

# **Dynamic Skill Assessment System** **(DySAS)**

Category: Web App

## **Purpose**

It is a general purpose software for assessing the knowledge and skill of an individual.

## **Scope**

It allows the teachers and professors to conduct exams which would be able to assess the students in a better way.

This software would have a question bank which would contain questions, each marked with their difficulty level. This question bank must be filled and updated regularly. Setting a paper for an exam would be an easy task as the professor would simply have to select the topics and difficulty level and the software would generate a different paper for each student. The questions in the examination would be dynamic in nature, that is, the next question for a student would depend on how many correct answers he/she has already given. So if a student has correctly answered a few questions in a row then the difficulty level of the next questions would increase and so will the marks, and if the student gives incorrect answers then the difficulty would drop and so will the marks for the question. This dynamic nature ensures that everyone gets to attempt the paper according to their knowledge level and the final score would reflect the true capability of the examinee.

Not in scope: monitoring webcam and/or microphone to detect cheating.

## **Introduction**

### **Existing systems**

The current system is a manual one, where the administrator has to design a question paper and decide the grading scheme beforehand. This system poses several problems, namely:

- The method of conducting exams is static and rigid, i.e. questions are decided beforehand. The downside to this is that questions can not be adjusted according to the ability of the examinees and correspondingly, every examinee gets the same paper irrespective of the level of their ability.

- Cheating is extremely easy since questions are decided beforehand.
- Administrators have to manually look for questions before each exam, which is a time-consuming task.
- Lack of availability of a common secret question bank.

## Proposed system

The proposed DSAS system aims to provide a better examination experience than the traditional examination system, both to the administrator and also to the examinees.

### Advantages for examinees

The advantages for examinees are as follows:

- Time and cost saving.
- Easy accessibility.
- Ability to modify answers easily.
- Ability to be tested according to their potential.

### Advantages for administrators

The advantages for administrators are as follows:

- Ability to decide the examination pattern.
- Modification of questions and other aspects of exams on the fly.
- They can add questions to the bank as and when they want, thus reducing the stress while setting the question paper before any exam.
- Availability of questions in a centralized question bank.
- Freedom to choose from dozens of difficulty changing algorithms which affect the overall difficulty of the exam.

## **Requirements**

### Functional requirements

- Users must have a valid User ID and password to login, thus creating their individual profiles.

- Administration can register new examinees.
- A website for attempting tests.
- A question store where each question should have an associated difficulty.
- Administrators can create classrooms for groups of students.
- Administrators and examinees can view results.
- Examinees can raise objections in the results which can be addressed by administrators.
- Administrators can change the marks and difficulty levels as and when they want.
- Administrators can provide the subject and topic of the exam.
- Administrators can choose the date and time for scheduling the test.
- Administrators can choose which group (classroom) the test is meant for.
- Software must support multiple algorithms for choosing the difficulty level of the next question to cater to different types of exams.
- Tests can be attempted in time limited fashion.

## Non-functional requirements

- Should be secure, question bank should be secured from unauthorized access.
- The platform should not facilitate cheating by students.
- Maximum time availability
- Better component design to get efficiency at peak time.
- Teacher registration facility is accessible by administration only.

## **Software tools**

- Client :
  - A standards compliant web browser
  - A stable internet connection
- Database server :
  - NoSQL database server
- Technologies : NodeJS, React, MongoDB

- Tools : Visual Studio Code, Postman

## **Deployment**

A Linux server supporting Node.js

## **Hardware specifications**

Server: >2 GB RAM

Storage: >5 GB

Processor: >i5-8th\_gen