Online Examination Portal for Effective Assesment

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Abstract—The aim of the work is to develop an online exam and classroom portal which can serve as the advancement in terms of examination pattern and educational services in today's virtual life. The project aims to provide a platform with easy-to-use interface. The central nature of the work needs to save time and increase the accuracy aspect of the work as the demand for the sme is rapidly increasing. Not only does this benefit the students, but it also helps the administrators or professionals like teachers who can work seamlessly on the backend through a well-designed interface. The work has also introduced its own randomizer to implement random logic The project can serve as a perfect service to the educational industry.

I. INTRODUCTION

The project aims to develop a virtual platform for students to have an easy access to their classrooms as well as their examination portal, all at one place. This project will be developed with a vision to solve the problems of not just the examiner but the examinee too, with a modern GUI and integrated platforms and plagiarism checks, it will be beneficial to not one but many users who use it including the students as well as the teachers.

II. LITERATURE SURVEY

We have conducted a survey about 14 research papers from different conferences across various journals. We have noted down a lot of points, both positive and negative. We came across a paper which discussed the implementation of a similar kind of application in the MVC architecture. On consider the perks of the deployment we decided that the best way to approach our project was the MTV(Model-Template-View) approach. We also came across various AI algorithms to implement remote proctoring systems in our system. Randomizing the questions was a tedious task for which we referred some techniques. A paper emphasized on the implementation as an object-oriented approach which was discarded as it was not compactable with our requirements. A paper also recommended tab locking techniques to secure the online testing. Detection of anomalous behavior was also studied in a paper which provides remote proctoring help. Co learning methods was also shown in a paper. Thorough studying of the papers we referred we came across a lot of factors and hence created our own approach to design the portal and implement it in our point of view.

III. OPINION SURVEY

As the project topic was new and in demand in the current scenario, we conducted a survey to see and evaluate the opinions and gather people's expectations from their view of point. We had created s survey form and spread it across all stakeholders of the education industry. A good response was received from 450+ people from different institutions, we have generalized the requirements. Most of the teachers have complained that managing multiple classes or subjects, so the UI needs to be improved or made such that it can be managed easily. From the students we got a lot of inputs, Improvements were suggested in proctoring systems and meaning stuff. Examinations needed certain amendments from both teachers and students. Considering all the inputs we framed a model for our portal and the design was carefully designed using these all considerations in mind.

IV. APPROACH

As we are developing a web solution, the front end is designed with HTML, styled by CSS, and the JavaScript included in the code till provide support some functions which ease the user interface and improves the user experience. Python Django is used as the backend along with sqllite3 as the main database. The main advantage of using Django as the framework is that we can use certain AI algorithms using for remote proctoring. MTV architecture plays an important role in the implementations. The design is flexible and open for future improvisations.
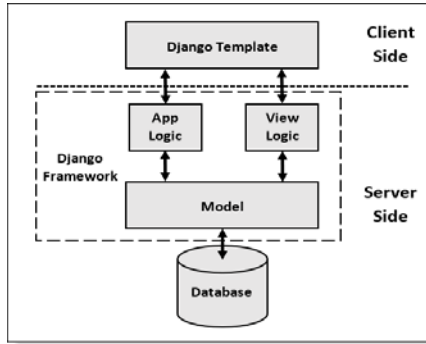
V. ARCHITECTURE

The most basic architecture for running the whole implementation is the MTV architecture over MVC architecture. It increases the speed and performance of the model.

A. MTV Architecture

The major advantage of using the MVT over MVC is that in MTV Flow is sometimes harder to understand as compared to MVC., URL pattern mapping takes place, Controller part is managed by the framework itself.

Modifications are easy, the application is loosely coupled, and it is suitable for small and large

Fig 1. Standard MTV Architecture

VI. ALGORITHMS USED

As security is one of the most important concerns in modern day projects, we used the famous Secure Hash Algorithm (SHA 1) in our project to implement security.

B. Secure Hash Algorithm

Hash algorithms are usually used to provide security to any form of confidential data. The major advantage of using hashes is that it uses encoding and comparison instead of classical decryption adding more to the confidentiality element of security.

SHA is used over MD5 as it is the latest version and has more strength over message digests. However, this consumes a little bit more memory, which may not be a major concern in implementation.
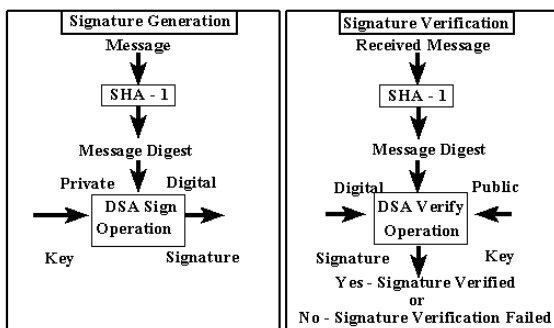

Fig 2. SHA Algorithm

C. Randomizer Algorithm

This algorithm is basically used to shuffle the questions in case of an examination or can be also used wherever we need randomization.

This algorithm comprises a pseudo random generator, upon providing the input the pseudo random generator generates a bit stream exactly of the same length as given in the input. The bit stream is then incubated with the data and hence the randomized data is incorporated.

Then again after the process the shuffled data is again sent through a filter which checks the data for further any discrepancy and then commutes the final data to the client ot the user.
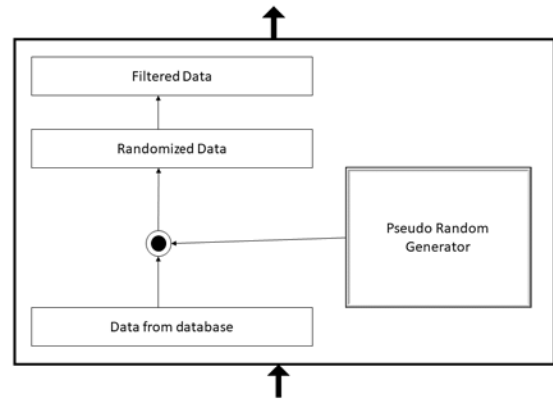

Fig 3. Randomizer Algorithm

VII. MODULES OF THE PRODUCT

The most basic architecture for running the whole implementation is the MTV architecture over MVC architecture. It increases the speed and performance of the model.

D. Administrator Based

- Can monitor the activity logs of all the users.
- Can add/remove users.
- Defines departments, classes, subjects and assigns them to the particular instructor, teacher.
- Add new events to the calendar.
- Generate and release results.
- Monitor overall progress for the entities.
- Simulate the working of modules overall.
- Keep eye on all the assignments and documents uploaded at different times at a single place.
- Use search option at all stages for better interactions.
- Perform audits.

E. Teacher Based

- Can create, invite, and organize different classrooms for students.
- Take regular classes and their backups.
- Provide study material, give it access controls and manage multiple classes data simultaneously.
- Create assignments with deadlines, alter them, evaluate them, and grade them.
- Create and conduct examinations using features of our remote proctoring system and examination environment.
- Run plagiarism checks on assignments and examination answer scripts.

F. Student Based

- The student can join any class, but only an approval is sent and only when the instructor validates it one can be part of it.
- He can attend classes, check for assignments, see pending tasks, see backdated data at his own ease.

- Can request back data of a particular instance from the controller.

Role specific tasks can be introduced, but it needs the server to be strong enough as the complexity increases.

Security of the system has a large scale for improvement for and can be improved in further years by implementing blockchain technology.

VIII. IMPLEMENTATION AND RESULT
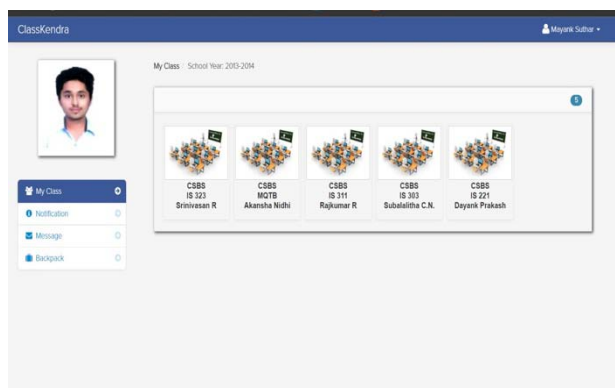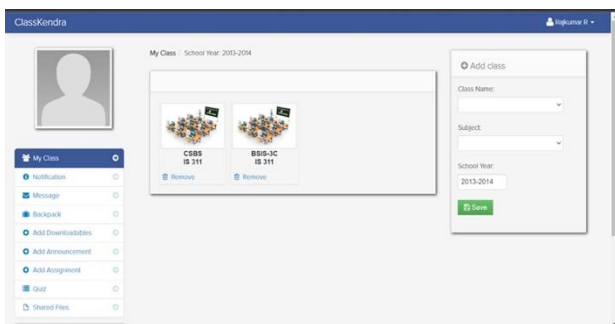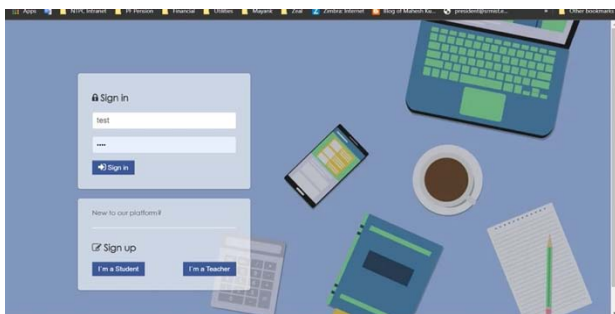
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