

ENHANCED DIGITAL ASSESSMENT OF EXAMINATION WITH SECURED ACCESS

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Abstract- Processing of manual evaluation has been digitized by the system under study which allows for random generation of question paper, enhanced evaluation and revaluation and online compilation for laboratory exams. The system performs reevaluation on request with the evaluated scripts being mailed and the scores intimated post correction. The aim is to automate the entire process of examination assessment by enabling correction on PC using both online or offline mode, by human. Security is enhanced by applying cryptographic techniques thereby avoiding the leakage of questions prior to the examination and prevents the manipulation of critical data involved in the process. The system provides efficient storing and retrieval of the big data. Repository of all the data involved in the process is available for future use. This eases the clerical process involved in examinations and facilitates parallel correction of different subjects at different locations by experts. A high level of accuracy is obtained in grading the students. Thus the system optimizes the human effort involved and also reduces the overall time consumed in the process of conducting and evaluating examinations.

keywords-random, digital evaluation, online compilation.

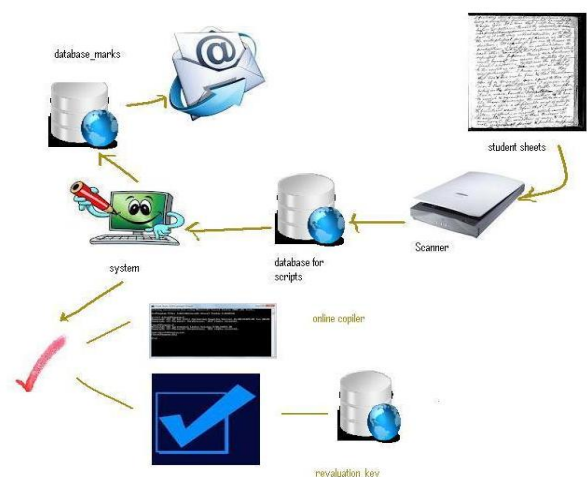
I. INTRODUCTION

Traditional paper based exam system has been practiced as a yard stick to measure the level of understanding by the students in their subjects. It has been an indicator to judge the student's knowledge. This paper based examination involves lot of human effort and consumes adequate time in conducting and assessing also there are difficulties in storing and maintaining huge records. Alternate to this paper based exam is electronic exams. This faces challenges in administrating and securing the data. The system has three unique components necessary to automate the entire paper-based grading process. First, the question paper for examination is generated randomly. A pool of questions is stored initially from which the system selects the question set for the examination. This is done by having a password key between the staff and admin that has to be matched for successful completion.

Secondly, once the students take up the examination, answer scripts are scanned in via a high-speed scanner and evaluated

on computers using a mouse. The grading is done through a browser, and no specialized software is necessary on the client system; the server system only requires LAMP (Linux, Apache, MySQL and PHP) architecture. In addition, the system can store the exams locally on the client, to allow for grading when not connected to the Internet. Client server architecture is used. The correction is made and the result is mailed. When the student needs clarification a copy of the corrected script is sent by mail and reevaluation is done on demand. The final part is to evaluate a student's performance in laboratory exams. ONLINE-COMPILER is used to check the output for programs in lab exams. Based on the level of accuracy achieved in executing, marks are awarded accordingly.

This system performs recording marks; analyzing examination performance from individual questions to variances from the same question across different evaluators [Reevaluation] coupled with checking the output for programs thereby automating the whole process of paper based grading. The system ensures a secured way of conducting exams and significantly reduces the time taken for evaluating and publishing results. Transportation of answer scripts to other locations is avoided as this paves way for Paper Chasing. Thus the whole paper based exam process is digitalized.



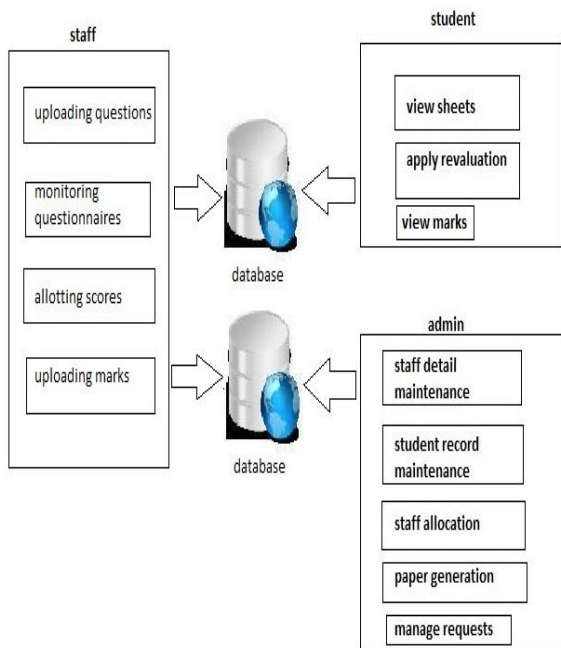
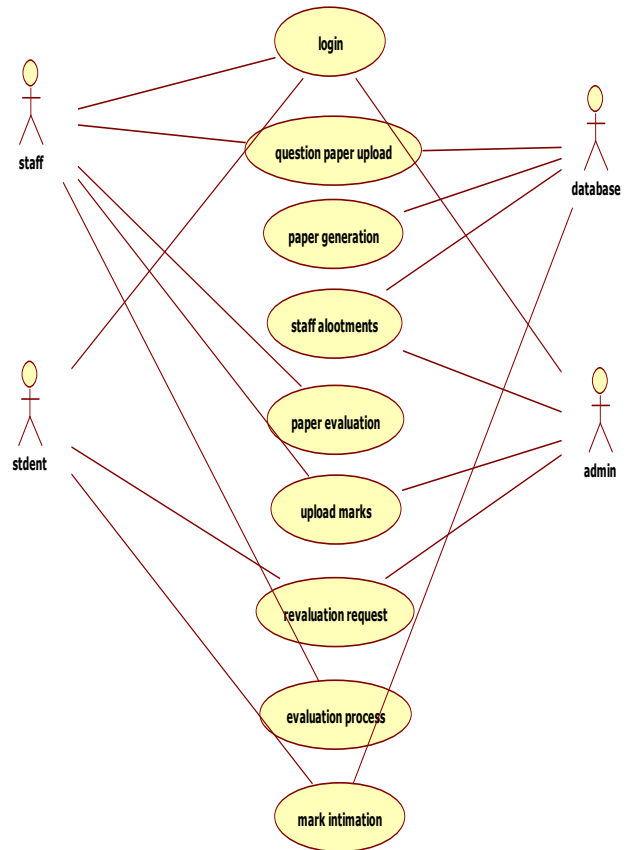
II. RELATED WORK

A similar grading system was presented in [1], which performs evaluation of paper exams on tablets. The system has ability to monitor and retrieve enormous range of data. It also reduces grading time and turn-around time due to automation of tasks (flipping pages, summing, recording grades etc). Other merits in the system include student identity being kept anonymous, simultaneous grading across multiple locations and access to view papers at a later date. But it does not select questions for the examination from a pool of questions specified by the concerned faculty based on the difficulty levels (easy, medium and hard). It also suffers in ability to check the evaluation accuracy.

Other related paper [2], presents secured e-exam grading system using cryptographic technique. It involves java remote method invocation for distributed systems. It uses public key infrastructure. It provides confidentiality, authenticity and integrity in e-learning environment. But it is difficult to evaluate and predict the security level.

III. SYSTEM DESCRIPTION

The system has three modules: random question paper generation, online compilation of lab exams and evaluation, reevaluation.



Random Question Paper Generation:

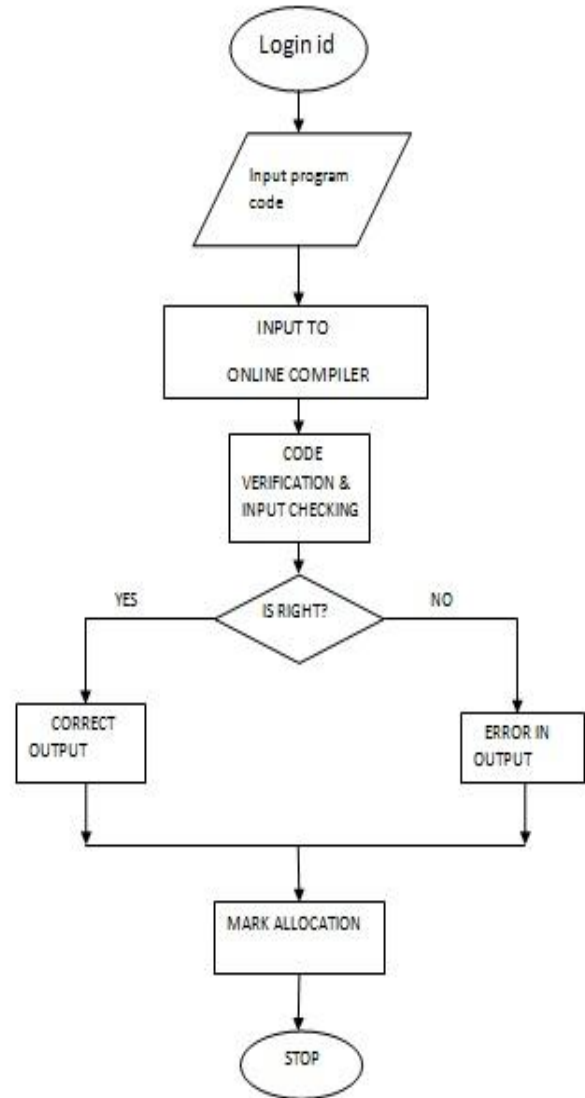
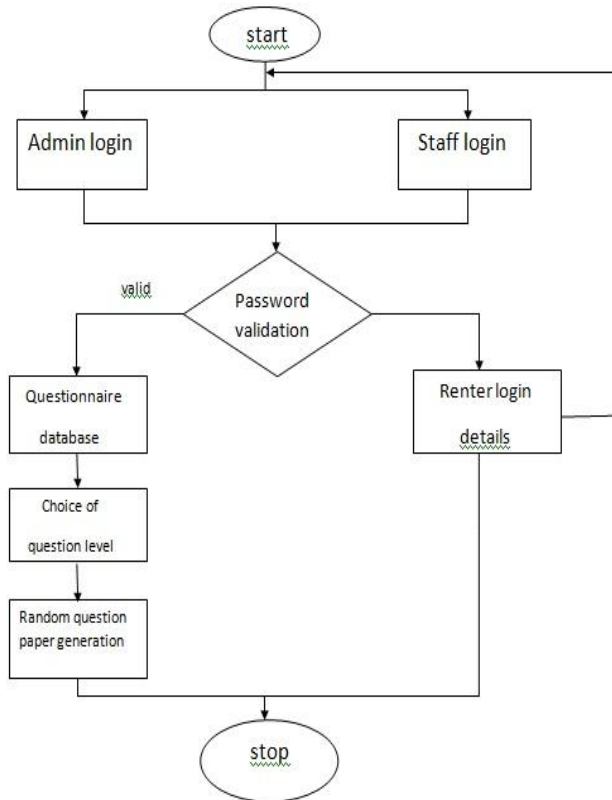
As one of the modules, the system performs secured distribution of question papers on the day of examination.

This will eventually prevent question paper leakages and intimation of questions by staffs to the students.

Initially a question bank is collected for each subject from the concerned faculties. It is stored in the database from which the system picks up the question set for the particular exam in a random manner.

The faculty and the administrator are given with their individual passwords that form a unique entry. This is encrypted and decrypted by cryptographic techniques. Only when they match each other the random question paper is generated and given for printing.

This unique password is crypt analyzed for preventing unauthorized entry from viewing the question papers.



Online Compilation:

The system has an added unique functionality of online compilation that helps in rating the students understanding of the programming languages (html, java and JavaScript) during laboratory examinations.

Online Compiler has been developed by setting frames using swing, which allows for typing code on the left and visualizing its relative output parallel on the right side. Pipe concept and compiler tool is used in particular to redirect the output from command prompt to the same screen as the coding developed for it. Run time compilation is performed when the class file is created.

This avoids the need to check the output individually by the faculty. A program may work well for a particular output say integer but not for float values, so these glitches are avoided to ensure that a good program is awarded full marks based on efficient coding techniques. Grades are given based on the results obtained.

Evaluation and Reevaluation:

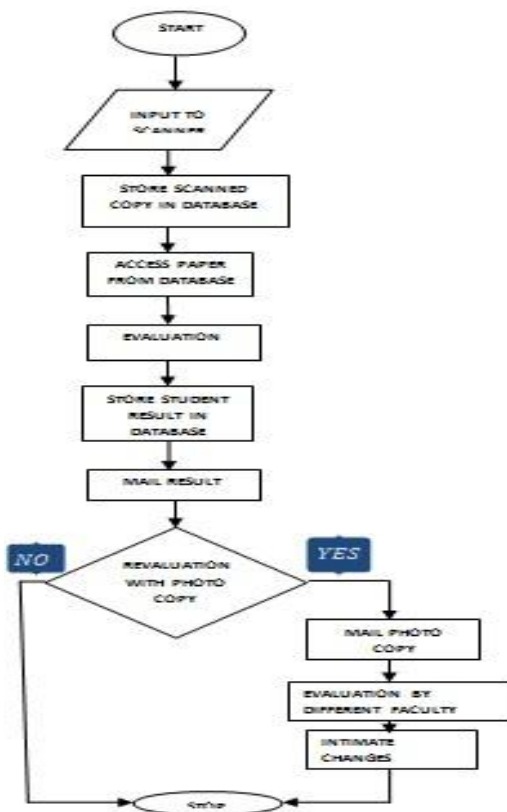
In this module the answer sheets of the students are scanned and stored in the database using MySql. Faculty is allocated with their answer papers to be corrected by the admin based on their field of expertise only.

The evaluation is done on the client side using the front end developed by the open source php language. Once the evaluation is done the marks are stored in the database using MySql queries and the results are mailed to the students. All the critical data have been stored in the server side repository.

Evaluation is done online or offline on the scanned answer scripts by the faculty for a particular set of papers based on their field of study only.

This makes the process quick since the issues regarding the time taken for transportation of the exam papers are eliminated.

If a student feels his paper needs to be evaluated again, then it is possible to request for reevaluation. The administrator is informed about the papers that have to be reevaluated and accordingly the admin assigns those papers to a different faculty who hasn't evaluated the specified papers earlier. The difference in marks is later intimated by mail to the respective students. If there is no change in scores then this information is also sent by mail.



IV. SYSTEM ADVANTAGES

Primary advantage of the system is to ease the process of traditional paper based examination. Apart from the reduction in time and human effort involved in conducting and assessing the examination the system is embodied with lot of additional features.

The system ensures the security in conducting the examination by Random question paper generation. This avoids question paper leakage as the questions are generated exactly before printing, rather than the conventional method where the question paper is already set. It involves

cryptographic encryption-decryption technique for providing the security.

In addition to normal theory exam evaluation the system also provides estimating student's practical knowledge. This is done by embedding online compilation in lab examinations. This will ensure that efficiency in coding is achieved. If there are syntactical and semantic errors then they are specified resulting in a quick analysis for awarding marks.

Reevaluation is extremely faster in this system as the student can view the evaluated scripts without any time delay and the results are published very quickly as the transportation of scripts is avoided and the digitalized version of answer scripts makes the evaluation process much faster and delivers the scores with precision.

It can also be implemented in interviews conducted by different companies. The system can be used effectively in any examination process irrespective of the environment it is used.

V. CONCLUSION

In this paper implementation to improvise the paper based grading has been put forward. All the phases involved in an examination process have been addressed. This project has added new dimensions to the existing system, making evaluation process much simpler and faster.

Its ease in operating ensures speedy score reporting to students and enhances better understanding of the subject by viewing their copy of scripts when the answers are still fresh in mind. Fair evaluation process is achieved as the question papers are also generated in a secured way.

VI. FUTURE WORK

The proposed system will be taken forward to android and ios platforms. This will enable the system to be operational across the globe on tablets as an application. Using a stylus the faculty can evaluate while travelling or from home at their own pace. This will enhance the flexibility of the system. The system can be also modified according to individual needs and operated by all the educational institutions as it works on open source platform; however the licensing work is still being worked on. The primary focus will be constantly towards improving the portability and user friendliness of the system.

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