International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 06 Issue: 03 | March - 2022 ISSN: 2582-3930

Secure Online Assessment System

Dhaval Shah[1] , Mir Pasad[1] , Neel Shah[1] . Mrs. Manya Gidwani[2]
[1]UG Student, Department of Information Technology, Shah and Anchor Kutchhi Engineering College, Mumbai
[2]Assistant Professor, Department of Information Technology, Shah and Anchor Kutchhi Engineering College, Mumbai

Abstract

In this pandemic situation of Covid-19, online learning has blossomed. All the schools and universities have been shut down and they were switched to online applications to finish their academic activities. However, there has been great trouble in conducting examinations. Some institutions have moved it to an assignment form where students can just copy and paste their answers from the internet. Exam cheating is a common occurrence around the world, regardless of the country's degree of development. Exam monitoring has gotten more difficult to control as e-learning has grown in popularity. As a result, continual real-time surveillance is required to protect the student's identity during the evaluation period. As a result, we describe an online exam proctoring system in this paper that allows for automatic and continuous monitoring. Face recognition is used in the deployed solution to ensure strong student verification. To improve the performance of the suggested system, we created numerous parameters to detect any fraudulent behaviour while the candidate is using the exam management system.

Keywords: *Online exam, continuous authentication, machine learning, automatic monitoring, exam proctoring.*

INTRODUCTION

In every facet of education, computerised and internet systems are becoming more prevalent. In today's schooling, information technology plays a critical role. The educational system has undergone significant changes as a result of computers and the internet. Information technology allows higher education institutions to save time and money while also allowing education to be delivered with ease, anywhere and at any time. Online and off-line apps are replacing paper-based literature. We can get access to massive databases of knowledge via computer software. This has a significant impact on education. Information technology allows for quick and easy information exchange. In the current period, technological advancement has reduced the amount of information available on the planet. Technology advancements have numerous benefits in education and other commercial industries that employ it. The transaction got more speedy, accurate, and efficient as a result of technical advancements. Computers have grown increasingly useful for every transaction as time has passed. An application established and developed for students and professors is the Online Examination System for Introduction to Management. The system aids pupils in taking exams. It also allows lecturers to upload questions and answers to a database and see whether students failed or passed the exam. Because of its precision and speed, the Online Assessment System is considered a rapidly evolving testing system. The test required fewer manpower as well. Almost many firms now use an online examination system to manage their exams because it saves students time during exams. Organizations can also easily track a student's development by administering an examination. As a result, the result takes less time to calculate.

REVIEW OF LITERATURE

Because it automates and digitises the examination administration experience, an online exam system provides a less arduous and overhead intensive examination experience. Both the educational and corporate worlds benefit from the online exam system. To shuffle questions, use the Random Number Generator Algorithm. It includes 3 main parts as Question management, Quiz generation and Test online. [1]

A web browser/server architecture was used to create an online examination system. Zhenmin created a revolutionary online examination system based on the Browser/Server framework DCOM technology for objective questions and operating questions, such as programming, operating Microsoft Windows, editing Microsoft Word, Excel, and PowerPoint, and so on. [2] It has been effectively applied to the remote evaluation of basic computer science operating skills, such as computer skills courses in universities and the national examination for high school graduates in Zhejiang Province, China.

Another system developed an online examination system called SIETTE; (System of intelligent Evaluation using Tests for Tele education). Guzman and Cornejo (2005) proposed the SIETTE (System of Intelligent Evaluation utilising Tests for Tele-education) online testing system (SIETTE). SIETTE is a web-based application for creating and editing adaptive tests. By combining adaptive student self-assessment exam questions with recommendations and feedback, it meets educational goals. [3] SIETTE offers a unique combination of security and mobility, as well as additional benefits. Multi-instructor capabilities, random question selection, and resume capability and random question and choice distribution, on the other hand, are all missing.

Computerized technologies are becoming more widespread in education in today's globe. Information technology is extremely important in schooling. The educational system has been transformed by computers. Educational institutions can save space and time by using information technology. while also allowing education services to be delivered quickly, anywhere, and at any time. Physical libraries, for example, are being replaced by open-access online libraries; students can interact with professors online, whether live or via video, from anywhere in the world. We can get access to massive databases of knowledge via computer software. The educational system will be fundamentally altered as a result of this. Information technology allows for quick and easy information exchange.

EMS: Rashad et al. (2010) proposed Exam Management System, an online assessment system that is accessible over the internet. The examination and auto-grading are managed by EMS for student tests, as well as supporting exam administration, collecting responses, auto-marking submissions, and generating test reports. Secure login, multi-instructor support, and portability are all available in EMS. The following features, however, are missing: resume capability, random question selection, random question distribution, and random choice distribution. [4]

Infosolutions Goa: They offer universities a system for online testing. It's a PHP and MySQL-based web-based system. The exam comprises of a variety of multiple-choice questions. The questions are picked at random and weighted appropriately for the different topics in mind. The responses are graded, and the marks earned for each, as well as the student's answer, are entered into a database. The examiner can acquire the results in a variety of formats, including a general mark list, a comprehensive general mark list that shows the student's marks in each subject matter, and each student's answer sheet. The software keeps track of each student's information and allows them to be edited if necessary. Individual Answer Sheets, General Mark Lists, and Trends Graphs all have password-protected access. Sessions are used for authentication, and the password is saved in the database in encrypted form (MD5 hash).

Fagbola et al. (2013) created a Computer Based Test System (CBTS) (CBTS). CBTS is a web-based online examination system designed to support examination processes and overcome challenges such is a lack of automated timing

flexibility, candidates logging out after the time limit has expired, result integrity, guarantee, stand-alone deployment, the necessity for flexibility, robustness, and built to support examination processes and address obstacles such as test administration, auto-marking, auto-submission, and examination result report production.[5]

A research done by the International Centre for Academic Integrity, says that over 70,000 undergraduate students 68% of them admitted into committing academic malpractice on examinations and plagiarize on assignments. Another survey was done by the Canadian Broadcasting Company on 54 Universities of Canada, declaring that 73% of students admitted on academic malpractice in the academic year 2011-2012 [11].

The educational philosophy of lowering exam results in order to focus more on knowledge; comprehensive quality and ability are yet to be fully grasped in teaching and managing departmental activities. It implies that a few pupils seek immediate achievement and gain, and learn to cope calmly with exams. The inspection cannot be utilised as the sole means of distinguishing sheep from goats. [12].

METHODOLOGY

In this project, the main aim is to develop an effective and easy to use online proctoring examination system. To achieve this goal, we will be considering a few factors like accessibility, usability. The design process of these online proctoring system, we consider three activities.

- Registration Module
- Admin Module
- Student and Faculty Module

So, first in the registration module we add the college or the university details along with identity. After the approval of this details the admin will get its username and password through which he can login to the system. The admin has the rights to add faculty, add students and add other admins if necessary. The admin is also able to view the details of existing faculties and students.

The next is the faculty module in which faculty can create exams for students and allow access to students of respective department to appear for the examination. The faculty can also view the exams already been scheduled and add start and end date of new exams with the allotted time.

The student module allows the student to view the details of the examination that faculty has scheduled and appear the exam. Once the student starts the examination, he/she enters into a full screen mode and are not able to switch between any tabs or apps. We load the window in such a way that it gets force to load and run only in the top most layer of the display which leads to it being always on the top. Once the allotted time gets over the examination ends and student cannot answer to any question. Students have to submit the paper before the allotted time.

We have also included a facial detection technique for proctoring the exam. Basically, it's a machine learning technique that detects different points on face. We have used a webcam and with the help of TensorFlow Face landmarks detection we have implemented this module. We have used a Face mesh which is a model to predict 3D facial surface geometry from monocular video captured by a front-facing camera in real time. If the students face is not detected inside the camera frame, then an alert will be passed. If these alert if sent 3-4 times then the examination will automatically end up and the student won't be able to appear for it further. Through this we have a very secured online proctoring examination system.

PROJECT FLOW

The diagram shows how the system will work step by step.

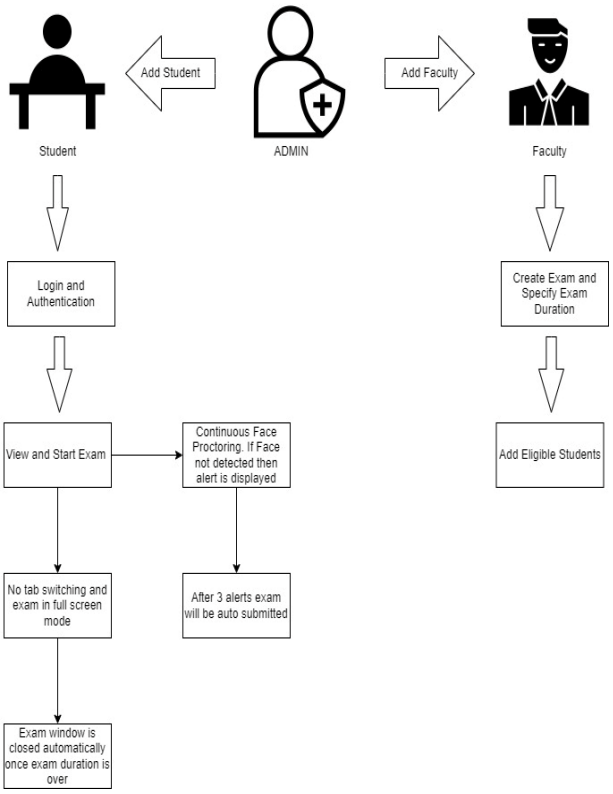


Figure 1. System Architecture of SOAS

RESULTS

Figure 2. Registration Page

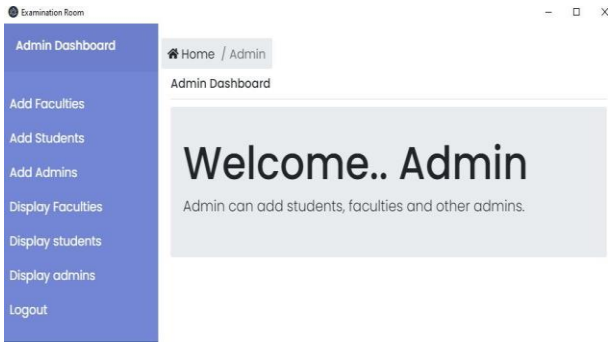


Figure 3. Admin Dashboard

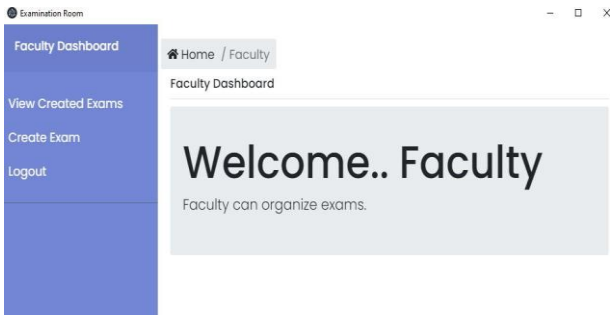


Figure 4. Faculty Dashboard

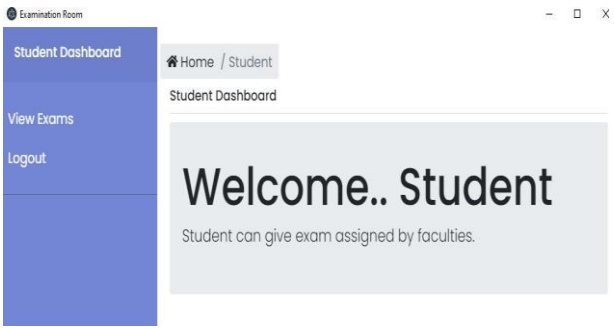
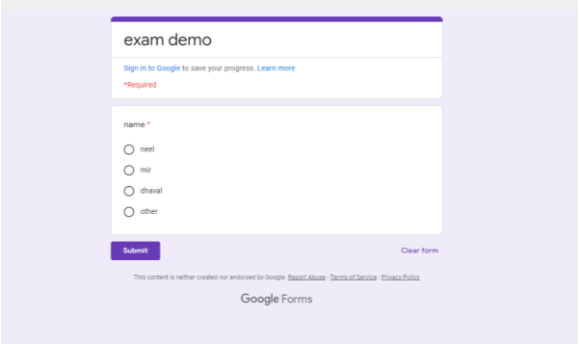


Figure 5. Student Dashboard



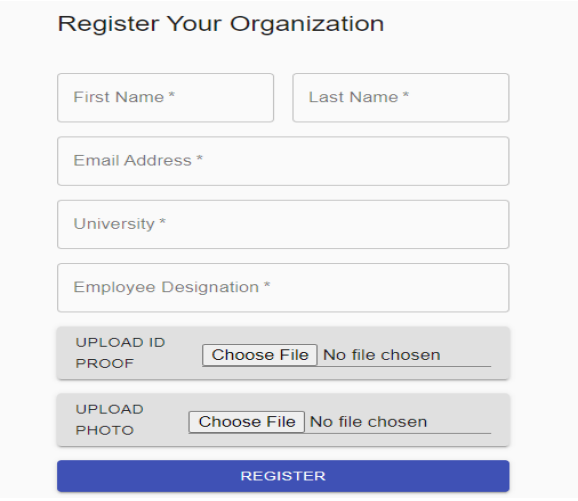


Figure 6. Exam Start Google Form with Camera Background Proctoring

CONCLUSION

Schools, colleges, universities, training institutes, and the corporate world can simply adopt the proposed online test system to administer exams more safely and flexibly. It will also provide an efficient way for faculty to schedule exams for students according to their department. The key concept is to reduce the usage of paper and convert the existing system of examination to digital form. It is observed that the information required can be obtained very easily and appropriately using computer. In today's world, beginners in computer can operate the system easily.

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