SRS - Unsupervised Test Platform

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1 . Introduction

This document describes the structural properties and software requirements for Unsupervised Test Platform.

1.1 Problem Definition

Currently, Computer-based exams/tests are supervised at designated exam centres. Due to Covid-19 situation, it would be ideal to provide the exams online and with the same degree of integrity

1.2 Purpose

The purpose of this document is to state the functional and non-functional requirements of the Unsupervised Test Platform. It also serves the purpose of documenting all the modules, interfaces and dependencies of the project.

1.3 Scope

This SRS document applies to the initial version (release 1.0) of the “Unsupervised Test Platform” software package. It describes the modelling and requirement analysis of the system. The main aim of the system is to provide an unsupervised and secure platform for conducting exams remotely while ensuring the integrity of the exam conducted.

1.4 Overview

The remainder of this document identifies the actors, use-cases, use-case scenarios, activity diagrams, assumptions and dependencies needed for the analysis and design of the Unsupervised Test Platform software package. The rest of the document contains the overall description of the system, requirements, data model and behavioural description of the system and project planning.

2. Overall Description

The problem statement requires us to create an Unsupervised test platform which can be used to conduct exams remotely and with integrity. This system should authenticate and identify the candidate first. At the time of candidate registration, the candidate will provide a valid government ID proof along with the webcam capturing the candidate. These ID proofs will then be used to authenticate the candidate before the start of the test. The webcam will once again capture the candidate's image and compare it with the ID proofs submitted during registration. If the candidate is successfully authenticated he/she will be allowed to attempt the exam else the candidate will be disqualified.

When the exam begins the browser goes into restricted mode. In the restricted mode the candidate is monitored using webcam technology for suspicious activity or behaviour. There are 2 ways in which we can monitor the candidates. Live monitoring or Post Exam monitoring. In live monitoring, the candidate is continuously monitored throughout the exam and if any suspicious activity is flagged, then the platform enters the lockdown mode thus preventing the candidate from completing the exam. This monitoring includes -

- Facial landmark positions tracking
- Eye movement tracking
- Neck movement tracking
- Checking for multiple people in the viewport
- Mobile Phone, Smart Watch detection using object tracking
- Background noise and speech detection
- Browser policing using full-screen modes, detecting browser tab switching, key monitoring and restriction.

In Post Exam monitoring, the candidate is recorded giving the exam, and the recorded video can then be processed to detect unethical behaviour. If the candidate is flagged, then he/she may be disqualified by the authorities.

2.1 Product Perspective

The software product is a standalone system and not a part of a larger system. This software product can embed other test-taking platforms and provide AI-based monitoring as a service. The system will provide users with functionalities like registering, viewing all tests, viewing past test results and building their profiles. The organizations can create new tests and examinations, configure the proctoring settings to suit their needs and view reports and logs of all candidates.

2.2 **Product Functions**

2.2.1 User Functions

- Registration
- Login/Logout
- View all tests eligible
- User Authentication before attempting the test
- Undergo Test
- Submit Test and View results
- View past test results
- User Profile
- Update profile details

2.2.2 Organization Functions

- Registration
- Login/Logout
- Create New Test
- Configure Test Settings
- Publish Test
- Send test invite to candidates via Email
- View logs and reports
- View Defaulters List
- Embed Proctoring with other test platforms

2.2.2 Platform Functions

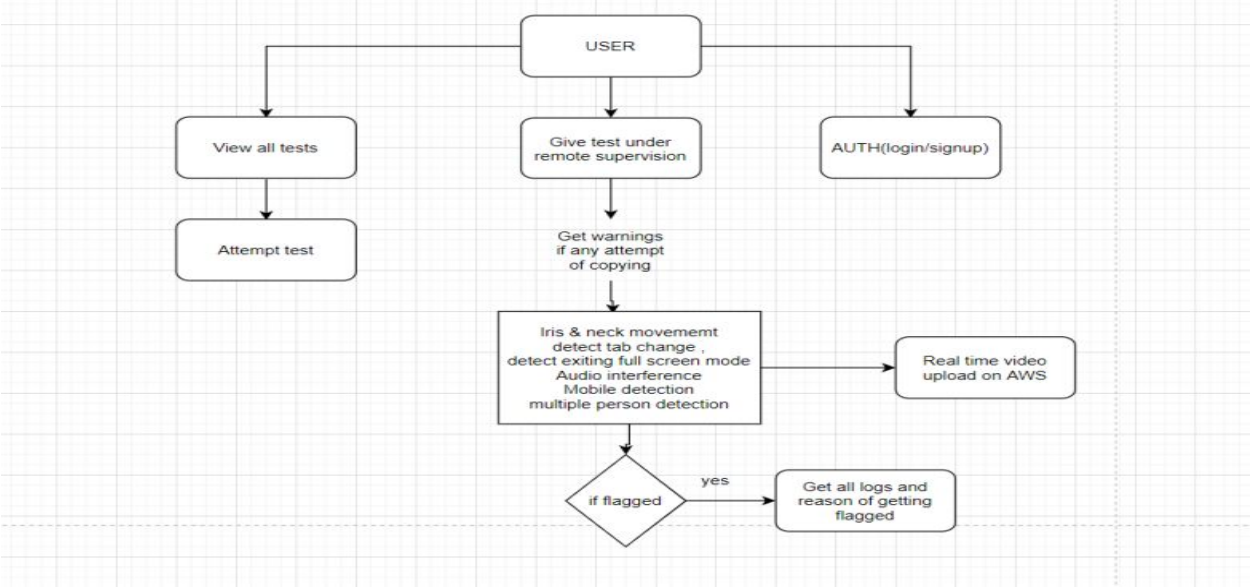
- Webcam based user authentication before the test
- Webcam and AI-based candidate monitoring
- Background speech detection and monitoring
- Dashboard for displaying logs and reports

2.3 Constraints, Assumptions and Dependencies

The system enables candidates to give their examinations remotely. Security and safety are the most crucial fundamentals of the system. The system has zero-tolerance concerning compromising safety and security. The system should not provide any candidate ways to cheat the examination. The system should provide up-to-date logs for reviewing candidate performances and identifying defaulters.

For the proper working of the system, we list our assumptions and dependencies as follows -

- Working internet connection.
- Access to the internet browser
- Fully functioning webcam and microphone
- User will allow control of webcam and microphone



3. **Specific Requirements**

3.1 **Interface Requirements**

3.1.1 User Interfaces

The system will provide user interfaces for the user and organization through the computer. The interface will be in the form of a web-hosted platform that is accessible via an Internet Browser.

3.1.2 Hardware interfaces

Hardware interfaces include Webcam Interface and Microphone Interface. These interfaces are accessed via the browser software interface

3.1.3 Software Interfaces

The software interface involves interfacing with the browser software. The software also interacts with a web server hosted in the cloud. This server interfaces with the cloud-based storage and database service for storing all the data.

3.2 **Functional Requirements**

3.2.1 User Functions

3.2.1.1 User Registration

To access any further functionalities, the candidate must first register. During registration, candidate details such as full name, email, contact number, address, education background, etc are required to be entered. Then the candidate has to upload a valid government ID proof document for authentication. The Webcam will capture the candidate's image for further verification. All the data will be stored in the cloud-hosted database and storage.

3.2.1.2 Login/Logout

Any registered candidate has to login to access the portal and exams. The candidate can log in using email and a password which is checked against the database for verification. Login and registration will leverage JWT technology for securely authenticating the users. Other login methods such as sign-in using Google/Facebook Account can also be integrated.

3.2.1.3 View eligible tests

On the portal home screen, the candidate can view all the tests that he/she is eligible to attempt. This data includes test details like the name of the exam, duration, conducted by which organization, marking scheme, test format and other details.

3.2.1.4 View past results and summary

The candidate can view his/her past performances and get a summary of the same.

3.2.1.5 Update Details

The candidate can update his/her account details.

3.2.2 Organization Functions

3.2.2.1 Organization Registration

The organization first has to register and create an account on the platform. This registration will include organization details such as email, contact number, password, etc.

3.2.2.2 Login/Logout

Once the organization is registered, they can login/logout using the registered email ID and password provided during the registration process. If the ID and password are valid, then the organization can access further functionalities. If the ID or password is invalid, then an error message is displayed.

3.2.2.3 Update Profile

The organization can view and update their account details.

3.2.2.4 Create a new test

Once logged in, the organization can create a new test. This provides them with the interface for configuring the proctoring settings, adding questions and selecting candidates who are eligible for the test.
Configuring the proctoring settings includes setting the thresholds for the different monitoring activities, assigning priority and severity to the activities, and storage-related configurations.

The interface provides facility to add new questions of different types which include single correct answer MCQs, multiple correct answers MCQs, text-based answer fields etc. The organization can also select the correct options for automatically grading the tests. They can also assign scores to individual questions.

The organization can then provide a spreadsheet with candidate emails to whom the test admit card and invite is to be sent. This invite will be sent to the candidates via email.

3.2.2.5 View Test reports and logs

The organization can view the reports and logs of the different monitoring processes for each of the candidates and tests. These logs will include webcam tracking data, facial landmark data, object detection data and audio recognition data along with the timestamps of the events. All the exam and test recordings will be available to the organization to review.

3.2.3 Platform functions

3.2.3.1 Invite Candidates

The platform should enable the organization to first upload a CSV file of emails that it wants to send the tests to. Only the selected students then receive the mail with the invite link.

3.2.3.2 Warning and automatic termination

When suspicious activity is detected on the candidate's end, various warnings must be displayed. These warning should be configurable by the organization that is setting the test. If the behaviour is beyond the set threshold, the system should enter lockdown mode and terminate the examination.

3.2.3.3 Provide logs of the examination conducted

During the examination, all the information of the candidate and his/her behaviour during the exam are recorded and logs are generated.

3.3 **Non Functional Requirements**

3.3.1 Performance Requirements

- The overall system should be fast and error-free.
- It should have built-in error checking and correction facilities.
- The system should be able to handle large amounts of data comfortably.

3.3.2 Security Requirements

The access to the software is given only to valid operators. We need a specific ID and password to get access to the software.

3.3.3 Availability Requirements

To ensure reliability, this system is being designed using software that is established to be stable and easy to use.

4. **Conclusion**

This SRS document is prepared for a better design of the unsupervised test platform. The functional and other requirements of the system are described and the needs of the users are stated throughout the document.