

The Design and Application of Paperless Examination System

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Abstract

In the current era the network technology is developed, the design and application of paperless examination system using the network technology has become a reality. This paper will introduce the paperless examination system design and application process in detail, help people to better master and use the system. This paperless test system described in this paper is built on the current very mature and well-developed Java technology. Java has become the common programming method of intelligent network technology, which can effectively improve the compatibility and usability of the paperless test system and make it get better application effect.

Keywords: paperless; examination system; design; application

1 Introduction

The rapid development of network information technology and the gradual popularization of the concept of environmental protection are the root causes for the realization of the paperless examination system. In the traditional examinations, a paper needs to go through a lot of manpower, material resources and time, such as writing, making, printing, examining, marking, scoring and analyzing. Paperless exams can simplify the examination process, to reduce the teacher's energy and time investment, so that teachers have more time and energy on improving the quality of teaching, rather than the examination process. Paperless examination is based on the perfect information technology, do not need to present on paper. This increases the flexibility of the examination and systematic, so that teachers can better design according to their needs test content.

Because paperless exams do not require the use of paper-like resources, trees and water are greatly conserved.

2 The design of paperless examination system

2.1 The functional requirements of paperless examination system

Paperless examination system functional requirements are divided into propositions and test papers, examination questions form, organizational examination, examination process, processing results, management, etc. [1]. In order to meet the requirements of different test content, paperless examination system should have a mass, scientific and objective topic database. So that teachers can also be based on the ability of students and examination requirements for the proposition and test paper, a clear examination of the knowledge points and difficulties. The question bank must also have the function of updating regularly. It can analyze the students' newest teaching materials every year, and also delete the problems that do not meet the requirements of the course or the outdated ones while adding more updated topics.

The paperless examination system is, in the final analysis, just another form and method of examination. Therefore, the merits of the traditional examinations should be retained [2]. In traditional examinations, the form of examination questions is divided into two parts, namely objective questions and application questions. Application is mainly to understand the students for the application of knowledge, design and development capabilities. Paperless examination system should be a reasonable choice of two types of questions, and allow students to complete the required time.

Through the examination is the teacher or the educational administration department unified organization, and to monitor the examination process, to prevent cheating. Paperless examination system to ensure that the examination notes before the test, the candidates during the examination will not affect each other, the examination papers will not be LAN or software attacks, leaked.

After the beginning of the examination, paperless examination system should be on the whole process of supervision of the examination process, if the students did not complete the required time to complete the required examinations, the system will automatically hand in volume. If the students during the examination crashes restart and so on, to ensure that the answers are saved before. When students complete the exam, the system can automatically generate test scores. And automatically generate the Excel form to send to teachers and academic management system. In addition, the paperless examination system also needs to have management capabilities, high security, versatility and good scalability.

2.2 The design of paperless examination system

The paperless examination system should have the following functions: (1) student information management: student information query, student information

editing and student data import and export; (2) test database information management: test information management, test import and export; (5) common tools: test data merge and help documentation. (4) test information management: the examination set up, generate test questions; (4) marking management: manual scoring, examination papers analysis and achievement library;

In the student information management student information inquiry, may carry on the inquiry according to student's name and student number. This information comes mainly from the system database and student information will be displayed in tabular form. Through the student information table editing and student data import and export functions to complete the basic management of student information, such as increase, modify or delete the basic information of students. The question bank information management is through the test question information management and the test question introduction derives carries on. Teachers can choose the appropriate test according to the needs of the examination, and according to the difficulty of the subject is divided into three levels. At the same time to develop the examination time, examination notes and so on. Objective questions can be systematically reviewed and analyzed. The results will be sorted library will form the results of the students sorted out. After importing the form, the teacher can archive or delete it as needed. The test data merge and help documentation is mainly to help merge student test scores, and in the service terminal to show up.

3 The application of paperless examination system

3.1 The application of exam timers

When students use their own student number and password to log into the examination system, after the success of the login, the students will stay in the examination notice interface. In the bottom right of the interface there will be a timer to start the countdown, the time is 100 seconds. Students must read the student's instructions in 100 seconds and then click on any button to enter the exam interface and start the exam. If 100 seconds countdown ends, students still do not enter the examination interface, the system will automatically enter the examination interface. In the test interface, the system will save the students every minute of the test answer and time, and sent to the server terminal [5]. In the examination time, students complete the examination papers and click "Confirm" to complete the examination. If the student does not complete the examination within the specified time, the system will automatically start the process of the completion of automatic delivery of paper. 30 minutes after the commencement of the examination, the student is able to hand in the volume immediately.

3.2 The application of answer information preservation and the secondary login

In order to ensure the security of the paperless test system and reduce the impact of accident on student examinations, such as power outages, crashes, etc., so to ensure the maximum reduction of the students answer the situation is the system must be considered. The use of secondary login can be restored to normal in the system, students enter the initial information and it will be able to test the state back to the system before the end of the state abnormal. In this way, to achieve the maximum limit of the students have to answer the case of recovery. In the system design, in order to fully preserve the students have answered the information is not. Because this requires the client and the server terminal to maintain consistency of data updates, so that the client and the service terminal for frequent data exchange. This will require a lot of data transmission in a short time, to the network and the server have caused great pressure. And this pressure will increase as the number of student clients increases. When increased to a certain extent, it is easy to cause network crashes or system crashes. The paperless test system is designed to send students to the server terminal to answer the situation every minute, and set the client automatically prompts and service terminal connection status.

3.3 The application of achievements automatic generation

Objective questions mainly to multiple-choice questions and determine the title-based, generally have a certain standard answer. In the establishment of the system of the question bank, we need together with these objective questions with the standard answer input. And in the topic of the time, to be selected with the answer to the objective questions enclosed in the student's questions. When the examination is over, the system will automatically compare the standard answer with the student's answer, and give the specific score according to the score of the topic, from the scores of students to calculate the objective questions. Subjective questions have teachers' manual review. Teachers in the marking is completed, enter the subjective score, the subjective and objective questions by the system scores, the final results generated by the students test scores and then enter the server terminal. By the server to organize a unified order to Excel files sent to the faculty and academic departments of the information terminal.

3.4 The application of login password encryption

Paperless examination system, there are three main login object, that is, administrators, teachers and students. The system needs to be based on the characteristics and needs of different groups of their login password encryption. MD5 encryption algorithm is a traditional encryption, it can be large-capacity information digital personal password compressed into a confidential format. MD5 encrypted ciphertext is irreversible, thus effectively ensuring the security of the login password. When a user logs in to the system, the system converts the password entered by the user into an MD5 value, which is then compared with

the data file password in the system. If the password is correct, the user will log on successfully. If the password is incorrect, the system will be disabled.

3.5 The applications of test file encryption

There are two main purposes of encrypting an examination file: to prevent disclosure of examination questions. To prevent others to use the "hacking technology" to modify the test paper or the answer has been completed exam content. The system uses Java Beans serialization based on the use of HashMap data structure and DES encryption algorithm for such documents to encrypt. DES is a standard encryption algorithm that is widely used in a variety of security secrets. DES encryption algorithm is 64-bit plaintext through 16 rounds of 64-bit cipher text output block, making it into 56-bit key and 8-bit parity combination.

4 Conclusion

The application of the paperless examination system can effectively improve the quality of school examinations, liberate teachers from the complicated examination preparation work, and reduce the consumption of natural resources. During the design and application of the paperless examination system, the designer should keep the advantages of the traditional examination, minimize the impact of the accident on the examination process and the information that the students have answered, and pay attention to the safety of the examination documents and landing passwords. With the network technology continues to mature and popularization, paperless examination system will also get better development and popularization.

References

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