<u>FYP Final Report</u>

MetaRoom

Final Year Project Report
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In Partial Fulfilment
Of the Requirements for the degree
Bachelor in Science (Computer Science)

Sukkur IBA University,
Sukkur, Sindh Pakistan
(2023)

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SUBMITTED TO THE DEPARTMENT OF COMPUTER SCIENCE IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER
SCIENCE

at the

SUKKUR BA UNIVERSITY

May, 2023

Supervisor:

Dr. Muhammad Hussain Mughal and Saif Hassan (former)

DECLARATION

"We hereby declare that this project report called **"MetaRoom"** submitted to the "Computer Science", is a record of an original work done by us under the guidance of Supervisor **Muhammad Hussain Mughal (**and initially under **Saif Hassan)**, and that no part has been plagiarized without citations. Also, this project work is submitted in the partial fulfilment for the degree of Bachelor of Computer Science."

DEDICATION

We dedicate this work to our parents who taught us to think clearly & motivated us to try our hardest in everything that we do, without whom we could not have reached our goals. After that we dedicate this to all those who suffered in their learning and faced hurdles in the pandemic in order to get education. Lastly, to all those who believe in the power of learning.

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ABSTRACT

In the realm of online education, there is a persistent and pressing issue that emerges from the inability of existing platforms to effectively cater to the diverse needs of both students and tutors. This challenge stems from the inherent requirement for different tools to address various aspects of the multifaceted learning process, resulting in a fragmented and disjointed experience. For instance, while Moodle serves as a valuable platform for assessing students during online classes, live lectures necessitate the use of separate platforms like Meet or Zoom. Additionally, students often find themselves compelled to switch to yet another platform for submitting assignments or attempting quizzes, further exacerbating the inefficiency and complexity of the overall learning experience.

To tackle this challenge head-on, our project is committed to introducing a revolutionary all-in-one platform that resolves the limitations ingrained within existing tools. Our innovative platform will seamlessly integrate the functionalities of a wide array of existing tools, offering a unified and comprehensive solution that caters to the diverse and evolving needs of online education. By skillfully consolidating the best features from platforms such as Moodle, Meet, Zoom, MS Teams, and numerous others, students and tutors will delight in a seamless and streamlined experience, eradicating the need for constant platform switching and ensuring enhanced efficiency and user satisfaction.

Moreover, we recognize and value the vital role played by freelance tutors within the broader educational landscape. As such, our platform will extend its benefits to these dedicated professionals by providing them with a centralized hub that caters specifically to their unique tutoring activities. By unifying the necessary tools for teaching, assessment, and collaboration, we aim to significantly alleviate the administrative burden faced by freelance tutors when juggling multiple platforms, enabling them to focus more on delivering exceptional educational experiences.

At the core of our vision lies the creation of an inclusive and highly efficient online learning ecosystem where students, educators, and tutors can seamlessly interact, engage, and collaborate. Through our all-encompassing platform, educational institutions, online classrooms, and freelance tutors can collectively embrace a simplified and unified approach to teaching and learning, ushering in a new era of educational excellence and accessibility. In pursuit of our vision, we plan to explore several exciting future directions that will further enhance the

capabilities, features, and overall user experience of our platform. These directions are intended to ensure that our platform remains at the forefront of online education technology.

Our project addresses the challenge of existing online education platforms lacking the ability to cater effectively to the diverse needs of students and tutors. The current fragmented experience requires switching between multiple tools, such as Moodle, Meet, Zoom, and MS Teams, for different aspects of the learning process. To overcome this challenge, we aim to introduce an innovative all-in-one platform that seamlessly integrates the functionalities of various existing tools. By consolidating the best features into a unified solution, students and tutors will experience a streamlined and efficient learning environment, eliminating the need for constant platform switching and enhancing user satisfaction. Freelance tutors will also benefit from a dedicated hub that centralizes teaching, assessment, and collaboration tools, reducing their administrative burden and enabling them to focus on delivering exceptional educational experiences.

Our vision is to create an inclusive and highly efficient online learning ecosystem that promotes seamless interaction, engagement, and collaboration among students, educators, and tutors. We plan to continuously enhance our platform's capabilities, features, and user experience to remain at the forefront of online education technology, fostering educational excellence and accessibility for all.

Keywords: remote learning, online tutoring, online classes

INTRODUCTION

1.1 Introduction to the project

Education serves as a fundamental pillar for the overall well-being and progress of any society. It encompasses the vital responsibility of teachers to deliver meaningful lectures, while student assessment plays a crucial role in evaluating their performance in various subjects. However, the landscape of education underwent a significant transformation at the beginning of 2020, as the closure of institutes worldwide due to unforeseen circumstances disrupted the traditional learning paradigm. This disruption affected more than 1.2 billion students across 186 countries [1]. In response to the unprecedented global situation, higher education institutes swiftly pivoted to adopt "remote learning" as an alternative approach. This shift marked a near revolution in the concept of education, as the idea of online lectures became increasingly prevalent and accessible. Unlike just two years ago, remote learning has now become an ordinary and familiar term in the education sector.

The impact of this paradigm shift has been noteworthy, benefiting academic personnel in numerous ways. Remote learning has presented opportunities for flexibility, enabling teachers to deliver lectures from the comfort of their homes or any other suitable location. It has also provided access to a wider range of educational resources, fostering innovative and engaging teaching methods. Additionally, remote learning has opened doors for collaboration and knowledge-sharing among educators globally, transcending geographical boundaries. Teachers from different parts of the world can now collaborate and share best practices, enriching their teaching methodologies and expanding their horizons.

However, it is important to acknowledge that remote learning is not without its challenges and downsides. One significant concern is the potential fatigue experienced by both teachers and students. The increased screen time, coupled with the absence of physical classroom interactions, can lead to exhaustion and reduced engagement. Teachers must find creative ways to keep students engaged, ensuring that learning remains a stimulating and fulfilling experience. Incorporating interactive elements, such as quizzes, discussions, and group activities, can foster active participation and prevent disengagement.

Moreover, the transition to remote learning has necessitated the use of multiple platforms and tools, causing frequent switching between different software applications. This

can result in a fragmented learning experience, potentially affecting the continuity and coherence of the educational process. To address this challenge, educators must seek integrated solutions that streamline the learning experience. Adopting an all-in-one platform that consolidates essential functionalities, such as live lectures, assignment submissions, and assessments, can simplify the learning journey and enhance overall efficiency. Such platforms would not only benefit students but also ease the workload for teachers, enabling them to focus more on delivering quality education.

In light of these drawbacks, it becomes crucial to strike a balance between the positive aspects of remote learning and the challenges it poses. While the convenience and accessibility offered by online lectures are undeniable, it is essential to address the potential drawbacks and find ways to mitigate them. By focusing on optimizing the learning experience and addressing the concerns of both educators and students, we can make the most of remote learning's potential and ensure a well-rounded educational journey for all stakeholders involved.

In conclusion, the paradigm shift towards remote learning has revolutionized the educational landscape, offering unprecedented opportunities and challenges. Educators must adapt to this new normal, embracing the benefits of flexibility, resource accessibility, and global collaboration while tackling issues like fatigue and fragmented learning experiences. By harnessing the potential of remote learning and implementing integrated solutions, we can build a cohesive and effective educational environment that meets the diverse needs of students and teachers alike. The journey towards an enhanced educational experience continues, driven by our commitment to nurturing future generations through innovative and adaptive teaching methodologies.

1.2 Literature Review

There is a wide variety of software available that can assist in various tasks. One notable example is Zoom [2], which was initially introduced for online meetings and includes features such as screen sharing and file sharing in its chat section. However, it should be noted that Zoom is not specifically designed for remote learning purposes. Another option for online meetings is Google Meet [3]. It offers similar features to Zoom [2] but is generally considered more convenient for users. Google Meet provides a reliable platform for conducting virtual meetings and offers features that facilitate communication and collaboration. For educational purposes, Moodle [4] is widely used by many institutions. It serves as an excellent platform for conducting assessments, including quizzes and assignments. Additionally, it includes an

integrated grading system. However, Moodle lacks the functionality of online lecturing, which limits its use in delivering live video lectures. Lastly, Kahoot [5] is a popular tool that allows teachers to create custom Multiple-Choice Questions (MCQs) for their students. It enables multiple students to attempt the questions simultaneously, adding an element of gamification to the learning process. However, Kahoot does not offer features for creating assignments, accepting submissions, or delivering video lectures. In summary, while there are several software options available for various educational tasks, each tool mentioned above has its own strengths and limitations. It's important to choose the software that aligns with the specific needs and goals of remote learning or online education.

1.3 Project Description

This section discusses the description of project MetaRoom. The background of the project, its scope and what has not been kept in the scope of this project, and other details such as stakeholders, and operating environment is also described.

1.3.1 Project Background

Education serves as a fundamental pillar for the well-being and progress of any society. The successful delivery of meaningful lectures is not just a duty but also a responsibility of every dedicated instructor. Equally important is the process of assessing students, as it plays a crucial role in determining their performance and understanding of respective subjects. However, the landscape of education experienced a dramatic shift at the beginning of 2020 when the closure of institutes worldwide due to the COVID-19 pandemic affected more than 1.2 billion students across 186 countries [1]. In response, Higher Education Institutes swiftly transitioned to "remote learning," triggering a paradigm shift in the concept of education itself. Online lectures became the new norm, impacting the lives of academic personnel in both positive and negative ways, with fatigue becoming a prominent concern for both teachers and students alike.

In this transformed learning environment, imagine a scenario where a teacher and students attempt to engage in remote learning. To attend a video lecture, they log into platforms like Zoom [2] or Google Meet [3], and when it comes to conducting assessments, they switch to online quiz platforms like Kahoot [4]. For content sharing related to the learning topics, they resort to file dropping platforms or explore alternative methods. The need to continuously switch between various platforms for different tasks during the learning process becomes not only tedious but also counterproductive, diverting focus away from the core objective of learning

itself. The disjointed nature of these tools hampers the seamless flow of the learning experience.

To address these challenges and streamline the remote learning process, we present MetaRoom, a cutting-edge software solution designed to create a harmonious and unified environment for teachers and students alike. By integrating multiple functionalities into a single platform, MetaRoom eliminates the necessity of switching between disparate tools, offering a holistic remote learning experience. Our vision is to empower educators and learners with a comprehensive virtual space that facilitates effortless transitions between lectures, assessments, content sharing, and collaboration.

MetaRoom's key feature is its Google-authenticated login, ensuring a secure and convenient access point for both teachers and students. By leveraging the widely trusted Google authentication system, we establish a robust and reliable framework that safeguards user identities and data. This not only instills confidence in users but also eliminates the need for creating and managing additional login credentials, simplifying the onboarding process and promoting widespread adoption.

Beyond the enhanced security and convenience, MetaRoom's unified ecosystem enhances productivity and learning outcomes. With seamless access to video lectures, live interactions, real-time assessments, content repositories, and collaborative tools, both educators and students can remain immersed in the learning journey without distractions. The intuitive interface and user-friendly design make MetaRoom accessible to users of all technical backgrounds, ensuring inclusivity and ease of use for a diverse audience.

In conclusion, MetaRoom stands as a beacon of innovation in the realm of remote education, addressing the challenges posed by the rapidly evolving landscape of learning. By integrating various functionalities and offering a Google-authenticated login, MetaRoom transforms the remote learning experience into a cohesive and enriching endeavor for teachers and students alike. As we continue to adapt to changing circumstances, our commitment to empowering education remains unwavering, and we are excited to witness the positive impact of MetaRoom on the future of remote learning.

1.3.2 Scope and Features

MetaRoom will allow the teachers/tutors to do the following:

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- Create a course and upload course content on it
- Host a video lecture session
- Create and conduct quizzes
- Grade assignments
- Join the video sessions using a room id
- Specify their free timings that would be visible to the students

MetaRoom will allow the students/peers to do the following:

- Enroll themselves into a course using a course key
- Access the course content uploaded by their instructors
- Attempt quizzes
- Submit assignments
- Join the video sessions using a room id
- Schedule a one-on-one session on available time slots with the tutor

1.3.3 Not in Scope

a. The MetaRoom platform would not provide any certifications to the students who attend the course. The teachers or institutes using the MetaRoom may provide it to the students on their own.

b. The payment feature has been given a low priority because for the payment integration, we need a payment service account. In order to have the account, one needs to register a business first.

1.3.4 Objectives

The objectives of the proposed system are as follows:

- To help both the teachers and the students to have an effortless and seamless remote learning experience.
- To enable the teachers to deliver video lectures to the students that are enrolled in the course.
- To enable the students attend the lectures and learn with having no dependencies on locations i.e., schools, colleges
- To provide all of the course content under one page, to both the teachers as well as the students
- To make the course content available at any time

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- To enable students book a one-on-one session with the course teacher on the time slots that the teachers have provided as their available time
- To enable the people who want to work from home as tutors but due to location constraints they cannot

1.3.5 Stakeholders

The stakeholders of the MetaRoom project include teachers, students, and freelance tutors. Teachers benefit from the platform's features, such as virtual meetings, content management, and quiz management, which enhance their ability to deliver engaging lessons and streamline administrative tasks. Students gain access to a user-friendly interface for attending virtual classes, accessing course materials, and completing quizzes. Educational institutions can leverage MetaRoom to provide a unified online learning environment, improving efficiency and fostering collaboration. Freelance tutors can utilize the platform to simplify their tutoring activities, centralizing their teaching and assessment processes. Ultimately, MetaRoom's stakeholders encompass various educational roles, all benefiting from its comprehensive functionality.

Table 1. The Stakeholders

Stakeholder	Focus
Tutor/Instructor	Tutors will use the system to achieve the functionalities provided in project scope.
Peer/Student	Peers will use the system to achieve the functionalities provided in project scope.
Admin	Admin will have the overall control of the system, such as statistics.

1.3.6 Operating Environment

The System will operate with a combination of following environments.

- **Web Browser(s):** Chrome, Opera, Firefox

- **Database:** MongoDB

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- **User Interface:** NextJS based web application

- **Communication:** via HTTP, TCP/IP, Web Sockets, Web RTC, Jitsi

- **Architecture:** Client-server architecture

1.3.7   System Constraints

The system will work under following constraints and failing one constraint may not help achieve functionality of the System.

1. **Software constraints:**

- VS Code is required to develop the web app.

- MongoDB database will be required to store the data.

- AWS Cloud Service will be required for hosting the web application.

2. **Hardware constraints:**

- Working Computer (with camera, microphone, speakers) are required to use the software

- Web Browser is required to access the web application

3. **Cultural constraints:**

- Our application will use the English language

4. **Environmental constraints:**

- The device is required to be connected to the internet.

5. **User constraints:**

- User must be able to use a web browser.

1.3.8   Assumptions and Dependencies

For the MetaRoom, we have the following assumptions and dependencies:

- Users should have the supported devices, such as a working computer

- Users must know how to use the device in order to use the system.

- Users must be connected to a smooth connection of internet to use the system.

- System should have access to the users' camera, microphone.

STUDY ANALYSIS

2.1 Software Requirements Specifications

In this section the requirements of the software are defined along with the specifications of our system have been discussed.

2.1.1 External Interface Requirements

In this section of the document, a comprehensive description is provided for hardware, software and communication interfaces and their relation to achieve the expected behavior of the system.

2.1.1.1 Hardware Interfaces

The system will operate only on Web Browsers and those must have support for features such as Internet, Camera, Microphone for the meetings to be conducted. Internet support is required for the system to communicate with the database, server and to call APIs. Along with that, database and application logic will be managed separately and will be hosted on a third-party service provider.

2.1.1.2 Software Interfaces

There will be multiple required Software Interfaces, tools and libraries for System to operate.

Table 2. Software Interface Description

Software Interface	Description
Operating Environment	The client application will run on a Web Browser. While the NodeJS hosting server will have its own OS such as Linux.
NextJS and UI Libraries	The front end of System will be designed using NextJS Framework of JavaScript and CSS Tailwind.
Jitsi	Will enable the Real Time video calling feature and chatting.
NodeJS, ExpressJS	Will manage all the business logic.
MongoDB	The application data will be stored in MongoDB Atlas.
STUN and TURN servers	Will be used in order to connect two browsers with one another for data streaming.

The web browser will provide native features of client devices such as Location, Camera and Internet. That data will be used by the system to provide promised features. Further, the system will enable the video calling feature. This type of communication will be carried out by WebRTC.

Moreover, the frontend components will communicate with the backend server via HTTP protocol. This communication will be bi-directional, that means the client will communicate with the server and vice-versa. In the end, the Server will directly communicate with Database to perform CRUD and other required operations and results will be reflected to the frontend.

2.1.1.3 Communication Interfaces

The System will highly rely over the Internet and 4G or Higher speed of network that will provide better performance hence better user experience. The MetaRoom running on a Web Browser will use HTTP protocol over TCP/IP to communicate with NodeJS Server. The data from Client to Server or Server to Client will be sent and received in JSON format, but WebRTC will use its default way of communication that is SDP (Session Description Protocol). For security of data, the system will use Standard encryption techniques such as Hashing, and SQL Injections.

2.1.2 Functional Requirements

Functional requirements are product features or functions that developers must implement to enable users to accomplish the tasks. This section deeply explains the functional requirements for the system.

This section has been divided into two sub-sections, functional hierarchy and use case diagram. The functional requirements that are to be expected by MetaRoom would be mentioned in the functional hierarchy diagram in the upcoming section. Moreover, the use case diagram in the next section would be giving an insight into what sort of scenario would be in the case of using the application.

Some general functional requirements that should be met by the system upon the completion, are mentioned as follows:

- The system must allow the users to log in using their credentials.
- The system must send a monthly email update to the parents if the parents' email was provided at the time of registration.
- User should be able to create a course and its corresponding pieces if they are a tutor.
- User, if is a tutor, should be able to upload course content, and create quizzes and/or assignments.

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- User, if he/she is a student, must be able to enroll in a course, as well as view any content provided by the tutor of the course, they are enrolled in.

2.1.2.1 Functional Hierarchy

The functional hierarchy of the MetaRoom project encompasses three primary areas: virtual meetings, content management, and quiz management. The top-level focus is on virtual meetings, which empower teachers to conduct remote classes seamlessly by utilizing video conferencing, screen sharing, and whiteboarding tools. This enables real-time collaboration and communication between teachers and students, transcending physical limitations. The next level centers around content management, providing teachers with a robust platform to organize and share course materials efficiently. Teachers can upload a variety of content types, such as documents, videos, and images, and categorize them into folders for easy access. Additionally, content management includes tracking features that allow teachers to monitor student progress, view which materials have been accessed, and gauge student engagement. At the lower level, quiz management offers teachers the ability to create multiple-choice quizzes effortlessly. They can design quizzes of varying lengths, specify correct answers, and leverage automatic grading for efficient assessment. Real-time results provide valuable insights into student performance, highlighting areas that may require additional instruction. By integrating virtual meetings, content management, and quiz management, MetaRoom presents a comprehensive solution that optimizes remote teaching, simplifies content distribution, and streamlines assessment processes. Through its cohesive functionality, MetaRoom enhances the effectiveness and efficiency of online education, fostering a seamless experience for teachers and students alike.

2.1.2.2 Use Cases

This section describes the use cases that are the high-level functions and scope of a system. These diagrams also identify the interactions between the system and its actors. The use cases and actors in use-case diagrams describe what the system does and how the actors use it, but not how the system operates internally. Following is the use case diagram of MetaRoom.

1. Sign up

UC-01: Sign up		
Use case Id:	UC-01	
Actors:	Peer, Tutor, Admin	
Feature:	Authentication	
Pre-condition:	User should open the web application User must be connected to the internet User should give the information as per requirements	
Scenarios		
Step#	**Action**	**Software Reaction**
1.	User opens the web application	The system will display the options to sign up or log in
2.	The Users request for sign up	The system will display a form for entering the necessary details
3.	The user should enter the information in the required fields	The system will store the information in the database
Alternate Scenarios:		
1a: User must select an option to create an account, if not then 1b **1b:** User is asked to log in **2a:** User should fill all the required fields, if not then 2b **2b:** User is asked to refill all the required fields		
Post Conditions		
Step#	**Description**	
1	User is registered into the system and can use the extended features of software	
2	User has an account	
Use Case Cross referenced	None	

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2. Log in

UC-02: Login		
Use case Id:	UC-02	
Actors: Tutor, Peer, Admin		
Feature: Authentication		
Pre-condition:	Users should sign up for the system User must be connected to the internet Users should have an authentic and registered account in the system's databse	
Scenarios		
Step#	**Action**	**Software Reaction**
1.	The users enter their registered credentials	The system verifies the user's email and password
2.	The users click the login button	The system will display dashboard of the web application based on who the user is.
Alternate Scenarios:		
1a: User should fill all the required fields, if not then 1b **1b:** User is asked to refill all the required fields **2a:** If user does not provide the registered login id and password then 2b **2b:** User is asked to try again **3a:** If user forgets the password, then 3b **3b:** The system will allow user to create a new password		
Post Conditions		
Step#	**Description**	
1	The user is logged into the system	
2	The user has access to the functions of the system	
Use Case Cross referenced	None	

3. Create an assignment

Table 5. Use Case for Creating an assignment

UC-03: Create an assignment		
Use case Id:	UC-03	
Actors: Tutor		
Feature: User can use the app in order to create an assignment, provide description of an assignment.		
Pre-condition:	User should have an account on the web app User must be connected to the internet	
Scenarios		
Step#	**Action**	**Software Reaction**
1.	User opens the app	The system will display the options to sign up or log in
2.	The User clicks the log in button and logs in	The system will display options for creating an assignment, quiz, meeting, etc
3.	The user selects "Create Assignment"	The system will allow the user to provide description of assignment, and a deadline.
Alternate Scenarios:		
1a: User must select an option of Create Assignment **1b:** User is asked to provide details and deadline of the assignment		
Post Conditions		
Step#	**Description**	
1	Application will start	
2	The user has access to the options/features of the application	
Use Case Cross referenced	UC-06	

4. Create a quiz

Table 6. Use Case for creating a quiz

UC-04: Create a quiz		
Use case Id:	UC-04	
Actors: Tutor		
Feature: User can use the app in order to create a quiz, create multiple choice questions.		
Pre-condition:	User should have an account on the web app User must be connected to the internet	
Scenarios		
Step#	**Action**	**Software Reaction**
1.	User opens the app	The system will display the options to sign up or log in
2.	The User clicks the log in button and logs in	The system will display options for creating an assignment, quiz, meeting, etc.
3.	The user selects "Create Quiz"	The system will allow the user to provide description of quiz, and a deadline, and the user would be able to create MCQs..
Alternate Scenarios:		
1a: User must select an option of Create quiz **1b:** User is asked to provide details, questions and answers, and deadline of the quiz.		
Post Conditions		
Step#	**Description**	
1	Application will start	
2	The user has access to the options/features of the application	
Use Case Cross referenced	UC-07	

5. Host a Video Lecture Session

Table 7. Use Case for hosting a video lecture session

UC-05: Host a Video Lecture		
Use case Id:	UC-05	
Actors: Tutor		
Feature: User can use the app in order to host a video lecture session for the peers.		
Pre-condition:	User should have an account on the web app User must be connected to the internet	
Scenarios		
Step#	**Action**	**Software Reaction**
1.	User opens the app	The system will display the options to sign up or log in
2.	The User clicks the log in button and logs in	The system will display options for creating an assignment, quiz, meeting, etc.
3.	The user selects "Join Room"	The system will allow the user to join a meeting with having a control over the meeting.
Alternate Scenarios:		
1a: User must select an option of Join Room		
Post Conditions		
Step#	**Description**	
1	Application will start	
2	The user has access to the meeting.	
3	The user is inside the meeting with controls.	
Use Case Cross referenced	None	

6. Submit an assignment

Table 8. Use Case for submitting an assignment

UC-06: Submit an assignment		
Use case Id:	UC-06	
Actors: Peer		
Feature: User can use the app in order to attempt the assignment created in UC-03		
Pre-condition:	User should have an account on the web app User must be connected to the internet	
Scenarios		
Step#	**Action**	**Software Reaction**
1.	User opens the app	The system will display the options to sign up or log in
2.	The User clicks the log in button and logs in	The system will display options for submitting an assignment, quiz, join meeting, etc.
3.	The user selects "Join Room"	The system will allow the user to see the assignment with its description, deadline and be able to upload the required content.
Alternate Scenarios:		
1a: User must select an option of "Assignment" **1b:** User must be able to submit their file.		
Post Conditions		
Step#	**Description**	
1	Application will start	
2	The user has access to the assignment submission page.	
Use Case Cross referenced	None	

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7. Attempt a quiz

Table 9. Use Case for attempting a quiz

UC-07: Attempt a quiz		
Use case Id:	UC-07	
Actors: Peer		
Feature: User can use the app in order to attempt the quiz created in UC-04		
Pre-condition:	User should have an account on the web app User must be connected to the internet	
Scenarios		
Step#	**Action**	**Software Reaction**
1.	User opens the app	The system will display the options to sign up or log in
2.	The User clicks the log in button and logs in	The system will display options for submitting an assignment, quiz, join meeting, etc
3.	The user selects "Attempt Quiz"	The system will allow the user to see the quiz questions, deadline, and the available answers to that question. And must be able to select an option among them
Alternate Scenarios:		
1a: User must select an option of "Attempt Quiz" **1b:** User must be able to select options among the given MCQs. **1c**: User would be able to see result once the deadline is over.		
Post Conditions		
Step#	**Description**	
1	Application will start	
2	The user has access to the quiz, and then the results.	
Use Case Cross referenced	None	

8. Join a meeting

Table 10. Use Case for joining a video session

UC-08: Attempt a quiz		
Use case Id:	UC-08	
Actors: Peer		
Feature: User can use the app in order to join a meeting, whose meeting ID is given to them with their course content.		
Pre-condition:	User should have an account on the web app User must be connected to the internet	
Scenarios		
Step#	**Action**	**Software Reaction**
1.	User opens the app	The system will display the options to sign up or log in
2.	The User clicks the log in button and logs in	The system will display options for submitting an assignment, quiz, join meeting, etc
3.	The user selects "Join Meeting for this course"	The system will allow the user to join the meeting with limited controls.
Alternate Scenarios:		
1a: User must select an option of "Join Room for this course" **1b:** User must be able to submit their file.		
Post Conditions		
Step#	**Description**	
1	Application will start	
2	The user has access to the meeting room with limited controls.	
Use Case Cross referenced	None	

9. See Stats of the web application

UC-09: See Stats of website		
Use case Id:	UC-09	
Actors: Admin		
Feature: User can use the app to see the stats, performance of students (anonymously), average statistics of the web app's performance, and so on.		
Pre-condition:	User should have an account on the web app User must be connected to the internet	
Scenarios		
Step#	**Action**	**Software Reaction**
1.	User opens the app	The system will display the options to sign up or log in
2.	The User clicks the log in button and logs in	The system will display options for viewing stats as admin.
3.	The user selects "View Stats"	The system will display the stats in front of the user.
Alternate Scenarios:		
1a: User must select an option of "View Stats" **1b:** User must be able to view the necessary statistics in forms of tables, charts, etc.		
Post Conditions		
Step#	**Description**	
1	Application will start	
2	The user can see the statistics of the web application performance.	
Use Case Cross referenced	None	

2.1.3 Nonfunctional requirements

This section outlines all the non-functional requirements that are intangible but will highly affect the system's usability and acceptance.

2.1.3.1 Performance Requirements

The System will be interactive, responsive and should not cause long delays. It must take care of hand-eye coordination to provide high usability. Following non-functional requirements with respect to performance must be respected.

1. The System responds in 0.1 second for each interaction, and performs action within 5 seconds.
2. All alert messages, modals and pop-ups must appear within 2 seconds.
3. Data uploading, fetching and saving settings must run in separate threads and asynchronously.
4. System must provide progress information for long operations in percentage (%) or count.
5. Search operation within the app should not exceed 5 seconds and System should provide a positive or negative response to the search.
6. Use of appropriate Data structures for in memory data must be ensured to enhance performance.
7. Network delays must be handled wisely and appropriate information should be displayed.
8. The system must be reliable so that users feel free to interact with the system at any time.
9. The database should be normalized and prevent redundant data.

2.1.3.2 Safety Requirements

Safety requirements should be taken care of and users must be warned of any possible loss. Following safety requirements must be considered

1. **T**he web app should not Crash while being in use.
2. Appropriate warning messages must be displayed in case of DELETE, CANCEL, CONFIRM and such actions.
3. User account and preferences must be prevented and data integrity must suffice.
4. User permission must be granted while using Camera or Microphone features of the device.
5. The System must have Terms and Conditions described in an easy-to-read text and user agreement shall be approved for offering services.

2.1.3.3 Security Requirements

The Security threats can occur as the system will highly rely on Network communication and Users' location. So, these must be addressed to provide privacy and data integrity. Following requirements must be fulfilled by the System.

1. System must use standard Encryption techniques to secure the data.
2. Secure network protocols such as HTTP over TCP/IP must be used.
3. Users must be authenticated via email or mobile number and only authorized people should have access to their data.

2.2 Software Design Specifications

This section describes the design view of the project MetaRoom. It includes sequence diagrams, the project architecture.

2.2.1   Sequence Diagrams

The Sequence Diagrams are used to show the interactions between objects in a single Use case and in sequential order. We have designed the Sequence Diagram to show how objects interact with each other for our proposed system.

2.2.1.1 Login

Figure 2 depicts the sequence in which a user logs in into the system. The user must enter credentials that would be authorized from the database and upon success, a user logs in successfully.

2.2.1.2 Signup

In case of not being a registered user, one is asked to sign up and provide the details as shown in Figure 3.

2.2.1.3 Enroll in a course

The sequence in which a user is enrolled into a course only if one is a student is depicted in Figure 4.

2.2.1.4 Submit an assignment

The diagram in Figure 5 depicts submitting an assignment from a student's side.

2.2.1.5 Attempt a qui6z

Attempting a quiz would look like as shown in Figure 6 if seen sequentially when a student would opt for attempting a quiz.

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2.2.1.6 Create a course

For an instructor, creating s course would seem like the Figure 7.

2.2.1.7 Create an assignment

In order to create an assignment, an instructor/tutor would have to perform these steps sequentially.

2.2.1.8 Create a quiz

For creating a quiz, a tutor is expected to perform the following steps in sequence

2.2.2 Project Architecture

The given figure depicts the architecture of a project that comprises four layers:

- **The Client Layer**: This layer represents the User Interface of the application. It enables users to perform CRUD (Create, Read, Update, and Delete) operations and facilitates video calling via interaction with STUN and TURN server layers.
- **The Application Server Layer**: This layer handles the business logic of the application. It serves clients and communicates with the database to store and retrieve data. Additionally, it interacts with peer connections for STUN and TURN servers.
- **The Database Layer**: This layer is responsible for storing and retrieving data.
- **The STUN/TURN Server Layer**: This layer is utilized for creating peer connections directly into browsers.

2.2.3 Entity Relationship Diagram

In this section, we present an in-depth analysis of our system's data requirements through the ERD, capturing the various entities, attributes, and associations that define the foundation of our database. By meticulously organizing and presenting the relationships between entities, the ERD aims to enhance our understanding of the system's data flow and support the decision-making process throughout the development lifecycle.

The ERD acts as a blueprint for the database implementation, promoting data integrity, optimizing data retrieval, and ultimately contributing to the successful realization of our project goals. Let's delve into the ERD to gain a comprehensive understanding of our data structure and lay the groundwork for a robust and scalable system.

Table 12. User Schema of MetaRoom

Roles
- Teacher
- Student
- Admin

User Schema
- username: String
- enrollemntNumber: String
- email: String
- phone: String
- role: USER_TYPE
- Courses Enrolled: [Course]
- department: Department
- image: String
- address: String
- verified: Boolean
- registrattionComplete: Boolean
- enrollments: [enrollments]
---if role is Teacher
- specialsedCourse: String
- Availability: [timeSlots]

Enrollments
- StudentId: UserId
- courseId: CourseId
- attendance: [
                {
                        MeetingId: String
                        meetingDate: DateTime
                }
        ]
- QuizSubmitted: [Quiz]
- AssignmentSubmitted: [Content]

Content
- contentName: String
- tineStamps:data
- content: File OR Link
- fileType: String
- expires Datetime
- contentType: CONTENT_TYPE

Course
- name: String
- durationOfCourse: Number
- courseContent: [Content]
- sessionTime: String
- sessionMeetingId: String
- teacherId: User
- studentsEnrolled: [User]
- courseEndDate: DateTime
- quizes: [Quiz]

CONTENT_TYPE
- ASSIGNMENT
- DOCUMENT

Meeting Room

- RoomName :String
- tineStamps:DateTime
- meetingJoinId: String
- expires:Datetime
- ScheduleTime: DateTime
- chat: [
    {
    Meeting Time:DateTime,
    MeetingMessage: [Messages]
    }
  ]

Time Slots
- startTime: time
- endTime: time
- day: String

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DEVELOPMENT METHODOLOGY AND RESULTS

3.1 Development Methodology

We have used an agile development process to develop this system. It helps to manage and implement the system into segments that basically reduces the risk factor. The agile development process involves planning, execution, and evaluation. In the testing phase, we have tested each component separately then integrated all the components and tested the overall working of the system. In the agile development phase, there are three stakeholders Teachers, Students, and Admin.

- Teacher will have to create an account and then process to create courses, upload quizzes, or grade the assignments uploaded by student.

- Students will have to create an account then join classroom meetings, attempt quizzes, or view the assignment uploaded by the respective teacher.

- Admin can view the overall performance of the website, i.e., number of courses and students enrolled, etc.

3.2 Results

In the result section of this report, we aim to discuss and define the resultant interface and its functionalities throughout the project in greater detail. This includes an in-depth analysis of the interface's features, its design, and the user experience. Throughout the project, we have worked tirelessly to develop an interface that is both user-friendly and aesthetically pleasing. The interface is designed to be intuitive and easy to navigate, with clear visual cues and intuitive controls that make it easy for users to find the information they need. One of the key features of the interface is its customizability. We have designed the interface to allow users to customize their experience, with options to adjust the layout, color scheme, and font size to suit their preferences. This feature is particularly important for users with visual impairments, who may require larger fonts or high-contrast color schemes.

Another important feature of the interface is its integration with other systems and applications. We have designed the interface to work seamlessly with a range of external systems and applications, including learning management systems, student information systems, and content

management systems. This integration ensures that users can access all the information they need from a single, centralized location.

3.2.1 Welcome screen

MetaRoom is an online platform designed for teachers that offers a range of features to manage virtual classrooms and interact with students. When users visit the MetaRoom site, they can either sign in using their existing login credentials or sign up by filling out a registration form with their basic information. The platform also offers the option of signing up or signing in using a Google account, streamlining the registration process. Figures 11A and 11B show the welcome screen in two parts, as being scrolled down.

3.2.2 Sign-up screen

To access the full range of features that MetaRoom has to offer, users must first complete a straightforward registration process. This process involves filling out a registration form that requires some basic personal information, such as the user's first and last name, email address, phone number, password, and confirmation of the password. It is important to note that users must provide a valid email address and phone number during registration, as these will be used for verification and communication purposes. Additionally, users should create a strong and secure password, as this is essential for protecting their account from unauthorized access. It is also crucial that users confirm their password correctly to prevent any login issues in the future. Once the registration form has been completed and the user has agreed to the platform's terms and conditions, they can proceed to create their MetaRoom account and start utilizing the platform's comprehensive features. From content management to video conferencing and quiz management functionalities, MetaRoom provides users with a robust and intuitive interface that enhances their collaborative efforts and productivity. Figure 12 shows the interface for this description.

3.2.3 Login screen and Google Auth Screen

To utilize the MetaRoom platform, individuals are required to have a valid account and input their login credentials on the designated login page. The login screen prompts users to enter their unique username and password, which are subsequently verified by the platform's authentication system to grant access to the platform. Upon successfully logging in, users are granted access to all of MetaRoom's comprehensive features, including video conferencing capabilities, content management tools, and quiz management functionalities. These features are designed to facilitate seamless collaboration and communication among users, enabling them to share and exchange ideas and information in a highly efficient and effective manner.

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The platform's user-friendly interface ensures that individuals can navigate and utilize all its features with ease, making it an ideal platform for individuals and teams seeking to optimize their collaborative efforts. Figure 13 depicts this in the form of web interface. Moreover, Figure 14 shows the interface that comes up after a user chooses to continue using their Google account for Google Auth.

3.2.4 User-info screen

The MetaRoom home screen serves as the primary hub for users to access the platform's extensive range of features. Upon logging in, users are greeted with their username and profile picture prominently displayed on the screen. The side bar situated on the screen provides users with a range of buttons to navigate through the platform efficiently. The side bar includes options such as the home button, courses button, meetings button, settings button, and user and sign-out button, allowing users to access various features with ease. Users can easily access their courses, meetings, and settings by utilizing the sidebar's navigation options. The main screen on the home screen displays essential user information such as recent activities or updates based on the user's preferences. This allows users to keep track of their progress and stay updated on their collaborative efforts. In addition, the user and sign-out button on the side bar enables users to manage their account by editing their profile and logging out of the platform when necessary. With its intuitive design and user-friendly interface, the MetaRoom home screen provides users with easy access to their account information and navigation options, enhancing their collaborative experience and productivity. Figure 15 demonstrates this scenario as the interface of the website.

3.2.5 Course Creation form for instructor

When creating a new course on MetaRoom, users are presented with a form containing various fields to be filled in. These fields consist of important details such as the course name, program, session time, student limit, end date, and a brief course description. Users can also enhance the course's visual appeal by uploading a cover image. The course name should be clear and concise, reflecting the course content accurately. In the program field, users can select the relevant program or subject matter for the course. Additionally, the session time specifies the duration of each session, while the student limit field specifies the maximum number of students allowed in the course. The end date field determines when the course will come to a close. Finally, the 'about course' field enables users to provide a brief overview of the course's content and learning objectives. By providing information in these fields, users can create a comprehensive course tailored to their needs and interests. Figure 16 shows the interface for the aforementioned form.

3.2.6 Course displayed after creation screen

MetaRoom's advanced course creation and management tools offer a user-friendly solution for both instructors and students. With the platform's intuitive interface, instructors can effortlessly upload course materials, create custom assignments and quizzes, and closely monitor student progress, all from a centralized location. Meanwhile, students can seamlessly access course content, complete their assignments and quizzes, and receive detailed feedback on their performance, without ever leaving the platform. Thanks to the platform's automatic grading system, instructors are able to save valuable time while simultaneously providing students with instant feedback, promoting a more efficient and effective learning experience. Through MetaRoom's highly collaborative learning environment, both instructors and students are able to deeply engage with the material, ensuring a deeper level of understanding and mastery. Overall, MetaRoom's course management features create a streamlined and highly engaging learning experience for all parties involved. This functionality is combined in the Courses Screen which is shown in Figure 17.

3.2.7 Create and Grade Assignment

When creating an assignment on MetaRoom, the instructor is presented with a form that asks for the following information:

- **Content name**: This is the name of the assignment that will be displayed to students on the course page.
- **Type**: The instructor can select the type of assignment from a dropdown menu, such as written assignment, group project, presentation, or research paper.
- **Deadline**: The instructor can set a deadline for the assignment submission. This helps to ensure that students complete the assignment on time and allows the instructor to provide timely feedback.

After this, an instructor can grade the assignments once they are submitted by the students. Upon successfully grading, a pop up would show the success message. All these mentioned steps can be visualized in Figures 18 – 21.

3.2.8 Submit an assignment and view grades on a submitted assignment

The assignment submission and grades form on MetaRoom's website provides students with a convenient platform to submit their assignments and view their grades once they have been graded by their instructors. This form allows students to upload their completed assignments directly through the website, eliminating the need for physical submission or separate file-

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sharing platforms. Once the instructor has evaluated and graded the assignment, the student can access their grades through the form, ensuring transparency and timely feedback. This streamlined process enhances communication between students and instructors, enabling efficient assignment management and facilitating a seamless learning experience within the MetaRoom platform. This scenario can be visualized in the interface screenshots given in Figures 22 and 23.

3.2.9 View Course Information

The course information viewing page serves as a centralized hub for all relevant course information. Upon clicking on a course on MetaRoom, instructors are directed to the course page, where they can access all course materials and information in one convenient location. The course page displays essential course details, including the course name, description, syllabus, and schedule. This information provides students with an overview of what to expect from the course and helps them plan their coursework accordingly. Overall, the course page on MetaRoom streamlines the course management process for instructors and offers students a comprehensive and easy-to-use platform for accessing course materials and information. By providing a centralized location for all relevant course details, the course page helps ensure that students have everything they need to succeed in their courses. A screenshot for this interface can be seen in Figure 24.

3.2.10 Create Quiz Page

When creating a quiz on MetaRoom, the instructor is presented with a form that asks for the following information:

- **Quiz name**: This is the name of the quiz that will be displayed to students on the course page.
- **Deadline**: The instructor can set a deadline for the quiz. This helps to ensure that students complete the quiz on time and allows the instructor to provide timely feedback.
- **Duration**: The instructor can set a duration for the quiz. This ensures that students complete the quiz within a set timeframe.
- **Add questions**: The instructor can add multiple-choice questions to the quiz by specifying the question text, the possible answer options, and the correct answer. They can also assign points to each question.

Once the instructor has created the quiz, it will be displayed on the course page along with the deadline, duration, and other relevant details. Students can access the quiz from the course

page and complete it on the platform. The platform's automatic grading system will grade the quiz and provide instant feedback to the student. All this can be seen in Figure 25.

3.2.11 Join Course screen

Joining a course on MetaRoom is a simple process for students. The first step is to obtain the unique link provided by the instructor. This link can be distributed to students via email or posted on the course website or social media page for easy access. Once students have obtained the link, they can click on it to access the course page. From there, they will be prompted to create a MetaRoom account or log in to their existing account if they already have one. This step is necessary to ensure that only authorized students are able to access the course content and materials. After logging in, students will be directed to the course page, which serves as a central hub for all course information and materials. Here, they can access the course syllabus, schedule, and any course materials that have been uploaded by the instructor. Students can also participate in course discussions, submit assignments, and communicate with the instructor and their classmates through the MetaRoom platform. This screen is shown in Figure 26.

3.2.12 Admin page

The creation of admin pages that display key performance metrics, such as the total number of users, students, teachers, subjects, and revenue, is an important feature for any online learning platform. These metrics provide administrators with an overview of the platform's performance and help them make informed decisions. By displaying the total number of users, administrators can quickly assess the growth of the platform and make decisions about scaling the infrastructure to accommodate more users. Similarly, the total number of students and teachers provides insight into the size of the user base and can help administrators plan for staffing and support needs. The total number of subjects is another important metric that provides insight into the range of courses available on the platform. By monitoring the number of subjects, administrators can identify areas where the platform may be lacking and make decisions about adding new courses or expanding course offerings. Finally, displaying the total revenue generated by the platform is a key metric that provides insight into the platform's financial health. By monitoring revenue, administrators can identify trends and make decisions about pricing and marketing strategies to ensure the platform remains financially viable. Overall, the creation of admin pages that display these key performance metrics is a crucial feature for any online learning platform. By providing administrators with insight into platform usage and performance, they can make informed decisions and ensure that the platform continues to meet the needs of its users. The Admin Page can be seen in Figure 27.

Chapter 4

CONCLUSION AND FUTURE DIRECTIONS

MetaRoom is an all-in-one platform tailored for teachers, offering video meetings, content management, and quiz management in a single site. By consolidating these features, MetaRoom enhances efficiency and organization for educators. The platform's virtual meeting capability enables teachers to conduct classes remotely, providing a collaborative environment with tools like video conferencing, screen sharing, and whiteboarding. Content management empowers teachers to share course materials and assignments, simplifying student access and review. Teachers can upload various content types and organize them into folders, while also tracking student progress and engagement. Quiz management allows teachers to create multiple-choice quizzes with automatic grading. They can craft quizzes of any size, designate correct answers, and receive real-time results. Additionally, MetaRoom provides analysis tools to identify areas where additional instruction may be beneficial. In essence, MetaRoom is an encompassing solution designed exclusively for teachers, enabling them to efficiently manage their classrooms and deliver engaging lessons through virtual meetings, streamlined content management, and automated quiz management.

As we envision the continued evolution of our all-in-one platform for online education, there are several exciting future directions that we plan to explore. These directions aim to further enhance the capabilities, features, and overall user experience of our platform, ensuring that it remains at the forefront of online education technology.

1. Advanced Analytics and Personalization: We recognize the immense potential of advanced analytics and personalization in revolutionizing online education. By harnessing the power of data, we aim to develop sophisticated analytics capabilities that provide valuable insights into student performance, learning patterns, and engagement levels. This data-driven approach will enable us to offer personalized recommendations, adaptive learning pathways, and targeted interventions, ultimately maximizing student success and learning outcomes.

2. Augmented Reality (AR) and Virtual Reality (VR) Integration: The integration of augmented reality (AR) and virtual reality (VR) technologies holds tremendous promise for immersive and interactive learning experiences. In our future development, we plan to explore the integration of AR and VR capabilities into our platform. This will allow students to engage in virtual labs, simulations, and immersive educational content, fostering deeper understanding and engagement across various subjects and disciplines.

3. Collaboration and Social Learning Features: Effective collaboration and social learning are essential components of a comprehensive online education experience. To promote collaboration and interaction among students and tutors, we intend to enhance our platform with advanced features such as real-time collaborative document editing, group project management tools, and discussion forums. These features will facilitate seamless teamwork and knowledge sharing, fostering a sense of community within the online learning environment.

4. Integration with Emerging Technologies: As technology continues to advance, we anticipate the emergence of new tools and technologies that can further enhance the online education landscape. We are committed to staying at the forefront of these advancements and integrating them into our platform. This includes exploring the potential integration of artificial intelligence (AI), blockchain, and other emerging technologies that can offer unique benefits in terms of security, credentialing, and personalized learning experiences.

5. Mobile Accessibility and Offline Learning: Recognizing the increasing prevalence of mobile devices in education, we are dedicated to optimizing our platform for mobile accessibility. We aim to develop user-friendly mobile applications that enable seamless access to course materials, interactive features, and collaboration tools on smartphones and tablets. Additionally, we plan to introduce offline learning capabilities, allowing users to download course content and participate in activities even without a stable internet connection.

In conclusion, the future of our all-in-one platform for online education holds tremendous potential for growth and innovation. By incorporating advanced analytics, AR/VR integration, collaboration features, emerging technologies, and mobile accessibility, we aim to continuously enhance the platform's capabilities and provide a truly transformative learning experience. We are committed to remaining at the forefront of online education technology, driving positive change in how education is delivered and experienced worldwide.

Appendix A - Figure Gallery: Visual Representation of Data
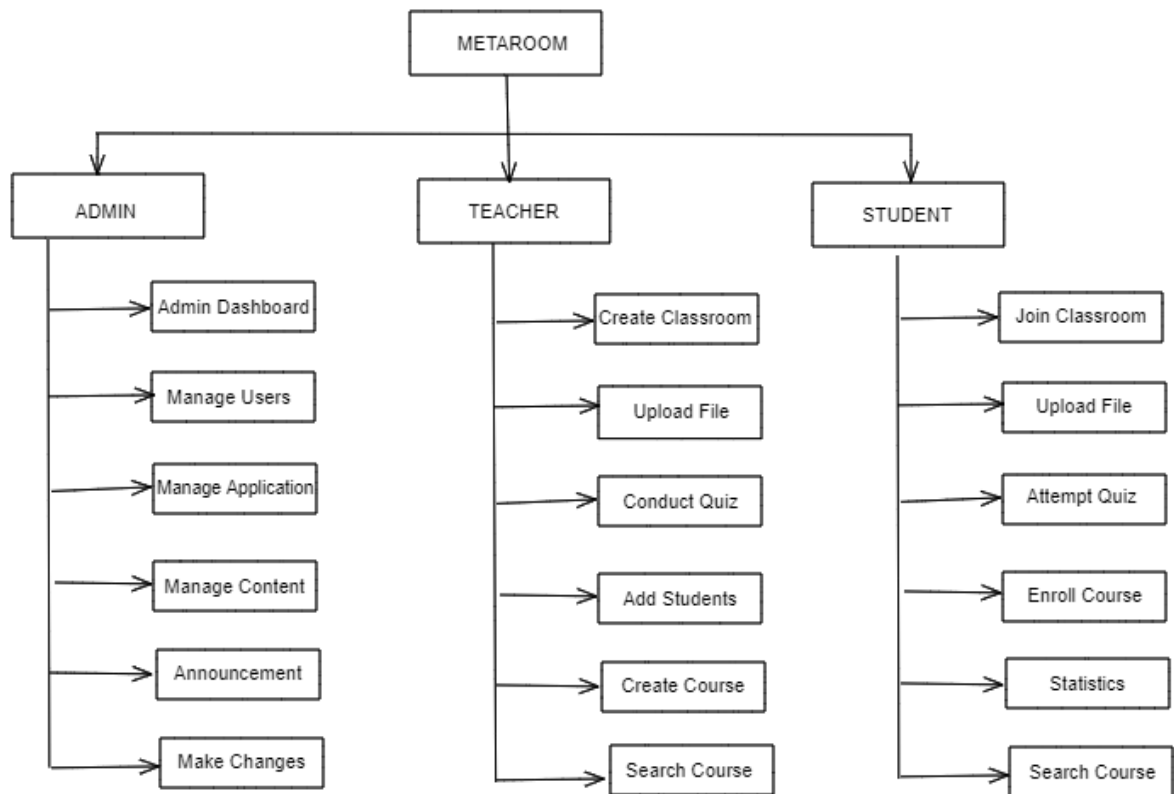
Figure 1. Functional Hierarchy Diagram
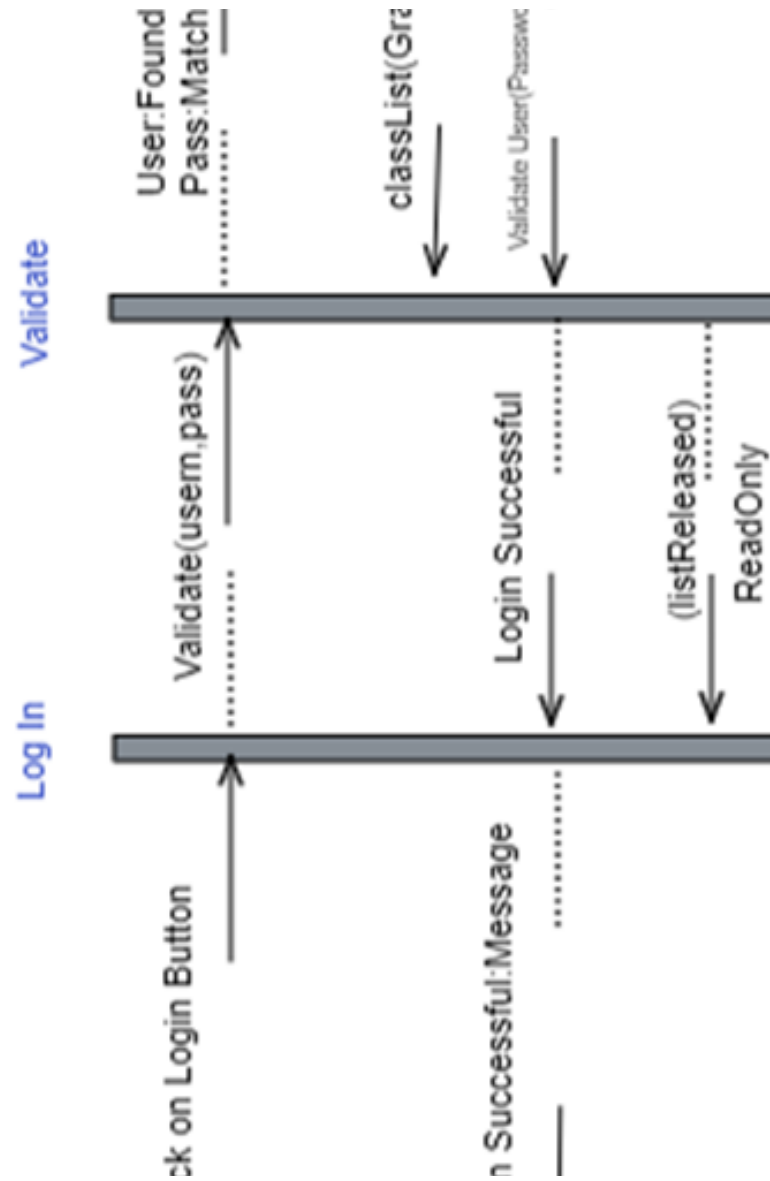
Figure 2. Sequence Diagram for logging in (for student)

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User   Browser   Web Service   Database

Register qequest
${email}
${Password}
${Repeat}

Check In the Database

Check If user Exists or not

return false if user exists

return the error message
try another email

If the user does not exists
the password and email
will be added to database

If the user doesnot exists the
email and password will be added

Sends email to login

user opens email and
start login process

Figure 3. Sequence Diagram for signing up (for student

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User   Browser   Web Service   Database

Register qequest
${email}
${Password}
${Repeat}

Check If user Exists or not

Check In the Database

return false if user exists

return the error message
try another email

If the user does not exists
the password and email
will be added to database

If the user doesnot exists the
email and password will be added

Sends email to login

user opens email and
start login process

Figure 4. Sequence Diagram for enrolling in a course (for student)

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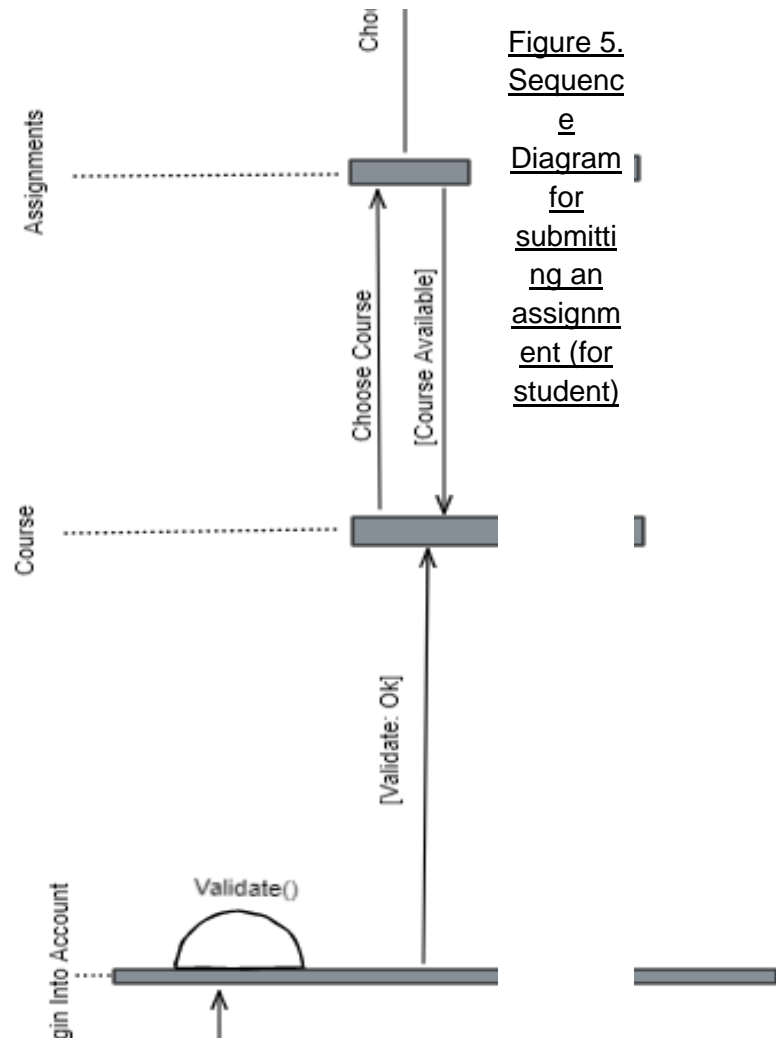
Figure 5. Sequence Diagram for submitting an assignment (for student)
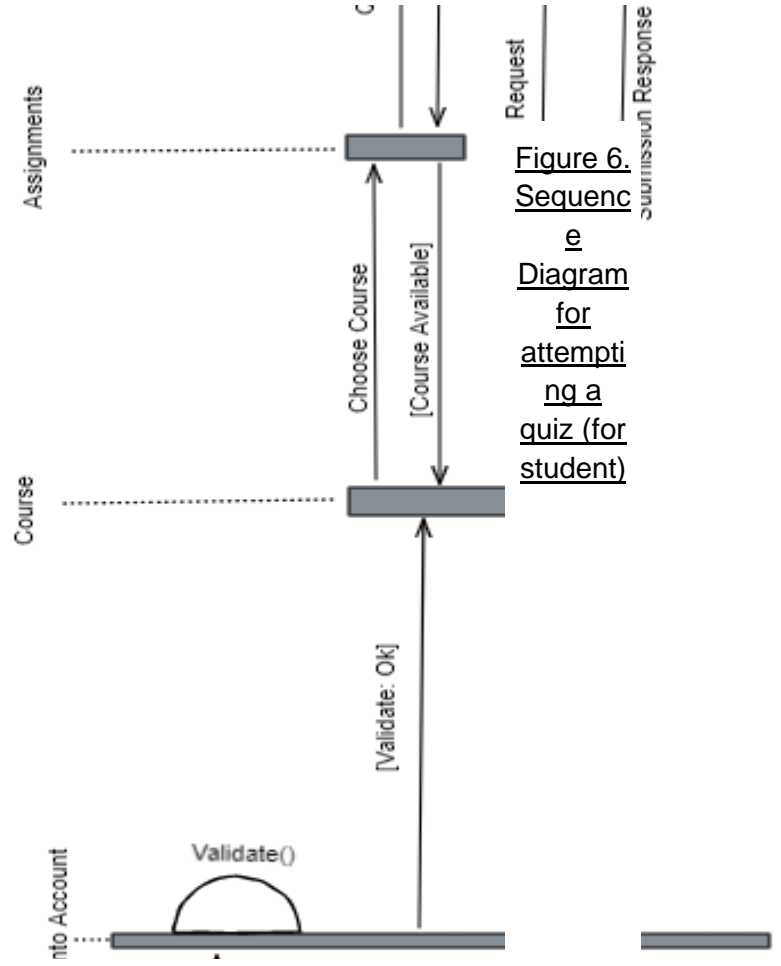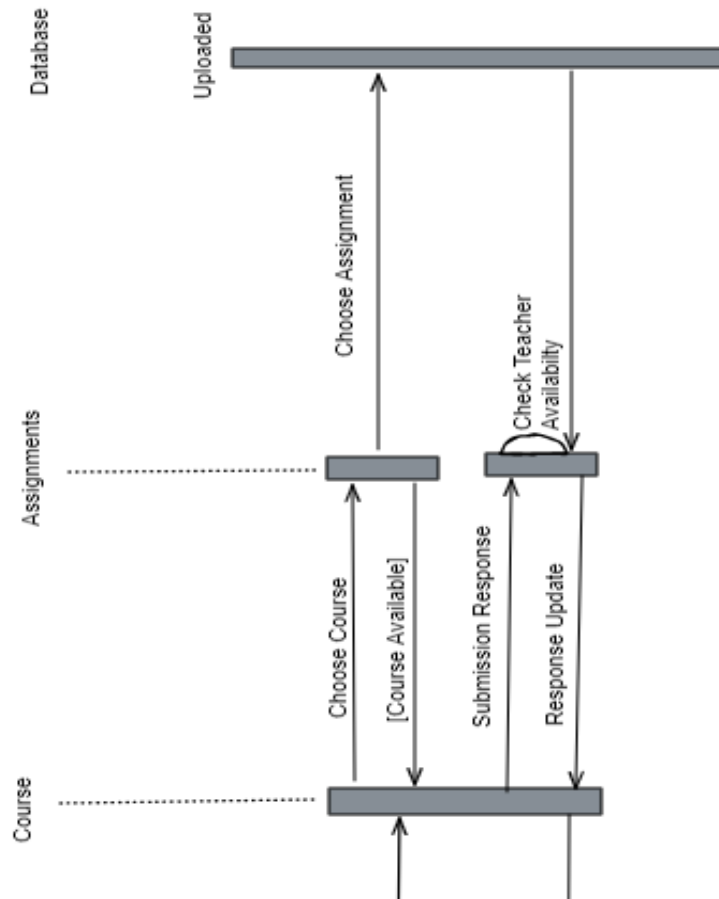
Figure 6. Sequence Diagram for attempting a quiz (for student)

Create Assignment

Teacher

Course

Database

Validate(Teacher)

Validate(IsCourseExists)

CourseExists

Course History

Created Assignment

Assignment Created

Success Message
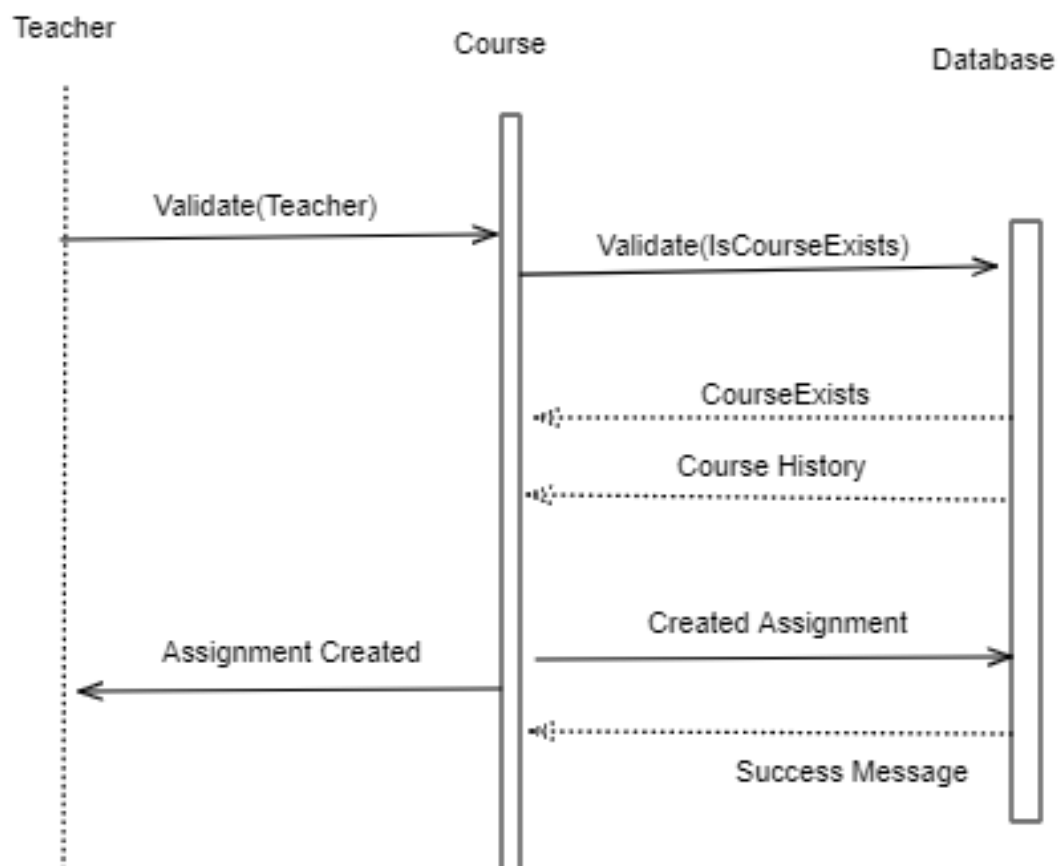
Figure 8. Sequence Diagram for creating an assignment (for teacher)

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Create Quiz

Teacher   Course   Database

Validate(Teacher)
Validate(IsCourseExists)

CourseExists

Course History

Created Quiz
Quiz Created

Success Message
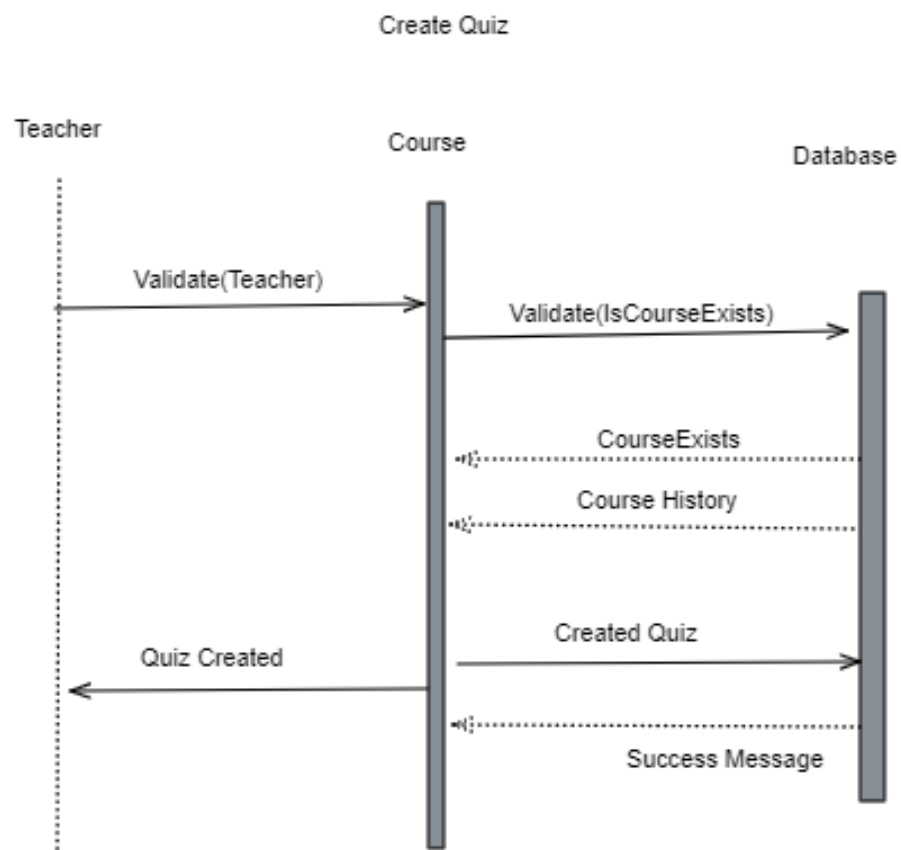
Figure 9. Sequence Diagram for creating a quiz (for teacher)
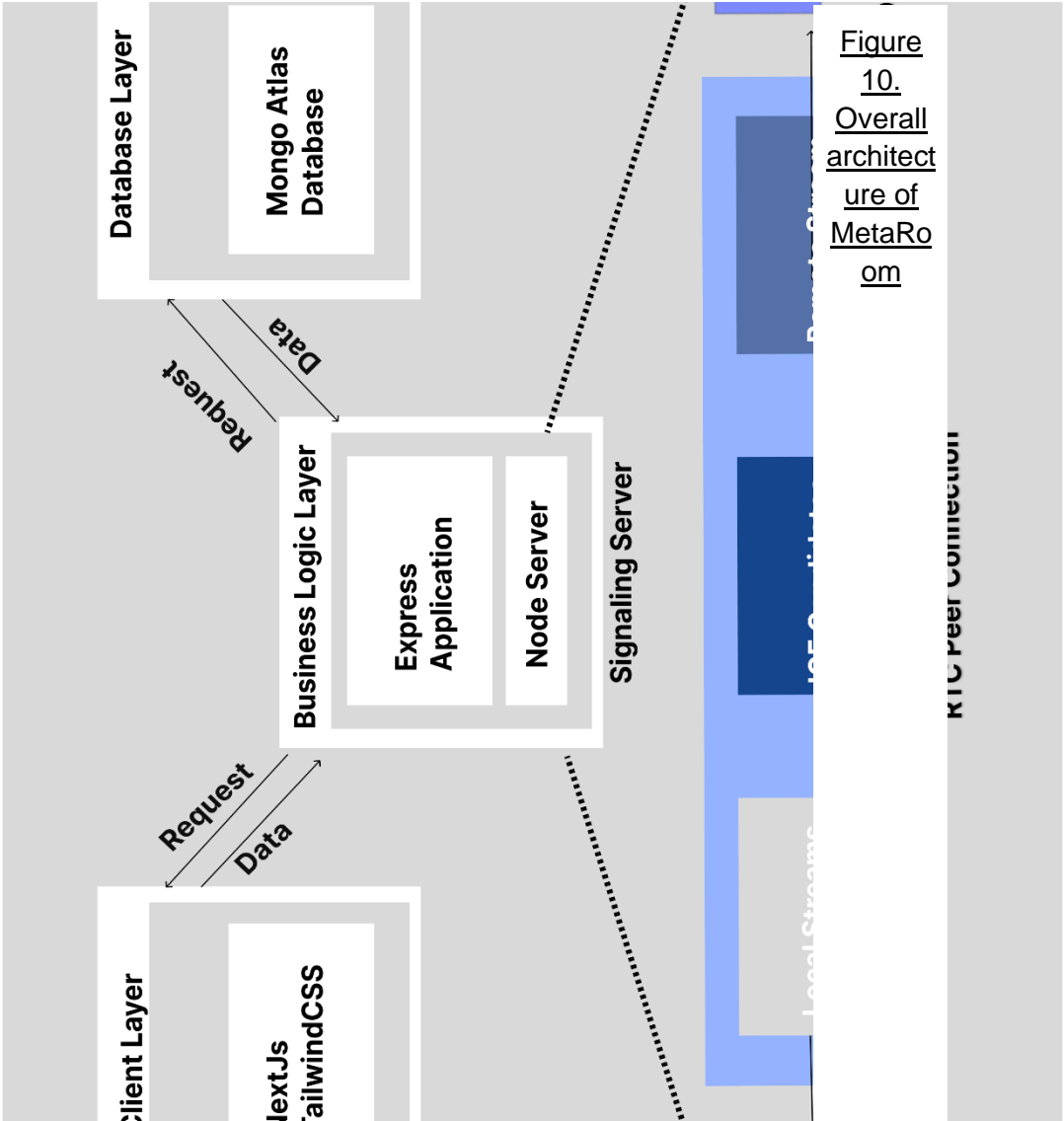
Figure 10. Overall architecture of MetaRoom

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Why MetaRoom?   About Us

More about us. Read here →

Organize your remote learning seamlessly

Eliminate the need of switching platforms to conduct a remote classroom, when we are providing everything under one platform.

Get started→   Live demo→

Figure 11-A. Top View of MetaRoom's Welcome Screen

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A better way to learn

Meta where everything you ever need for remote learning is provided, Room where you can interact with your teachers with no hurdles. MetaRoom, where remote learning meets comfort.

Access class content from your work desk

Whatever goes on in a traditional classroom, assignments, quizzes, lecture notes, you get everything under one page at MetaRoom

Host real-time video lectures

Host video sessions at MetaRoom where your students can join and take a remote class.

Manage your courses under one platform

If you are a teacher, you get all your courses you are teaching under single platform.

Communicate with your teachers one-to-one

Apart from the video sessions, students can book a one-on-one sessi with their teachers.

ICES

Meta

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Figure 11-B. Bottom View of MetaRoom's Welcome Screen

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Metaroom

Sign up to your account

First Name

i.e. John

Last Name

i.e. Smith

Phone

i.e. 03XXXXXXXX

Email

i.e. john.smith@xyz.com

Password

·········

Confirm password

·········

☐ I agree with the terms and conditions.

Submit

G   Continue with Google

Figure 12. Sign up Screen for all users

Figure 13. Sign in Screen for all users once they are registered in the database
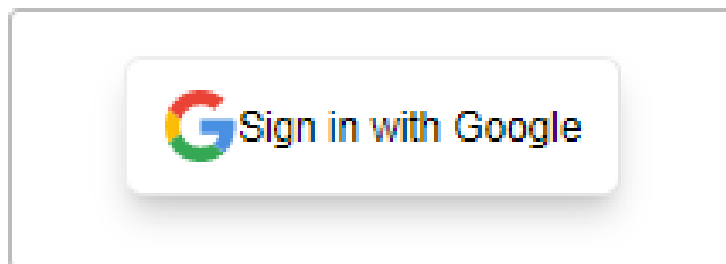
Figure 14. Continue with Google option to use Google Auth

Figure 15. User Information Screen

Figure 16. Form for creating a course for instructor
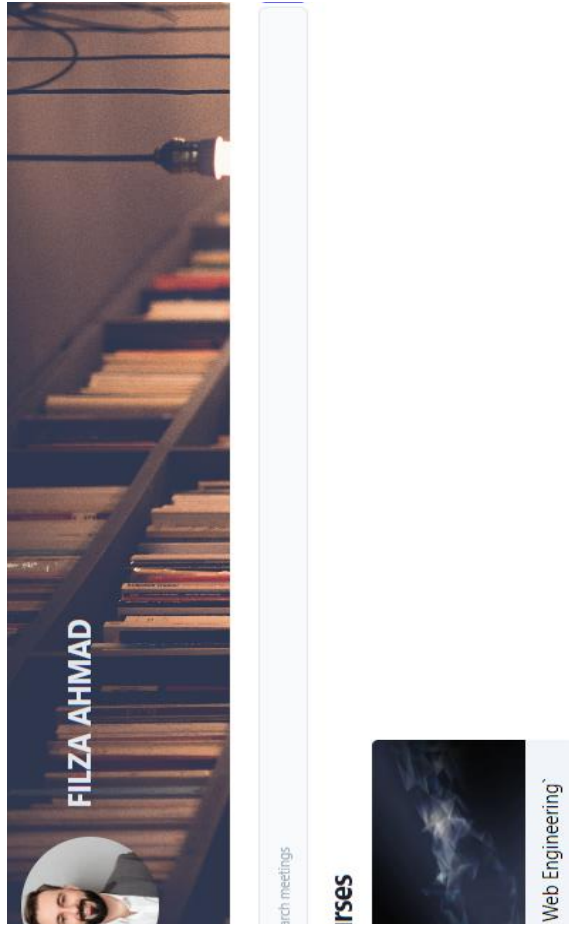
Figure 18. Screen displaying the form for assignment creation for an instructor

ASSIGNMENT

asignment 1
description :dgfdgdfgfdgdfg
deadline :26/05/2023
download[1]

Evaluate Sub

Figure 19. Instructor can click on this button to evaluate the submissions

Figure 20. Submitted Assignments are displayed on Instructor's Screen
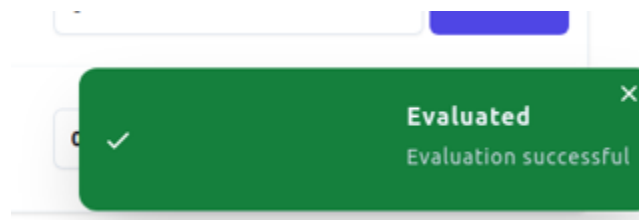
Figure 21. A prompt showing the success of the evaluation done

ASSIGNMENT

🔗 asignment 1
🔗 description :dgfdgdfgfdgdfg
🔗 deadline :26/05/2023
download[1]

Show Evaluation   Submit Assignment

Submit Assignment

Assignment Name

Introduction to Python

Assginment Upload

Assignmnet Upload or drag and drop
Any file upto 10MB.

Cancel   **Save**

Figure 22. The option of submitting an assignment displayed on a student's screen

ASSIGNMENT

🔗 asignment 1
🔗 description :dgfdgdfgfdgdfg
🔗 deadline :26/05/2023
download[1]

Show Evaluation   Submit Assignment

Assignment Evalation

Evaluated

Out of : 10
Score : 5.7

Figure 23. A student can view their grades once evaluated by the instructor
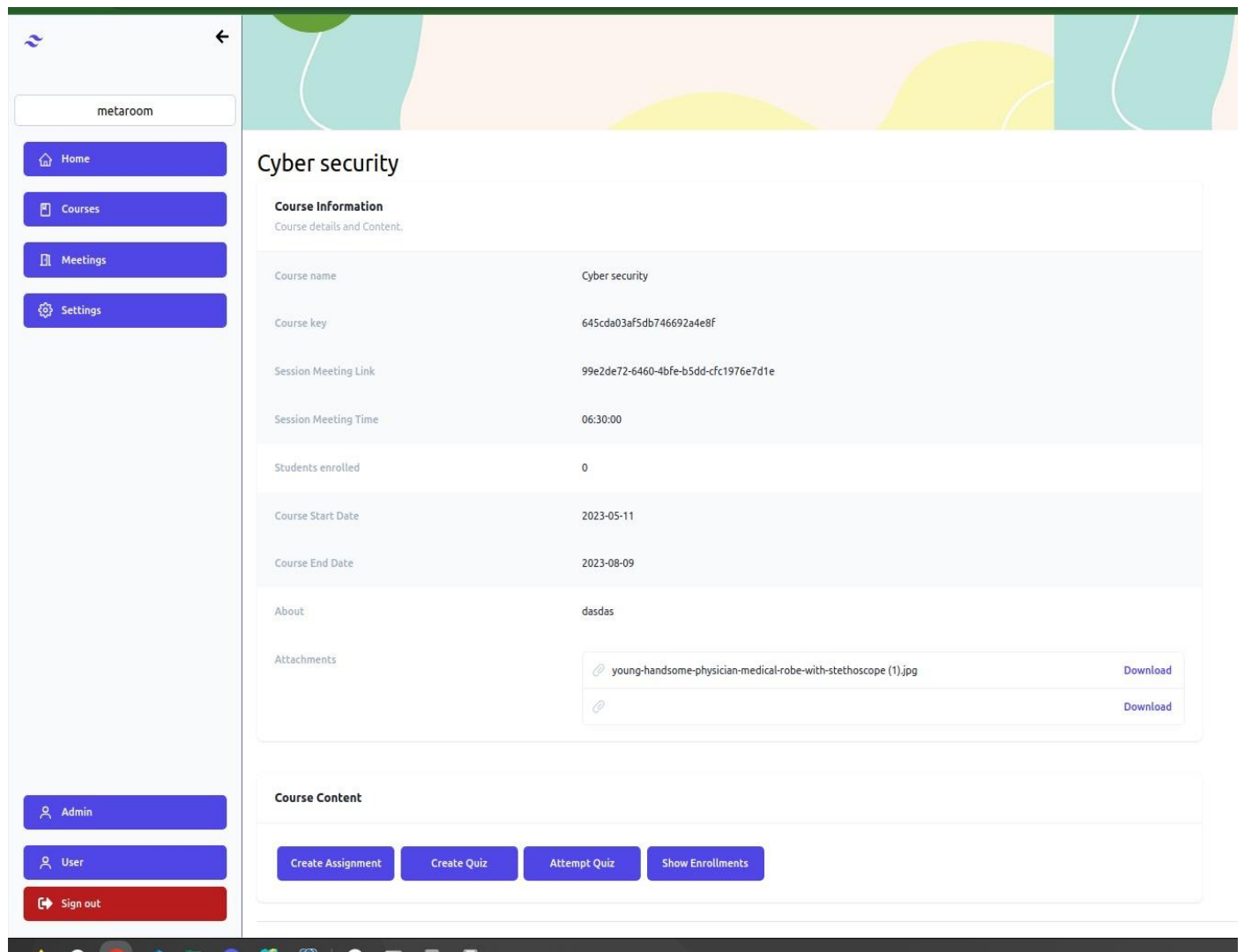
Figure 24. Screen where an instructor can view the overall course details and options

Quiz Time

Quiz

Option 2:

Option 4:

Answer--

Question

2023

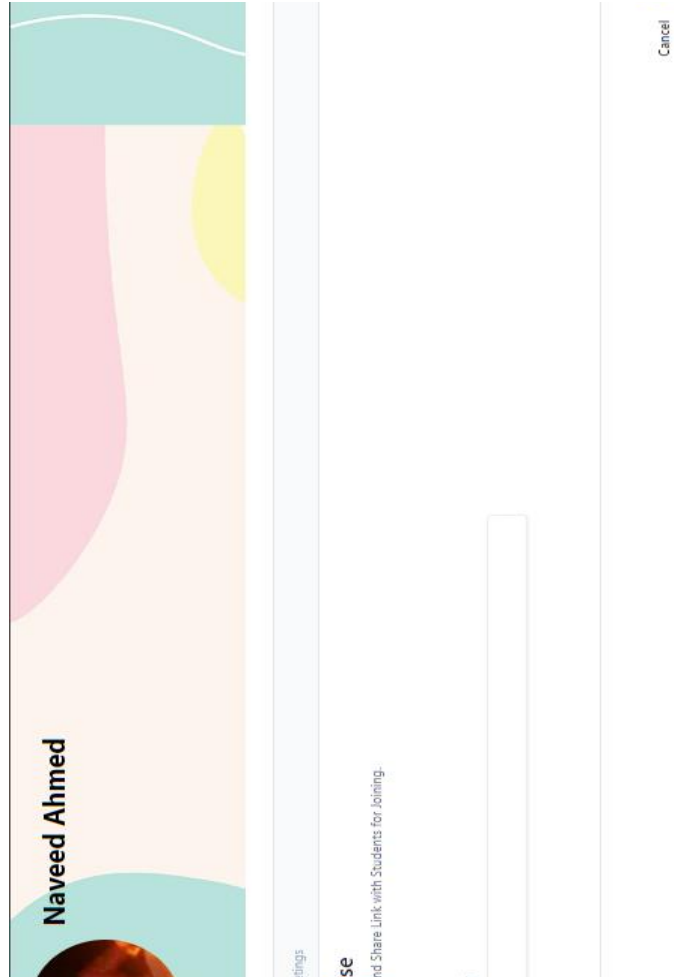Figure 25. Screen showing form for quiz creation to an instructor

Figure 26. Screen displaying the options for student to join a room
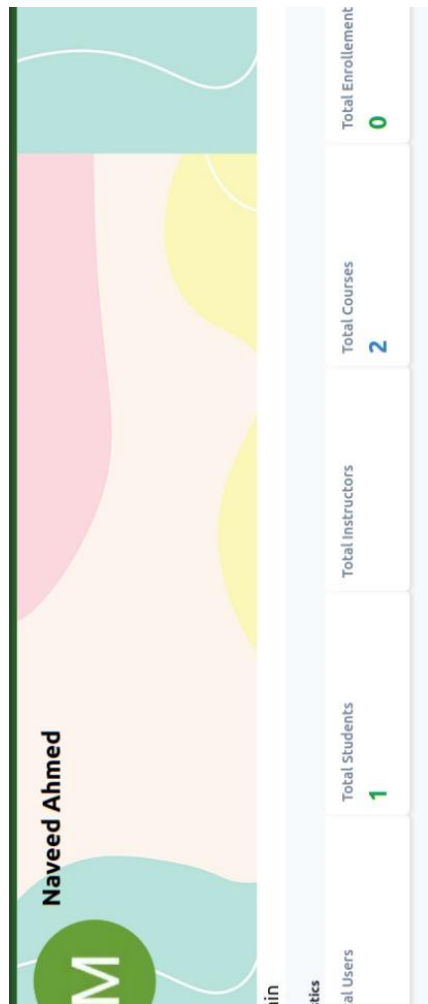
Figure 27. Screen for admin to look at stats

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