Survey of Automated Practical Exam Systems

Ashitosh Dhapate[1] , Sanket Dhumane[2] , Atharva Karanje[3] , Janamejay Keskar[4]
[1](Computer Engineering, Pune University, Pune
Email: dhapateashuad@gmail.com)
[2](Computer Engineering, Pune University, Pune
Email: sdradkad@gmail.com)
[3](Computer Engineering, Pune University, Pune
Email: atharva18karanje@gmail.com)
[4](Computer Engineering, Pune University, Pune
Email: janamejay.keskar@gmail.com)

ABSTRACT

Practical exams form an integral part of the education system. Practical exam carries a weightage of around 30-35% of the total marks. Due to flexibility, user friendliness and availability, conducting exams on various online platforms has gained tremendous popularity. But the major challenge faced while conducting exams on an online platform is which proctoring techniques should be used. In this proposed system, a method is used to avoid the physical presence of a proctor. Currently, no system of this type is used. The proposed system intends to automate the process of allotting problem statements to the students. This system has ability to keep functioning even if there is network failure or loss of internet connectivity. It will also generate various types of analysis according to various attributes of the evaluation system.

This system will provide remote access provisions for formatting PC's as well as installing softwares. It will also keep track of student's behaviour and activities thus avoiding malpractices during examination. Also, this system intends to ensure fair allotment of problem statements to the students.

Keywords *- Automation, intelligent system, online examination, practical exam.*

I. INTRODUCTION

Through practicals, students get to know the real world application of concepts which they have learnt in theory sessions. Every semester, each and every institute conducts practical exams for which they have to format PCs, install various softwares, prepare the problem statements, etc. at least 10 to 15 days before conducting the practical examination. Also, there is an absence of a system which keeps track of students' activities during the examination. Current systems require a lot of manual intervention in order to schedule as well as conduct the practical exam.

So, considering these problems there arises a need to develop a simple and effective automated system to complete these cumbersome tasks with ease. This system will certainly help many institutes to speed up the process of conducting practical exams.

The paper proposes some techniques to automate the cumbersome process of formatting PCs, installing different softwares and allotment of problem statements. The proposed system also intends to keep a track of different malpractices that the students might indulge in.

II. EXISTING SYSTEM AND PROPOSED SOLUTION

The existing system is completely manual and time consuming. For scheduling a exam, the existing system requires a lot of manual work like configuring the systems with necessary softwares , allocation of labs and problem statements, monitoring of students etc. Further, the current system is inefficient in handling the malpractices that take place during the exam. Hence, an automated system is proposed that overcomes all the shortcomings of the existing system as well as add some additional features in it.

For scheduling a exam, the proposed system shall have remote access provisions, where in the proctor can access systems remotely and configure it with necessary softwares. Further, the proposed system will allot the problem statements to the students randomly without making use of any chits. After logging on to the

system using their login credentials, the students will be able to view the problem statement which has been allotted to them. If a student is not able to implement the problem statement allotted to him, he can request for a change in the problem statement. The proctor will be able to view this request and decide whether to allow the student to change the problem statement or not. The proposed system will keep track of the students who have requested for a change. This will help in fair evaluation of the student's performance.

The system will also help in monitoring students' activities such as opening of multiple tabs, number of lines actually typed, presence of I/O device that aids in performing the practicals etc. The system shall generate log file of all such activities and submit it to the server for further analysis.

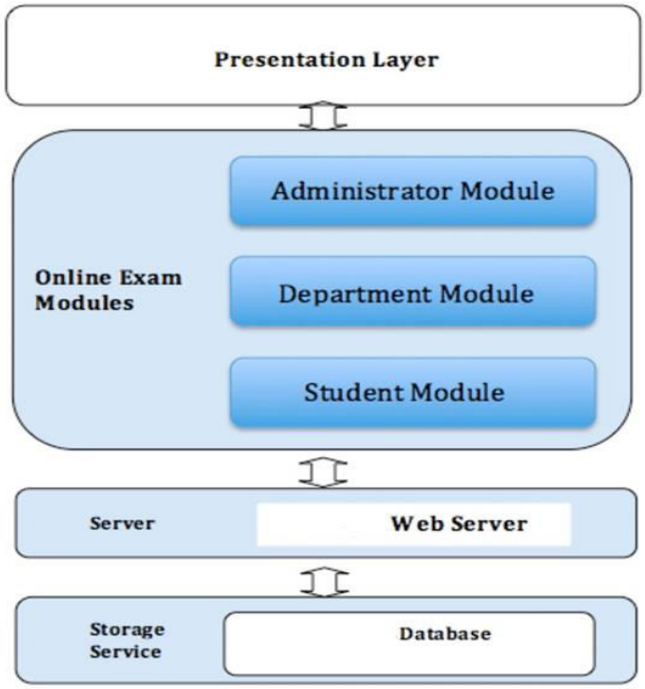
The proposed system also helps in analyzing the students' performance. The faculties and the practical in-charge of a college can view reports about how students have fared in different practical exams with help of graphs, tables, etc.

III. RELATED WORKS

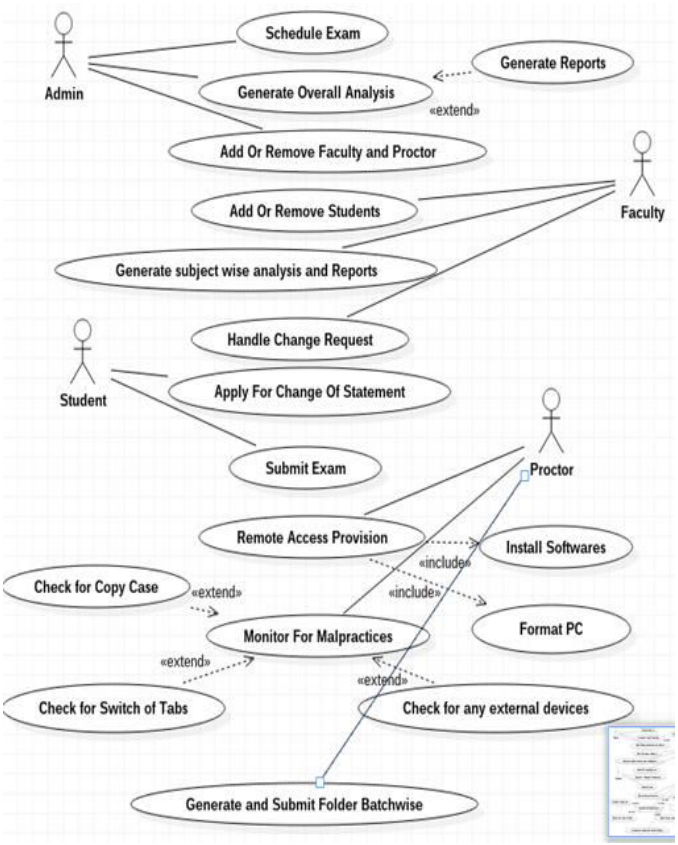
[1] Proposes Eye gaze tracking as one of the method used for online monitoring of the system. But this method requires some hardware like very high resolution cameras and infrared light sources. Apart from this there are some softwares available in the market for monitoring of the systems like Proctor U, Kryterion Inc.
Kryterion is one of the popular software to monitor systems. The exam instructor needs to connect with Kryterion hardware for their students to attend and monitor the exam. When account creation is done, Kryterion will share a link with the students. Due to that link user access for the student to attend the exam is possible. After that student will be able to login in Kryterion using the credentials. Once student is successfully logged in, the examination slot will be allocated and one of the registered proctor will commence the verification process.
[2] Aims to resolve problems due to loss of internet connectivity and hence proposes a cloud based exam system over LAN based exam system. Main objective is to allow submission of problems even in the absence of internet connectivity.
[3] Discusses about the importance of Fully automated mock exam system that is as similar to a real practical exam as possible.
[4] Proposes idea of sandbox. Sandbox is one of the technique to achieve the controlled environment for exam systems. With the help of sandbox we can impose artificial limits on processes running on top of it. We can apply limits like file system access, execution time limit, blocked access to other softwares and many more whichever we like. These sandbox has been widely used for various purposes.
Safe Exam Browser (SEB), a shell sandbox for the online exam. When running, it locks the desktop, defines a list of allowed processes that can be run during the exam, defines a list of white listed and blacklisted IPs for the exam.

IV. FIGURES AND TABLES

Proposed System uses Dynamo DB for storage of data. Presentation layer will be built on React whereas Node.js will be used in the middleware. The database and main application are connected by network. Here, every system will be interconnected with LAN and will communicate with cloud based server for fetching problem statements as well as uploading the log files for analysis. Following figure shows the proposed architecture of the system:



The above fig has explained everything about the specific modules, now we can have our focus on the functionalities in the system.
The proposed system will have different roles like proctor, student, admin and faculty etc. This role will be used to maintain all the functionalities as well as the attributes of the system.



Student: student can get problem statement as soon as he login and then he can do change request only once if he wishes to do it.
Admin: Admin can take the charge of the complete system can do major changes in the system such as scheduling an exam,adding or removing the proctors and also generating the analysis.
Proctor: Proctor has to monitor the complete exam and the proposed system will help him in notifying if any student tries to cheat in any manner.
Faculty: Faculty can add the students who are going to attempt the exam and can also handle the change requests done by the students.

Hence, the fig 1 and fig 2 depicts all the information regarding the proposed system. This system can be made adding up some of the existing modules in the current systems. This system will be definitely an powerful system to conduct the practical exams in an specified university.

V. CONCLUSION

The proposed system focuses on completely removing all the manual work done by the lab assistants and faculties in the current scenario of practical exam systems. It also adds some major modules regarding the analysis and malpractices in the exam. The proposed system will be useful for every college and it can come up as a product in the market. But it has a limitation that the methodology of conducting practicals of every university may vary from the rules and standards of education system they opt.

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