

# **Interim Report of Online Examination System**

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## **1. Introduction:**

In this world, the outcomes of several tests are used to carry out anything that must be upgraded. Whether testing software, programs, or people. This application is built around that idea. To be specific, the application's main idea is to skill test individuals at any level under the corresponding problem sets assigned by the teacher. This program can be used to completely replace the outdated and conventional method of conducting and attending exams. Since technology has recently taken over the world. Everything appears to be improving over time, from food delivery to consumers' homes to financial sectors with online payment systems. The same educational system and the way it is managed appear to be trailing despite the daily advancement of technology. Why can't the educational sector employ the most advanced technology but sensitive industries like banking and medicine can?

People who have received an education in a field are better equipped to think, feel, and act in ways that promote success and increase both their own and their community's degree of happiness (Al-Shuaibi, 2014).

The online testing system is presently viewed as a quickly developing examination approach because of its accuracy and pace. Additionally, fewer employees are needed to run the exam. Due to the reduction in student exam time, practically all businesses now administer tests using online testing platforms. Organizations can also easily monitor the progress of the student they give a test. The calculation of the outcome is quicker as a result. It also helps to lessen the need for paper (Muna R. Hameed, 2017).

In China, education in basic computer operating skills has been widely adopted. The skills encompass those needed to use Windows, Microsoft Office, networking, etc. an electronic government foundation integrated with a range of courses. Today, all undergraduate students must pass the Computer Skills course, and the corresponding Computer Operating Exams are prerequisites for all city officials. Additionally, high schools are now implementing fundamental computer education. Since the late 1990s, thousands of people in Zhejiang Province have taken part in various levels of computer

education and testing. A Web-based learning and testing system must be created to successfully handle the issue of mass learning and evaluation of fundamental computer education (Yuan Zhenming, 2003).

## **1.1. Problem scenario:**

Considering how little time and effort is required to examine exam papers and produce results reports, online examination systems are very helpful to educational institutions for exam preparation. It is simpler for educational institutions to monitor students' progress when they use online tests. The Scholastic Institute and training facilities employ this strategy most effectively since it makes it easier to manage the tests and efficiently get results. Up until recently, exam and result preparation were done manually, which required more time to complete (Muna R. Hameed, 2017).

The drawbacks examining the traditional way through the paper-based are discussed below.

- i) Administration of evaluations using paper requires a lot of time. It can take many months to complete the cycle of administering the forms, collecting, and analysing the data, disseminating the results, and acting on the feedback (Explorance, 2013).
- ii) The high expense of paper-based testing or evaluation is one of the main issues. The procedure, which includes printing the problem sets, giving out answer sheets to the participants, and paying the paper checker, ends in a bloated and pointless expenditure of money.
- iii) Method for gathering data. When everything is kept in a paper file and packed up, it is challenging to view and reuse the same record in the future.
- iv) Due to the exam papers' inflexible layout, there is less flexibility in the procedure. If the questions have errors, the document must be updated. Furthermore, it prohibits altering the questions.
- v) A response that needs human effort or has low confidence (for example, handwriting that is impossible to read, is invalid, or is not valid based on the established norms) must be reviewed. (pappersurvey, 2021).
- vi) A huge quantity of paper is used while giving tests on paper. Because of this, trees are needlessly taken down for paper.

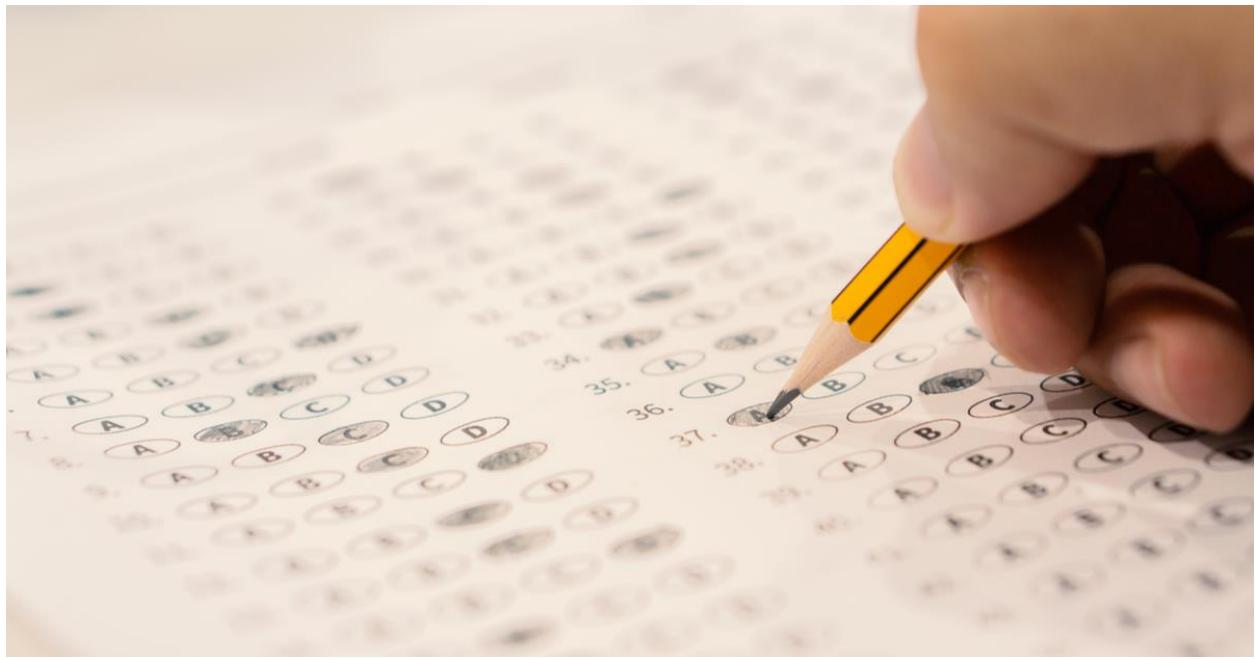


Figure 1 Paper-based evaluation (Gomes, 2020)

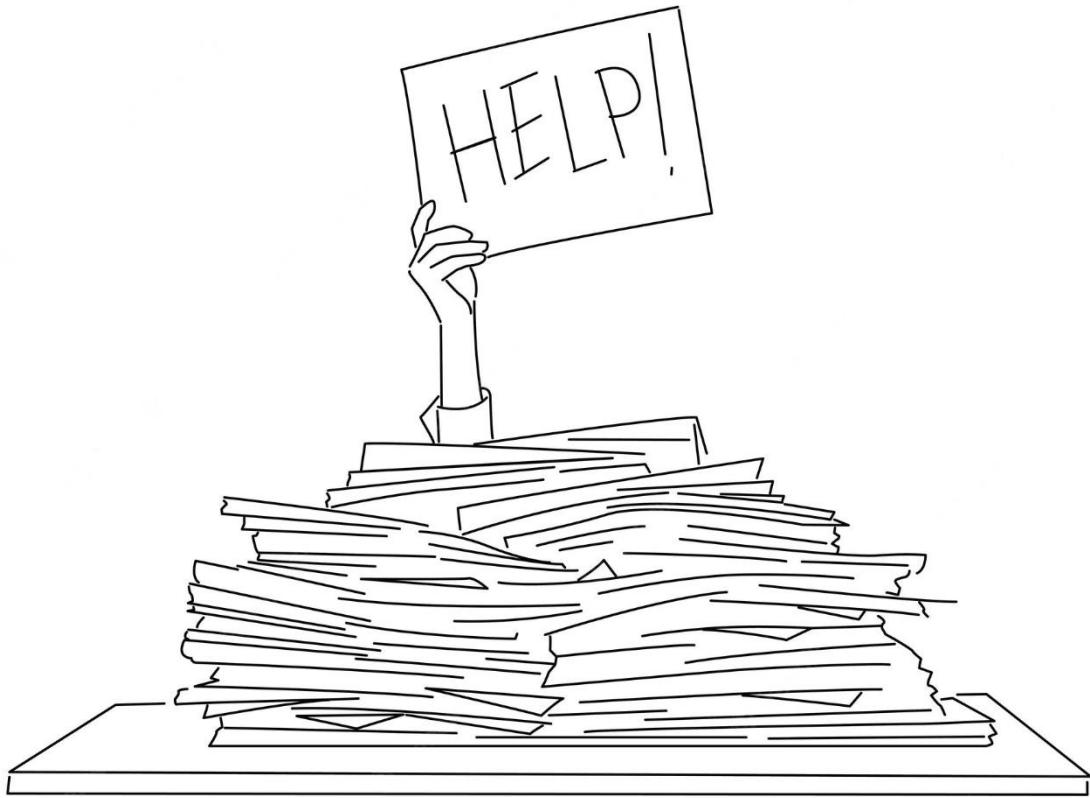


Figure 2 Pile of papers (user4541274, n.d.)

## 1.2. Problem Solution:



*Figure 3 Scholar as a solution (The application itself)*

- i) As a solution to the problem, using the mode of technology that allows the eradication of the use of paper-based evaluation and examination is the best option. This application provides an easy user interface for all the participating members.
- ii) Not only conducting and attending the evaluation process. The results will also be stated for each individual and will also be recorded for future purposes.
- iii) As all the information or the records are being stored in a database, it makes it a lot safer, more manageable, and easier to handle the data properly.
- iv) This application boosts the efficiency of work by properly utilizing the amount of force and reducing the time consumed.
- v) With less paper being used and discarded during paper-based testing, fewer trees will need to be cut down, which will help preserve the environment.
- vi) The cost of using and distributing materials to conduct an exam is also reduced by this application.
- vii) It resolves issues with poor and atrocious handwriting and correct or incorrect responses depending on predetermined standards.

- viii) This application is a suitable step to ensure that technology is used in education, enabling it to advance and improve institutional sectors.
- ix) The technology makes it far simpler to correct issues with printing mistakes and last-minute alterations than paper-based testing. When conducting critical reviews and examinations, this is quite beneficial.

### **1.3. Aims and objectives:**

#### **1.3.1. Aim:**

The product aims to provide the enterprise with a system that allows replacing various evaluations and examinations that have been taken on a paper basis in the past. The product also allows them to store the record and the information of their participants and students and use that data for further purposes.

#### **1.3.2. Objectives:**

The objectives to achieve the aim are listed below:

- i) To understand the working mechanism of a web application and learn to express the product through it.
- ii) To research the features to be added to the application to make it fully useful.
- iii) To research the tools, ide, and different software to enhance the application itself.
- iv) To work with the data using the most appropriate database for better security and functionality of the product.
- v) To learn and implement API to leverage the existing code on the different ends of the application (front end and back end).
- vi) To provide a fast, efficient, secure, and trustable application to conduct and attend evaluation tests or examinations.
- vii) To design the application to be user-friendly in every context.

## **1.4. Report structure:**

### **1.4.1. Introduction:**

The introduction to the project discusses the project's purpose. It conveys more information about the project's general concept than it does about the mandatory procedural requirements. Both the problem's context and its solution are covered. The project's goals and objectives are also emphasized.

### **1.4.2. Background study:**

Background research is a fundamental component of the project. It not only provides a quick synopsis but also goes into detail on each project component. It contains the information required concerning the project as well as a description of the approach that was used in the project.

### **1.4.3. Development to date:**

This section covers the amount of work completed to the date of this project report. It includes the prototype (UI/UX), wireframe, UML diagrams, and survey. Progress details are discussed in detail in this sector.

### **1.4.4. Analysis of progress:**

It keeps track of the work done to date and provides analysis of the progress and determines the workflow of the project.

#### **1.4.5. Future work:**

This sector highlights the further work to be done for the completion of the project.

#### **1.4.6. References or bibliography:**

This sector includes the sources from which lines, images, and paragraphs have been taken as a reference as content in the report.

#### **1.4.7. Appendix:**

The appendix in **this report** consists of the content matter that couldn't be adjusted in the main section of the report itself due to the word limit. It also includes additional information on subject matter.

## **2. Background:**

### **2.1. Background of the project:**

The extraordinary evolution of the educational system over time has been greatly aided by technological advancement. Teachers can now easily track student achievement while also improving the learning environment thanks to learning management systems and smart classrooms (Admin, 2022).

The implementation of the online exam system significantly improved the previous evaluation strategy. Due to complete automation, the review process is today thorough, precise, and speedy. Along with making life easier for educators and teachers, this technological advancement has benefited students and test-takers (Admin, 2022).

### **What exactly is an online examination system?**

The complete schedule of an online test, including all its components and features, is referred to as the examination system. Online exam software is used by the online examination system to create, conduct, and evaluate tests. A variety of benefits come with this kind of testing technique. Some of these include the fact that it does away with the necessity for paper for the question-and-answer sheets and any form of manual work that would be excessive for an offline test (Admin, 2022).

### **Background on the working mechanism of the online examination system:**

- a) Creation of test: A useful and compelling online test can be created by the administrator using a range of features. With the variety of question types provided by the online test development platform, a subjective, objective, or MCQ-style test can be easily created (Admin, 2022).
- b) Conducting tests: Conducting a test on a big scale is not a challenge with online tests. Online exam software can accommodate many students at once. Many candidates can

be tested effectively owing to the "candidate management" capability. It enables the test-taker to classify the candidates into the appropriate groups and, during the test, assign various tests to each group, conducting several tests at once. In addition, the students are divided into groups according to their grades or class (Admin, 2022).

c) Evaluation of test: The last and most important parts of any test are its result, report, and feedback. The full report system provided by the online test method is both immediate and incredibly accurate. The software may instantly score the test paper following marks assigned by the exam's creator. Following the test, a report is created with scores for each subject, section, and question (Admin, 2022).

## 2.2. Expected outcomes and deliverables:

[Expected outcomes and deliverables \(Appendix section\)](#)

## 2.3. System architecture:

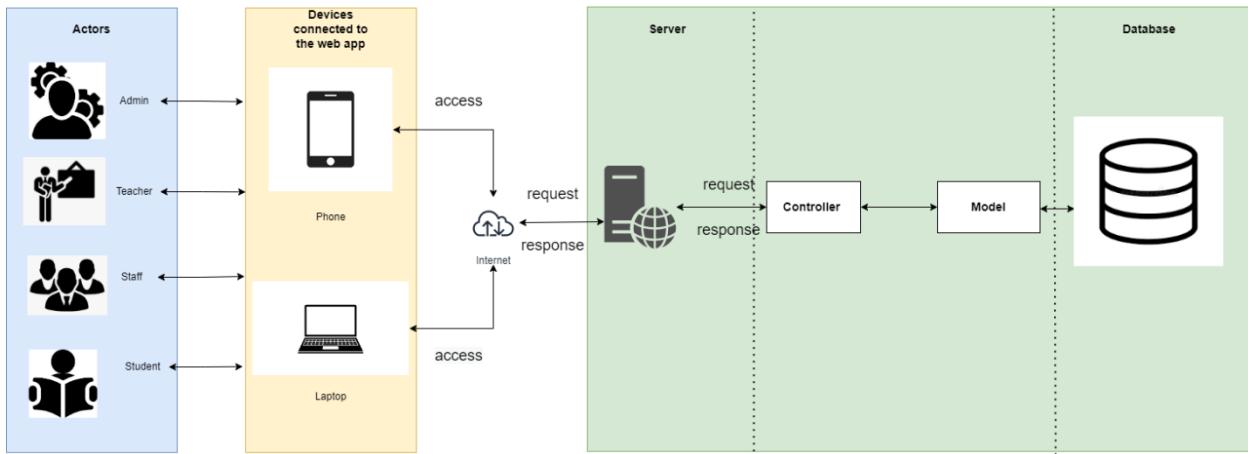
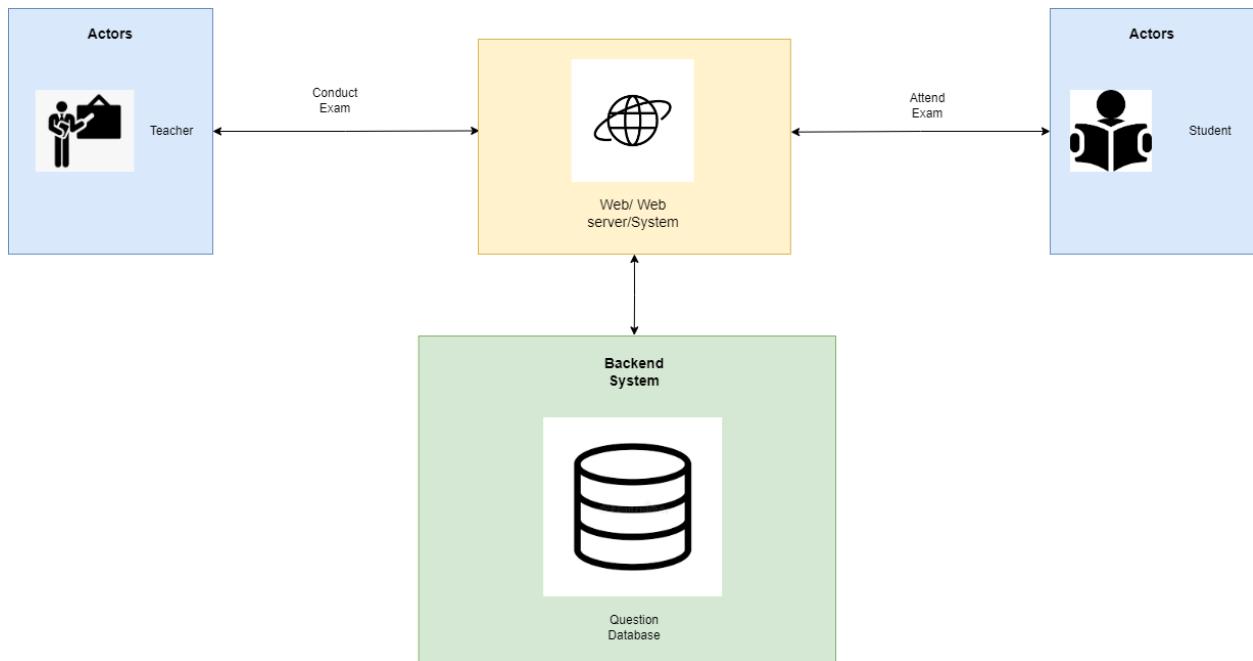


Figure 4 Main system architecture

The actors use the web application from their respective devices which are connected to the internet. The server manages the requests and responses from the system. The controller follows, where it manages the incoming requests as well as the view and database by using the model.

The browser first sends a request to the Controller. The Controller then exchanges data with the Model via communication. To render the data, the Controller next engages with the View. To the View, the information's presentation is what matters; the final presentation is irrelevant. It will be an HTML file that dynamically renders data based on input from the Controller. The Controller will then receive the View's final presentation and communicate the data to the user output (Kumar, 2021).



*Figure 5 System architecture for examination*

This a basic system architecture for examination where the teacher conducts an exam which is requested by the student. The server manages requests and responses from both actors accordingly. The web server returns responses for the asked pages from the web application asked by the student.

## **2.4. Applications used:**

[Explanation of applications used \(Appendix section\):](#)

### **2.4.1. Programming language:**

- i) Python:
- ii) JavaScript:

### **2.4.2 Framework:**

- i) Django (Backend framework):
- ii) React (Frontend framework):

### **2.4.3. Database:**

- i) PostgreSQL:

### **2.4.4. API:**

- i) Django Rest Framework:

## 2.5. Similar projects:

### 2.5.1. Speed Exam:

In contrast to other platforms, SpeedExam provides a straightforward and logical process for building tests; users are not forced to build tests and add questions concurrently. The user can upload questions to create their question bank from which they can create tests as needed by uploading them here. The user can reuse their queries and might be able to provide their material more effectively (Exam, n.d.).

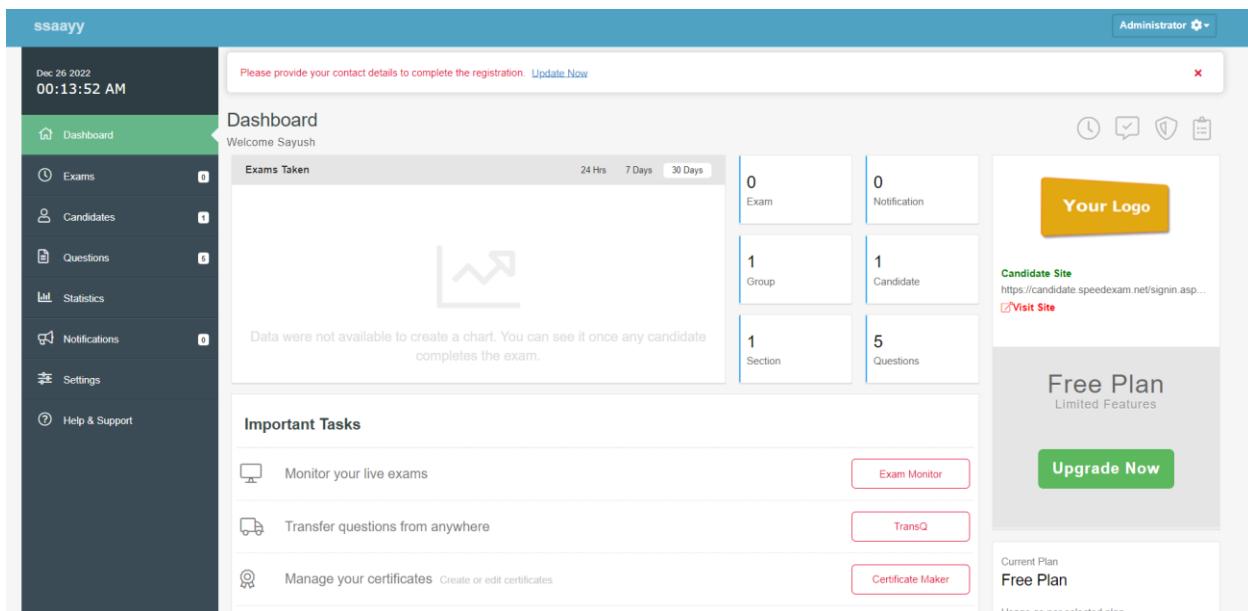


Figure 6 Speed Exam dashboard

Figure 7 Speed Exam create a new exam

	Candidate Name	Group	Username	Action
<input type="checkbox"/>	100	Sayush Khadka	Default	<a href="#">sayushkhadka77@gmail.com</a>

Figure 8 Speed Exam candidates list

The screenshot shows the 'Add New Question' page within the Speed Exam application. The left sidebar displays the user's name 'ssaayy' and various navigation options: Dashboard, Exams (0), Candidates (1), Questions (6), Statistics, Notifications (0), Settings, Help & Support, and a date/time stamp 'Dec 26 2022 00:16:16 AM'. The main content area is titled 'Add New Question' and includes fields for 'Question Type' (set to 'Multiple Choice (Radiobutton)'), 'Section' (set to 'Select Section'), and a 'Question' editor. Below these are four answer boxes labeled A, B, C, and D, each with a radio button and a set of rich text editing icons. A 'Remove' link is located at the bottom of each answer section. To the right of the main form is a 'Related Tasks' sidebar with links for 'Copy & Paste Questions', 'Import Questions', 'Export Data', and 'Question Feedback'. A 'TransQ' feature box is also present.

Figure 9 Speed Exam add new question

## 2.5.2. Eklavvy:

Academics, professors, instructors, and even commercial organizations were consulted during the development of the Eklavvy platform. To increase the validity, precision, and scalability of academic tests and hiring evaluation procedures, Eklavvy is a simple Plug-and-Play SaaS platform. It might become tedious and exhausting to conduct each interview and examination by hand for institutions or larger organizations (Eklavvy, n.d.).

The system is accessible to everybody with a basic digital device because it has been designed to be both simple to use and incredibly effective at handling enormous workloads. A number of assessments have been taken using the Eklavvy platform all around the world. They may confidently assert that our features and services are unmatched in the domains of proctoring and digital exams (Eklavvy, n.d.).

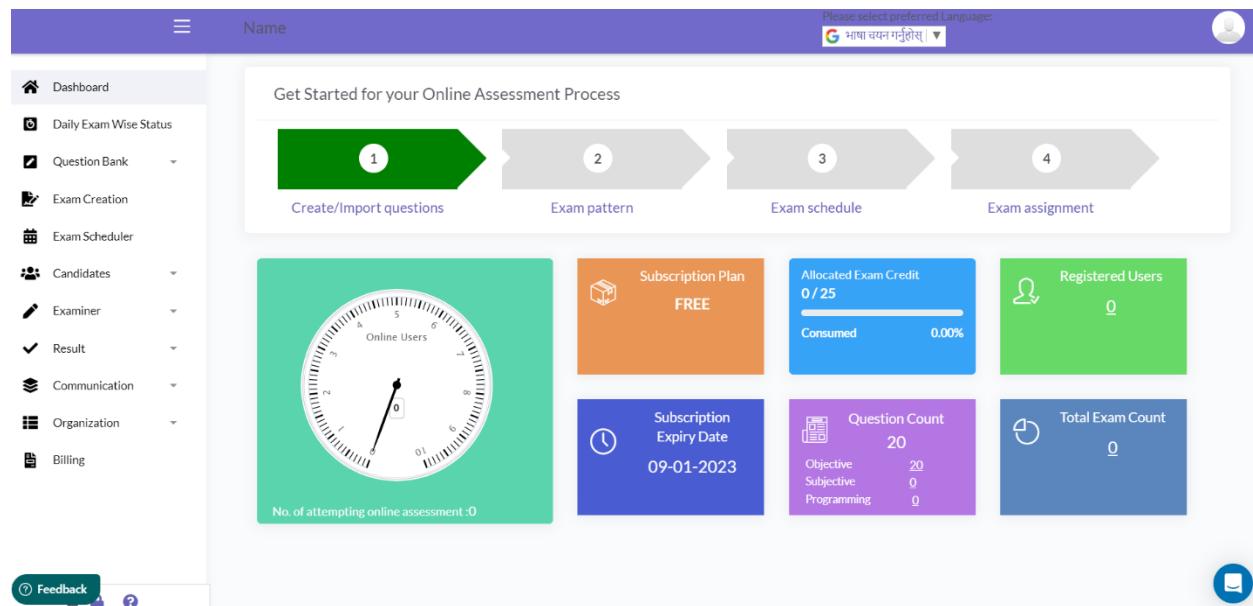


Figure 10 Eklavvy dashboard

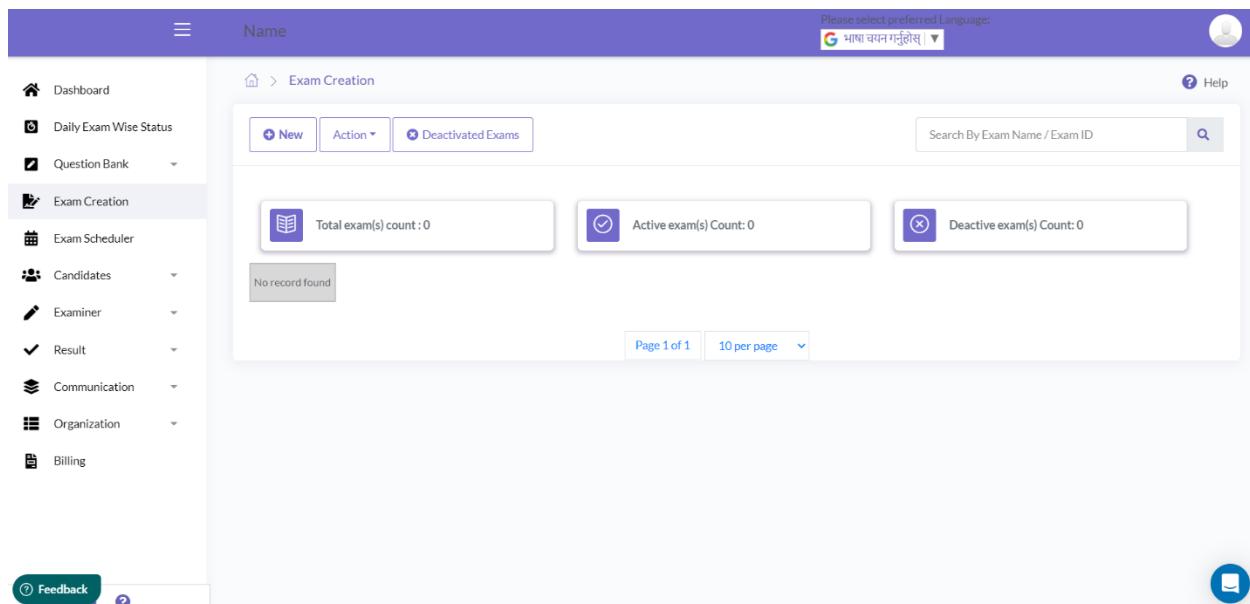


Figure 11 Eklavya exam creation

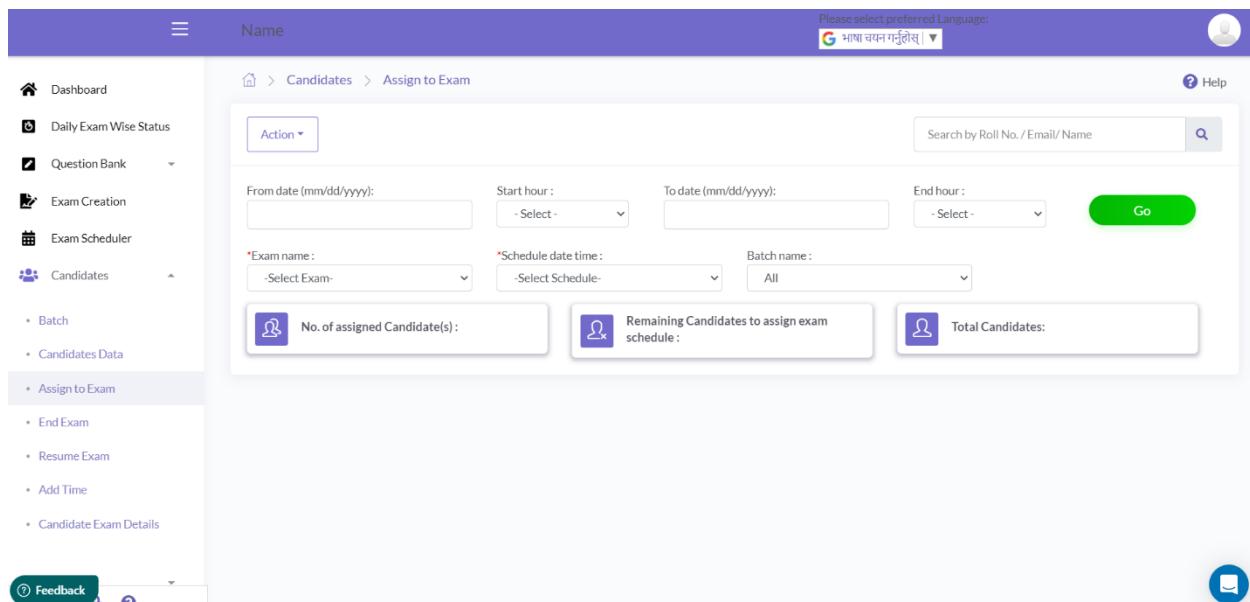


Figure 12 Eklavya assign to exam

The screenshot shows the 'Candidate Result' section of the Eklavvy application. The left sidebar includes 'Dashboard', 'Daily Exam Wise Status', 'Question Bank', 'Exam Creation', 'Exam Scheduler', 'Candidates', 'Examiner', and 'Result' (selected). Under 'Result', there are 'Candidate Result' (selected), 'Exam Analytics', 'Subjective Exam Analytics', and 'Edit Certificate'. The top right has a language selection 'Please select preferred Language: भाषा वरपन गम्भीर' and a help icon. The main area shows search fields for 'From date (mm/dd/yyyy)', 'Start hour', 'To date (mm/dd/yyyy)', 'End hour', and dropdowns for 'Exam', 'Schedule date time', 'Batch', and 'Fraud suspected?'. A button labeled 'Go' is at the bottom right. A box displays 'All assigned candidate count: 0'.

Figure 13 Eklavvy candidate results

The screenshot shows the 'Assign Examiner' section of the Eklavvy application. The left sidebar includes 'Dashboard', 'Daily Exam Wise Status', 'Question Bank', 'Exam Creation', 'Exam Scheduler', 'Candidates', 'Examiner' (selected), 'Examiner Dashboard', and 'Assign to Examiner' (selected). The top right has a language selection 'Please select preferred Language: भाषा वरपन गम्भीर' and a help icon. The main area shows search fields for 'From date (mm/dd/yyyy)', 'Start hour', 'To date (mm/dd/yyyy)', 'End hour', and dropdowns for 'Exam name', 'Schedule date time', 'Batch name', 'Select Subject', and 'Select Topic'. A button labeled 'Go' is at the bottom right. A box displays 'Total No of Candidate(s):'.

Figure 14 Eklavvy assign examiner

### 2.5.3. Class Marker:

Since 2006, companies and academic institutions have utilized ClassMarker to create, administer, and grade their online quizzes and tests. This online testing method offers immediate test results for both the exam administrator and the test takers. Big companies, academic institutions, and individual instructors can benefit from ClassMarker, an online testing service provider with an easy-to-use quiz interface (ClassMarker, n.d.).

The premium-hosted online testing solution, which is easy to use across all widely used web browsers and satisfies all assessment requirements, is the greatest alternative for online testing (ClassMarker, n.d.).

The screenshot shows the ClassMarker dashboard. At the top, there is a navigation bar with links for Dashboard, Tests, Links, Groups, Help, My Account, and Logout. The Dashboard link is highlighted. Below the navigation bar, the page title is "Dashboard". A green header box displays a welcome message: "Welcome to ClassMarker", "You have successfully registered!", "To get started, go to your email and click the Verification link we just sent to you at: sayushkhadka777@gmail.com", and "Remember to check your SPAM folders.". Below this, there are two tabs: "Overview" (which is active) and "Latest results". The main content area has a section titled "Welcome to your Dashboard" with the text: "The dashboard will display relevant information when you start creating Tests and receive results, such as last tests taken, tests in progress, etc.". It also includes a "Get started with ClassMarker:" section with a button labeled "Create a Test". To the right, there are "Shortcuts" for "Create a Test" and "Assign a Test", and an "Activity" section with a "Download recent activity" link.

Figure 15 Class Marker dashboard

**ClassMarker** 

Hi Sayush | Upgrade | Logout

Dashboard Tests Links Groups Help My Account 

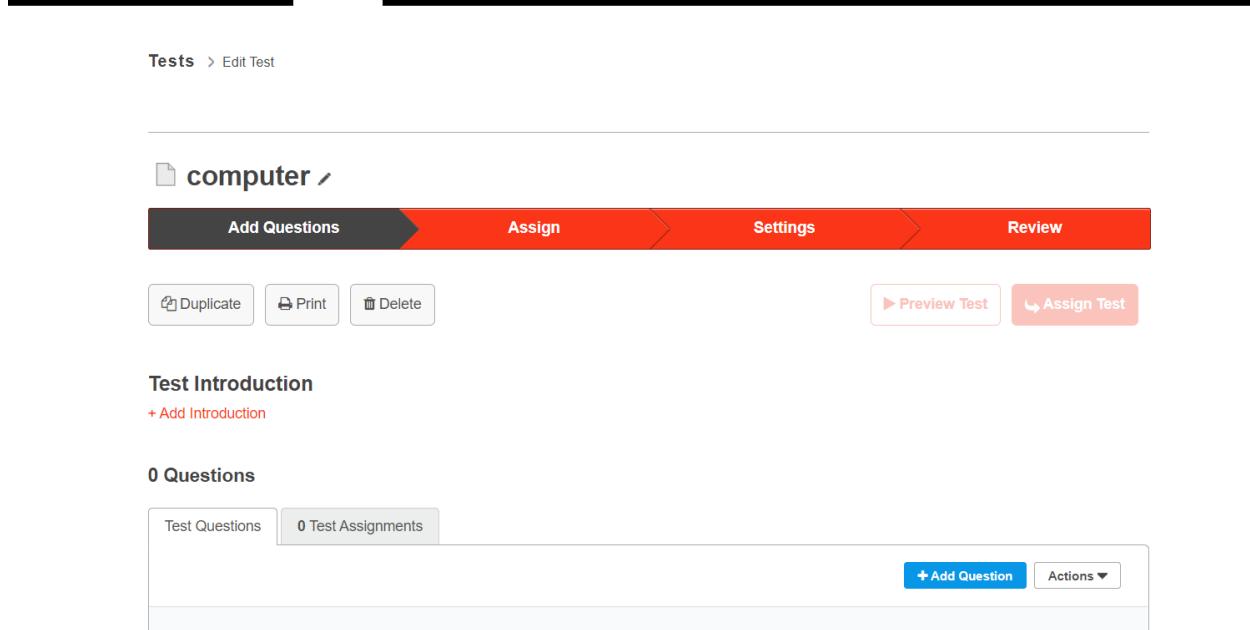


Figure 16 Class Marker create test

**Question**

(A)  This answer option is correct

**Instructions**

- Question Examples and Guides
- Copy & Paste Symbols
- Learn how to write great Tests

**Answers** 

(A)  This answer option is correct

(B)  This answer option is correct

(C)  This answer option is correct

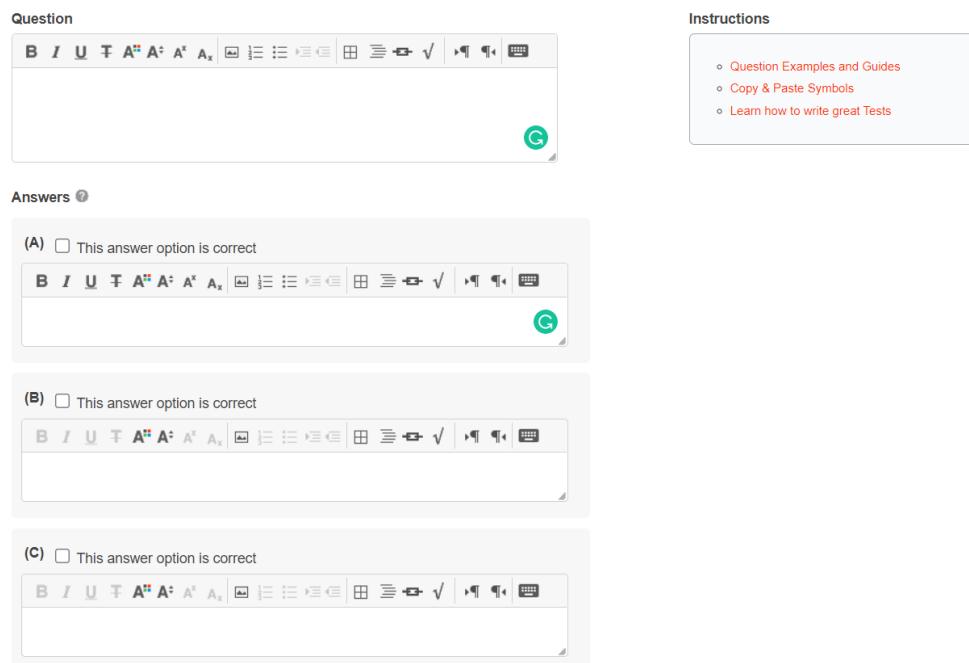


Figure 17 Class Marker set questions

## 2.6. Comparison of the projects:

S.no	Features	Scholar (My project)	Speed Exam	Eklavya	Class Marker
1.	Register	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2.	Login	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3.	Post Notice	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	View Notice	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Assign Staff	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Conduct Exam	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7.	Take Exam	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8.	Generate Report	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
9.	View Report	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
10.	Student credentials are provided through email	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	Billing	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

12.	Notification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	Feedback chat app	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
14.	Friendly User Interface	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Table 1 Comparison of the projects

### **3. Development to date:**

#### **3.1. SRS document (Software Requirements Specification):**

[SRS Document \(Appendix Section\)](#)

#### **3.2. Methodology:**

##### **3.2.1. Considered methodologies:**

- i) Waterfall methodology
- ii) Agile methodology
- iii) Rational Unified Process (RUP)
- iv) Prototyping Model (Evolutionary Prototyping)

[Explanation of the considered methodologies \(Appendix Section\):](#)

##### **3.2.2. Selected methodology:**

##### **Prototyping Model (Evolutionary Prototyping):**

[Selected methodology \(Appendix section \(Evolutionary Prototyping\)\):](#)

### **3.3. Survey:**

[Survey \(Appendix section\):](#)

### 3.4. Wireframes:

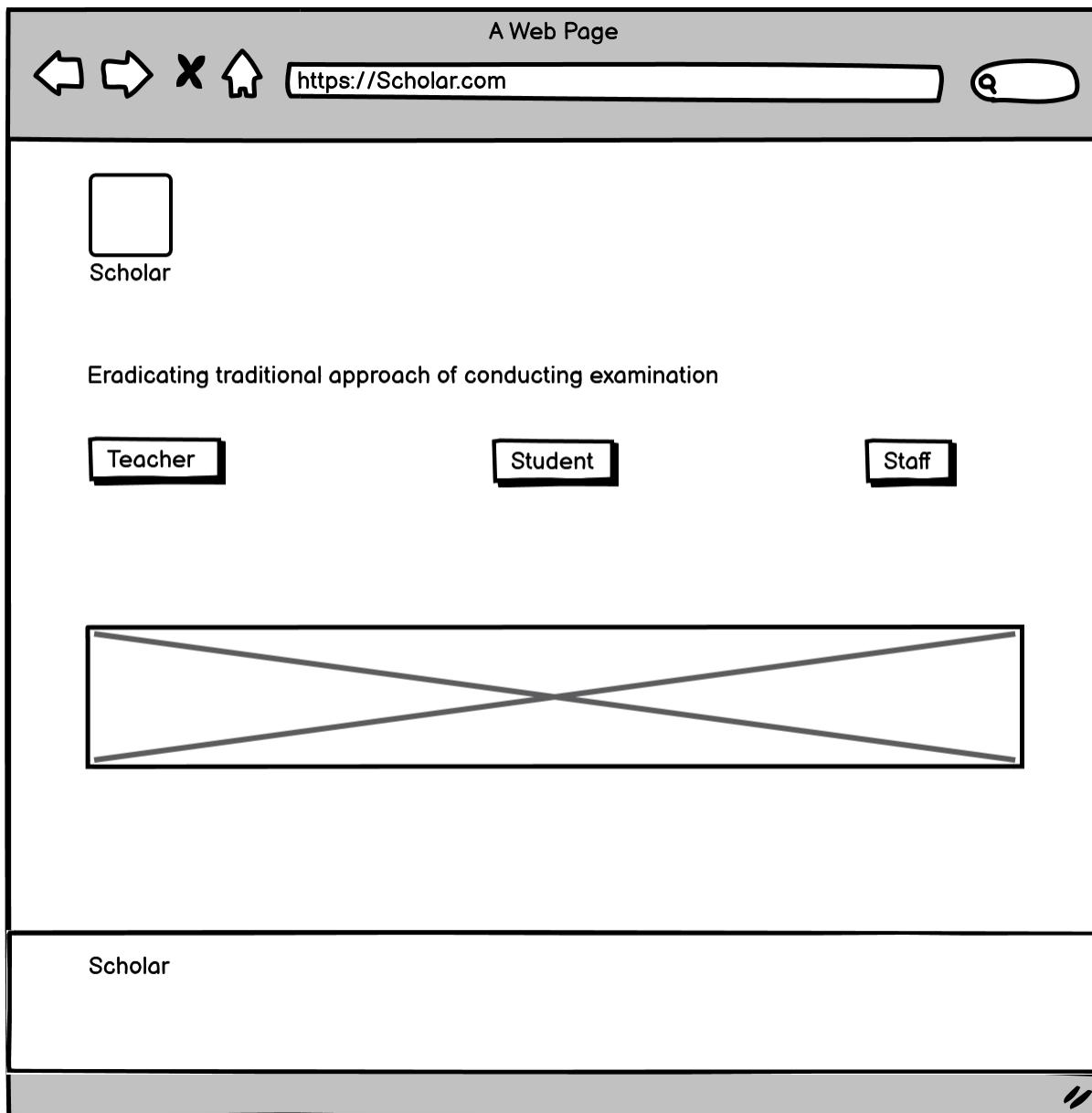


Figure 18 Home page (Wireframe)

A Web Page

https://student-registration

Scholar

Student Registration

First Name \_\_\_\_\_

Last Name \_\_\_\_\_

Username \_\_\_\_\_

Email \_\_\_\_\_

Password \_\_\_\_\_

Password Confirmation \_\_\_\_\_

Student ▾

Subjects ▾

Class ▾

Register

Figure 19 Student Registration (Wireframe)

A Web Page

https://staff-registration

Scholar

Staff Registration

First Name

Username

Password

Student ▾

Last Name

Email

Password Confirmation

Position ▾

Register

Figure 20 Staff Registration (Wireframe)

A Web Page

https://teacher-registration

Scholar

Teacher Registration

First Name \_\_\_\_\_

Last Name \_\_\_\_\_

Username \_\_\_\_\_

Email \_\_\_\_\_

Password \_\_\_\_\_

Password Confirmation \_\_\_\_\_

Student ▾

Subjects ▾

Class ▾

Register

Figure 21 Teacher Registration (Wireframe)

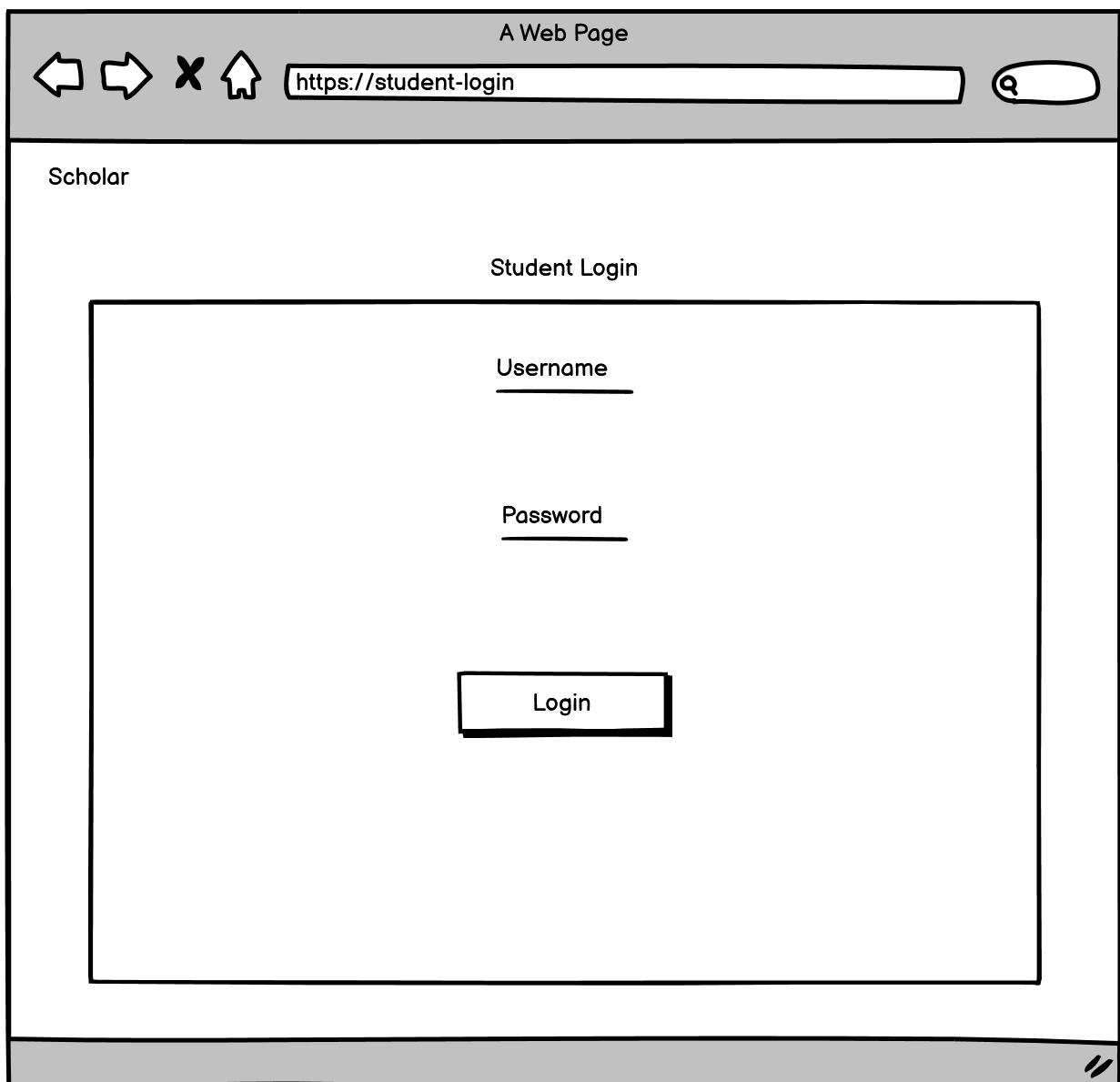


Figure 22 Student Login (Wireframe)

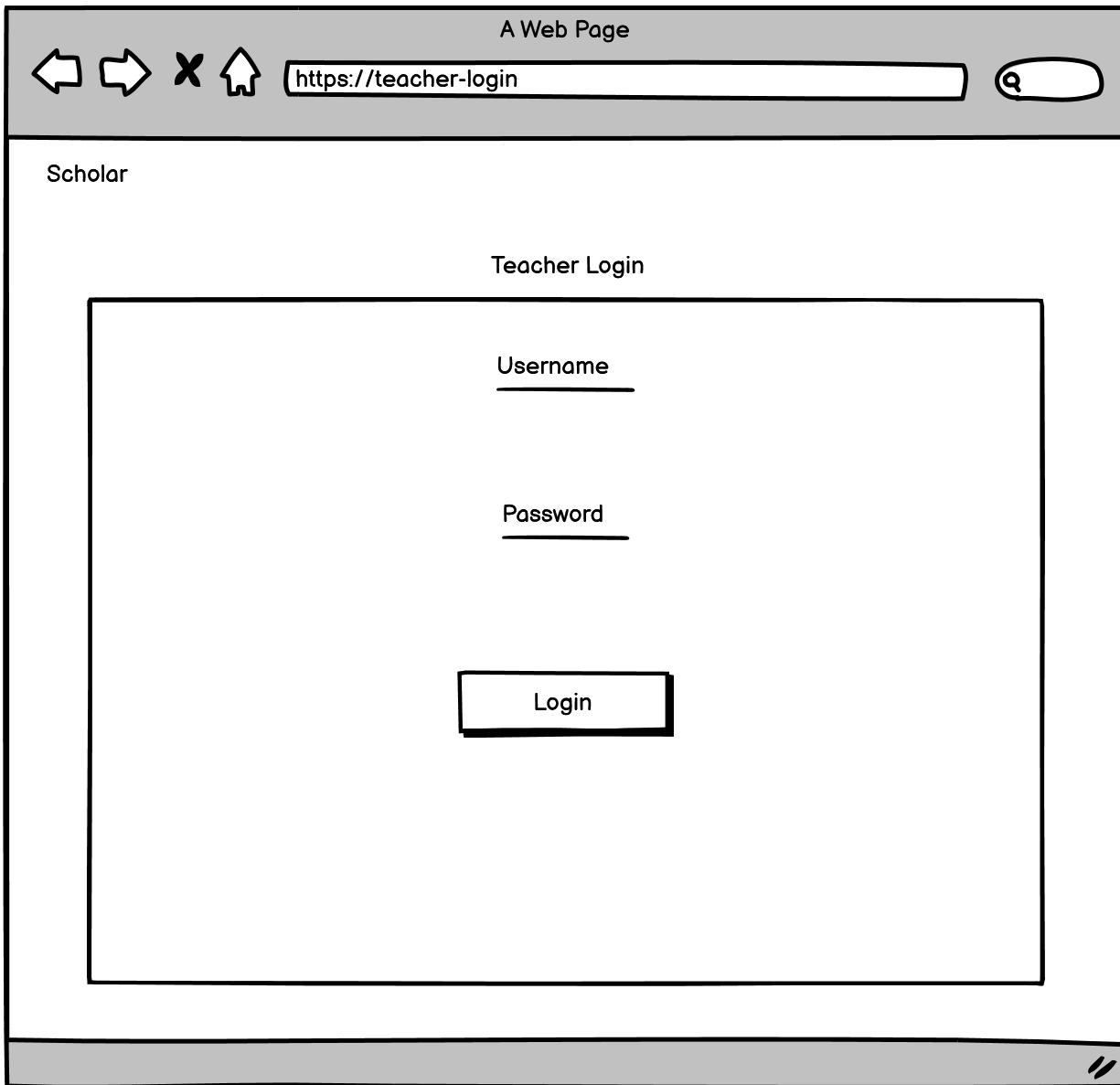


Figure 23 Teacher Login (Wireframe)

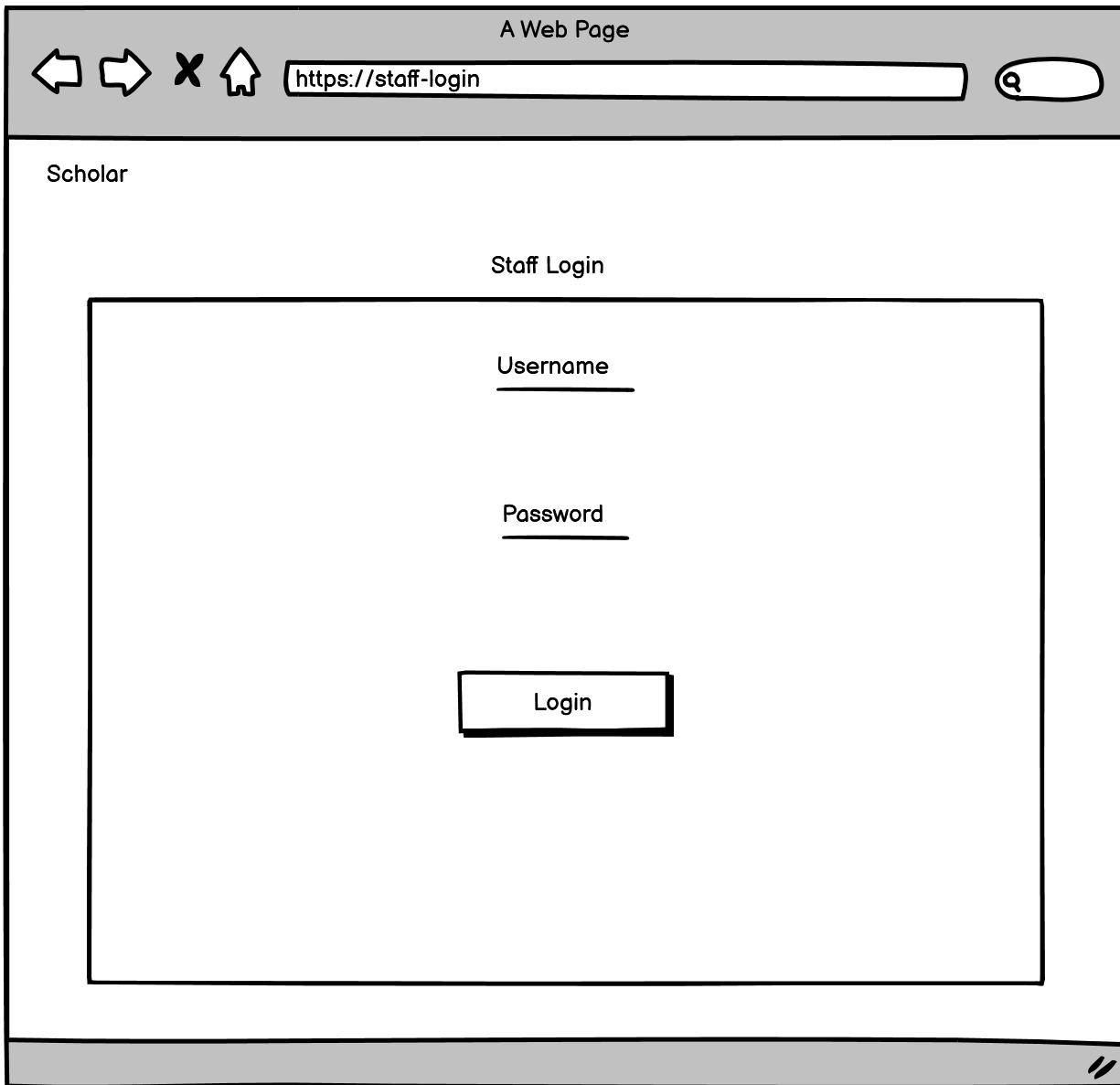


Figure 24 Staff Login (Wireframe)

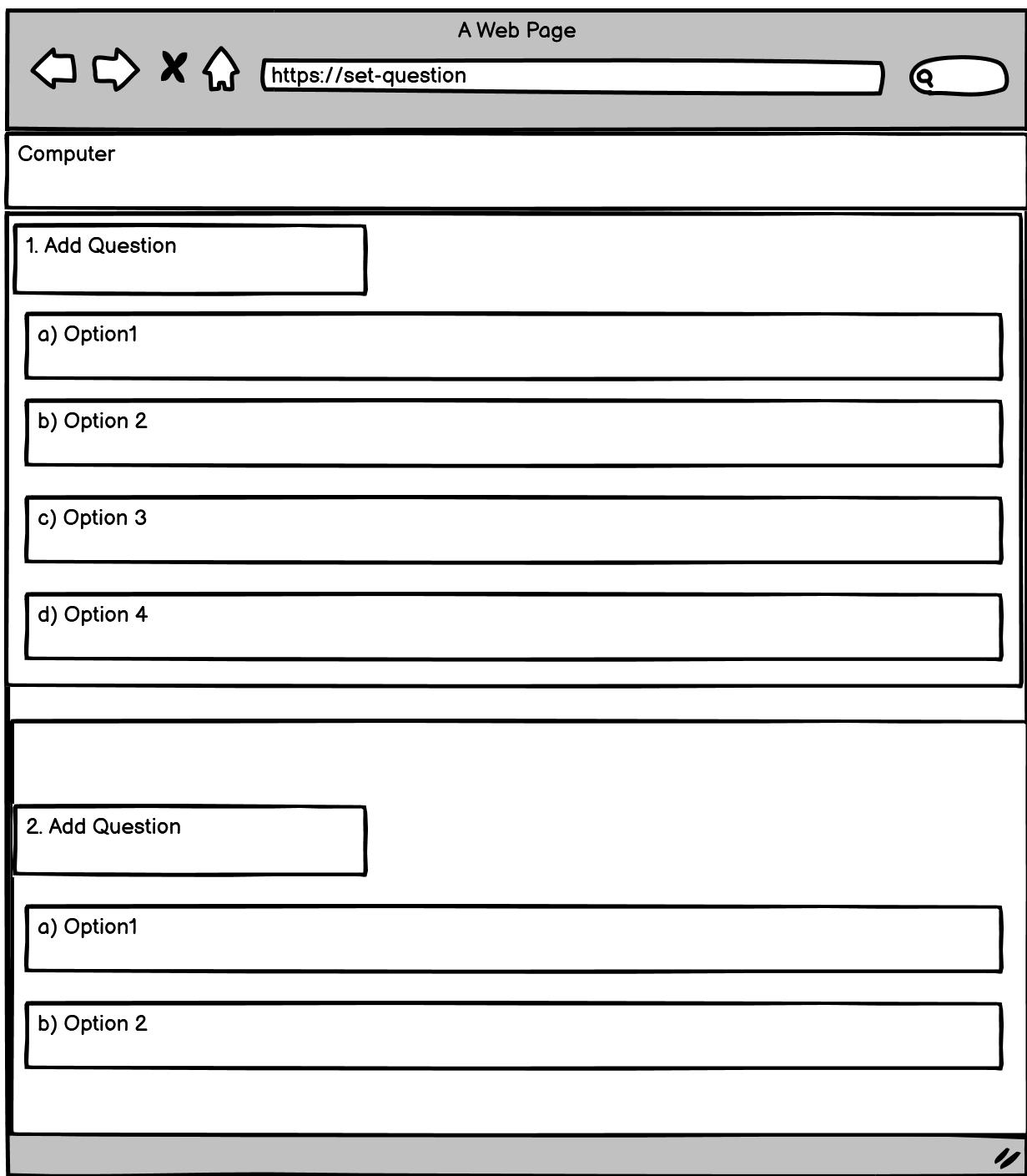


Figure 25 Set questions (Wireframe)

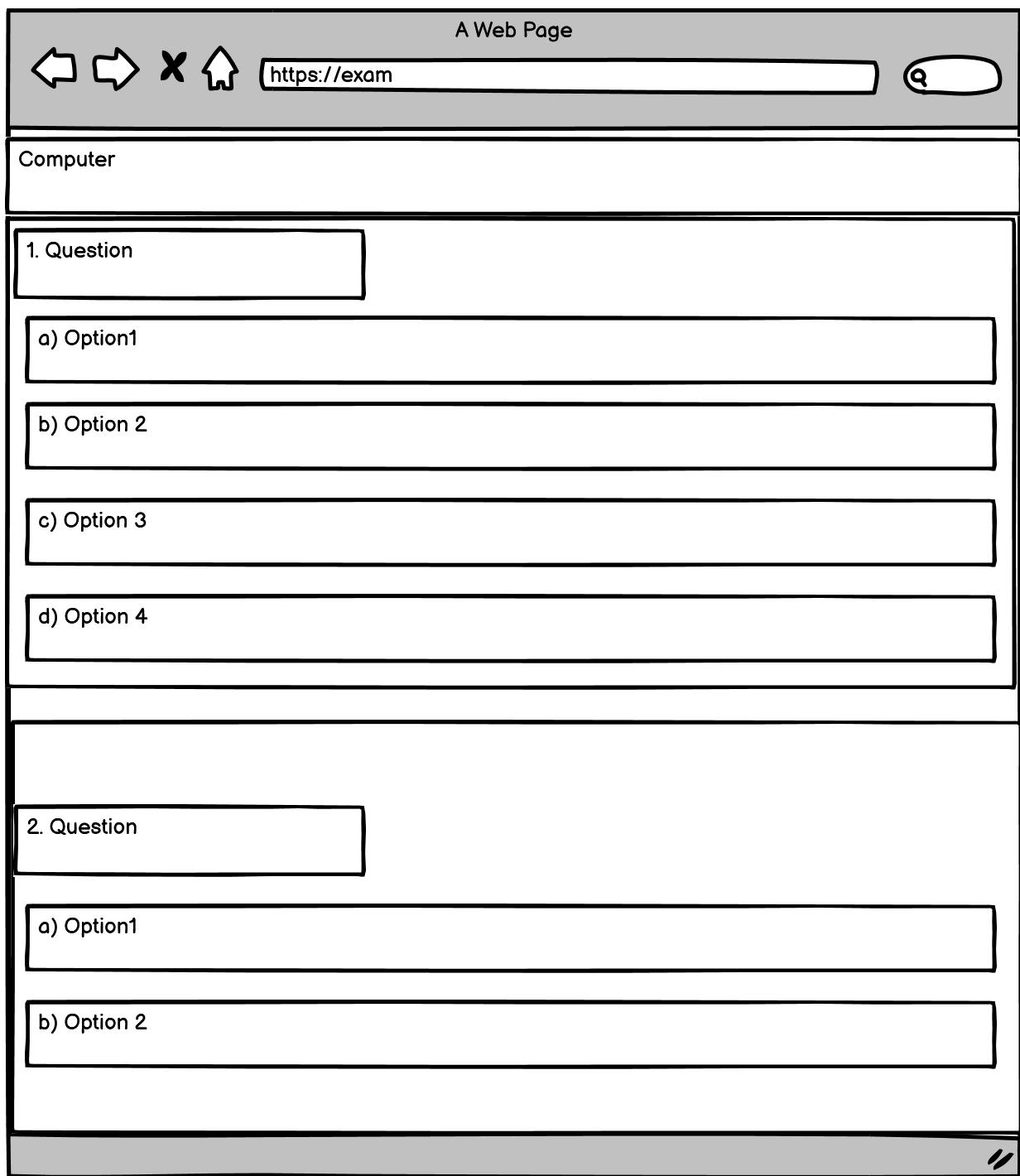


Figure 26 Take the exam (Wireframe)

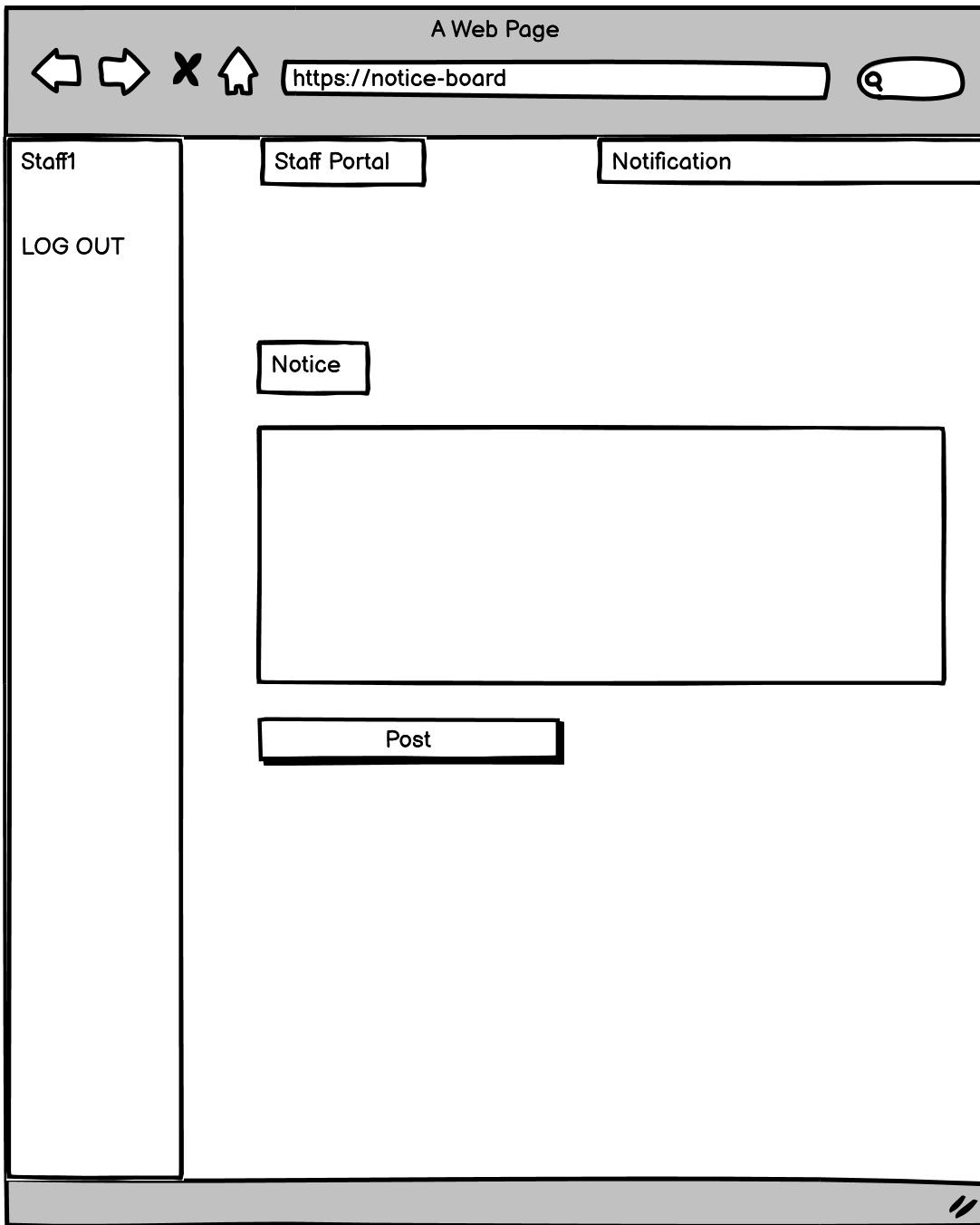


Figure 27 Notice Board (Wireframe)

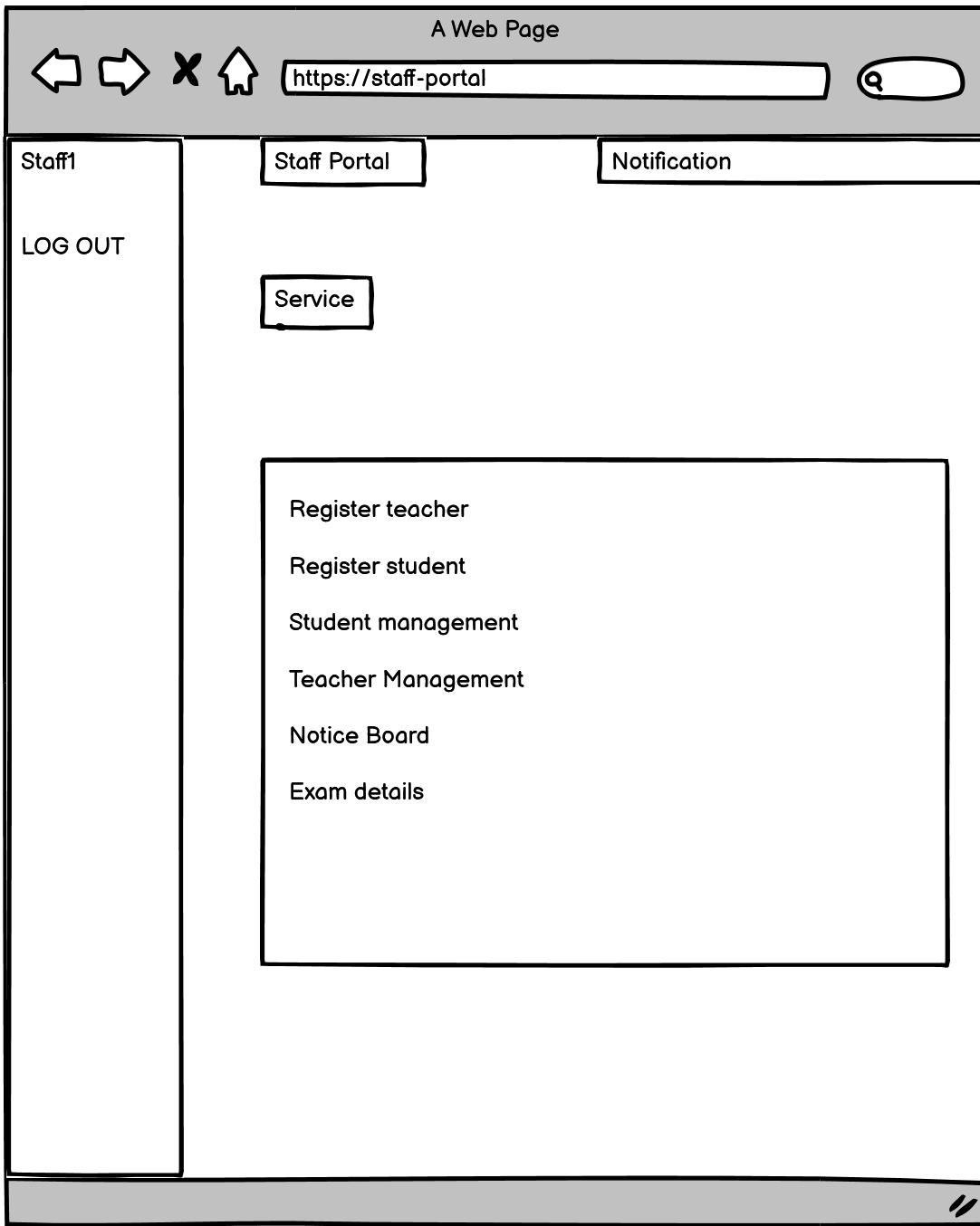


Figure 28 Staff portal (Wireframe)

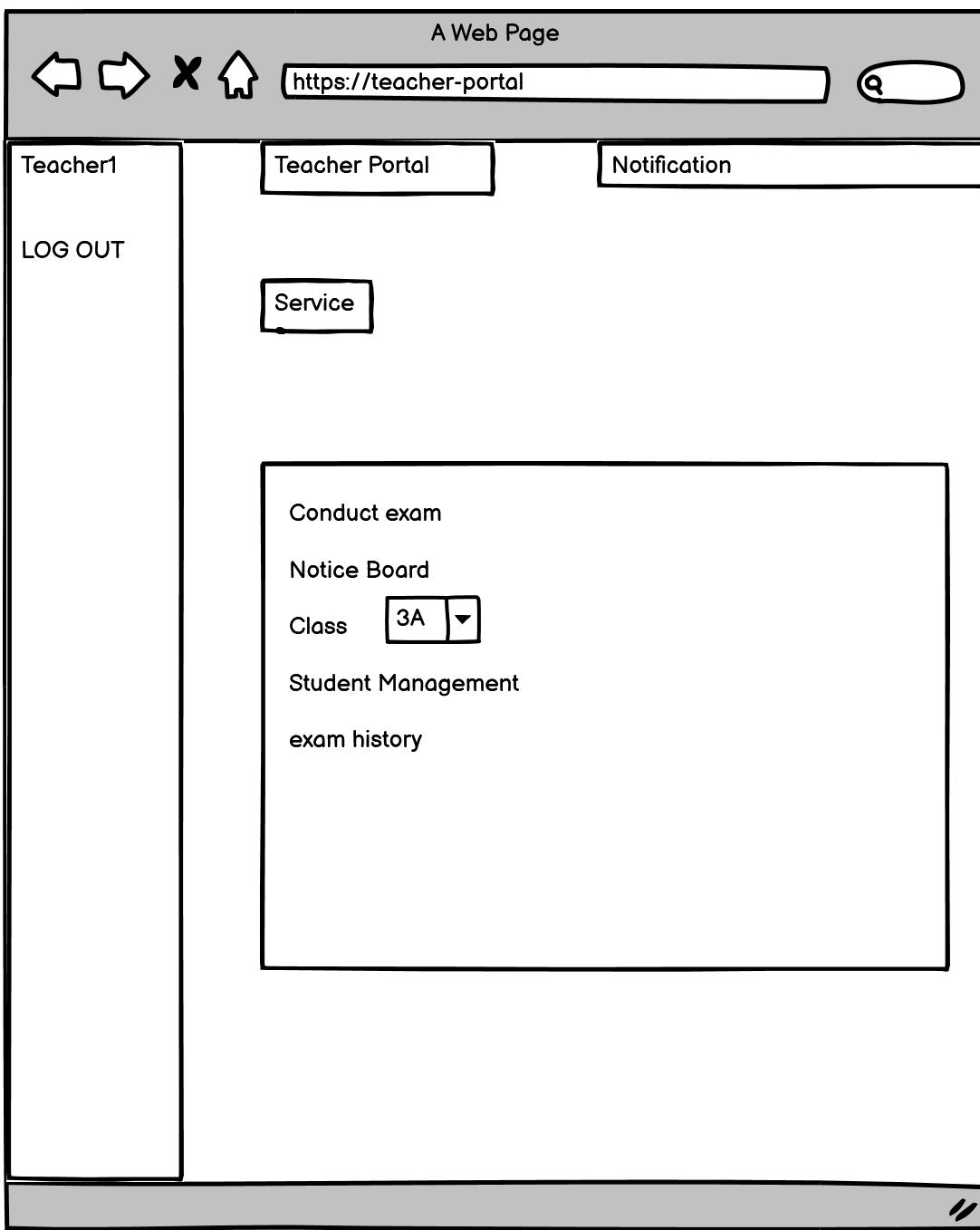


Figure 29 Teacher Portal (Wireframe)

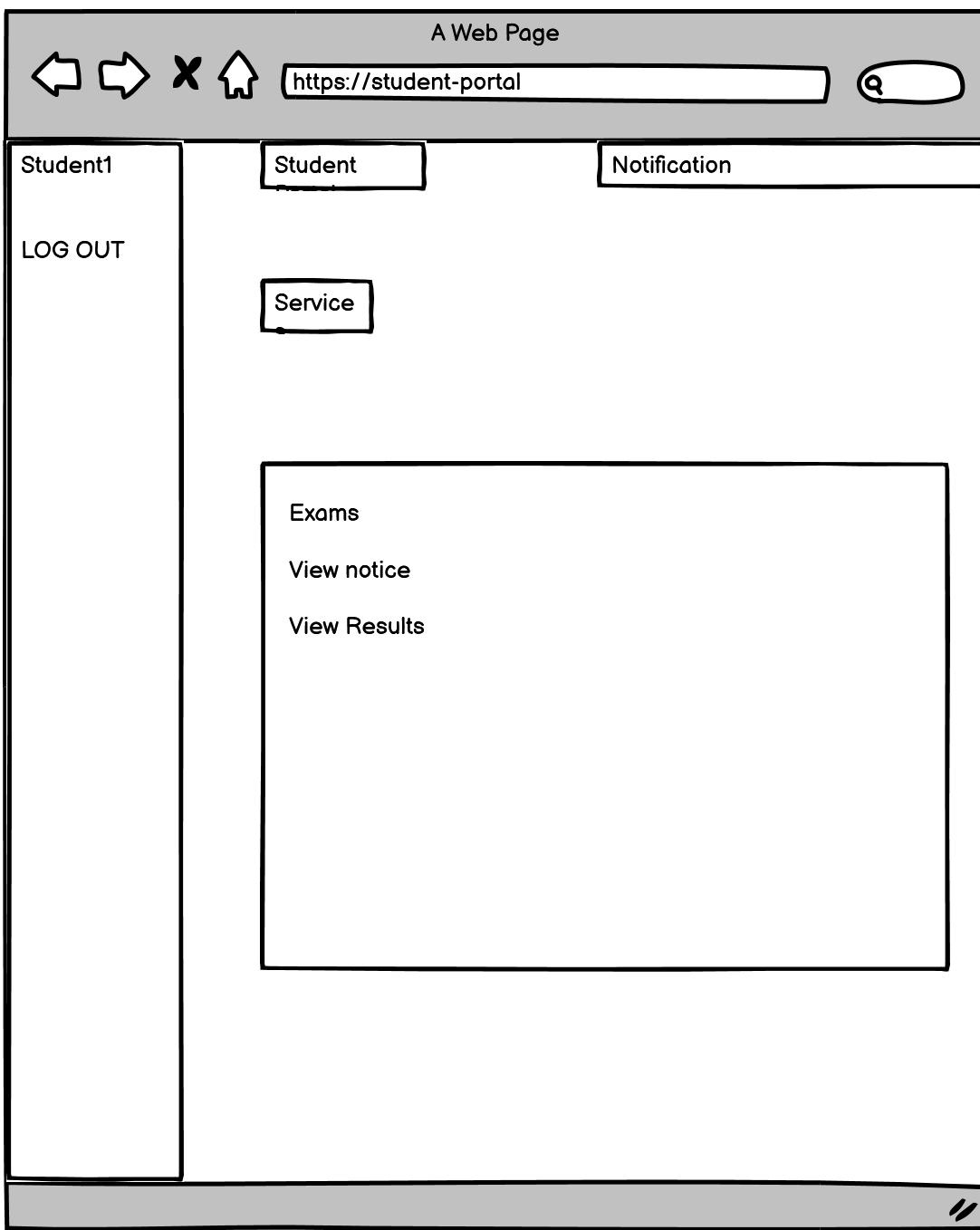


Figure 30 Student Portal (Wireframe)

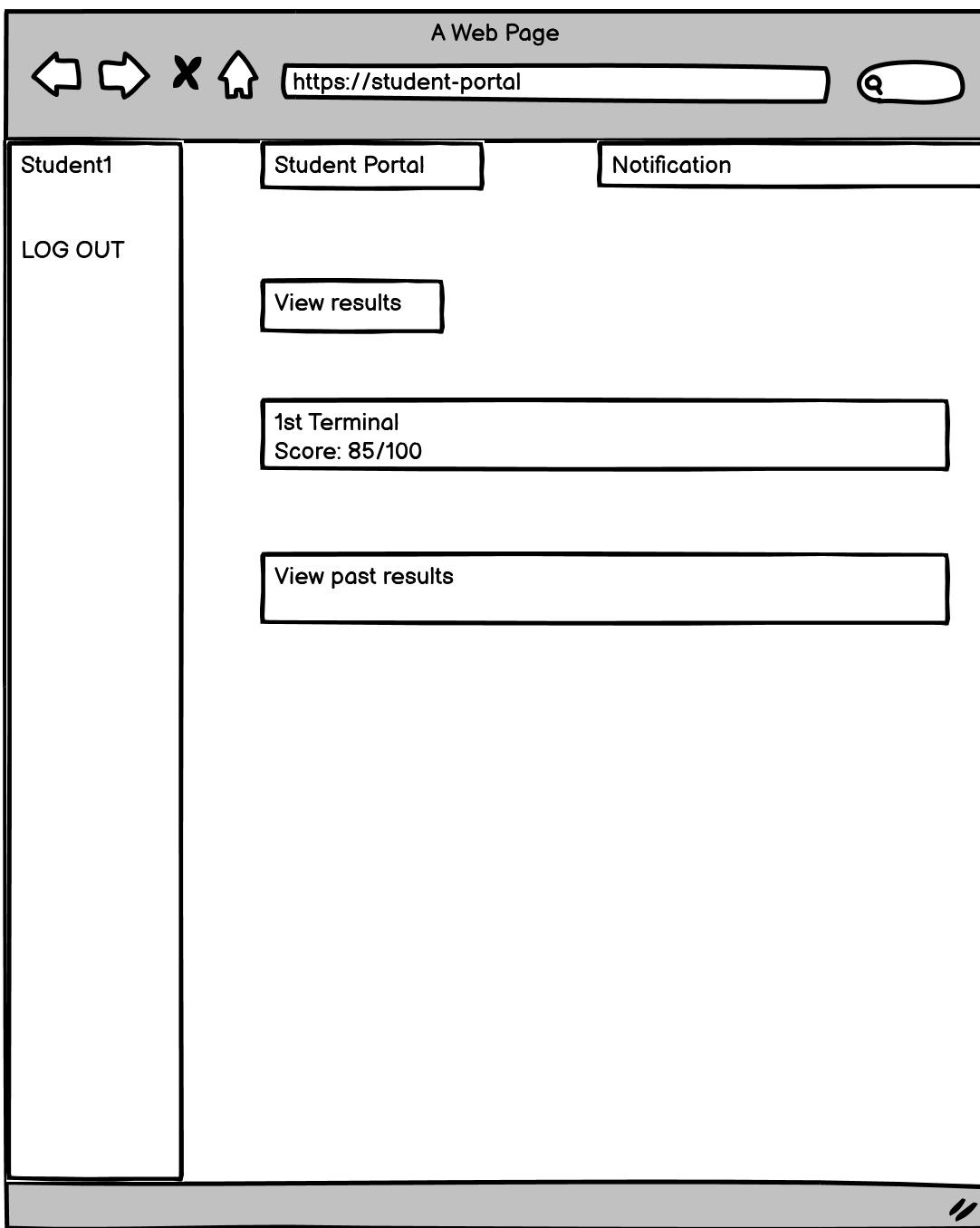


Figure 31 Student Portal view results (Wireframe)

### 3.5. Prototype (UI/UX (Graphic designing/Page layout)):



**Scholar**

Eradicating traditional approach  
of conducting examination

**INFORMATION**

ABOUT US  
FAQ

**QUICK LINKS**

SERVICES  
ABOUT US

**CONTACT US**

+2727727272

COPYRIGHT 2022

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Figure 32 Home page (Prototype design)

## Scholar

### Student Registration

The image shows a prototype design for a 'Student Registration' form. The form is contained within a white rectangular box with rounded corners, set against a dark blue background. The fields are arranged in two columns. The left column contains 'First Name' and 'Username' input fields, followed by 'Password' and 'Role' fields, each with a small downward arrow icon indicating a dropdown menu. The right column contains 'Last Name' and 'Email' input fields, followed by 'Passwrod confirmation' and 'Subjects' fields, also each with a small downward arrow icon. At the bottom center of the form is a dark blue button with the word 'Register' in white capital letters.

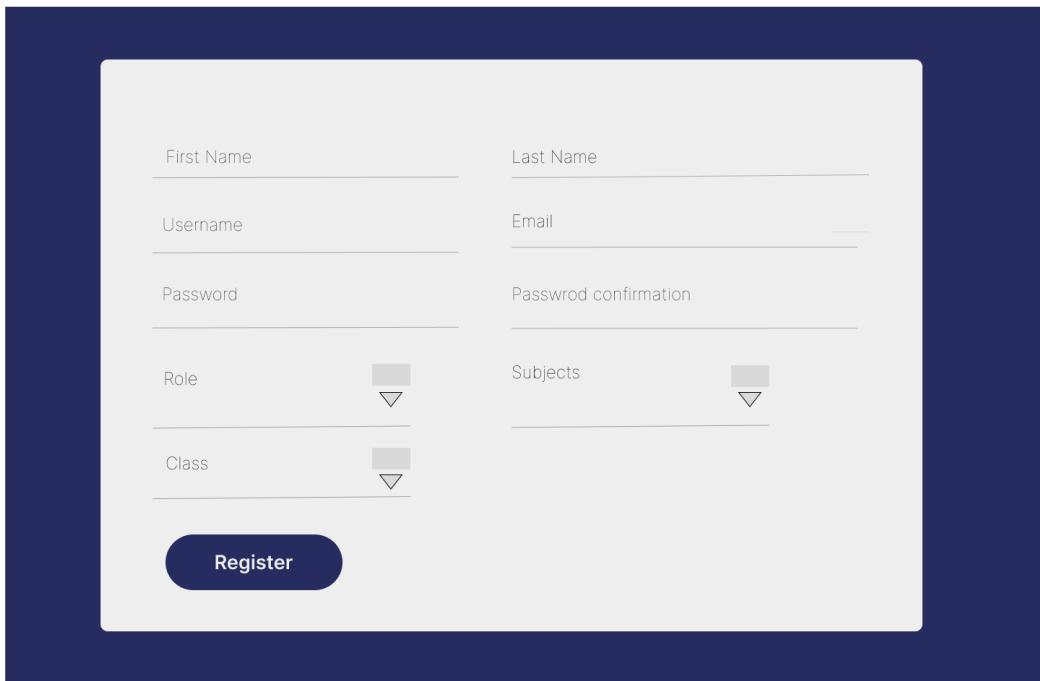
First Name	Last Name
Username	Email
Password	Passwrod confirmation
Role	Subjects
Class	

Register

Figure 33 Student Registration (Prototype design)

## Scholar

### Teacher Registration



The image shows a prototype design for a Teacher Registration form. The form is contained within a white rectangular box with rounded corners, set against a dark blue background. The fields are arranged in two columns. The left column contains 'First Name' and 'Username' input fields, followed by 'Password' and 'Role' dropdown menus. The right column contains 'Last Name' and 'Email' input fields, followed by 'Passwrod confirmation' and 'Subjects' dropdown menus. A large blue 'Register' button is positioned at the bottom center of the form.

First Name	Last Name
Username	Email
Password	Passwrod confirmation
Role	Subjects
Class	

Register

Figure 34 Teacher Registration (Prototype design)

## Scholar

### Staff Registration

The image shows a prototype design for a 'Staff Registration' form. The form is contained within a white rectangular box with rounded corners, set against a dark blue background. The fields are arranged in two columns. The left column contains 'First Name' and 'Username' inputs, followed by 'Password' and 'Role' inputs. The right column contains 'Last Name' and 'Email' inputs, followed by 'Passwrod confirmation' and 'Position' inputs. Each input field has a small downward-pointing arrow icon to its right. A large blue button labeled 'Register' is positioned at the bottom left of the form area.

First Name	Last Name
Username	Email
Password	Passwrod confirmation
Role	Position

Register

Figure 35 Staff Registration (Prototype design)

**Scholar**

**Student Login**

Username \_\_\_\_\_

Password \_\_\_\_\_  
•••••••• 

**LOGIN**

*Figure 36 Student Login (Prototype design)*

**Scholar**

**Teacher Login**

Username \_\_\_\_\_

Password \_\_\_\_\_  
•••••••• 

**LOGIN**

*Figure 37 Teacher Login (Prototype design)*

**Scholar**

**Staff Login**

Username —————

Password —————  
•••••••• 

**LOGIN**

*Figure 38 Staff Login (Prototype design)*

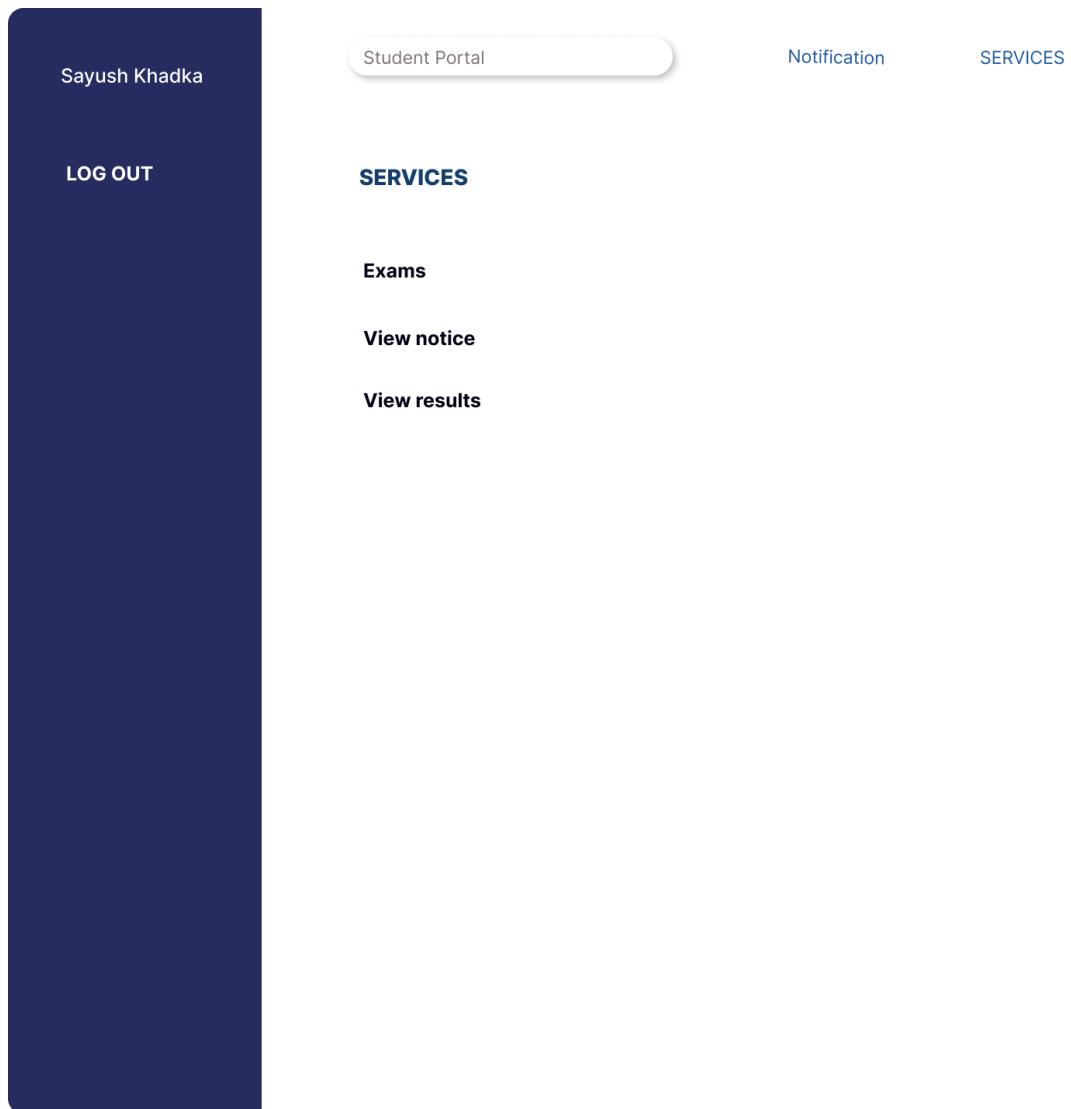


Figure 39 Student Portal (Prototype design)

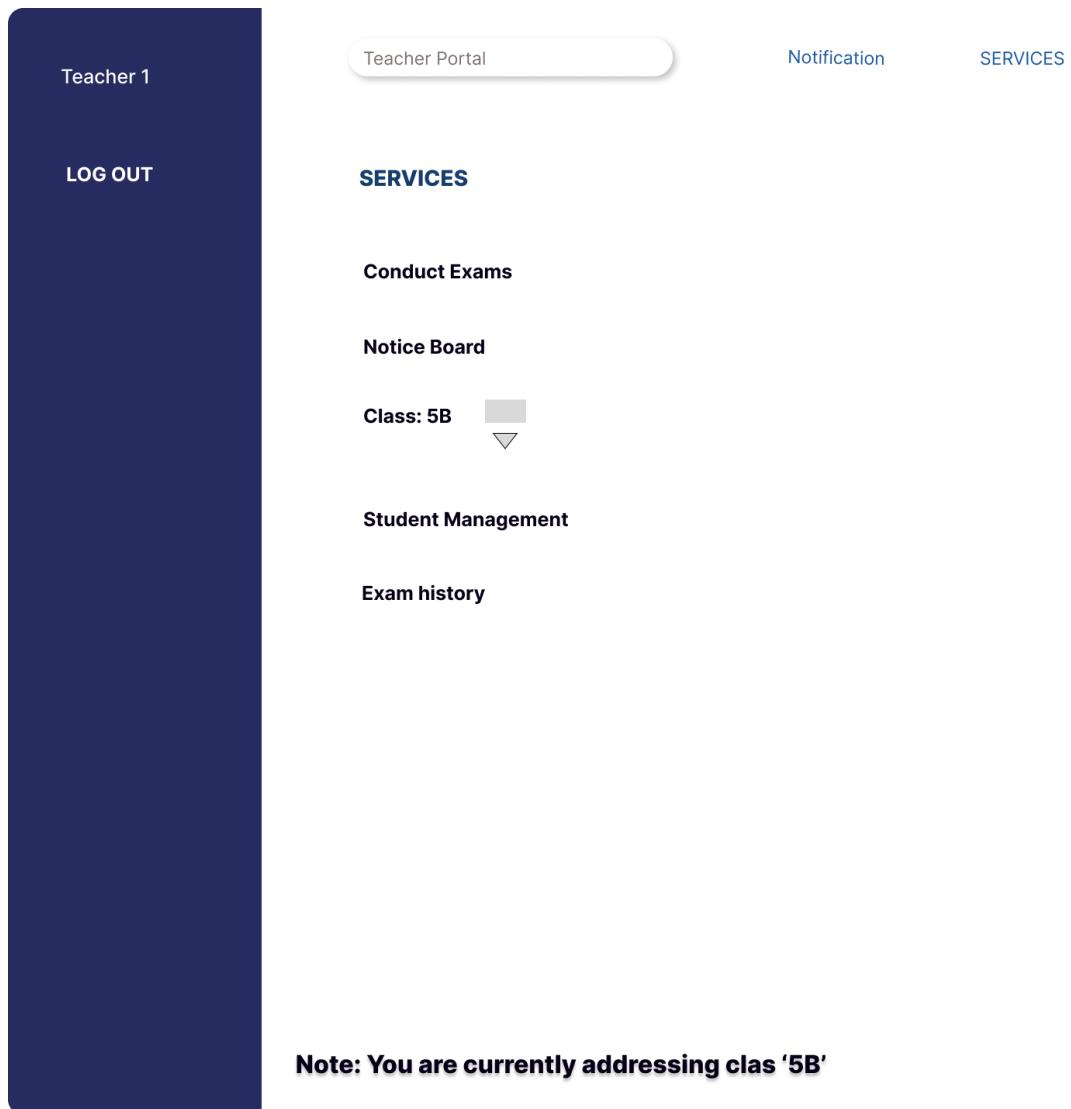


Figure 40 Teacher Portal (Prototype design)

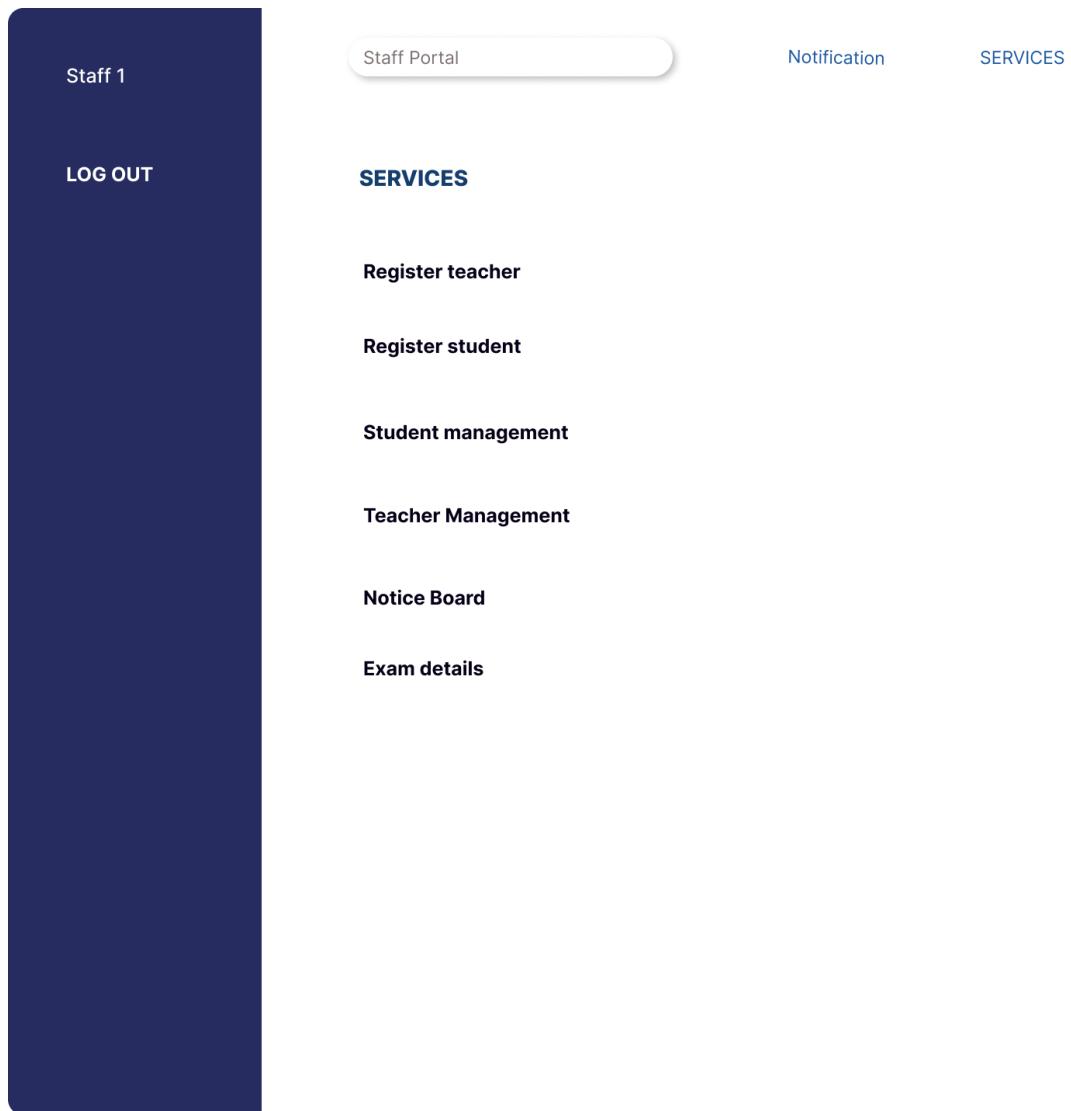


Figure 41 Staff Portal (Prototype design)

Computer

**1st Terminal****1. Who was the father of computer** Michael Faraday Charles Babbage Adam Smith Add answer**2. When was the first computer made?** 1945 AD 1500 AD 1290 AD None of the above*Figure 42 Conduct examination (Prototype design)*

## Computer

1. Who was the father of computer

Michael Faraday

Charles Babbage

Adam Smith

Philo Taylor Farnsworth II

---

2. When was the first computer made??

1945 AD

1500 AD

1290 AD

None of the above

---

**Finish Test**

Figure 43 Take examination (Prototype design)

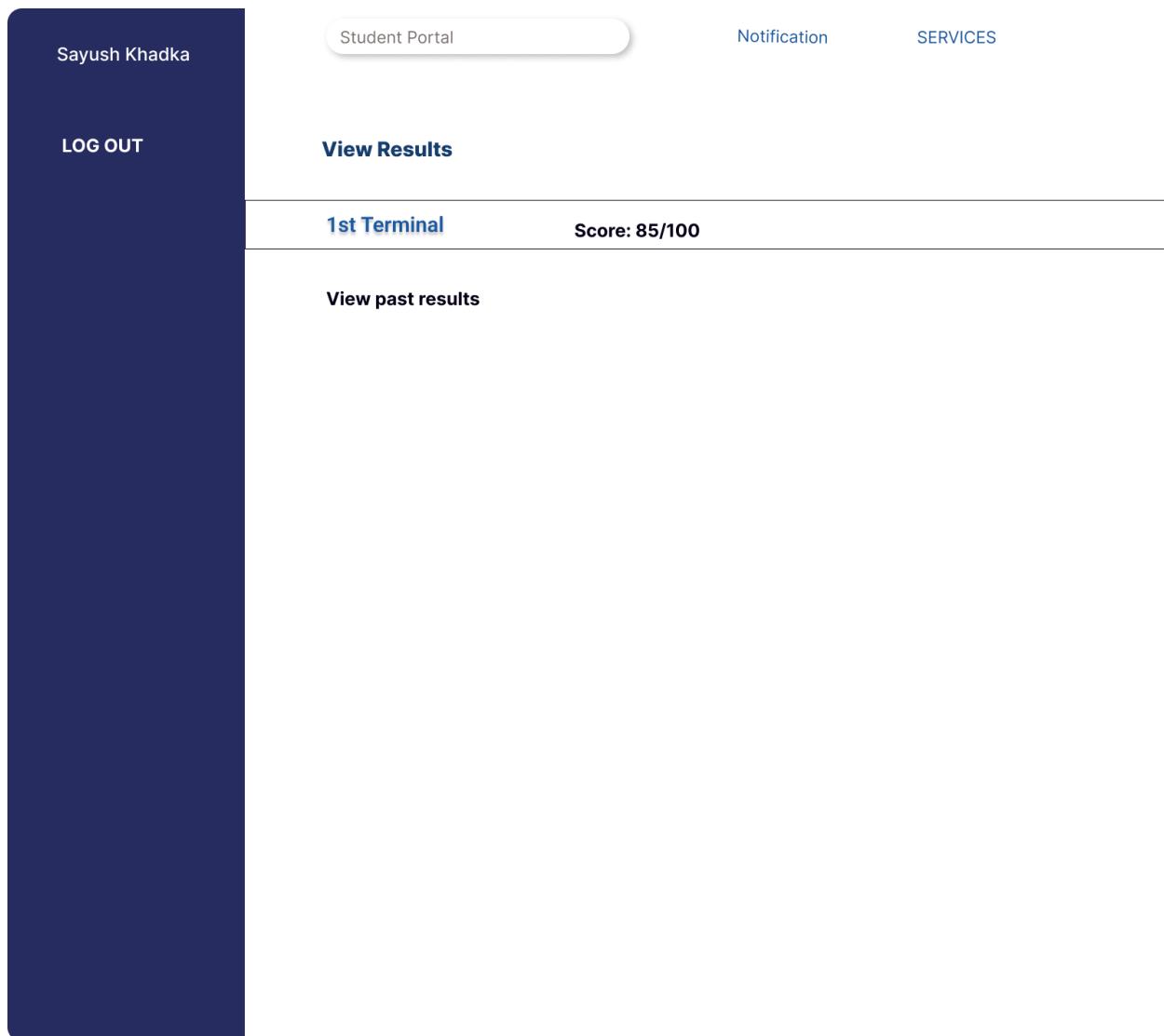


Figure 44 View result (Prototype design)

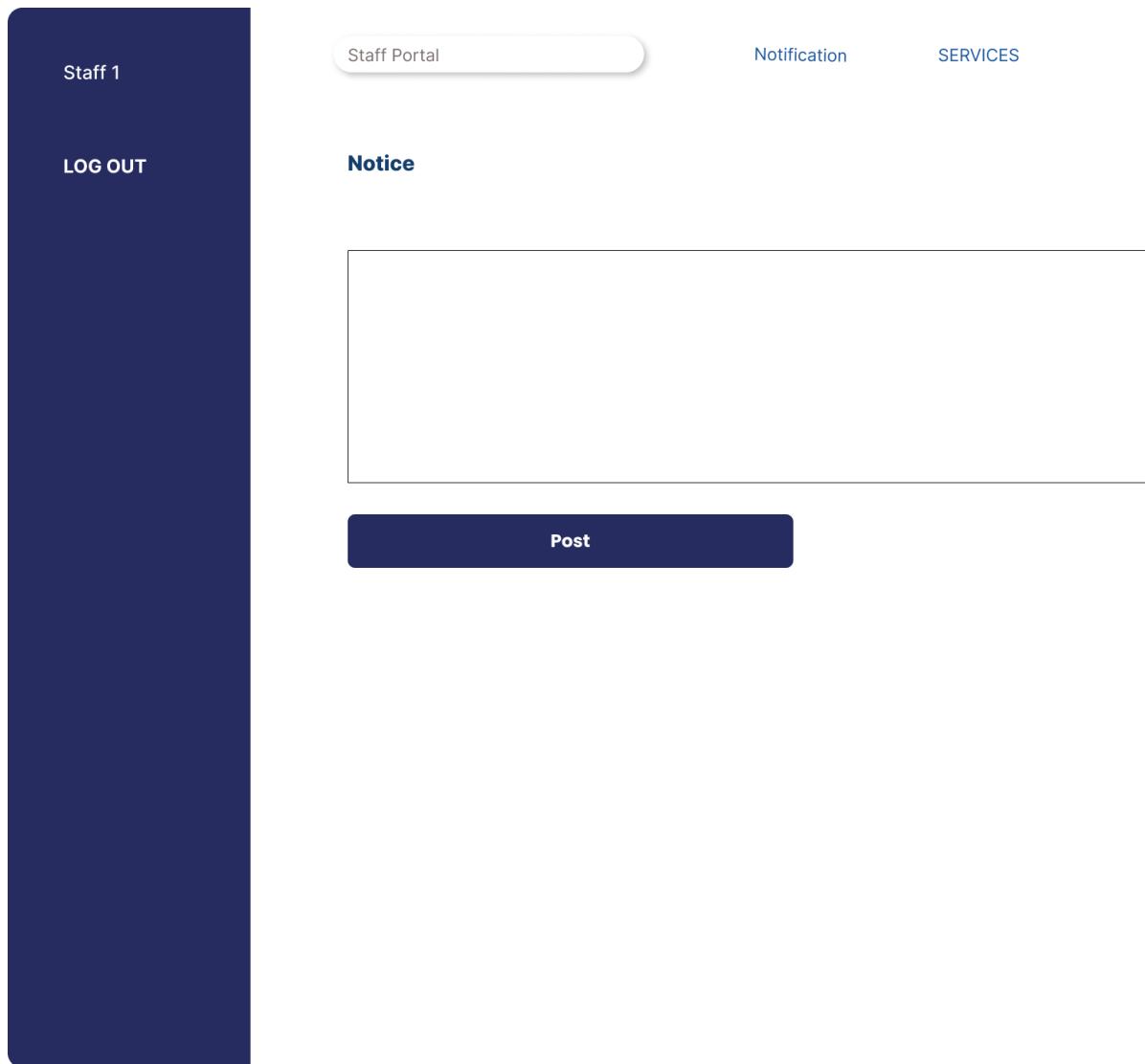


Figure 45 Post notice (Prototype design)

### 3.6. Use case diagram:

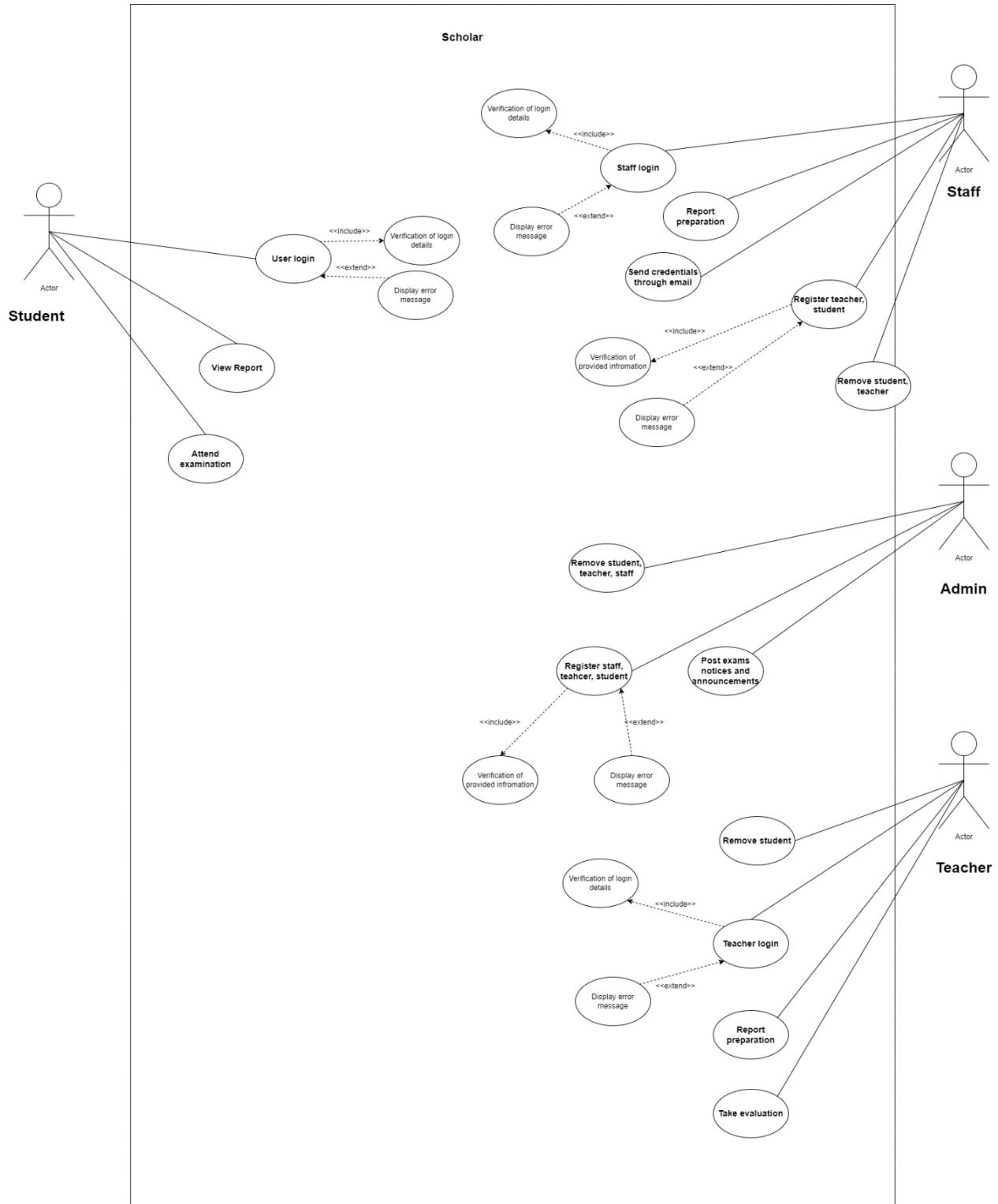


Figure 46 Use case diagram

### **3.7. High-level use case diagram:**

[High level use case \(Appendix section\):](#)

### **3.8. Expanded use case description:**

[Expanded use case \(Appendix section\):](#)

### 3.9. Sequence diagram:

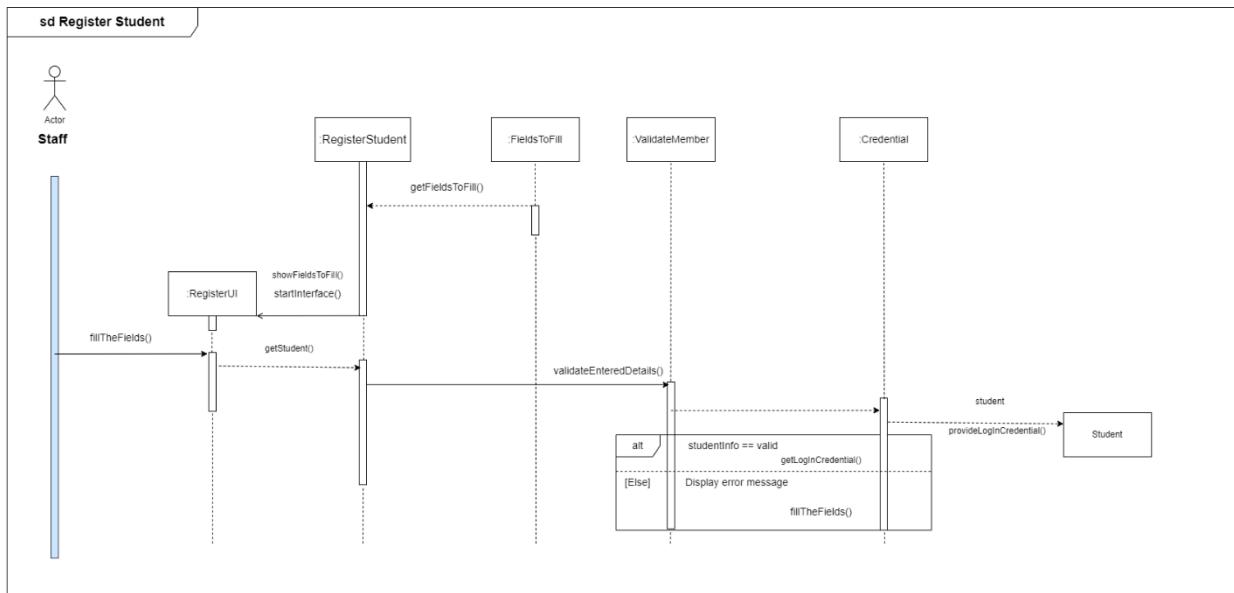


Figure 47 Student Registration (Sequence diagram)

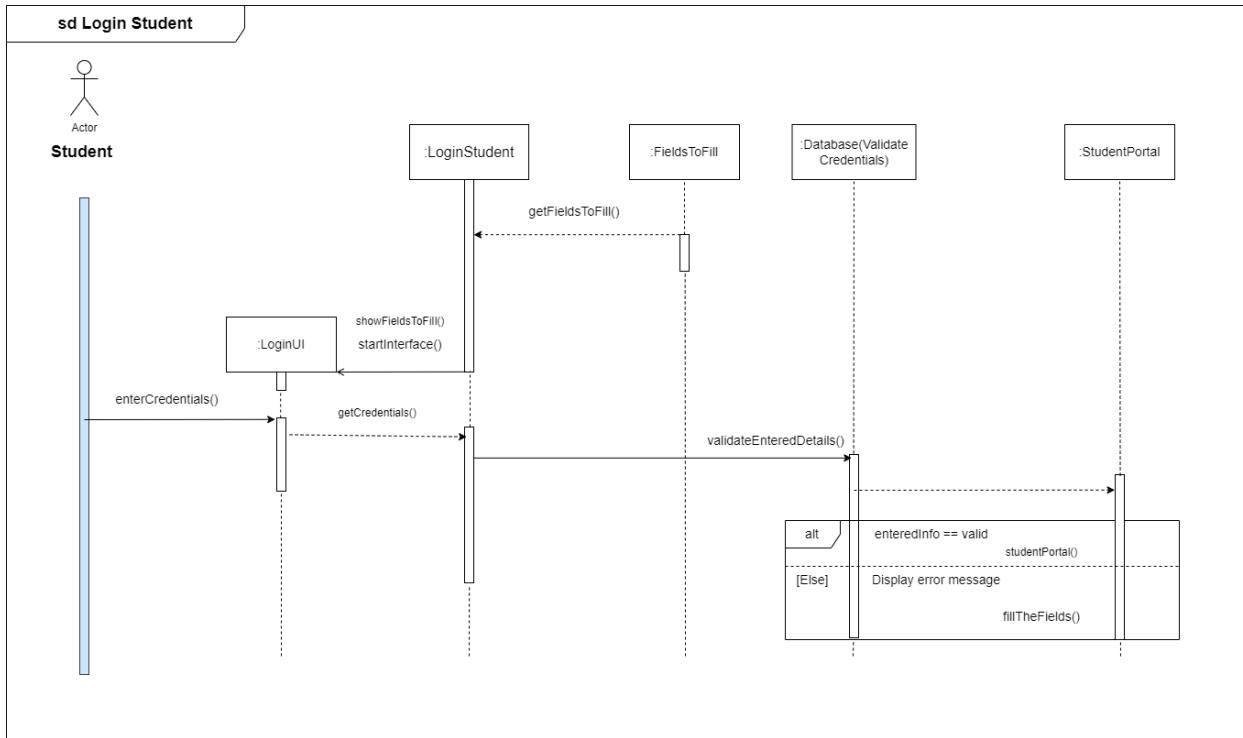


Figure 48 Student Login (Sequence diagram)

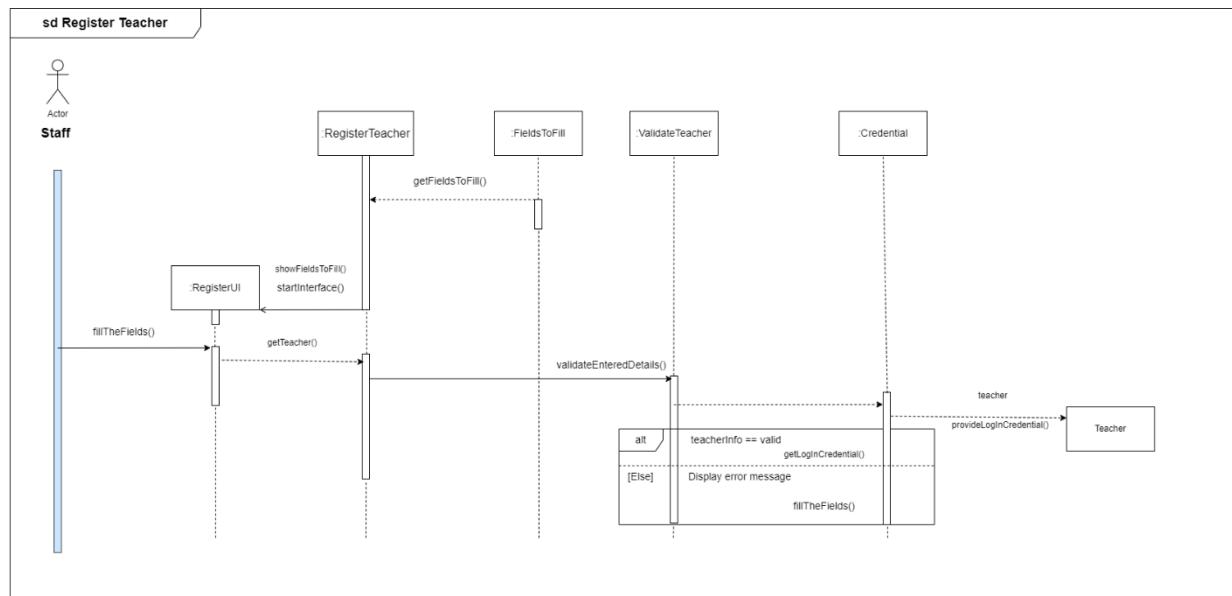


Figure 49 Teacher Registration (Sequence diagram)

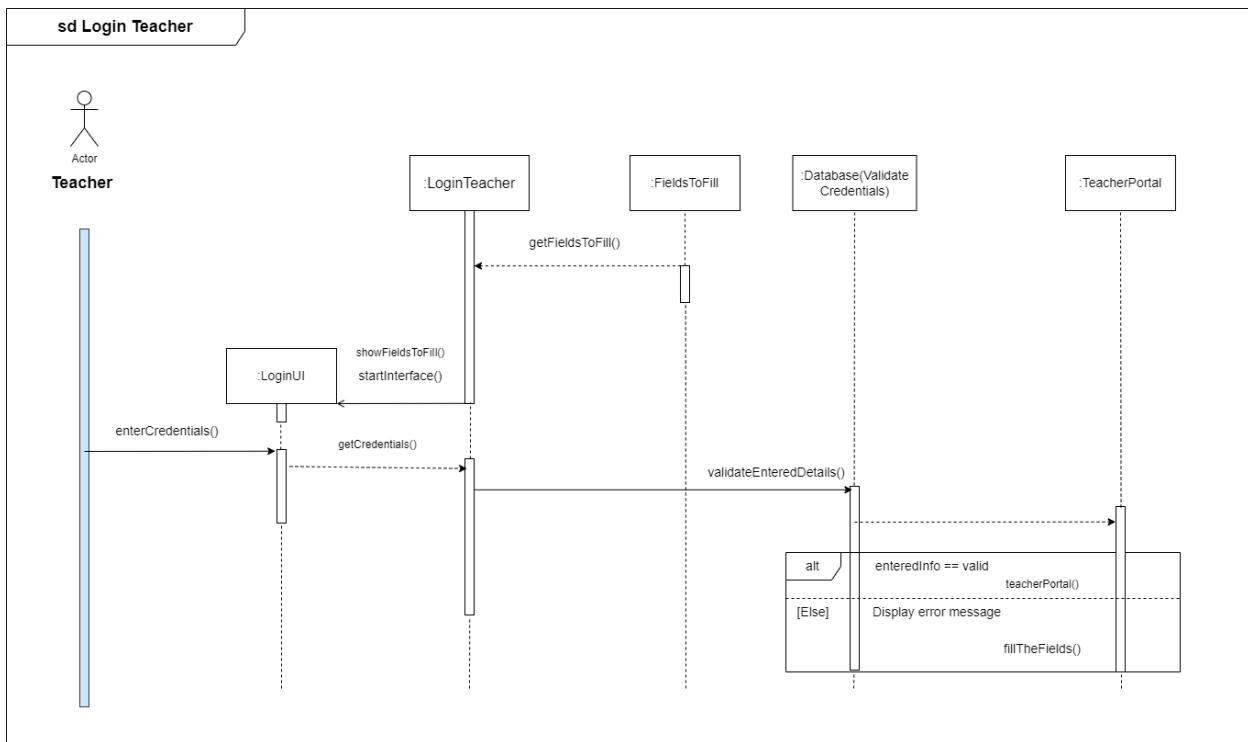


Figure 50 Teacher Login (Sequence diagram)

## 4. Analysis of progress:

### 4.1. Progress per Work breakdown structure:

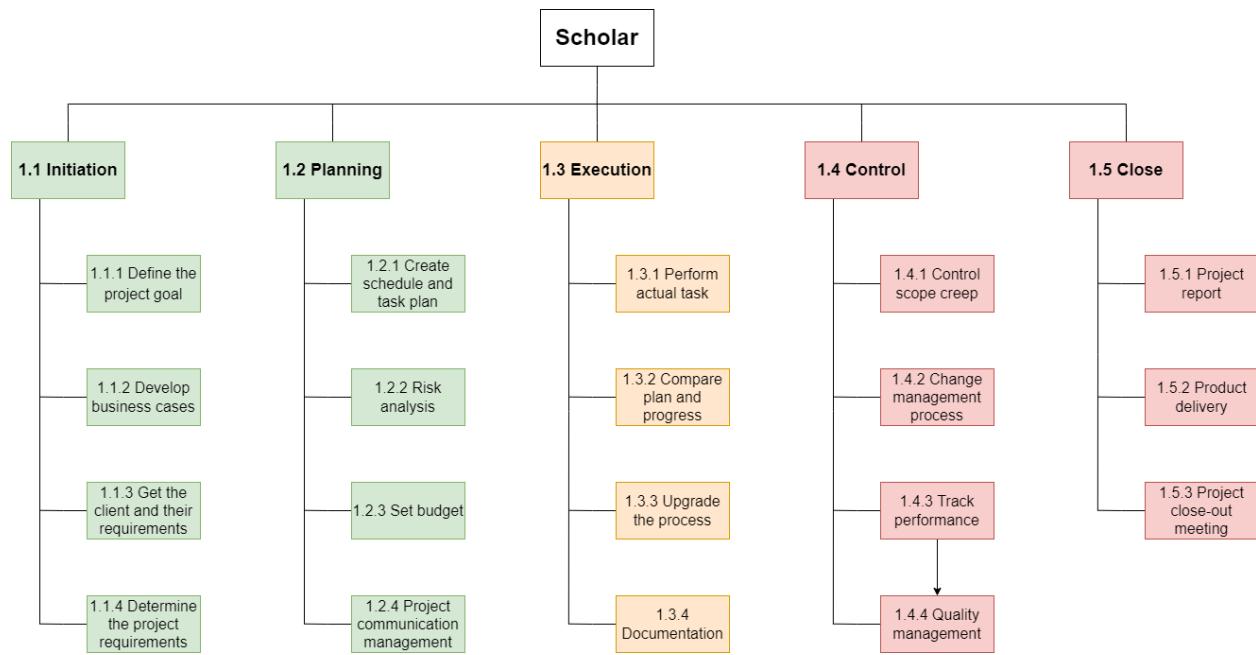


Figure 51 Work breakdown structure

#### 4.1.1. Progress review (Work breakdown structure):

The initiation and planning phases have been finished, as per the work breakdown structure. While the other two—control and close—are still under work, the execution portion is currently ongoing.

For better visualization, according to the work breakdown structure above,

- green-coloured boxes are the ones that have been completed.
- orange coloured box denotes that the project is in that phase and the work is being done in that phase.
- red coloured box denotes the remaining part of the project to be done and is in progress.

## 4.2. Progress per Gantt chart:

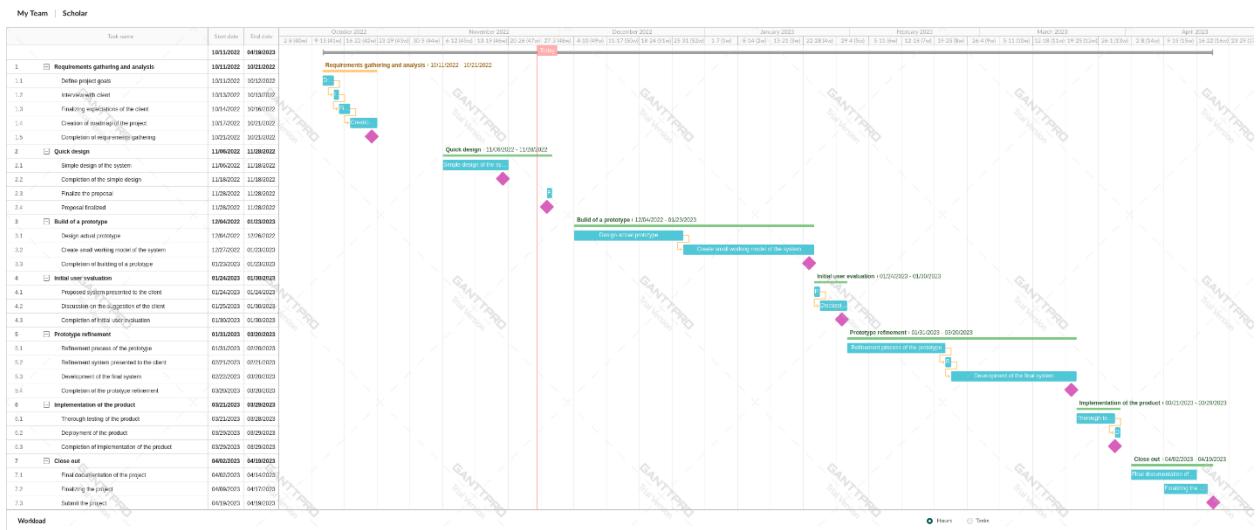


Figure 52 Gantt Chart (full view)

My Team | Scholar

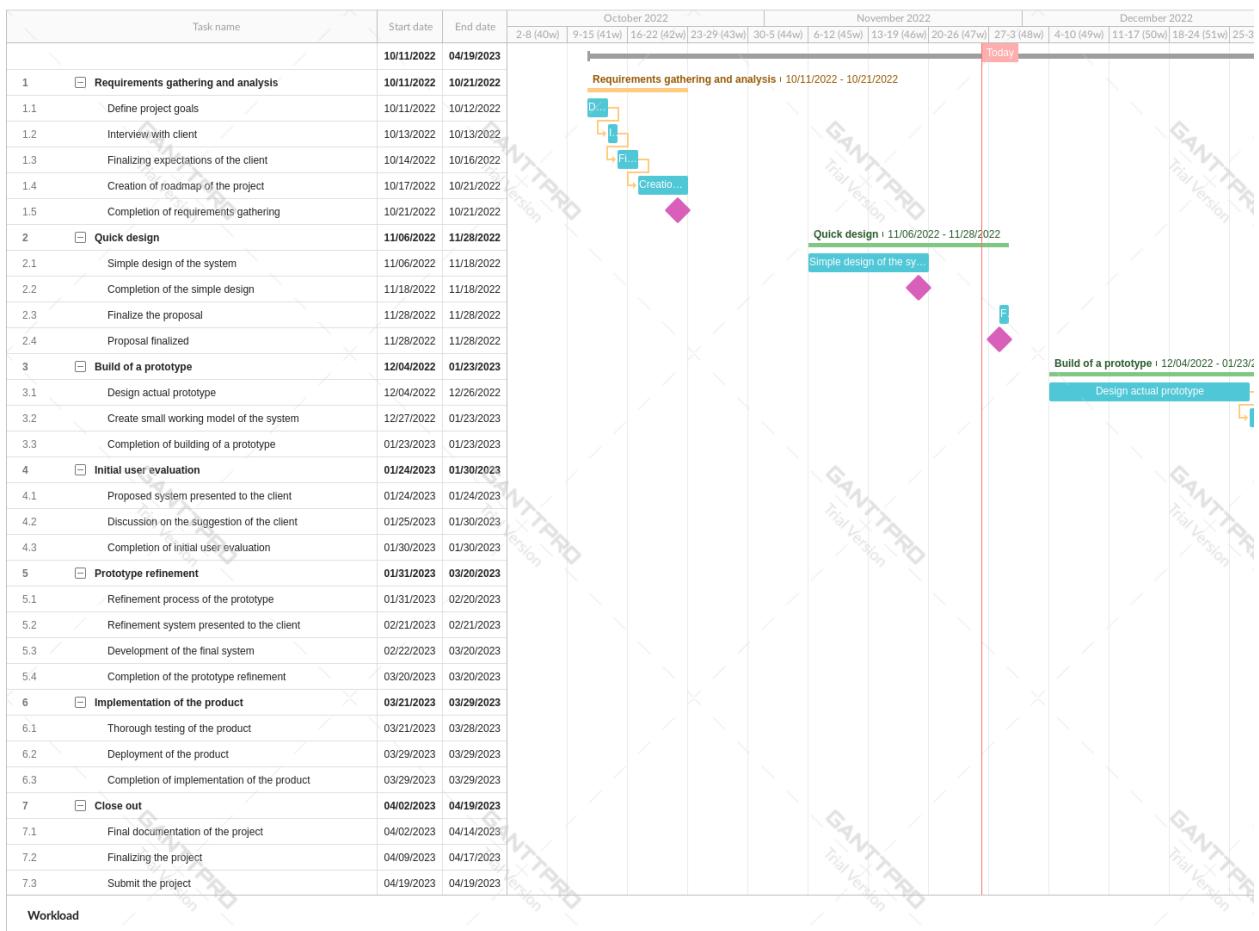


Figure 53 Gantt chart (Larger view 1)

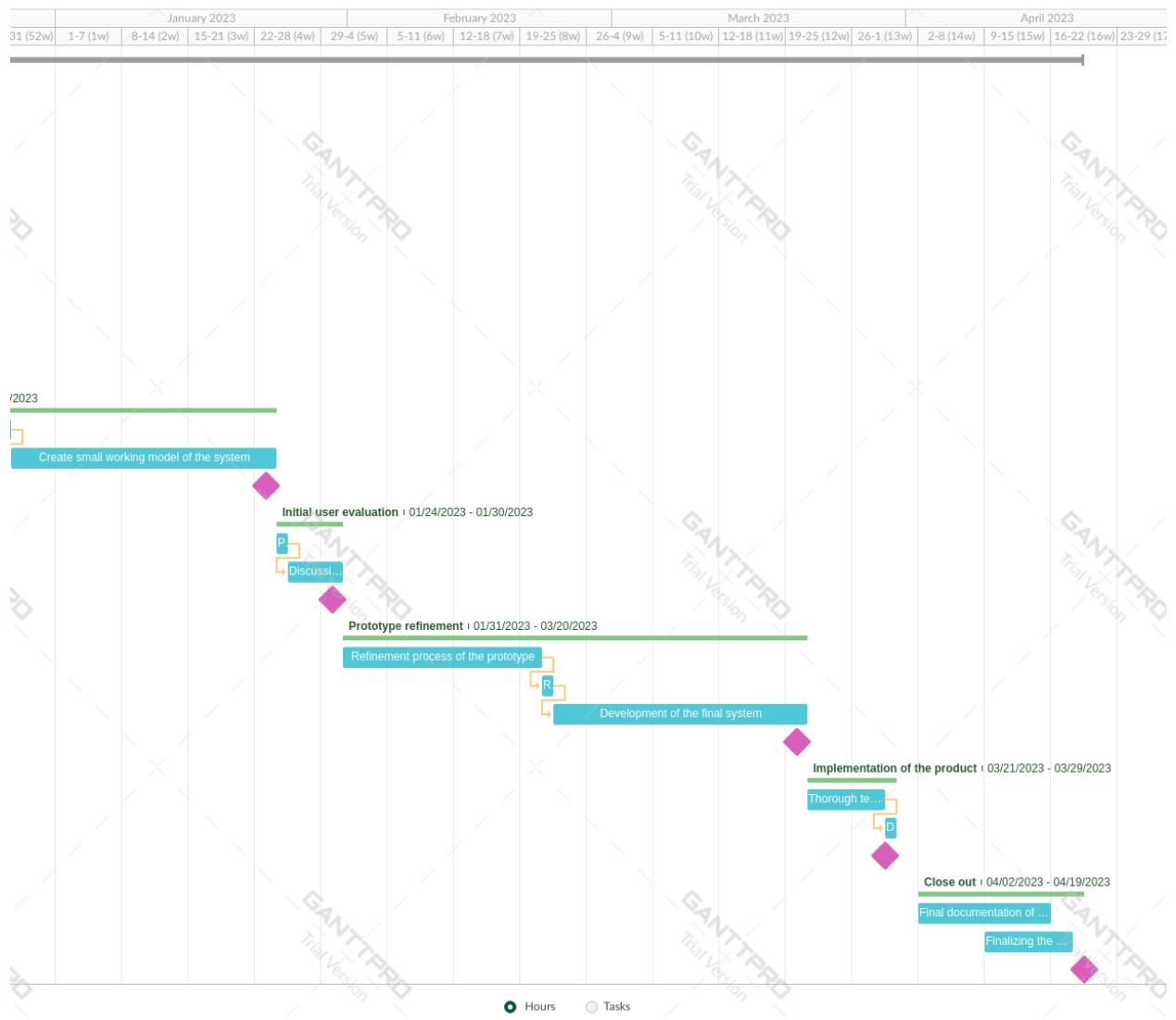


Figure 54 Gantt chart (Larger view 2)

#### 4.2.1. Progress review (Gantt chart):

According to the above Gantt chart and the methodology applied to it, stages of requirement gathering and analysis, and quick design have been completed to the full extent.

Moving towards the next top-level heading of the methodology, which is the Build of a prototype, designing the actual prototype (UI/UX design) has been completed which was due to be completed by 26 December 2022. This marks that the work progress is in a healthy state and has been going and flowing according to the Gantt chart.

### 4.3. Progress per milestone:

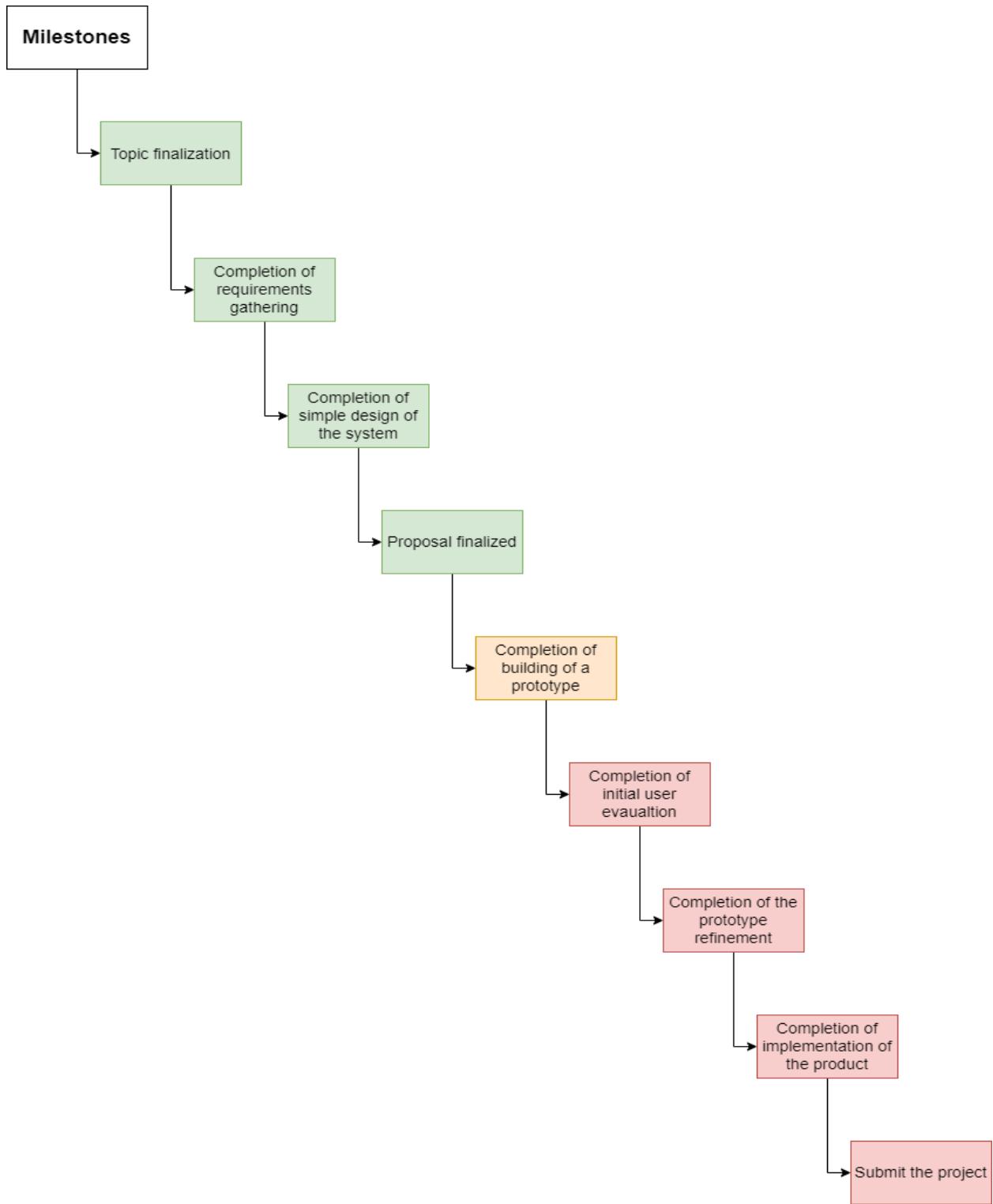


Figure 55 Milestone

#### **4.3.1. Progress review (Milestone):**

According to the milestone above,

- green-coloured boxes or the milestones are the ones that have been completed (topic finalization, completion of requirement gathering, completion of the simple design of the system, proposal finalized)
- orange coloured box or the milestone denotes that the project is in that phase and the work is being done in that phase (completion of building of a prototype).
- red coloured box or the milestone denotes the remaining part of the project to be done and is in progress (completion of initial use evaluation, completion of the prototype refinement, completion of the implementation of the product, submit the project).

#### **4.4. Progress as per table:**

Task	Status
<b>1. Requirements gathering and analysis:</b> <ul style="list-style-type: none"><li>• Define project goals</li><li>• Interview with client</li><li>• Finalizing expectations of the client</li><li>• Creation of roadmap of the project</li><li>• Completion of requirements gathering</li></ul>	Completed
<b>2. Quick design</b> <ul style="list-style-type: none"><li>• Simple design of the system</li><li>• Completion of the simple design</li><li>• Finalize the proposal</li><li>• Proposal finalized</li></ul>	Completed
<b>3. Build of a prototype</b> <ul style="list-style-type: none"><li>• Design actual prototype</li><li>• Create small working model of the system</li><li>• Completion of building of a prototype</li></ul>	Ongoing
<b>4. Initial user evaluation</b> <ul style="list-style-type: none"><li>• Proposed system presented to the client</li></ul>	In progress

	<ul style="list-style-type: none"> <li>• Discussion of the suggestions of the client</li> <li>• Completion of initial user evaluation</li> </ul>
<b>5. Prototype refinement</b>	In progress
	<ul style="list-style-type: none"> <li>• Refinement process of the prototype</li> <li>• Refinement system presented to the client</li> <li>• Development of the final system</li> <li>• Completion of the prototype refinement</li> </ul>
<b>6. Implementation of the product</b>	In progress
	<ul style="list-style-type: none"> <li>• Thorough testing of the product</li> <li>• Deployment of the product</li> <li>• Completion of the Implementation of the product</li> </ul>
<b>7. Close out</b>	In progress
	<ul style="list-style-type: none"> <li>• Final documentation of the project</li> <li>• Finalizing the project</li> <li>• Submit the project</li> </ul>

Table 2 Progress as per table

#### **4.5. Final review:**

When we combine all the reviews above, we can say that the project is moving forward and staying on schedule. The key headings and subheadings of the methodology have been followed accordingly too.

## **5. Future Work:**

As per the Gantt chart, the project is absolutely on track. Project has been following the evolutionary prototype methodology.

### **The completed parts are:**

- i) Requirements gathering and analysis: Under the functionalities that must be inscribed in the application, the requirements analysis and collection have been finished by me. Actors (various users including administrators, staff, students, and teachers), who take the exam, evaluate it, and show reports are required.
- ii) Quick design: The second stage, which also sees the completion of the product's rapid or basic design. To get a general idea of how the application would be designed, I have created wireframes.

### **On-going part:**

- iii) Build of a prototype: At this point, I would develop a genuine prototype of the product using the knowledge learned during rapid design. It is the essential system compressed into a smaller package.

UI/UX design prototype work has been completed. The fabrication of a compact functional model of the actual product is still ongoing.

After the prototype design has been completed, I will construct a prototype. This includes coding, integrating libraries or frameworks from other sources, and testing the prototype to ensure it functions. This is the ongoing part in the project

### **In progress:**

- iv) Initial user evaluation: I would deliver a prototype after making it to the client (the survey in this project) for a quick evaluation. The process of developing a prototype takes consumer needs and any necessary revisions into account.
- v) Prototype refinement: Depending on the feedback it has gotten; I may adjust the prototype by adding or removing features, improving the user experience, or fixing any technological issues could all fall under this category.

If the client (survey in this project) wasn't satisfied with the current version, I would change the prototype as necessary in response to their suggestions and complaints. Refinement continues until the client's requirements are met. When the client (in this case, the survey) is pleased with the finished product, I will create a final system based on the customer-accepted prototype.

Until the prototype is ready to be launched or included into the finished product, feedback is gathered, it is improved, and the process is repeated.

vi) Implementation of the product: I'll thoroughly test the system using the appropriate testing methods once the final prototype is created, and then I'll start using the finished product.

vii) Maintenance of the product: To make sure the product operates well over the long term; I would give it routine maintenance.

Documentation: With the end of the successful product comes the final documentation holding the working mechanism and description of the product itself.

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## **7. Appendix:**

### **7.1. Expected outcomes and deliverables:**

This app promises to its users that it will have a well-functioning web application with all the mentioned functionalities to achieve its aim. This app will allow an institute to have student progress data in digital form, helping to retrieve the information efficiently and effectively. This app will help to keep track of the past reports of both students and the institute.

To elaborate more on the deliverables (according to the acting users):

#### **7.1.1. Primary deliverables:**

##### **Outcomes from the admin:**

The admin has the highest control amongst the acting bodies in this application.

- a) Register teacher/student/staff
- b) Remove teacher/student/staff
- c) Update teacher/student/staff
- d) Post notice
- e) Generate a report

##### **Outcomes from the staff:**

The staff is the support system. Questions and queries asked by other bodies are resolved by this body.

- a) Register teacher/student

- b) Remove the teacher/student
- c) Update teacher/student/staff
- d) Post notice
- e) Generate a report

**Outcomes from the teacher:**

The teacher is the evaluation conducting body.

- a) Remove the student
- b) Generate a report
- c) Conduct exam/quiz/evaluation/problem set
- d) Set answers

**Outcomes from the student:**

The student is the body that attends the examination or the evaluation.

- a) Give exam or quiz
- b) View report

### **7.1.2. Secondary deliverables:**

- a) Login credentials are sent through email after registration.
- b) Random password generator.
- c) Password change option.
- d) Digital/email marketing is open due to the availability of the student's email addresses.

The above outcomes and deliverables have been listed and elaborated according to the acting bodies of the application. The bodies functioning together provide an overall working online evaluation/examination application.

## **7.2. SRS Document (Software Requirements Specification):**

### **Introduction:**

#### **Purpose:**

The document holds the project plan for Scholar.

#### **Intended Audience:**

It's for the educational institute intending to move their student evaluation process online.

#### **Intended Use:**

The system allows educational institutes to carry out the examination and report online. Helping the institute to eradicate traditional methods of taking the examination and bringing a revolution in modern approach in then educational sector.

#### **Scope:**

Outcomes from the admin:

The admin has the highest control amongst the acting bodies in this application.

- a) Register teacher/student/staff
- b) Remove teacher/student/staff
- c) Update teacher/student/staff
- d) Post notice
- e) Generate a report

Outcomes from the staff:

The staff is the support system. Questions and queries asked by other bodies are resolved by this body.

- a) Register teacher/student
- b) Remove the teacher/student
- c) Update teacher/student/staff
- d) Post notice
- e) Generate a report

Outcomes from the teacher:

The teacher is the evaluation conducting body.

- a) Remove the student
- b) Generate a report
- c) Conduct exam/quiz/evaluation/problem set
- d) Set answers

Outcomes from the student:

The student is the body that attends the examination or the evaluation.

- a) Give exam or quiz
- b) View report

### **Overall Description:**

### **Assumptions and Dependencies:**

- i) Students/teachers cannot register themselves.
- ii) Admin or the staff register the student/teacher.
- iii) Staff is registered by admin.

### **System Features and Requirements:**

#### **Functional Requirements:**

- i) The student should be able to take the examination.
- ii) The teacher/examiner should be able to design exam test papers.
- iii) The system should provide a platform to take exams.
- iv) The teacher/examiner should be able to generate a report about the examination.
- v) Notice board feature.
- vi) The student should be able to view the result.

#### **Non-Functional Requirements:**

##### **Design and Implementation Constraints:**

The academy has imposed a constraint to make the online system using Python (Django) for the backend and JavaScript (React) for the front end.

##### **External Interfaces Required:**

##### **Software requirement:**

- i) Operating System: Windows 7 or above

**Hardware Specification:**

- i) RAM: 4GB
- ii) Storage: 5GB
- iii) Processor: Intel core i5(5<sup>TH</sup> generation or above)

**Other Non-Functional Requirements:**

- i) The system should be compatible with windows 7 or above.
- ii) The interface must be user-friendly.
- iii) Notifications function in the portal itself.
- iv) The system must be updated frequently.
- v) The system must have a clean-looking user interface.

**Goals of Implementation:**

- i) Developers will update the program if there is a new operating system or device in the future.
- ii) Developers will add new features according to the requirement on that date.
- iii) Developers will update the system in case of any bugs.

### 7.3. Explanation of the considered methodologies:

#### Waterfall methodology:

According to the waterfall technique, software development is carried out sequentially or linearly. Several jobs make up the project's division, with phases denoting the highest-level grouping. For a phase to be declared complete and include clear departure criteria, which is frequently a sign-off from the project stakeholders, the phases must be completed in the correct order (Sherman, 2015).

The Waterfall Method

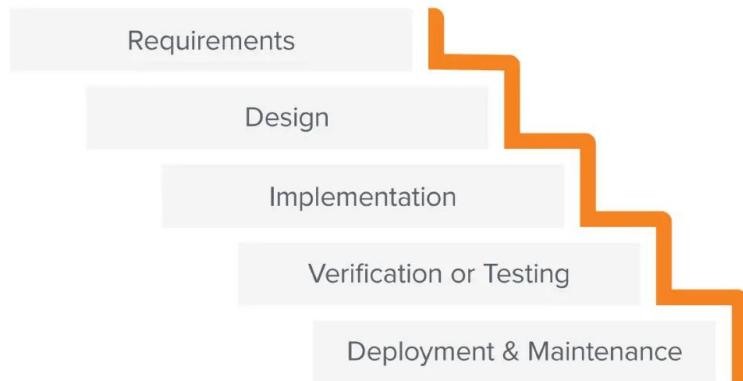


Figure 56 Waterfall Methodology (Team, 2022)

Reasons for not choosing this methodology:

- i) Waterfall methodology heavily relies on teams following a set of steps that keep them always moving forward. The system can rarely be changed in traditional versions. As my product requires frequent changes in the design and implementation as required by the client.

- ii) My product requires the involvement of the client in processes like requirement gathering and initial user evaluation. As an internal process, the Waterfall methodology lays little attention on the end user or client involved in a project.

These are the reasons why the waterfall methodology has not been Implemented.

## **Agile methodology:**

Through the course of the project's software development lifecycle, the agile approach promotes constant testing and development. The Agile methodology for software testing comprises concurrent development and testing as compared to the Waterfall model (Hamilton, 2022).

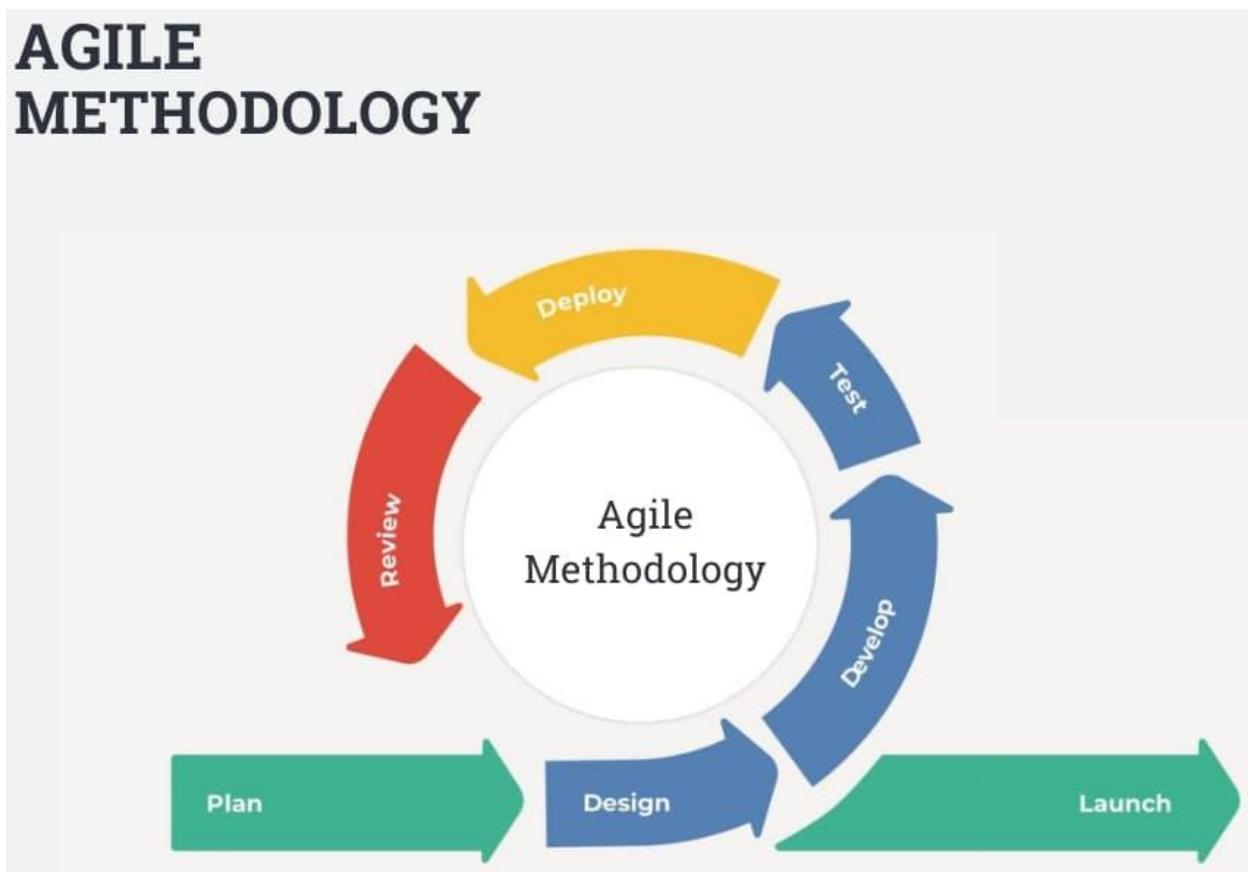


Figure 57 Agile methodology (InterQuality, n.d.)

Reasons for not choosing this methodology:

- i) Agile iterations are ideal for software development because they allow for the steady creation of smaller deliverables. However, this level of fragmentation would not work with a long-term project. My product is a long-term project and therefore this methodology is not suitable.
- ii) Agile methodology condenses massive volumes of data into shorter user stories with scant details. It will be difficult for me as a result to comprehend the client's requirements.

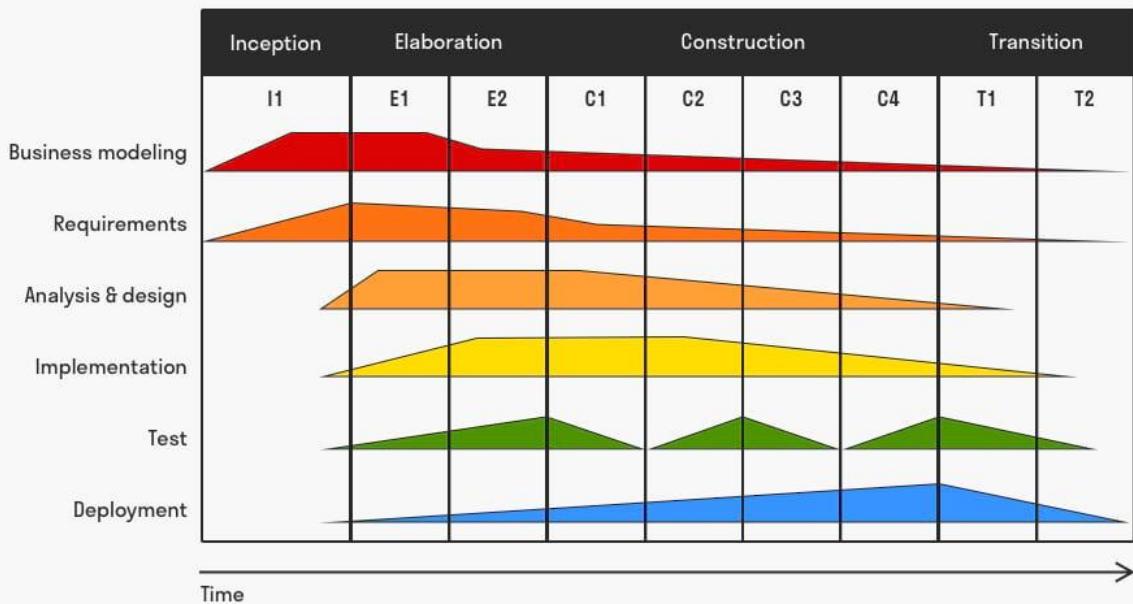
These are the reasons why agile methodology has not been implemented.

### **Rational Unified Process (RUP):**

Rational Unified Process is an agile software development process that separates the four phases of the project life cycle. Business modelling, requirements, analysis and design, implementation, testing, and deployment are the six essential development disciplines that are used in each phase. Though some operations are more important and need more time at each stage than others. For instance, business modelling frequently takes place during the conception and elaboration phases. Before going on to the project's next stage, each of the four stages' main objectives must be accomplished. The main goal of RUP is to create high-quality software on a manageable timetable and budget. The life cycle phases can all be repeated as needed to complete the initial objectives. Once the transition phase has been completed, the project is complete (Bugajenko, 2021).

## Rational Unified Process (RUP)

toolhero



[www.toolhero.com](http://www.toolhero.com)

Figure 58 Rational Unified Process (RUP) (Janse, 2019)

Reasons for not this methodology:

- i) Implementing software development using this methodology is difficult since it uses a complicated process. Therefore, I didn't use this particular methodology in this project.
- ii) I can't apply this methodology for this project because it takes a lot of time and is expensive.

These are the reasons why Rational Unified Process has not been implemented.

## 7.4. Selected methodology:

The chosen methodology for this application is evolutionary prototyping.

Using the evolutionary prototyping method, the software developer or development team first produces a prototype. The final product is created after collecting initial consumer feedback and creating subsequent prototypes, each with enhanced or expanded features (Sherrell, 2013).

Prototyping Model Phases (SDLC phases):

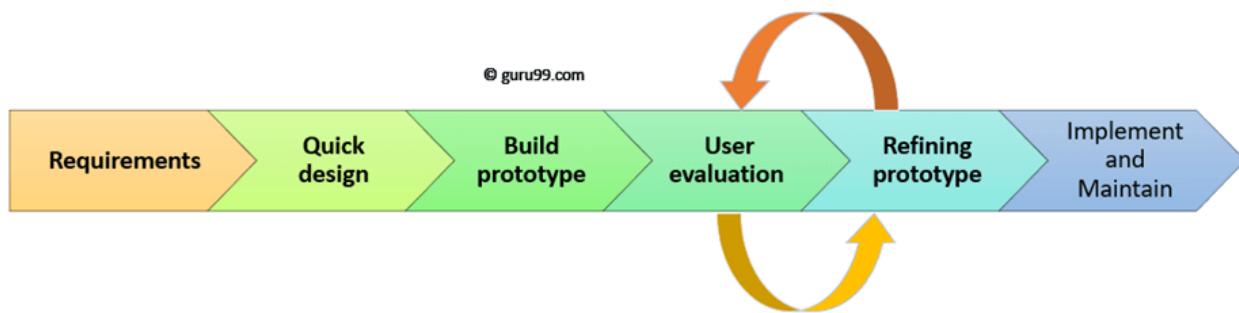


Figure 59 Prototyping Model Phases, (Martin, 2022)

i) Requirements gathering and analysis: The first step in prototyping is to do a requirement analysis. At this stage, the system's needs are thoroughly established. (Martin, 2022).

Throughout this process, I would ask the client questions (survey in this project) to determine what they wanted from the product and move forward with their answers.

ii) Quick design: The second stage could consist of a quick design or a rough design. During this stage, the system's fundamental design is developed. But it's not a fully realized design yet. It provides the user with a quick overview of the system. The rapid design aids in the development of the prototype (naimishsahu08, 2021).

To give the client information (survey information) on the product's basic design, I would therefore give them a quick design of the product.

- iii) Build of a prototype: Using the information obtained during rapid design, I would create a true prototype of the product at this step. It is a condensed form of the necessary system.
- iv) Initial user evaluation: After creating a prototype, I would give it to the client (survey in this project) for a preliminary assessment. The prototype-refinement process considers any necessary modifications and consumer requirements.
- v) Prototype refinement: I would adjust the prototype as needed in response to the client's (survey in this project) recommendations and criticisms if they were unhappy with the present version. The refinement procedure is carried on until the client's demands are satisfied. I would develop a final system based on the customer-accepted prototype after the client (survey in this project) is satisfied with the finished outcome.
- vi) Implementation of the product: When the final prototype is made, I will extensively test the system using the right testing techniques and put the final product to use.
- vii) Maintenance of the product: I would perform routine maintenance on the product to ensure that it works well over the long term.

Reasons for choosing this methodology:

- i) One of this methodology's main elements is its support for the product's evolving environment. This component makes it simpler for me to meet the client's needs more effectively.
- ii) This methodology offers a superior risk analysis as changes are encouraged which saves my time and resources.
- iii) This methodology requires user participation in the product's development phase to provide a better product.
- iv) There is room for improvement, which enables me to the addition of new and improved features to the product.

v) With this methodology, errors and functional gaps are found right away, enabling me to develop a better product.

## **7.5. Explanation of applications used:**

### **7.5.1. Programming language:**

#### i) Python:

Python is a general-purpose language, which makes it flexible and appropriate for developing a variety of functionalities. Because it is an interpreted language, Python is a high-level programming language that can abstract away specifics from code and does not require compilation before execution. Even the majority of unskilled programmers can grasp Python's code since it places such a strong focus on abstraction (Wilson, 2022).

#### ii) JavaScript:

JavaScript is widely used to create websites today. First developed by Netscape as a method for adding dynamic and interactive elements to websites. Although both ECMAScript and JavaScript influence, JavaScript's syntax is more similar to C than it is to ECMAScript, a scripting language created by Sun Microsystems. Because JavaScript is a client-side scripting language, the client's web browser, rather than the web server, runs the source code. When a webpage loads, JavaScript functions can therefore work without a server (Christensson, 2014).

### **7.5.2. Framework:**

#### i) Django (Backend framework):

Django is a powerful Python web framework, that uses the architectural design pattern known as model view controller (MVC). The major objective of Django is to simplify the process of developing intricate, database-driven websites. It was created in a hectic journalism environment. This web framework was initially developed by The World

Company so that they could use it to run some of their news-focused websites. In July 2005, it was made publicly accessible under a BSD license (Techopedia, n.d.).

ii) React (Frontend framework):

React is a JavaScript package designed to help programmers create user interfaces or UI. When using websites and web apps, users interact with UI, which are collections of on-screen menus, search bars, buttons, and other features (Morris, n.d.).

Using React, programmers can build powerful online applications that can modify data without refreshing the browser. React's primary goals are to be quick, scalable, and easy to use. It only functions with the application's user interfaces. This has to deal with the MVC template's view. It can work with other JavaScript frameworks or libraries, like Angular JS in MVC (Pandit, 2021).

### **7.5.3. Database:**

i) PostgreSQL:

A highly stable open-source database system called PostgreSQL offers a variety of SQL features like foreign keys, subqueries, triggers, and several user-defined types and functions. Providing several tools that methodically build and reserve data workloads, considerably enhances the SQL language. It is heavily used to store data by numerous geospatial, analytics, mobile, and web applications (Kinsta, 2022).

### **7.5.4. API (Application Programming Interface):**

i) Django Rest Framework:

The Django REST framework (DRF), which is free, well-known, and maintained, is a Python/Django framework designed for creating complex online APIs. It is a flexible, feature-rich framework that allows for the creation of both straightforward, pre-built API

endpoints and complex REST structures. The Django REST framework has a ton of capability, but the base view class is rather straightforward, and the framework is generally easy to use. The primary objective of the DRF is to distinguish clearly between a model, a generalized wire representation (like JSON, XML, etc.), and a set of generic Class-Based Views that may be customized to satisfy any specific API endpoint using a Serializer that specifies their mapping (quintagroup, n.d.).

## 7.6. Survey:

### 7.6.1. Survey report:

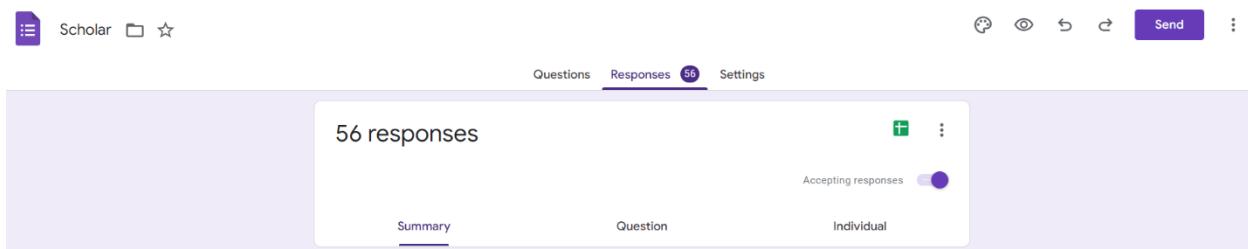


Figure 60 Survey Summary

A survey had been conducted for my application ‘Scholar’ for respondents’ decisions and opinions as well spread information on the use of technology properly in the educational sector to a level.

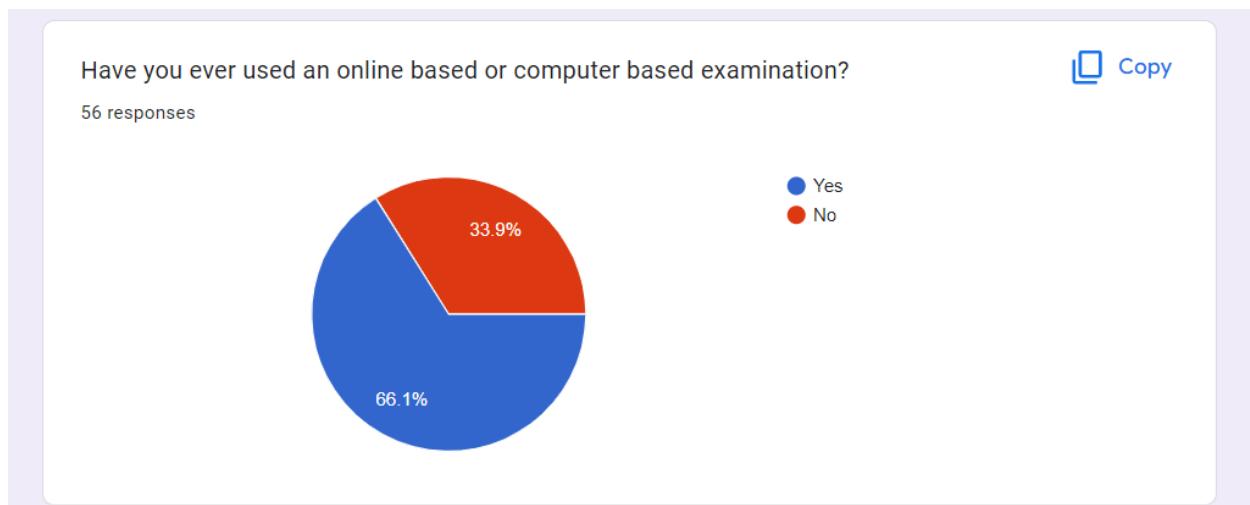


Figure 61 Have you ever used an online based or computer-based examination?

The above figure shows that many people have used online or computer-based examinations.

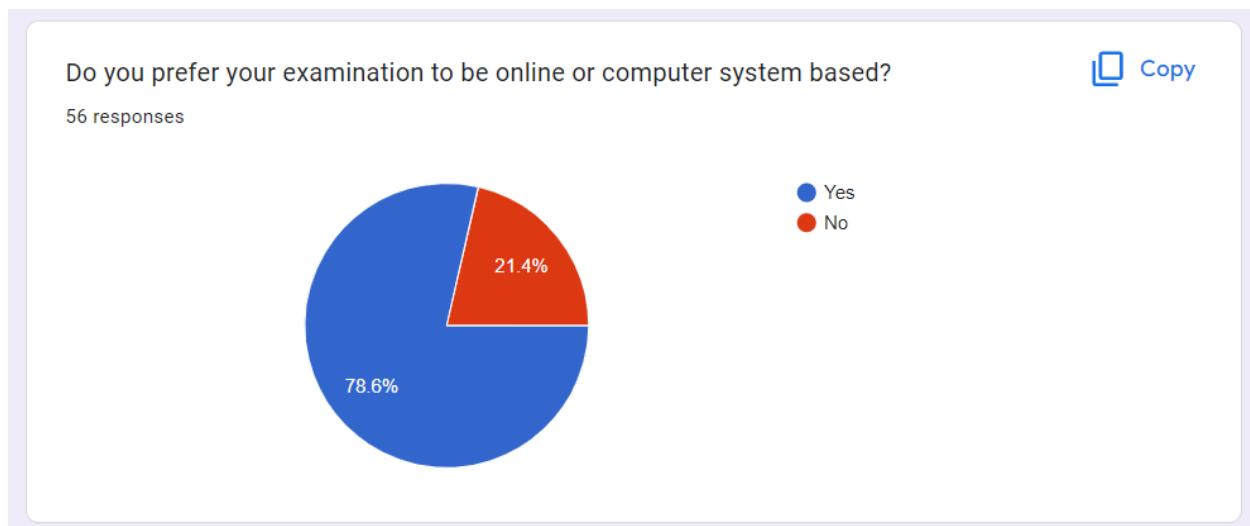
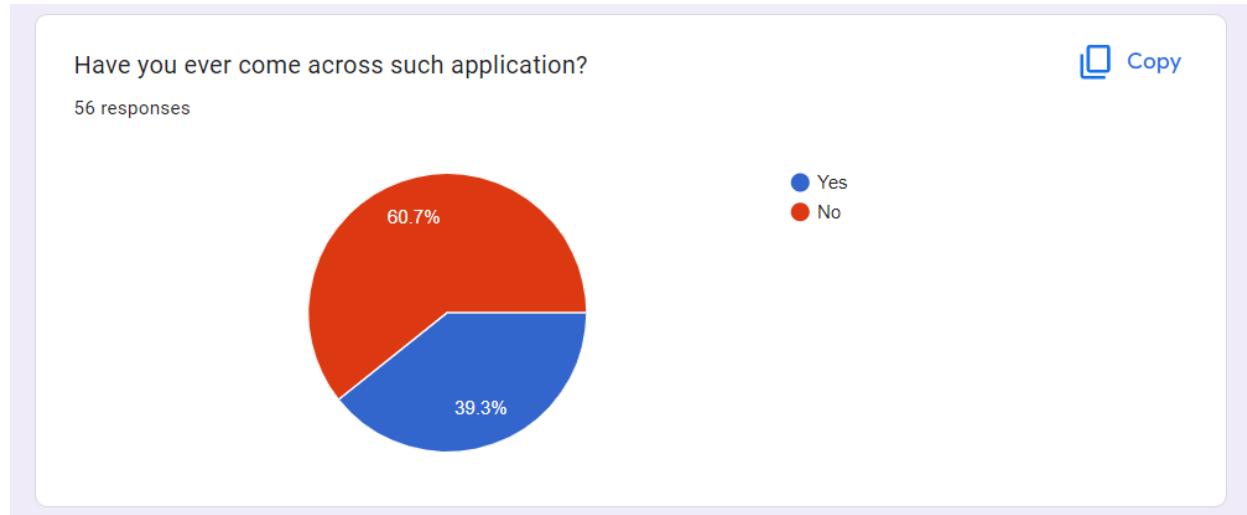


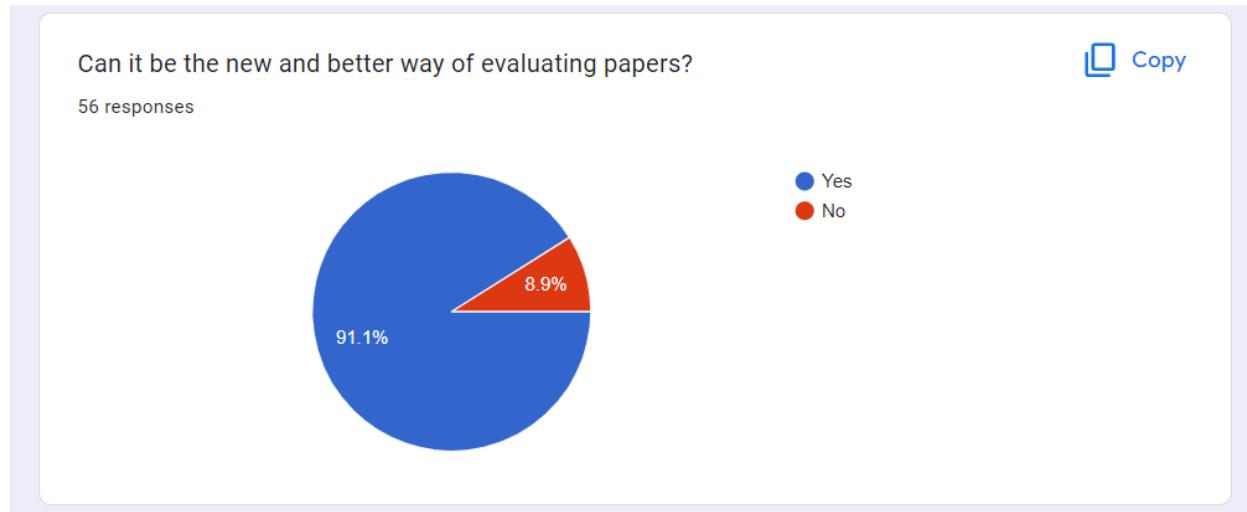
Figure 62 Do you prefer your examination to be online or computer system based?

The above figure shows that a greater number of people prefer online or computer-based examinations in comparison to traditional paper-based examinations.



*Figure 63 Have you ever come across such application?*

The figure above shows that fewer people have come across an application like Scholar (an online examination system).



*Figure 64 Can it be the new and better way of evaluating papers?*

The above figure shows that the maximum number of people prefer the evaluation of their papers to be done through an online or computer-based system.

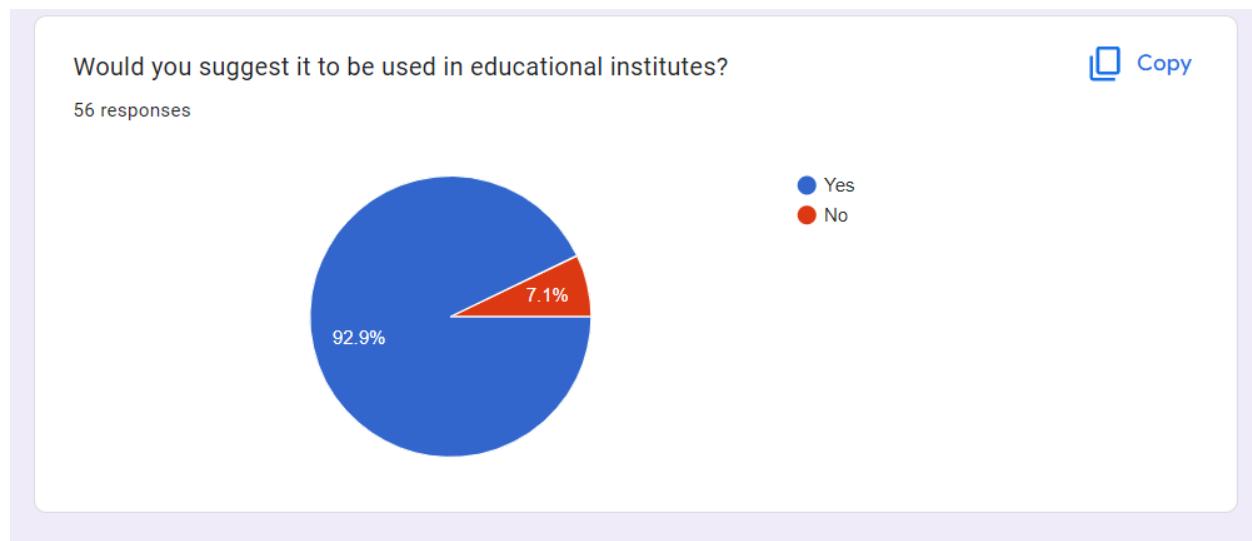


Figure 65 Would you suggest it to be used in educational institutes?

The above figure shows that the maximum number of people suggest that educational institutes implement applications like Scholar (online or computer-based examination).

Online examination is better than the traditional approach of conducting the examination. Why or why not?

38 responses

Online examination is better considering the world we live in today since we have access to technology but regardless traditional approach is also convenient to those area where they lack access to technology a

online examination is better because it is time efficient, environmental friendly and scalable with worldwide reach

Online examination might not be a better way of conductinh exams as it is difficult to monitor and manage time.

No ..due to the different unfortunate circumstance like network connecton, device problem etc.

Yes, because it allows us to analyze the data instead of memorizing it. I believe 21st century is an age of technology and information. You can get info anywhere but its up to us how we use those info. Online exam allows us such analytical approach of evaluating students' capacity.

Because it allows us to write and think freely on our own space.

It's more comfortable

Figure 66 Online examination is better than the traditional approach of conducting the examination. Why or why not? (Series 1)

The above figure shows the respondents' answers to why or why not online examination is better than the traditional approach of conducting an examination.

Online examination is better than the traditional approach of conducting the examination. Why or why not?

38 responses

However, if everything goes well and this problem is solved in future, online exam can be a better option at that time, but not in the current situation of the country.

Very nice

Advantages of Online Exams hlp4othr@gmail.com Online examination is better than the traditional approach of conducting the examination. Why There are several reasons why online examinations may be better than traditional examinations in certain situations: Convenience: Online examinations can be taken from any location with an internet connection, which is more convenient for students who may not be able to travel to a specific location to take an exam. Flexibility: Online exams can be scheduled at a time that is convenient for the student, which may not be possible with traditional exams that are held at specific times and locations. Reduced cheating: Online exams can be designed to minimize the opportunity for cheating, such as by using proctoring software that monitors the student's webcam and screen during the exam. Increased accessibility: Online exams can be made more accessible for students with disabilities by providing accommodations such as text-to-speech or larger font sizes. Cost savings: Online exams can be more cost-effective for institutions to administer, as they do not require the use of physical space or resources like paper and ink. Of course, there are also potential drawbacks to online exams, such as the need for reliable internet access and potential technical issues. It is important to carefully consider the specific needs and goals of a particular examination and determine the best approach based on those factors.

Figure 67 Online examination is better than the traditional approach of conducting the examination. Why or why not? (Series 2)

Some more answers on the respondents' answers to why or why not online examination is better than the traditional approach of conducting the examination.

### **7.6.2. Analysis of survey report:**

According to the survey conducted by Scholar,

- i) People have used online measures to conduct and take examinations ([Figure 61](#)). But on the other hand, they also have not come across such applications ([Figure 63](#)). This means even though they have appeared for online examinations, they have not used a proper application to conduct such online or computer-based examinations. They may have used some other ways to conduct the examinations online but not through a proper application.
- ii) Maximum people prefer the examination to be conducted through an online or computer-based system ([Figure 62](#)).
- iii) Maximum people suggest online, or computer-based examination would be better than the traditional way of paper-based examination ([Figure 64](#)).
- iv) Maximum respondents also suggest educational institutes should have online or computer-based examination systems ([Figure 65](#)).
- v) Respondents have given their answers to why or why not online examination is better than the traditional approach of conducting an examination ([Figure 66](#)), ([Figure 67](#)). Most of them support that online examination is better than the traditional approach of conducting the examination.

## 7.7. High level use case:

### 7.7.1. Use case: Register student/teacher

Use Case:	Register student/teacher
Actors:	Staff
Description:	A student or a teacher provides personal details to the institute itself and staff registers the student or a teacher respectively to become an online member of the system.

Table 3 Use case: Register student/teacher

### 7.7.2. Use case: Student Login

Use Case:	Student Login
Actors:	Student
Description:	After the registration of the student, he/she is provided with the login username and password through email. The student can now log in to the system using the correct username and password.

Table 4 Use case: Register student/teacher

## **7.8. Expanded use case:**

### **7.8.1. Use Case: Register student, teacher**

Use Case: Register student/teacher

Actor: Staff

Description: A new student/teacher provides personal details to the institute to get registered to the system (Scholar).

Typical Course of event:

<b>Actor action:</b>	<b>System response:</b>
1. The staff prepares the student/teacher records based on the information provided to the institute.	2. System interface gets displayed.
3. The staff fills in the required information asked by the system.	4. System takes the input and validates it.
5. The staff registers by clicking on the register button.	6. If the entered information is correct after the verification of the information, the system registers the student/teacher and provides a username and password for the registered member of the system through email.

*Table 5 Use case (Expanded): Register student, teacher*

Alternate courses:

Line 3: If the user entered information is incorrect or the verification process fails, the system displays an error message allowing the user to enter the valid and correct information and the use case ends.

### **7.8.2. Use case: Student Login**

Use Case: Student Login

Actor: student

Description: After the registration of the student, he/she is provided with the login username and password through email. The student can now log in to the system (Scholar) using the correct username and password.

Typical Course of event:

<b>Actor action:</b>	<b>System response:</b>
1. The student receives the login credentials from their respective institute through email.	2. System interface gets displayed.
3. The student fills in the required information asked by the system for login.	4. Systems take the input and validates it.
5. The student clicks on the login button.	6. If the entered information is correct after the verification of the information, the system allows the student to log in to the student portal.

Table 6 Use case (Expanded): Student Login

Alternate courses:

Line 3: If the user entered information is incorrect or the verification process fails, the system displays an error message allowing the user to enter the valid and correct information and the use case ends.