SQL Based Paperless Examination System

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Abstract

A database management system (DBMS) consists of software that operates database, providing storage, access and security, backup and other facilities. Database management systems can be categorized according to the database model that they support, such as relational or XML, the type(s) of computer they support, such as a server cluster or a mobile phone, the query language(s) that access the database, such as SQL or X Query, performance trade-offs, such as maximum scale or maximum speed or others. Using these facilities we intend to develop A Paperless SQL Based Examination. This shall support a descriptive examination and multiple clients at a given time. Paperless examination is an important role of modern education, which can effectively reduce the teachers' workload and improve work efficiency. This article describes a novel SQL-based paperless examination system, including objective questions as well as SQL programming questions.

Keywords: Database, Examination, Paperless, Test, Sql

1. Introduction

The paperless examination is a kind of ones that use computer network to replace traditional test paper; some interrelated functions of examination are realized by right of computer simulation. Paperless examinations play a vital role in the development of modern education in that they effectively reduce teachers grading load and increase their overall efficiency. In addition, paperless examinations reduce errors in grading and promote the fairness of the examination. Up till now; we have already had a rich class of paperless examination systems.

However, those systems concentrate mostly on dealing with objective questions and fall short on more subjective issues such as programming. There are a few paperless examination systems that orient on programming languages. Usually, students would have to submit experiment reports and get feedbacks from the teacher who grades the reports.

2. Software Structure

The choice of the platform is governed by need of the requirements. The online exam system requires use of a web based application that can present a descriptive exam format for SQL DML statements. This application requires presenting a highly maintainable, secure platform which provides high robustness, reliable, scalable, and updatable in order to acquire new features in near future to improve user acceptability.

2.1 Software Options

● Microsoft .NET Based C#, ASP.NET:

ASP.NET is a web application framework developed and marketed by Microsoft to allow programmers to build dynamic web services.

● JAVA-J2EE:

Java Platform, Enterprise Edition or Java EE is a widely used platform for server programming in the Java

programming language.

● WHY J2EE?

Because:

->Open and standard based platform

->Developing, deploying and managing n-tier, Web-enabled, server-centric

->Component- based enterprise applications

->Huge User Base

->Cross Platform Technology

1) Can use any J2EE implementation for development and deployment

2) Vast amount of J2EE community resources

3) Can use off-the-shelf 3rd –Party business components.

-> Value for Business –Customers:

1) Many implementation choices are possible based on various requirements

Performance, tools and more

2) Large developer tool.

3. Model View Controller Architecture (MVC Architecture)

The main aim of the MVC architecture is to separate the business logic and application data from the presentation data to the user. Here are the reasons why we should use the MVC design pattern. They are reusable: When the problems recur, there is   no need to invent a new solution. They are expressive: By using the MVC design pattern our application becomes more expressive.

Model: The model object knows about all the data that need to be displayed. It only represents the data of an application. In the SQL based paperless examination system the model is consist of net-beans, EJB.

View: The view represents the presentation of the application. The view object refers to the model. It remains same if there is any modification in the business logic.   In the system view is JSP and HTML with which actual designing is to be performed.

Controller: The controller is responsible for intercepting the requests from view and passes it to the model for the appropriate action. In this database system controller is nothing but the servlets with the help of this all validation and data storage is controller.
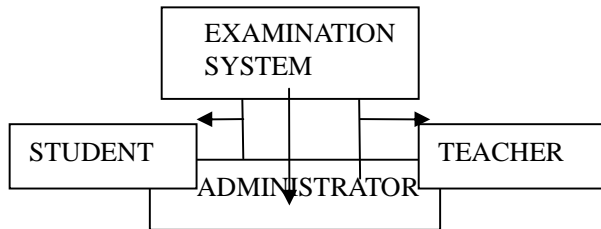

4. Examination System

The SQL based paperless   Examination system is consisting of the three main views.

1. Administrator

2. Teacher

3. Student

The Administrator is one who controls all over the examination system. The scheduling of the exam is handled by the administrator. The Teacher is the second important view of the system. Teacher is one who creates Question set for the exam and storing correct answer.

If no syntax errors then UNION operation is performed on the answer of the student and correct answer. Student is the third and central view of the sql based paperless examination system.

These all three views are controlled by the examination system.

The Fig 1.is the functional diagram of the sql based paperless examination system. It gives the designing idea of the examination system. And also gives how all three views are controlled by the examination system.

5. Process Of Statements

The key function of the system is process of statements. We can divide statements into two parts: one is query statements, the other is Data Manipulation Language (DML) statements.

5.1. Preprocess of statements

Preprocess can remove some errors before evaluating the submitted solution. The step has two advantages: one is to make system running effective, and the other is to give more error hints easily. Preprocess includes the following sub-steps:

Validity checking of the statements: The step calls the DBMS Parse stored procedure to check the validity of input statements. Checking of the number of data object columns: It analyzes the number of data object columns in input query statements.Checking of the order of data object columns: It analyzes the order of the data object columns in input query statements.

5.2. Process of DML statements

DML is used to update data in a database. This includes three types of statements - DELETE, UPDATE, and INSERT. No result set is returned with the execution of DML statements. So it is more difficult to process DML statements in comparison with query statements. We use a method as follows: First convert DML statements into corresponding query statements according to some rules, and then evaluate converted statements in the same way as evaluating query statements. This method effectively guarantees accuracy and efficiency.

6. Realization And Testing

We use JBuilder 9 and Dreamweaver MX 2004 to develop the examination system. The web server's operating system is Windows Server 2003 Enterprise Edition, with the JBOSS-4.0.2 and Tomcat-4.1.25 as Java runtime environment. The database server use windows Server 2000 + SQL Server 2000. We have arranged 120 students to test this exam software with a real environment. The examination subject is Computer Application Base. Test result show that the exam software is running stable, the peak time in the network service does not appear the phenomenon of server crash; all the candidates have successfully completed their examination process. The test paper is created from the examination questions database automatically. The examination question types includes the single-choice questions, the multiple choice questions, the true-false questions, the blank filling questions and the blank filling program questions and the program designing questions and so on. Before begin of the examination, the administrator generates the test paper automatically according to question type and test scores requirement from examination questions database. Students can carry on examination through using this test paper after beginning the examination. Due to the limited length of this paper, here would not give detailed researches.

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After completing this examination, only as long as submit this examination answers would finish this examination, if because occur machine fault, network failure and so on, when students cannot submit test examination, then submitting test paper answers can be completed by the examination administrator in system background. After all examination students complete submitting test paper answers, automatic paper rating would begin, after the paper rating is over, the system can output all students test paper scores, and total scores, at the same time, results of the examination will be outputted to Microsoft excel sheets by using a stored procedure, so teachers can check these results, and fill in scores tables. The facts have already proved that this paperless examination have better stability and practicality, it can complete examination of these curriculum successfully, and alleviate the burdens of teachers, improve efficiency of teacher work, and students affirm that this system is very good, all indicates this is a safe, reliable paperless examination system.

7. Future Scope

Automatic Grading System for Essay type Exams ex: TOEFL.

Prompt, Standards based evaluation accepted worldwide by a consortium of universities.

Course Specific evaluation that aims to test skills in certain special areas of interest like programming languages, research aptitude.

8. Applications

Creation of a Paperless Examination Application for Multiple clients

Provision for Descriptive as well as objective evaluation of Examinee

Research on parser techniques

Database Optimization using offline mode

Enhancement of educational course delivery and design

9. Conclusion

The SQL paperless Examination system shall effectively improve the automation level of examination for courses especially related to DBMS SQL.   The project shall improve student performance by introduction of prompt feedback mechanism. The teacher shall also be benefited by analysis provided by the system, which will reduce workload of teachers effectively.

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