

SQL Based Paperless Examination System

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Abstract- Paperless examination is an important role of modern education, which can effectively reduce the teachers' workload and improve work efficiency. However, the current paperless examination system mainly deals with the objective questions, it is almost impossible to deal with subjective questions such as programming languages, particular in SQL.

There is no such practical system as far as know. This article describes a novel SQL-based paperless examination system, including objective questions as well as SQL programming questions.

Index Terms- Database; SQL programming; Paperless Examination

I. INTRODUCTION

Paperless examinations play a very important 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. 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. For instance, the Paperless Examination System of C Programming Languages by Zhejiang University is a rather comprehensive system that covers a complete series of functions, which include practice, testing, and grading.

For years course has been part of computer science. It has been noticed that while teaching that the biggest challenge the students encounter lies in applying the knowledge and concepts that they learn in class to practice. Although we might be able to partially solve the problem by designated experiments; the approach fails to guarantee prompt feedbacks on the accuracy of students operation. Usually, students would have to submit experiment reports and get feedbacks from the teacher who grades the reports.

II. FUNCTIONS AND AUTHORIZATION

Users of the SQL paperless examination system are classified into three categories, each granted with a different level of

authorization. Namely, we have system administrator, teacher, and student.

System administrator is in charge of management of the system infrastructure. Normally the role is assigned to the responsible party of the course.

This role permits access to the following functions:

a) Account management: add, edit, and delete teacher and student accounts as well as setting permission level of various accounts in lot quantity.

b) Question lib management: set and maintain the global lib of practice questions and the lib of examination questions.

c) Test management: set up the test by customizing the time, format, types of questions of the test. Also includes the export and analysis of scores after a test.

d) System Maintenance: system functions such as regular data backup and data recovery. Authorization associated with the teacher account is related to teaching and management of student information.

Specifically, the role is granted following functions:

a) Customize and announce course materials: a teacher may post course materials onto the systems for students' reference, including presentation slides, experiment notes, introduction of the course, syllabus, and so on.

b) Question lib management: a teacher can post and maintain certain portion of the practice questions for students in his class to use; he may also set the availability of the global lib of practice questions. However, teacher users cannot browse or edit the lib of test questions.

c) Student management: maintain student information, including add, edit, and delete information of students in one's class.

d) Grade management: manage test scores, including edit, delete, export, etc. Student accounts have access to download materials, do practice, and tests.

The functions below are permitted:

a) Material download: browse and download course materials.

b) Practice: solve practice questions and submit answers within the time frame pre-designated by the teacher.

c) Test: solve test questions and submit answers within the time frame pre-designated by the teacher. With the description of functions and authorization, we present the system function module in Figure 1:

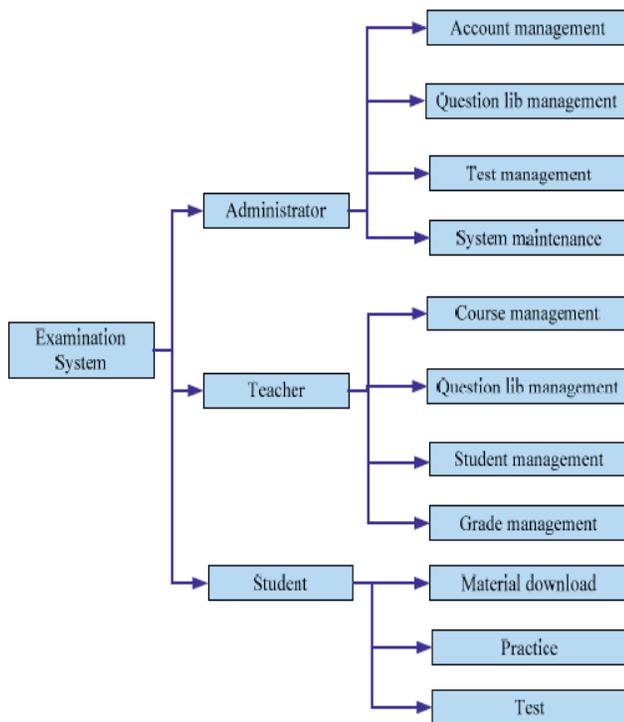


Figure.1 System function module

III. 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.

1. They are reusable: When the problem recurs, there is no need to invent a new solution; we just have to follow the pattern and adapt it as necessary.
2. 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 is model who is aware about all the operations that can be applied to transform that object. It only represents the data of an application. The model represents enterprise data and the business rules that govern access to and updates of this data. Model is not aware about the presentation data and how that data will be displayed to the browser. 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 uses the query methods of the model to obtain the contents and renders it. It remains same if there is any modification in the business logic. In other words, we can say that it is the responsibility of the view's to maintain the consistency in its presentation when the model changes.

In the system view is JSP and HTML with which actual designing is to be performed.

Controller: Whenever the user sends a request for so meeting then it always go through the controller. The controller is responsible for intercepting the requests from view and passes it to the model for the appropriate action. After the action has been taken on the data, the controller is responsible for directing the appropriate view to the user. In GUIs, the views and the controllers often work very closely together.

In this database system controller is nothing but the Servlets. With the help of this all validation and data storage is controller.

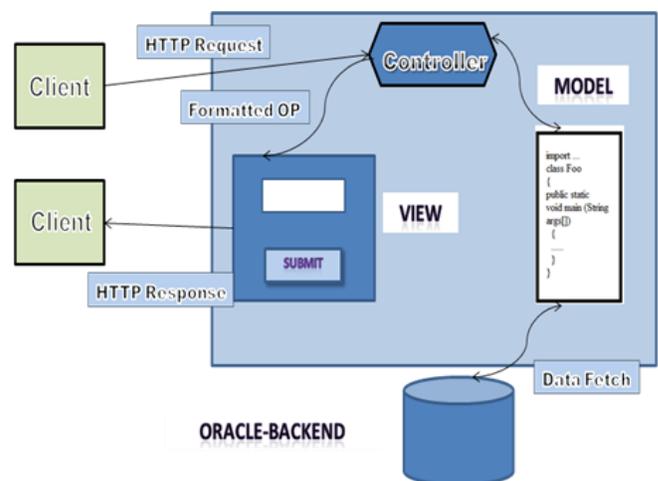


FIG: MVC Architecture for system

IV. 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 generally handled by the administrator only. The administrator can update his profile also. The administrators have rights to view that how many number of students are giving exam.

The Teacher is the second important view of the system. Teacher is one who creates Question set for the exam. Also teacher is storing the correct answer in the database so when student submit the answer of the question at that time the answer given by the student and correct answer stored in the database are checked syntactically first.

If no syntax errors then UNION operation is performed on the answer of the student and correct answer. If the operation is giving the true value then the answer given by the student is correct and marks are given to the student. Teacher can also see

the result of the student. He can update his profile. Student is the third and central view of the sql based paperless examination system. The student can update his profile. Now student give the test and view the result.

These all three views are controlled by the examination system.

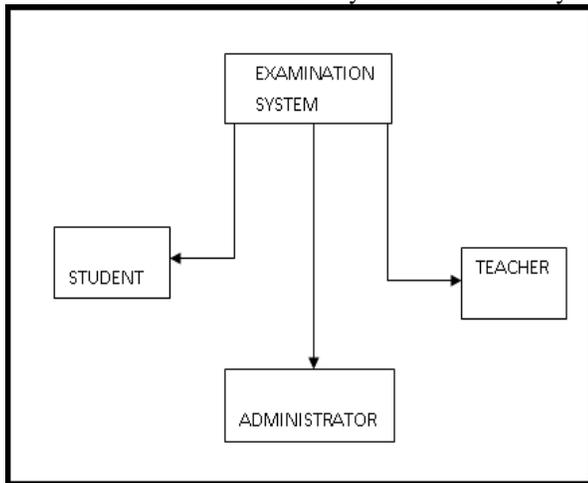


Fig: System Diagram

The above diagram 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.

V. NOVEL FEATURES OF THE SYSTEM

Comparing to existing paperless examination systems, the novel feature of our system is that it implements not only the examination of objective questions, but also questions that involve SQL operation. All the existing test systems handle objective questions well, including multi-choice questions with one or more answers. However, as for operation questions, mostly we need to grade manually which has the problem of heavy load of teachers and high error rate. We did not have a mature machine grading program due to the multi-formity of SQL language, i.e. we have more than one standard answers to a single question. Thus, we cannot execute machine grading with simple methods such as text comparison. We propose an efficient solution with our system. Namely, we are able to filter the multi-formity and compare the results directly, with setup of testing data and comparison of resulting inquiry sets. This method can effectively judge the results of inquiries. For DML commands, with proper transition to corresponding inquiries, we may perform the same process of judging. Meanwhile, we separate the practice lib and standard answer lib. The practice lib is used for students to test their inquiry commands during tests; whereas the standard answer lib is used to determine the correctness of submitted inquiries. The two-lib design prevents students from getting by with a final result set pieced together with the contents in practice lib. The mechanism of system grading is shown in Fig:

THE MECHANISM OF SYSTEM GRADING:

The following flow diagram gives the idea that how the marking i.e. grading is controlled in the SQL based paperless examination system.

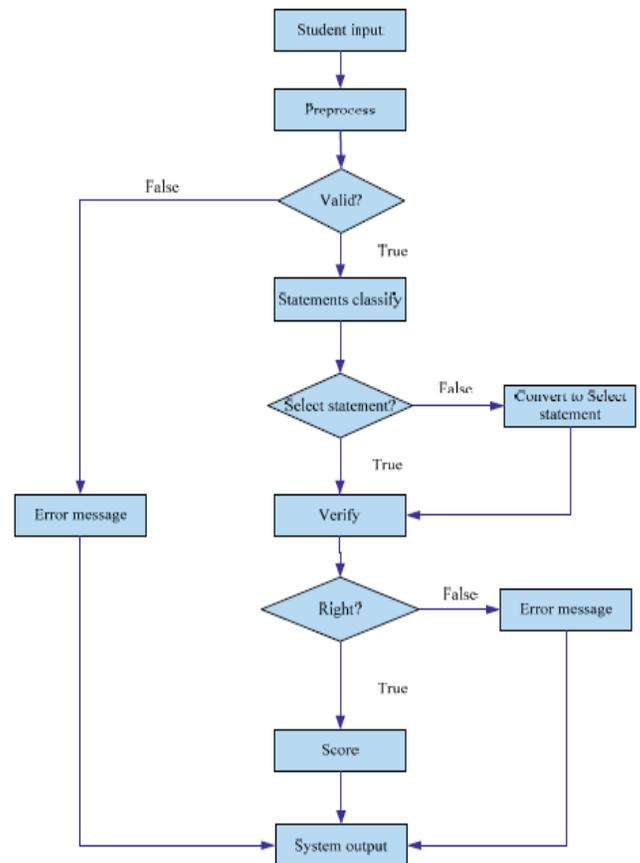


Fig: Mechanism Of Grading System

VI. 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. Fair grading due to automation shall improve student confidence in examination systems, one of the major goals which all premier universities intend to achieve. The system shall act as a stepping stone for further improvement in DBMS systems due to allied research in storage techniques and data retrieval systems.

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