EVALUATE – ONLINE EVALUATIONS MADE SIMPLE

A PROJECT REPORT

BY

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SUBMITTED TO

DEPARTMENT OF COMPUTER SCIENCE ENGINEERING BENNETT UNIVERSITY

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# DECLARATION

We hereby declare that the work which is being presented in the report entitled “Evaluate-Online evaluations made simple”, is an authentic record of our own work carried out during the period from JUNE, 2020 to November, 2020 at Department of Computer Science and Engineering, Bennett University Greater Noida.

The matters and the results presented in this report has not been submitted by us for the award of any other degree elsewhere.

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LIST OF ABBREVIATIONS

Abbreviation Explanation of the Abbreviation

AAA Authentication Authorization and Access Control

CSP Cloud Service Provider

DNS Domain Name System

IAM Identity and Access Management

ABSTRACT

Our vision for the project is to ease the workload and hassle for teachers by letting them create exams in a user-friendly way. Therefore, to ease this process we decided to develop a web-based application for teachers and students where teachers can create exams in the most user-friendly way and students can easily attend the exams securely. We decided to go with website implementation of this project as the website will be designed completely responsive to compensate the need for a mobile app. Teachers can choose from a variety of ways to conduct exams, like MCQs, single line questions, fill-ups, true-false, long answers, etc. Teachers can even choose what restrictions they want to apply on an exam, e.g., restricting students from going to the previous question, shuffling of questions, etc. The main motive of this project is to provide small schools and institutions an easy to use and viable platform to conduct exams and hold records. Technologies that we are planning to use MERN stack. For the frontend, we will use HTML5 and CSS for designing the website, React for all the interactive UI components. For the backend of our project, we will be using Node JS and Express. For the database, we decided to go with MongoDB as it is easy to deploy, operate, and scale MongoDB.

1. INTRODUCTION

Our project is based on the basic fact to ease the process of taking evaluations during this e-learning era. The first innovation includes safe and secure means of taking small assessments/quizzes on a proper platform that is built for this only purpose keeping in mind. Secondly, we decided upon the idea of showcasing a detailed analysis of a student or the whole class mainly leader board-based results. Teachers can very freely and without hassle can create and schedule exams in any type of model they want, may it be short answer questions, multiple-choice questions, fill-ups, true-false, long answer questions, or even insert an image, whatever he or she pleases, or the situation demands. We decided upon the idea of showcasing a detailed analysis of a student or the whole class mainly leader board-based results. We decided to go with a website for the implementation of this project rather than a mobile app because the website will reach a larger audience than with a mobile app as the website will be designed completely responsive to compensate for the need for a mobile app. To come up with something of Industry standards but I and my whole team are definitely up for it and we will try our best to fulfill the standards set above and hopefully add some more cool and exciting features as we go our way for building this project and meanwhile broaden our mind in the particular niche.

1.1 Problem Statement

In these tough times of COVID, it has become as difficult for many schools, institutions, universities as well as for several coaching to keep a track on the progress of their students. It becomes difficult for our teachers to prepare and execute tests, quizzes as well as small assessments with their respective students. We got this idea because our university was still conducting exams on google forms and the university’s learning management was not good enough to conduct exams on large scale. Google's form is very good in its ways, but it was not the best solution for creating and conducting exams. Teachers can even choose what restrictions they want to apply on an exam, e.g., restricting students from going to the previous question, shuffling questions for students to slow them down from cheating. Our target audience includes schools and colleges currently shut down due to the pandemic. We decided upon the idea of showcasing a detailed analysis of a student or the whole class. We decided to go with a website for the implementation of this project rather than a mobile app because the website will reach a larger audience than with a mobile app as the website will be designed completely responsive to compensate for the need for a mobile app.

1. Background Research

In these tough times of COVID, it has become as difficult for many schools, institutions, universities as well as for several coaching to keep a track on the progress of their students. It becomes difficult for our teachers to prepare and execute tests, quizzes as well as small assessments with their respective students. Also keeping major constraints related to legibility and fair conduct of these evaluations, it becomes hard to find out whether students are giving these evaluations without indulging in unfair means. Our solution can be utilized in managing and conducting these evaluations with ease by providing the instructor with multiple options for forming questions in various ways like either by creating single or multiple choice or subjective questions along with the option of restricting students from going backward. But, by including an individual timer for different questions separately and shuffling questions which can be set by the instructor can decrease the chance of cheating between tests exponentially. We know that we cannot prevent unfair means fully, but it is a nice feature to have to reduce it to some extent. Also, by having a track on student’s browser activities and activities performed on a machine it becomes a step easy to inform the instructor regarding malpractice. Along with it, we want to make our application very user friendly to make it easy for teachers and students who find this online platform cumbersome to use. So that they can operate it with ease. We also know that many institutions have their platforms like Learning Management System but as with our university, it is a major issue of the server crashing constantly when the amount of log-in increases making it difficult for students to attempt their tests, quizzes, etc. The fact that these platforms are not oriented for proper evaluations. As these were like a substitute for taking assessments and small quizzes during the offline mode of teaching. But after lockdown, it became difficult for institutions to take complete evaluations as these were not able to take this amount of load. This might be the situation of every other school and college. Many small-scale institutions are denied access to these kinds of methods for evaluations. Google Forms is an alternative as it is a free platform along with google analytics, but it is not a platform developed for evaluations.

When we decided upon the project for easy creation of exams and detailed analysis for the result, we wanted to cross-check if it is even that important or we are just wasting our time.

So we wanted to survey students from different schools and colleges, as of my school from which I completed my 12th I got to know they weren’t conducting exams until the lockdown was further extended and they were not using any tools to conduct exams instead they were just sending out pdf of question paper for students to solve and students have to solve the paper and create a pdf out of it through their phones and teacher has to go through a lot of repetitive and hectic process of just sorting students out based on their respective emails and upload their marks, this can cause a lot of time wastage and the chances were that due to the huge number of mails, the few of the student's marks were uploaded wrong. Which is not the ideal case for teachers as well as the students.

Our university also proceeded the same way for few papers like Physics. But along with them, they use their learning management system for that, which was pretty good until it crashed, and to state a few examples we once gave exploration in engineering exam at least 4 times because of the crashing of the learning management system.

We contacted students from other schools and universities, most of them either promoted their students to the next session because of not proper availability of good software for exams or just gave out a bunch of pdfs to students to solve in a particular time limit e.g. one of my friend in a medical college in Lucknow simply got promoted which should not be the case for a medical student.

We even checked a few software out on the internet to better understand the market, and it was surprising to know not most but all of them were paid and difficult to work with. We checked out the “Think Exam” which was the leading one in the industry, but their charges were skyrocketing and were being used because users were left with no choice which should not be the case.

With our website, we plan to change this graph.

* 1. Proposed System

Our solution can be utilized in managing and conducting these evaluations with ease by providing the instructor with multiple options for forming questions in various ways like either by creating single or multiple choice or subjective questions along with the option of restricting students from going backward. But, by including an individual timer for different questions separately and shuffling questions which can be set by the instructor can decrease the chance of cheating between tests exponentially. We know that we cannot prevent unfair means fully, but it is a nice feature to have to reduce it to some extent. Along with it, we want to make our application very user friendly to make it easy for teachers and students who find this online platform cumbersome to use. So that they can operate it with ease. We also know that many institutions have their platforms like Learning Management System but as with our university, it is a major issue of the server crashing constantly when the amount of log-in increases making it difficult for students to attempt their tests, quizzes, etc. The fact that these platforms are not oriented for proper evaluations. As these were like a substitute for taking assessments and small quizzes during the offline mode of teaching. But after lockdown, it became difficult for institutions to take complete evaluations as these were not able to take this amount of load. This might be the situation of every other school and college. Many small-scale institutions are denied access to these kinds of methods for evaluations. Google Forms is an alternative as it is a free platform along with google analytics, but it is not a platform developed for evaluations.

* 1. Goals and Objectives

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Table 1: Goal and Objectives

|  |  |
| --- | --- |
| **#** | **Goal or Objective** |
| 1 | Make the system extensible – future updates like xxx can be done easily |
| 2 | Make the system easy to support – provide good documentation, configuration/build files, administrator’s manual |
| 3 | Make the system very easy to use – users would agree that minimal to no training is needed |
| 4 | Build a prototype that demonstrates the user interface by xx/xx/xx - in order to get early feedback from the customer/users |
| 5 | Have fun working on the project |

1. Project Planning

This section covers the details of the project planning. Selecting the lifecycle of the development, project stakeholders, resources required, assumptions made are detailed in the sections below.

* 1. Project Lifecycle

The team will use an agile approach. Our team will gather prerequisites, basics of each framework and create a high-level development plan at the onset of the project and then implement the gathered requirements as we learn things on. The team will follow a SCRUM-like approach with an emphasis on frequent meetings and collaboration.

* 1. Project Setup

Table 2: Decision Description

|  |  |
| --- | --- |
| **#** | **Decision Description** |
| 1 | Windows 10, MacOS Catalina, Git, VS-Code, JavaScript, HTML, CSS, MongoDB |
| 2 | Best coding standards will be followed (default Capstone coding standard, etc.) |
| 3 | Google authentication to be used as the only log-in procedure to avoid clustering. |
| 4 | Separate dashboards for students and teachers. |

* 1. Stakeholders

Table 3: Stakeholders

|  |  |
| --- | --- |
| **Stakeholder** | **Role** |
| Dr. Tapas Badal | Course coordinator |
| Dr. Shakti Sharma | Mentor |
| Manish Sharma | Team member |
| Shridhar Vijay Kumar | Team member |
| Ananya Kumar Gangver | Team member |

* 1. . Project Resources

Table 4: Project Resources

|  |  |  |
| --- | --- | --- |
| **Resource** | **Resource Description** | **Quantity** |
| Database Server | We are using MongoDB for fulfilling database requirements. | 1 |
| Capstone Team | Our team of students who will be the primary developers of the project. | 4 |
| Windows Workstation | Windows-10 workstation with VS-Code for developing in JS dependencies and libraries. | 1 |
| Mac Workstation | A Catalina workstation with X-Code for developing the Catalina version of the software. | 1 |
| Smartphone & PC | Any smartphone and any PC/Laptop to be used as test hardware for the web-based version of the software. | 2 |

* 1. Assumptions

Table 5: Assumptions

|  |  |
| --- | --- |
| **#** | **Assumption** |
| A1 | The capstone team and mentors will be able to meet face to face once a week and will update on the progress with respect to the milestones. |
| A2 | Team members will familiarize themselves with React.Js, MongoDB, Node.js environments along with all the run-time dependencies. |
| A3 | Regular debugging to be done to avoid last time bugs and crashes. |
| A4 | Team will have try to complete a working model to present by mid-semester |
| A5 | Testing of database and backend side server with node.js to be completed after mid-semester. |
| A6 | Major work should be completed before semester end. |
| A7 | The models developed could be extended to other forms. |

1. Project Tracking
   1. Tracking

Table 6: Tracking

|  |  |  |
| --- | --- | --- |
| **Information** | **Description** | **Link** |
| Code Storage | Project code will be stored in GitHub repository. | Link |
| Project Documents and Assignments | Weekly reports, specification and design documents, etc. will be stored in our \_\_\_\_\_\_\_\_\_ | Link |

* 1. Communication Plan

Table 7: Regularly Scheduled Meetings

|  |  |  |
| --- | --- | --- |
| Meeting Type | Frequency/Schedule | Who Attends |
| Conference Call/ MS Teams | Weekly | Project team and mentor |
| Team Meeting | Weekly | Project team |
| Short Meeting | Weekly in class | Project team |
| Sprint Review Meeting | End of each sprint | Project team and mentor |

Table 8: Information To Be Shared Within Our Group

|  |  |  |  |
| --- | --- | --- | --- |
| Who? | What Information? | When? | How? |
| Project team | Task assignments & General scrum information | Weekly | Team meetings, listing in Project Specification at any suitable platform. |

Table 9: Information to Be Provided to Other Groups

|  |  |  |  |
| --- | --- | --- | --- |
| Who? | What Information? | When? | How? |
| Course Coordinator and mentor | Final deliverables | At completion of project | Project specification doc., code, Power Point presentation and video. |
| Mentor | Weekly report | Weekly | Weekly progress, code and demonstration. |

Table 10: Information Needed From Other Groups

|  |  |  |  |
| --- | --- | --- | --- |
| Who? | What Information? | When? | How? |
| Course coordinator and mentor | Requirement changes | Start of each weekly meeting | Conference call or meeting with course coordinator and mentor. |

* 1. Deliverables

Table 11: Deliverables

|  |  |
| --- | --- |
| **#** | **Deliverable** |
| 1 | Code (GitHub repository) |
| 2 | Web application made till date |
| 3 | Final report document |
| 4 | Final artifacts (final PowerPoint presentation, 3-minute video, and final sprint) |

1. SYSTEM ANALYSIS AND DESIGN
   1. Overall Description

Primary users of our website will be students and teachers. So, we have kept the design of the User Interface as simple as possible without compromising on functionality. Giving and taking tests and assignments for both teachers and students are hassle-free. To target a larger audience, we knew to keep all functions and essential elements in an easy reach of the user while they interact with our website.

This will result in saving time of our users, hence increasing their productivity. We tried to keep the design clutter-free by using the intuitive symbols instead of unnecessary text. This helped us in achieving a clean and sober user experience overall. We also tried to adopt a uniform colour theme throughout the website which makes the feel of using a website compact and easy.

The main motive behind designing this User Interface to make a person who is new to using a phone/computer should be able to easily interact with our website and create/give assignments and tests in the easiest possible way possible without server overloading issues.

* 1. Users and Roles

Table 12: Users and Roles

|  |  |
| --- | --- |
| **User** | **Description** |
| Front-End Developer | One member of our team is solely responsible for the front end development which includes developing the whole front end design. |
| Back-end Developer | One or more member will be involved in building the backend and the functionalities of all the UI elements along with database designing and connectivity. |
| UI Designer | All team members were involved in building UI design and important decisions were taken by all regarding every small detail related to the end user experience. |

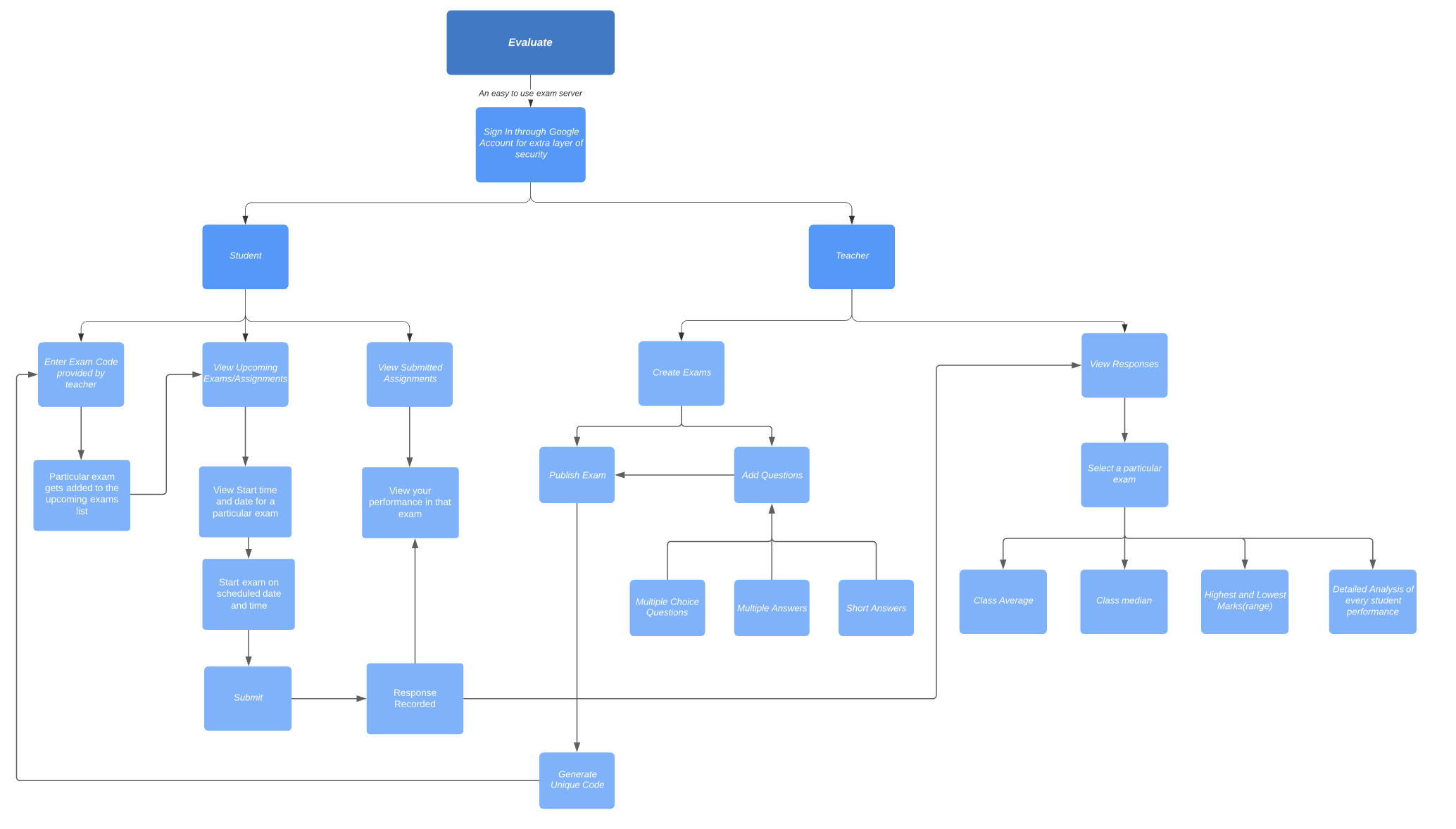
* 1. Design diagrams/ UML diagrams/ Flow Charts/ E-R diagrams
     1. Use Case Diagrams

Figure 1: Use-case diagram

* + 1. Class Diagram

Diagram

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Figure 2: Class Diagram / Data Architecture

1. User Interface
   1. UI Description

We are creating a web application for taking and giving online evaluations in an easy and clutter free manner. So, in this case UI and interaction with UI matters the most as it is the primary asset of our application. We tried to keep the color scheme, buttons size, button shape, scroll panel etc. to be uniform so that our users could have a hassle-free experience and do not have to look out for each and every option every time. Keeping the design minimalistic and aesthetic takes the user experience to a whole new level. Primary users of our website are going to be teachers and students. So, we have kept the design of the User Interface simple without compromising on functionality.

* 1. UI Mockup

Graphical user interface, text, application

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Figure 3: Welcome Page

Graphical user interface, application, Teams

Description automatically generated

**Figure 4: Student Dashboard**

**Graphical user interface, application, Teams

Description automatically generated**

**Figure 5: Teacher Dashboard**

**Graphical user interface, application, Teams

Description automatically generated**

**Figure 6: Question making/launching/editing page**

**Graphical user interface, application, Teams

Description automatically generated**

**Figure 7: Selecting type of profile after login page**

1. Project Closure

This section elucidates the overall lookup at the project and some of the future works that may enhance the solution.

* 1. Goals / Vision

Our aim was to develop a platform which is user-friendly and transforms the way of taking quizzes, assignments, tests etc. for anyone new to technology.

* 1. Delivered Solution

To tackle this problem our team produced the idea of creating a uniform platform where taking and giving online evaluations should not be a hassle anymore.

Here comes “Evaluate – Online Evaluations made simple”. As the title of our platform portrays, this platform is optimized solely for conducting online evaluations. It is possible due to its easy-to-use User Interface which is minimalistic, clutter-free and anyone can master the functionalities in seconds.

* 1. Remaining Work

1. To improve bandwidth issues in order to support multiple online users at a single time without any server crashing.

2. To include separate timer for separate questions in order to reduce cheating issues amongst students.

3. To include separate settings for every single quiz/assignment/test.

4. Generation of a unique code every time a teacher launches a quiz/test so the students can easily enroll into the quiz/test.

5. Make it optimized for every platform.

6. AI enabled supervision on students through camera in real time.

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