diagram, developers can clearly see that among all the participants and the system of the target system function specific what kind of mapping relations, these participants can what function module executive. Use case diagram for the system modeling from the user's point of view, so, for the user, the graph is visual. When the use case diagram is decomposed, the method of the top-down method is used, through the decomposition of the use case diagram, the relationship between each participant and the functional modules can be refined, and the development work is convenient. The use case analysis of the target system uses this method, firstly, the overall case analysis is carried out, and the basis of this method is that the top-down order is used to decompose the case. The system use case diagram is shown in Figure 5.

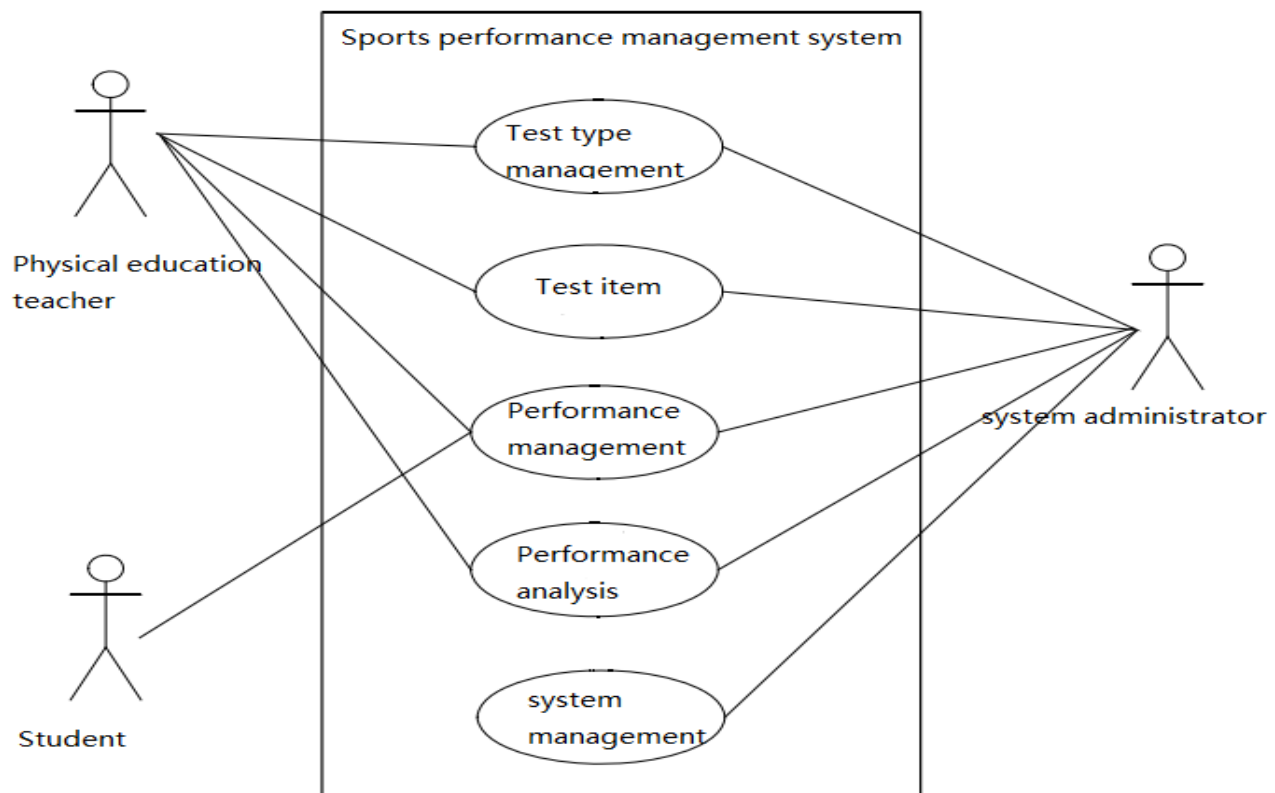


Fig.5 System Use Case Diagram

4.3 Data flow analysis.

Data is generated in the process of operation and processing, and the data flow analysis is the data flow analysis. The data flow is taken out as a whole analysis is the content of the data flow analysis. In data flow analysis, need to consider the following points: (1) the data flow direction in the process of handling data, to clear the direction of the data flow, where to start, where to end; (2) when the data flow, whether there is a change, what changes are needed in particular accurate record. Data flow analysis is to hope that through these analysis[13], some problems may exist in the process of data flow, data of common problems are: poor flow; data before and after the inconsistency phenomenon; data processing mode is not reasonable. The analysis of these problems as far as possible to fully exposed, in the discovery of the problem after a busy targeted to solve the corresponding. After the analysis of data flow, the results of the analysis are recorded, and the data flow diagram is used to describe the relationship between the data. Data flow diagram allows developers to more intuitive grasp of the flow of data, in order to better development of software. When drawing the data flow diagram, it can be divided into three layers. The whole information flow of the system can be clearly presented in front of the developer through the description of the three flow chart. The three layer is: top layer, zero layer, layer 1. The top is standing in the point of view of the overall description of the system data flow, mainly describes the system boundary information flow; zero layer is down from the top of the subdivision, relatively more meticulous, expressed the flow of running a specific functional modules of data layer; the final function module, they can not re subdivision, is also the smallest possible unit.

5. Design and implementation of the system

5.1 System architecture design.

The system uses a multi tier architecture design patterns, in order to reduce the load of the server, the system uses two servers, which a database as a special access to the server, a used as the deployment of a web server. Operating system using a dedicated server operating system. The

architecture of the system is shown in Figure 6.

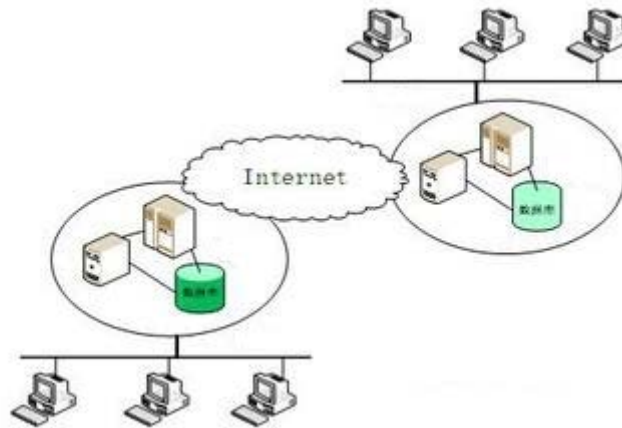


Fig.6 System Architecture Design Functional modular design.

In the process of developing the system, the function module design is a very important work, and the early adoption of the target user detailed communication and discussion, the system's functional requirements, and here is the demand function is realized as the specific functional modules of the system, through the design of the function module, realize the function of user requirements. The design work of the system function module is to determine the function of the target system and how to realize the call between the modules. Usually in the design of functional modules, the modules need to be divided, the more difficult to achieve the module is divided into a number of easy to achieve a small module[14], the complexity of the problem is simple. The specific functions are as follows: (1) test type management: test type refers to the sports test related sports items, which are provided by the teaching syllabus. Test type management contains work that is related to the type of test operation, including the addition of test types, test types, and the deletion of test types. (2) test: test project project management refers to the physical test involved in specific projects, such as the high jump, long jump, basketball, test project management refers to the test items related to business management, mainly includes the add, modify, test items test project test project. Delete, scores of weight setting. (3) performance management: performance management refers to the student's sports performance related management, including the results of the entry, modify, delete performance scores, query results, scores for the export and conversion operations.

5.2 System implementation environment.

The platform of this system is as follows:

Hardware platform:

CPU: Intel (R) Core (TM) 2 CPU Q9500 Auad @2.83GHz

Memory: 4GB

Software platform:

Operating system: Windows 7

Database: Server SQL 2008

Development environment: JDK6.0

Development tools: Myeclipse10

Development language: Java

Web server: Tomcat 6.

5.3 System database design.

Database design refers to all the data in the target system is how to store, how to read and operate the process of design, which is a very important part of the system development work. A complete system is essential to the database, therefore, the design work will be very important. The system will involve a lot of data in the operation process, because the system is essentially a complete program execution and data operation, the database design is actually to the relations and connections between

various kinds of data are designed, and these links, the establishment of data model. Database design work usually includes the concept of database design, database design, database design, database design, etc.. The database concept design is actually to carry on the abstract to each kind of data, will need to reflect the objective world to carry on the abstract of the model, to find the relationship between them. Express these associations with the conceptual model. In the formulation of the model is the use of E-R drawing method, through the undirected edge of the entities and attributes to complete the drawing. For example, the objective existence of things for the table, it features corresponding to the material, the length and width of higher, when described, we can set the table as a description of the entity, and the material and the length and width and height can be used as the attribute, then describe when they can be listed together, through to connected, see what designers understand the properties of this graph corresponding to the entity, which is convenient to the database design work late. After analysis, the target system consists of user information entity, student information entity, test type entity, test project entity, test score entity, achievement information entity. In front of the database is about the concept of design, conceptual design is actually isolated from the logic design. Conceptual design is a data model that is supported by computer in the design of objective things in the real world. And logic design is the result of conceptual design to be re converted, so that it can meet the logical structure of the specific computer support. The database design of the system includes two parts, logical design and physical design. What kind of logic design and database management system is not much correlation, it is essentially the data entity relationship specification work, and physical design is a clear definition of database management system in detail, including the selection of database, to determine the relevant attributes of the entity. After the database concept design and logical design[15], the next to the physical design of the database. The physical design and the specific use of DBMS are related. Therefore, the physical design structure and method of storing data in accordance with some given DBMS the database, which will depend on the sprint specific design measures of computer architecture, for a given application tasks will automatically select the optimal dash storage structure, data access method and related storage path. The schematic diagram of the system E-R diagram is shown in Figure 7.

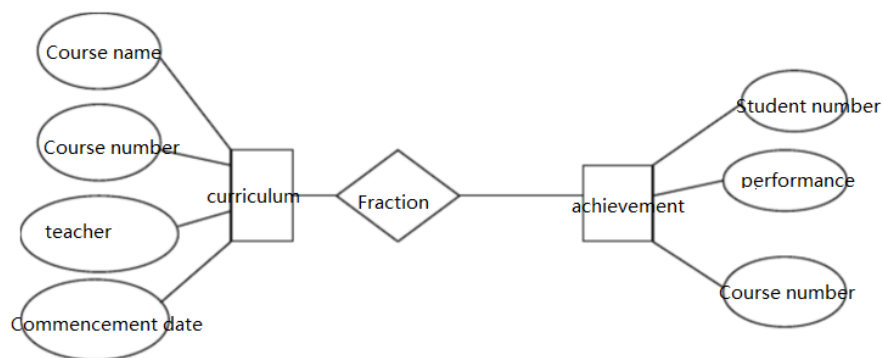


Fig.7 Schematic Diagram of the System e-r Diagram

5.4 Summarize and Expectation

Integration testing is the integration of different units together to complete the testing process by integrating it with other modules. The integration test may also be called a joint test, or an assembly test. Each function module is the composition of the system, each unit of sequential combination, increment of testing, until all the modules are combined together, in order to find out whether the normal convergence and cooperation of each unit and the module, whether can reach the predetermined function. In combination, is usually carried out in accordance with the order from the bottom to the top, a module of the bottom and above were combined to test whether the normal work, then the bottom module and the above modules are tested, in order to carry on, and then each at the bottom of the two modules combined results with the above test, and so on, until all the modules are

combined together. With the reform of education system and social talent requirements increase, all-round development has become the focus of the current teaching task, teaching has become a very important part of school education, has become an important course in the exam. With the advent of the information age, the school also fall over each other by teaching the information construction work, physical education as an important part of the informatization construction is the inevitable requirement of the development of the times and trends. I entered the Jiangxi Manufacturing Polytechnic College sports professional related departments to understand, and teachers and staff to communicate, find the current school sports performance management for the relevant aspects of the work still exists many problems, lead and informatization development does not adapt, in view of this situation, the design and development of the target system, designed by the application of the target system, standardize the sports performance management related work processes, the realization of scientific management and information management, teachers from the complex work in the traditional relief, improve work efficiency.

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