Design and Implementation of the Online Examination System

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Abstract

Today in the 21st century, people for the understanding of the scientific information, with The Times progress and development, the company develop gradually, computer-based online examinations are gradually replacing traditional examinations. Online examination system uses the current relatively popular B/S structure, uses Java language and MySQL database to carry on the development to the system background, uses the JSP technology to design the page .This system contains two modules: administrator module and students modules, the administrator module includes item bank management, subject management and other functions; Students modules include personal data management, online examination and other functions. The system has low cost, high efficiency, and take advantage of today's Internet, breaking time and geographical constraints, so that the test can be anytime, anywhere.

Keywords

Online exam system; Java; M ySQL database; B/ S.

1. Introduction

Internet technology innovation has long been commonplace, and has been reflected in all aspects of human daily life, including work, study and even in the field of education applications have also caused major changes. From the paper exam of the past to more convenient, faster, fair and just online exam gradually change. It also brings human beings into an era of continuous innovation and thus reflects the value and significance of the network.

Online examination system can make full use of the network information, and establish a convenient, efficient and shared examination question bank. The examination mode tends to be paperless, so that students can take the examination on the Internet anytime and anywhere, thus reducing the workload of teachers, improving work efficiency and the quality of students' testing, and also greatly reducing the consumption of unnecessary material resources due to the examination. At the same time, the online examination system through the computer automatic assessment of the student's test results, the teacher manual paper error is inevitable, but also make the test become more clear, the results also become more accurate, enhance the credibility of the results.

2. Research Background and Significance

When students after a period of learning and accumulation, the assessment of the efforts of the stage, examination is a good way to assess, from all levels of all kinds of schools to detect the domestic and foreign institutions of great prestige launched a series of grade certification, examination has infiltrated into all kinds of needs around us. We have entered the network information age, as people do not deepen the understanding of information science. People began to use the Internet with innovative thinking to achieve a more objective, convenient way to use the advantages of the Internet to improve the traditional form of examination. Compared with the online examination, the traditional examination information management method is

to rely on artificial to achieve, the efficiency is very low, on the one hand, the consumption of manpower, material resources, time and money is extravagant waste behavior; At the same time, the storage of information has become a problem. In order to solve the problems brought by the outdated examination form to students and teachers, we should keep up with the pace of The Times, with innovative thinking and advanced perspective to use the advantages of The Times, and design an online examination system.

The advanced online exam mode is based on the Internet, so that the exam is not restricted by geographical location, so users can view the test information online in real time; Exam completely get rid of the paper medium, from the volume to the final score evaluation and test results of statistics are transmitted through the computer and the Internet data, all candidates information, questions, papers, test results are stored in the database. Candidates can directly query the results after the end of the examination, which is a rational and economical use of human and material resources; The security of the system is also very important, the system can ensure the security of network communication data; The manual setting of test paper requirements system can make the test paper more scientific compared with the manual screening and modification of the test paper. It also includes fast retrieval speed, convenient search and low operating cost. These best points can maximize the efficiency of querying and searching information, which is also an important condition for making the exam more innovative and rigorous.

3. Relevant Technology Introduction

3.1. Java Technology

JAVA is a completely object oriented development tool mainly facing the Internet. Java was also the first language to allow users to transfer applications over the Internet from a remote server to a local machine and execute them, making it easier for programmers to take over. Make the development language get better innovation. More powerful. The language is more than capable of being used for Web services development; it is also capable of being developed for system-level applications. It features interface inheritance, operator overloading, and, most typically, full support for object-oriented programming. At the same time, Java has a variety of powerful service features for programmers to be convenient: you can write dynamic WEB pages and eventually realize dynamic pages, XML Web services, and so on. The Java language is like a kite, but as soon as you use your imagination and gently pull on the string, it will fly higher and farther.

3.2. MySQL Database

MySQL is a multi-user, multi-threaded SQL database server. The most commonly used structured query language (SQL) is used for database management. Even programmers who have just come into contact with it can quickly become familiar with its various functions. Safe and reliable, fast running speed does not waste a lot of time, cross-platform can also be implemented, functional stability and so on, very suitable for the implementation of a variety of different functions of the application software, in the database back end development. Its internal distribution system allows for the benefits of high speed and very flat performance and can be used continuously. Provide services to users flexibly. Rational use of system resources will not increase the burden of the system, so that the overall cost of the system has been greatly reduced.

3.3. B/S Structure

B/S structure is a kind of network structure mode which gradually becomes popular after the emergence of Web. It makes the client get the unity, the server becomes the core part of the system function realization, a lot of work will be undertaken by the server, in addition, the

server also completes including the access to the database, the execution of the application program work and so on. A series of problems caused by the excessive load of the client computer have been well solved, which actually reduces the load on the system. The biggest highlight of it is that users can access and use the system website function in any place where they can surf the Internet, without the region and time and other aspects of the hard restrictions. An internet-capable electrical brain is the first requirement for the use of this structure, because the system is very convenient and fast in terms of business expansion. In the aspect of maintenance, only through the direct and simple modification and update of the web page, all users of the synchronous update and can be realized basically completed. Therefore, the shareable nature is realized.

3.4. Eclipse Is Introduced

Eclipse is a Java-based, open source application development platform. It is also one of the most excellent Java integrated development environments, and more and more programmers are using it to write code. Its main feature is to support a wide range of open source products and support effect is very good, Eclipse currently supports Java Servlet, AJAX, JSP database link tools and other functions. System design in Eclipse can bring a wide range of applications to users, so that people learn simple, powerful function, the storage of information is also relatively large. And the data is flexible is one of its characteristics, as far as the current implementation, we write a small part of the code, can achieve a very different from the very great function. Therefore, the development of the system mainly uses Eclipse to manage the system code.

4. System Analysis and Design

4.1. System Requirement Analysis

According to the investigation and analysis, the online examination system mainly contains two modules, the administrator module includes: student information management, subject management, question bank management, examination paper management, performance management functions.

4.2. Feasibility Analysis

4.2.1 Economic feasibility

The focus of this system lies in the development and design of the management system and the maintenance of the later stage. The time cycle needed to complete the design is not long, and it should be realized soon. Therefore, the human and material resources consumed are limited, and the total cost of development is greatly reduced. It also represents the development of higher value programs at less cost. It fully reflects the value of the system.

4.2.2 Operation feasibility

The system is based on B /S frame structure, the access to the system and operation is through the Internet to complete, and the operation process is easy to complete, easy operation, easy management, good interaction is the characteristics of the system, simple interface, operation process and method is not complex.

4.2.3 Development feasibility

Online examination system management related affairs with the needs of today's times become more and more, so it is necessary to have a perfect online examination system, to the online examination system information for proper management. In the process of continuous improvement, it is particularly important to ensure scientific management methods, and the sustainable development of the work flow model is our constant goal.

To sum up, this on-line examination system has high feasibility in economy, operation and development.

4.3. System Process Analysis

System development, according to the needs of the system for the overall design planning, and then the choice of database and system function module design.

5. Database Design

Good database design simplifies the code around the Web pages it supports. A system with a poorly designed database is not nearly as fast as a system with a properly designed database. And a well-designed database is easier to use, the data query response cycle is shorter, the website traffic is increased, and the efficiency of data storage is gradually enhanced, and the integrity of the data is also guaranteed. Conceptual models should be able to easily and accurately represent common concepts in the information world. The conceptual structure design of the database adopts the Entity - Relationship (E-R) model design method, the components of E-R model method are: entity, attribute, connection.

6. Detailed System Design and Implementation

6.1. System Overview

The on-line examination system adopts B/S structure, which is a very suitable model structure in the Internet environment. The system is composed of client, presentation layer, application service layer and data business layer. It is also composed of client server, web browser, application server and database server.

6.2. User Login Module

When users enter the system, they first see the user login interface. In order to prevent user login error, for example: the user enters the wrong user name or password information; The user name or password is empty, etc. The user input information needs to be validated. The main job of the validation page is to connect to the database and determine whether the user name and password are consistent. If the information is correct, jump to the corresponding main screen through the JSP redirection statement response.sendredirect (). The login verification of administrators and students is similar, but the query conditions and the connected database table are different, and after the login is successful, the jump page is different.

6.3. Administrator Function Module

6.3.1 Add student information function realization

After the administrator logs in, click the hyperlink of "Add Student Information", and the page will jump to Xueshengxinxi_add.jsp page. The request.getpa rameter() method is used to obtain the data, and the ResultSet object is connected to the database to execute the SQL statement to obtain the student number ResultSet. Perform a loop over RS_ result.next() to confirm the presence of data, and return and refresh the page if the student number to be added already exists. If it does not exist, execute INSERT statement to insert the added student information data into the student information table, then the student information is added successfully and the page jumps to the student information management page.

6.3.2 Realization of paper generation function

After the administrator logs in, click the hyperlink of "Add Test Paper" and the page will jump to the shijuan_add.jsp page. The administrator only needs to set the corresponding number of each question in the corresponding subject exam paper. After clicking Submit, the form data will be submitted to the shijuan_add_post.jsp page. Use request.getParameter() method to get the value from the previous page, execute SQL statement to query the topic ID of each item

under the subject, use order by rand() to randomly extract, and then conduct string splices. All the ID values obtained from this ResultSet object are concatenated in the form of ", "after the ID. Use the substring() method to truncate the string, starting from 0 to the last character, removing the last comma. According to the ID array formed by each question type, the system extracts questions from the question bank, executes INSERT statement to insert data into the test paper generation table, the test paper is added successfully, and the page jumps to the test paper management page.

6.4. Student Function Module

Student module students can manage personal data, online examination of each subject, the results of the view.

When the student clicks the online exam, the page jumps to the shijuan_detail.jsp page, obtains the test paper ID through getParameter() method, and queries the ID value of each question type generated with the set volume in the test paper generation table. Execute the SQL statement to get the content of the questions of each question type generated with the unit volume, and loop the result set with a while to get the questions of each question type. After students click submit, the form data will be submitted to the page of jiaojuan. JSP. Define two objects to get the values of the answers and the correct answers, respectively. The equals() method is used to determine whether two objects have the same value, equal and score, different or no score if the student has not answered the question. The total score is based on the scores and calculation of each question type. Finally, the score, user information and test paper number are added to the score table.

7. System Test

7.1. Purpose of the System Test

In the process of program design, it is inevitable that some incorrect information will appear. The main purpose of the test is to find as many errors as possible during the operation of the test system. If any errors are found in the system, the errors will be summarized and debugged after the test. Finally, form a Bug report, so that the basic functions of each module of the tested software can be smoothly carried out, as far as possible to reduce the possibility of errors in the software. Avoid similar system problems in the future, as well as reference for future system improvements.

7.2. Method of System Test

There are many kinds of system testing. Generally speaking, there are black box testing and white box testing. Black box testing is a test that compares the program to a black box, without considering the internal structure and processing process of the program, it is carried out in the program interface, just checking whether the program function is used properly according to the specification. The white box test is the opposite. Use-case testing mainly uses the black box testing method to develop a detailed test plan for each module, conduct tests, and check whether the test results are consistent with the expected results.

8. Summarize

Before the system development, in order to make the completion of the project more efficient, I learned from a lot of other people to achieve the online examination system, its advantages and disadvantages were summarized, and the idea of their own to achieve a kind of online examination system. Only on the basis of truly understanding the business, can we refine and optimize the business operation process to achieve what specific functions. Know yourself and know your enemy and you will fight a hundred battles. Due to the lack of in-depth knowledge

of the Java language before this, in the process of developing this system, great and small difficulties always come one after another, such as: the page display is not standard, the database connection failed, etc. I learned a lot of lessons from this: having strong professional knowledge is a necessary condition to complete the project. I have not formally entered the society, through the completion of this project, I obviously feel my own inadequacy, weak experience, and unskilled use of technology. But through this experience, I found my own programming ideas, found the direction and motivation to work hard, and strive for a better me tomorrow. To achieve their own learning to flexibly apply to the design and implementation to improve their programming level.

After the test of the system page design simple and generous, operation is also very convenient and fast. The specific functions are also more comprehensive, according to the system needs analysis, the system administrator to generate papers, as well as students online examination is the bright spot of the system. Continue to design and develop on the basis. And then make the online examination system more and more complete.

References

[1] Minri Technology. Java project development whole record [M]. Beijing: Tsinghua University Press, 2018.

[2] Wang Jiamin. Java high performance development: foundation, framework and project practice [M]. Beijing: China Machine Press, 2018.

[3] He Dinghua. Java Programming Case Tutorial [M]. Beijing: Tsinghua University Press, 2019.

[4] Liu Chunmao. Java +MySQL Dynamic Website Development Case Classroom [M]. Beijing: Tsinghua University Press, 2018.

[5] Zhang Qian, Liang Na, Zhao Feng. Java website development technology [M]. Beijing: Beijing University of Technology Press, 2018.

[6] LU Dalin. Java +MySQL Dynamic Web Design [M]. Beijing: China Machine Press, 2017.

[7] LIN Shixin. Basic Tutorial of Java Program Design [M]. Beijing: Publishing House of Electronics Industry, 2018.

[8] FAN Aiwan, HUANG Kai. Java +MySQL Website Development from Zero Learning [M]. Beijing: Tsinghua University Press, 2018.

[9] Andrea Tarr. java and MySQL 24-Hour Trainer[M].Wrox,2011.

[10] Cristian Darie,Emilian Balanescu.Beginning java and MySQL e-commerce [M].Berkeley CA New York,2008.

[11] Zhao Gang. Application Research of Java Servlet+EJB Web Pattern [J]. Electronic Design Engineering, 2017, 21(13):47-49.

[12] Hsiao I H, Sosnovsky S, Brusilovsky P. Guiding students to the right questions: adaptive navigation support in an e-learning system for Java programming[J]. Journal of Computer Assisted Learning, 2017, 26 (4) : 270-283.