

Online Automatic Assessment Environment

Mr. Quresh Lakdawala¹, Mr. Bhavik Khatri², Mr. Saif Mulla³, Mr. Bharat Choudhary⁴

¹⁻⁴Student, Dept of Computer, KJ College of Engineering & Management Research Pune, Maharashtra, India

Abstract - The growth of the internet has influenced drastic technological advancements in the field of science. The already growing internet was fueled even more by COVID-19 pandemic. The COVID-19 pandemic has caused many problems, one of them being the issue regarding conducting exams. Hence a platform was required which would solve the current issue and also prove to be useful even after these tough times. The Online Automatic Assessment Environment System checks all the boxes. This system enables a student to attempt their exams from their home and the teachers can have a detailed report regarding the students performance without even manually checking papers. The Online Assessment System is today's modern era tool for conducting tests in a healthy environment.

Key Words: Natural Language Processing, Natural Language Toolkit, Gensim, Face Detection, Voice Detection, Image Conversion.

1. INTRODUCTION

In today's world online examination systems are the new trend. These systems are extremely flexible when compared with the traditional methods of conducting exams. These systems are a major relief for teachers because the answers are checked automatically and these systems are also capable of red flagging certain papers which might be a bit too complicated to evaluate due to some reasons so that the teacher can check them manually. Also the amount of data that both the teacher and the student get regarding their performance in the exams is far more superior when compared to the traditional methods of conducting exams.

These systems are not only limited to schools or universities but also can be used in the corporate world by various companies. These companies when visiting campuses can conduct exams for the candidates on this platform and get immediate results making the whole process smooth and fast.

The applications are many and the benefits are even more. The Online Automatic Assessment Environment can prove to be a very great platform for many organizations in the near future.

2. Proposed System

Online Automatic Assessment Environment is a platform through which the teachers can conduct the exam online. Teachers are able to create tests with both types of question objective as well as descriptive. Online

Automatic Assessment Environment prevents the students from doing malpractices by Face and Voice Detection Feature. Students can check their previous results in such a way that they can compare the original answers with their attempted responses.

2.1 System Activities

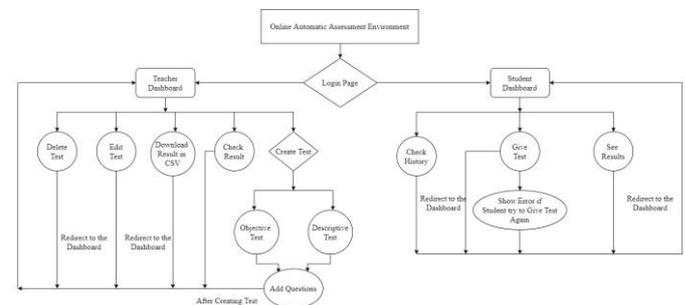


Chart -1: Flowchart diagram

The whole system can be considered as two parts. The first one being the admin/teacher and the second is the student part. Though the two parts are not dependent on each other the whole system is built as one platform. The following points discuss more about the system below.

2.1.1 Login Activities

This is the login module where the user, be it a teacher or a student, has to login into their respective accounts to be able to use the platform. The login page for both are the same. The user has to enter their email and password to login into their accounts.

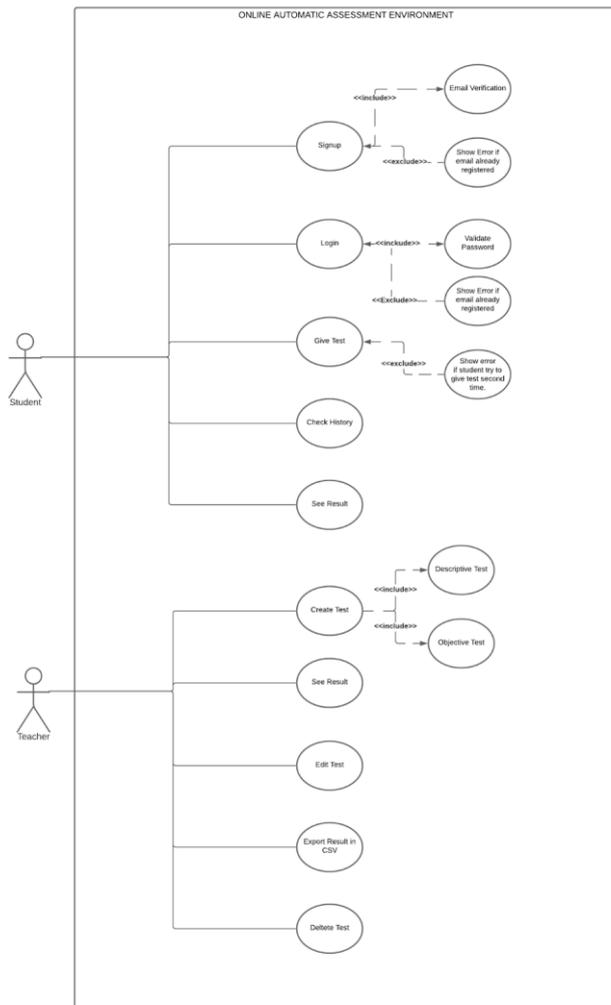


Chart -2: Use Case diagram

2.1.2 Admin Activities

Once the admin has logged in to their accounts the page visible to them is the dashboard. The admin dashboard has all the tests that are created by the admin visible on the screen. The dashboard also has the option to create a new test.

There are two ways to create a new test. The first is the manual way of creating tests wherein the teacher has to fill the basic information regarding the test asked in the dialog box and then type one question at a time with the options.

The second way to create a new test is to upload an excel sheet containing all the questions and options with the correct format required by the system. The specified format is the key factor in creating a test by uploading an excel sheet. Once uploaded the test will be created automatically without having the need to type one question at a time.

Once the test is created it can be edited by pressing the edit button provided on each test.

Once the test has started the teacher can view the results of the students as and when they submit the test.

2.1.3 Student Activities

After logging in the student is taken to the student dashboard page where the students can see all the upcoming tests. All the basic details of the tests are visible along with a countdown timer indicating the time at which the test will start and before which a student is not able to start the test.

Once the countdown timer reaches 0, the start button is enabled. By clicking on this button a new test window is opened in fullscreen where the students can attempt the test.

Once the new window is opened the user is asked for the camera and mike permissions. The student can only proceed further if they grant the camera and mike permission in the pop-up. Once the test is started the window goes into fullscreen mode.

An attempt to change the tab or to exit full screen mode will show a warning. After 3 warnings the test will be auto submitted and students will be redirected to the result page.

While giving the test the time left to complete the test is displayed at the top right corner. Once the assigned time is over the test will be auto-submitted and the result will be displayed.

The result page shows all the answers marked by the student with the correct answer surrounded with a green border.

On the dashboard there is a history icon by clicking on which the user is redirected to the history page. The history page shows all the information about the previous tests attempted by the students along with the detailed result.

3. Goals and Objectives

The main goal was to create a platform which can prove to be helpful for both teachers and students. As said earlier students can attempt their exams from anywhere and the teachers do not have to manually check the papers. The platform is also capable of checking the long format answers by detecting the keywords from the answers provided by the teacher. More about this feature is talked about in the coming sections.

4. NLP(Natural Language Processing)

Natural language processing (NLP) is a subfield of linguistics, pc science, and synthetic intelligence concerned with the interactions among computer systems and human language, especially the way to software computer systems to procedure and examine massive quantities of herbal language data. The end result is a pc successful of "understanding" the contents of files, along

with the contextual nuances of the language inside them. The generation can then appropriately extract records and insights contained within the files in addition to categorize and prepare the files themselves.

In the context of this platform, NLP is used for checking descriptive/long answers. For more clarity, a test can either have Multiple Choice Questions(MCQ) or Descriptive answers in which a detailed explanation is required for a particular question. This platform with the help of NLP can identify the keywords from the provided answer by the teacher and compare it with the answer written by the student and give marks based on this comparison. This feature makes the platform truly user friendly for the teachers. This feature is achieved with the help of two libraries NLTK and Gensim which are explained below.

4.1 NLTK(Natural Language Toolkit)

Natural language toolkit (NLTK) is the most famous library for Natural language processing (NLP) which was written in Python and has a huge network at the back of it. NLTK additionally could be very smooth to learn, actually, it's the perfect Natural language processing (NLP) library that we're going to use. It incorporates textual content processing libraries for tokenization, parsing, classification, stemming, tagging and semantic reasoning.

4.2 Gensim

Gensim is billed as a Natural Language Processing bundle that does 'Topic Modeling for Humans'. But it's miles nearly an awful lot more than that. It is a main and a brand new bundle for processing texts, operating with phrase vector models (inclusive of Word2Vec, FastText etc).

5. Face Detection

Face detection is a computer era being utilized in a number of packages that identifies human faces in virtual images. Face detection additionally refers back to the mental procedure with the aid of using which people discover and attend to faces in a visible scene.

While trying the check the face of the person is continuously monitored with the assist of face detection. The person is visually capable of see the face detection in movement at the lowest of the page

6. Voice Detection

The test page also has a voice detection module. This module asks for the mike permission on the user's device and detects any background noise. Hence the user is required to sit in a quiet room. This feature is to ensure that no malpractices are happening while the student is attempting the test. This feature also gives the assurance to the teacher that the exams are being conducted by fair means,

The user can see an icon displaying the background noise the system is detecting while the student is

attempting the exam and accordingly the user can sit in a quiet place.

7. Image Conversion

If the question is an image rather than a text the image is converted to base64 format and saved in the backend. Base64 format converts the image of any format(jpg, jpeg, png) into a string and the string is saved in the backend, and whenever to show the image on frontend, the image is fetched from the backend and base64 again converts the string value into a specified image. Thus, Converting the image into base64 helps the platform manage multiple images in a better and efficient manner.

8. System Interface

8.1 Register Page

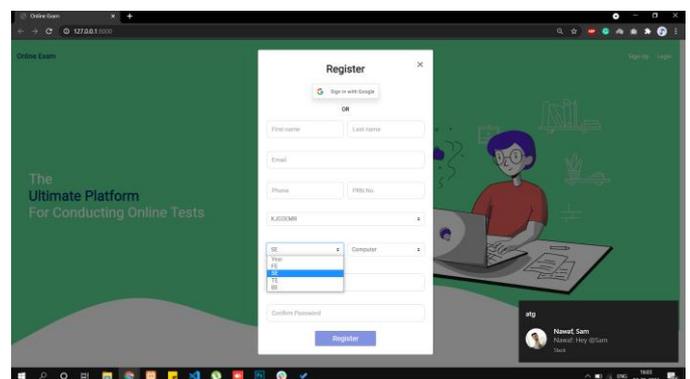


Fig -1: Register Page

8.2 Teacher Dashboard

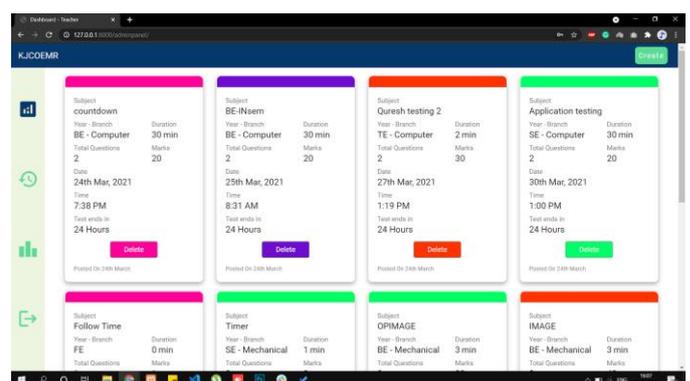


Fig -2: Teacher Dashboard

8.3 Test Create

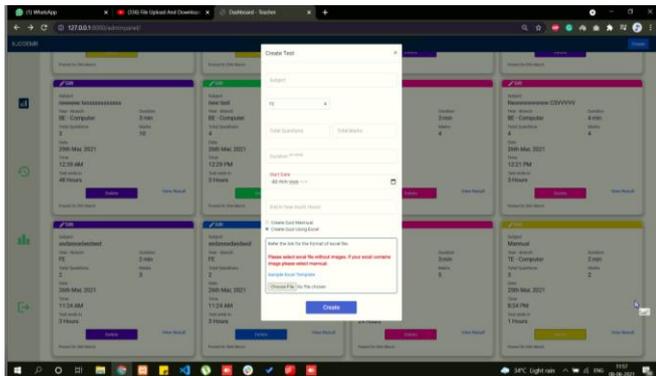


Fig -3: Test Create

8.5 Student Test Page

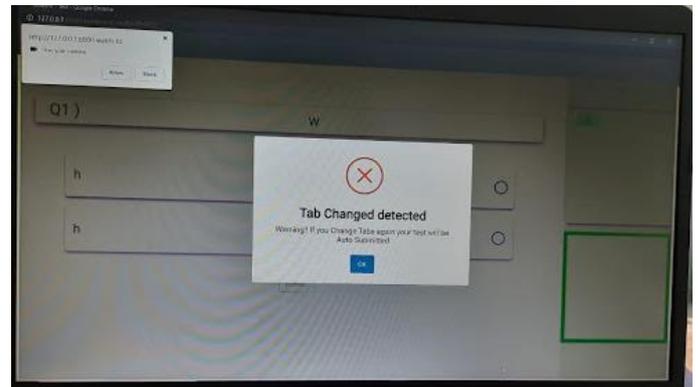


Fig -6: Test Page

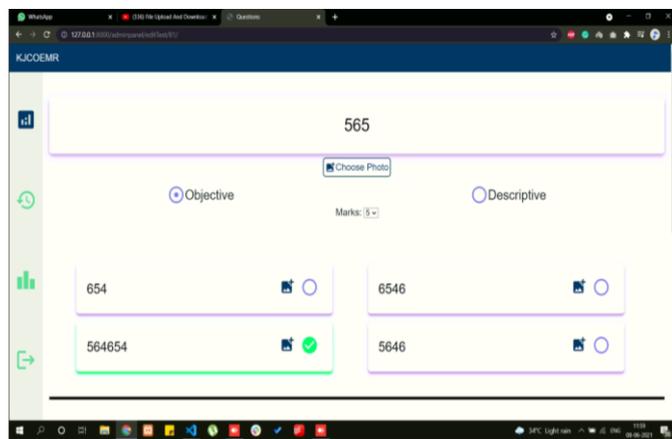


Fig -4: Questions

8.6 Permission Page

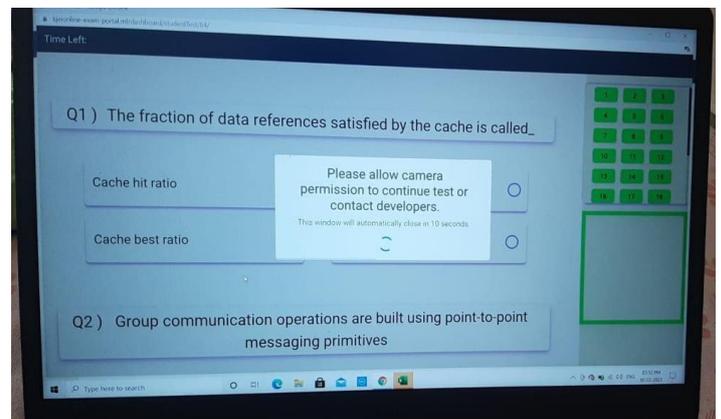


Fig -7: Permission Page

8.4 Teacher Result Page

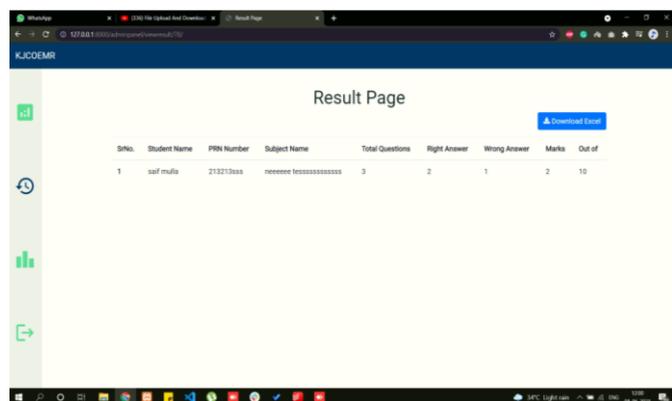


Fig -5: Teacher Result Page

8.7 Student Result Page

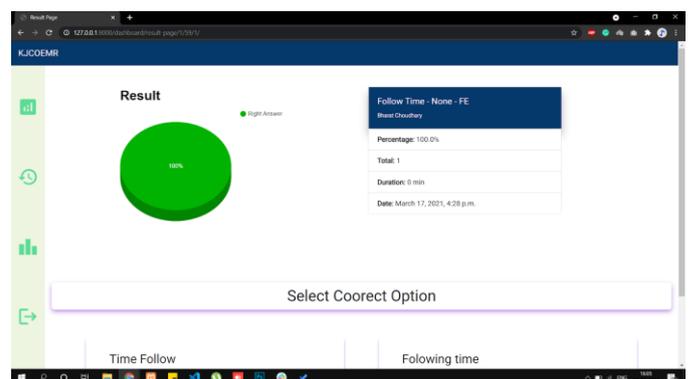


Fig -8: Student Result Page

9. CONCLUSIONS

In a nutshell, Online Automatic Assessment System is a very promising and a relevant platform in the context of the current scenario. The automated evaluation not only

unburdens the teachers work but also fastens the evaluation process as a whole.

Also with all the statistics available it is unparalleled to the manual way of generating reports.

All-in-all online systems give far more information regarding a students performance in a graphical and easy to understand manner.

Hence the fact can not be denied that in the near future online systems would be the preferred mode of conducting examinations.

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