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RESEARCH ARTICLE

### DESIGN AND IMPLEMENTATION OF AN ONLINE MEETING APPLICATION

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#### Abstract

Online meeting applications nowadays have become an important component of the electronic marketplace. In this research paper, a practical case study will be presented to highlight best practices for the analysis and design of an Internet-based online meeting application. The proposed Online Meeting Application was designed and implemented using includes Node.js, React.js, MongoDB, Javascript and Amazon S3 for images as a proposed programming language and various UML (Unified Modelling Language) to make several diagrams which contribute in design of the Online Meeting Application. The proposed Online Meeting Application will help users to connect online via video, audio, share files, recorded sessions for later, send invites vis email, timeline handling, etc. The proposed Online Meeting Application together with the tools which have been used based on the analysis and implementation environment, offers excellent advantages to support system development.

**Keywords:** Meeting Application and Unified Modelling Language, Premium Video and Audio Calling, Real Time Collaboration, File Sharing.

#### Introduction

Effective collaboration channels are essential to success. The existing tools provide limited opportunities to collaborate in virtual meetings with individuals from different geographies. Additionally,

discussions required outside of a scheduled meeting are often conducted via email. This creates multiple

silo threads that not all cross-functional team (CFT) members traverse. This makes it difficult to keep track of conversations and the slows down productivity. Conference calls should be scheduled

just to catch up with everyone, not to look for solutions.

Currently, we use different apps for document storage. We use the scheduler to track my work, but not its meetings feature. Full adoption of this application will support on going collaboration and allow you to track conversations about each project in one place. This is especially useful for large projects with members from different teams, such as regulatory, commercial, contractual, and tax, located all over the world. Via This Application, users can:

- Users can connect with each other live with video and audio in real time.
- Can share file with each other.
- Chat with each other in real-time.
- Adding feature to schedule meeting for later.
- Can preview file if not want to download.
- Share Screen
- Whiteboard in meeting
- Can chat using speech to text feature.
- Users can see recorded class with chat saved for future.
- Will send invite via email.

## **System Analysis**

To layout the UML diagrams for the online meeting application we should use object-oriented evaluation and design (OOAD) which refers to a set of rules which enables to lay out a business aspect primarily based software. A methodology outlines the machine improvement lifecycle via defining deliverables and responsibilities in an object-oriented undertaking. you could use a mixture of notation and UML techniques to shorten the machine improvement lifecycle, simplify machine maintenance, and boom module reusability.

To find functions and relevant data we prepare requirement analysis. The data handled by the system and the flow of it is described by the entity-relationship diagrams.

Object-oriented software development comes with a systematic way of tackling a problem and uses

new methods of design, which are assisted by computer-aided software engineering tools.

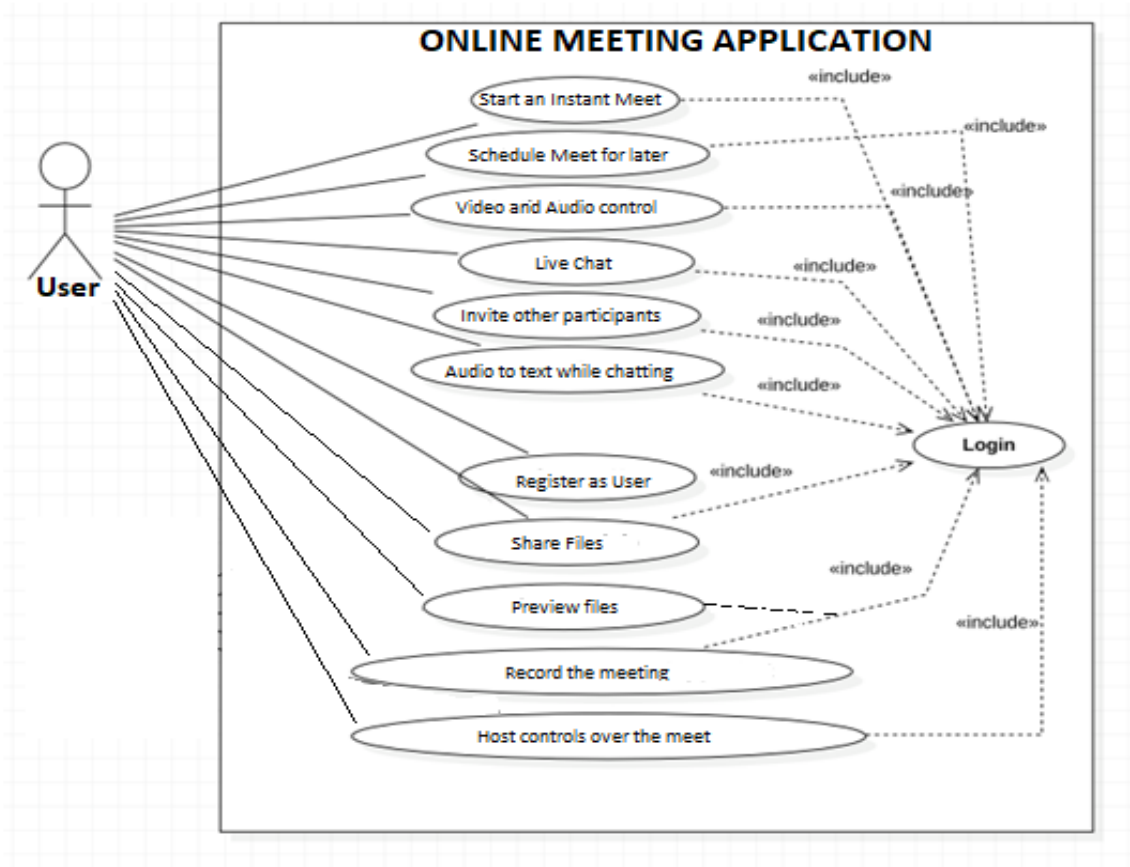
UML is a language used to specify, visually model, and document the artefacts of an object-oriented system under development . Represents a set of ideas unified from different ways. UML is used in system design to improve reusability and maintainability. Object-oriented analysis methods provide classes, use cases, state diagrams, sequences, and other graphical notation for modelling. UML has been successfully used in many projects to model different requirements and architectures. Use case diagram, class diagram and sequence diagram were selected for the user's requirements analysis. Class Diagrams were selected to represent the classes' static structure.

The work designs and implementation of the online web-based meeting application would be using UML. Where in the proposed OAS, we would be using many popular diagrams such as use case, sequence, class diagrams, and user interfaces which are offered by UML to enable the new functions to be updated and added easily. The proposed OAS will help both the seller and bidder to get the best bids that they want to achieve.

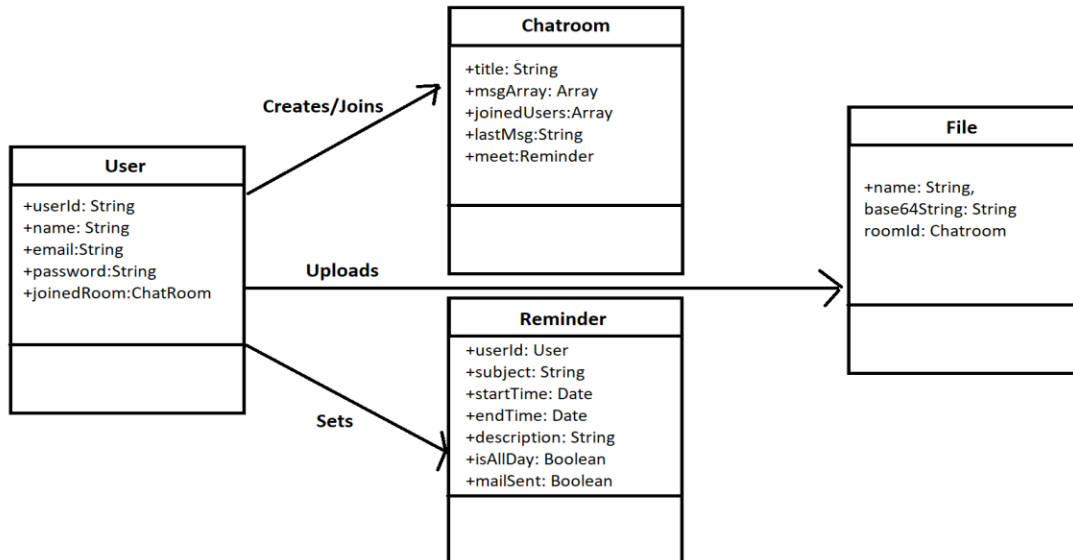
## **Use Case Diagrams**

A use case diagram belongs to the family of behaviour diagrams. A use case is a representation of the functionality (what the user action would be) that the system would provide. Use case descriptions are usually in tabular form where the actor (users) are placed just beyond the boundary and the use cases are shown inside the table and to show the relationship between the users and the use cases we are using and the arrow. The use case diagram also defines the boundary of the system.

The use cases are only described in an abstract form, meaning that the diagram only shows the user what functionality is provided, rather than showing the implementation. These are not object-oriented, but are encapsulated in UML to make the project lifecycle from specification to implementation more accessible Use Case Diagram for a User using the application.



**Class Diagrams**



Class diagram is a static diagram. Class diagram generally represent the static view for an application. Class diagrams are generally used for visualizing, describing, and documenting different aspects of a system.

Class diagram shows a collection of classes, interfaces, associations, collaborations and defines the relationship in between them. Class diagram are also known as structural diagram. A class diagram works according to the approach and principles of object oriented system. The only diagram which are directly mapped to the programming languages (object oriented) and so are widely used at the time of construction.

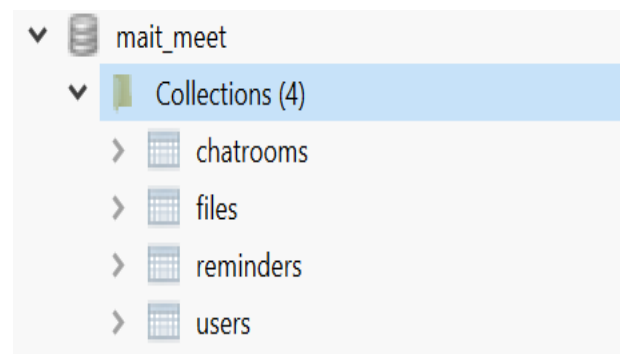
Class diagram is also considered as the foundation for component and deployment diagrams. Class diagrams are not only used to visualize the static view of the system but they are also used to construct the executable code for forward and reverse engineering of any system.

Generally, UML diagrams are not directly mapped with any object-oriented programming languages but the class diagram is an exception.

### Database testing and construction

Database testing is fundamentally used to find bugs that can affect the security, consistency, reliability, and performance of the system and is important for validating the system against user-set requirements. MongoDB was used for database implementation. The snippet of the JSON object represents the data storage inside the database.

### Collections:



### Reminder schema

```
db.getCollection('reminders').find({})
```

reminders 0.002 sec. 0

Key	Value	Type
(1) ObjectId("639491d7d678653e14b3321a")	{ 9 fields }	Object
_id	ObjectId("639491d7d678653e14b3321a")	ObjectId
mailSent	false	Boolean
StartTime	2022-12-09 18:30:00.000Z	Date
EndTime	2022-12-10 18:30:00.000Z	Date
Subject	StandUp	String
userId	ObjectId("635f8030b5d40b4744d8bab2")	ObjectId
createdAt	2022-12-10 14:04:07.584Z	Date
updatedAt	2022-12-10 14:04:07.584Z	Date
_v	0	Int32

db.getCollection("files").find({})

files 0.004 sec. 0

Key	Value	Type
▼ (1) ObjectId("63949204d678653e14b3321e")	{ 7 fields }	Object
_id	ObjectId("63949204d678653e14b3321e")	ObjectId
name	5.png	String
base64String	data:image/png;base64,iVBORw0KGgoAAAANSUHEUGA...	String
roomId	ObjectId("636004117b4a012bf0284329")	ObjectId
createdAt	2022-12-10 14:04:52.819Z	Date
updatedAt	2022-12-10 14:04:52.819Z	Date
_v	0	Int32

### Files Schema

db.getCollection("users").find({})

users 0.02 sec. 0

Key	Value	Type
▼ (1) ObjectId("635f8030b5d40b4744d8bab2")	{ 8 fields }	Object
_id	ObjectId("635f8030b5d40b4744d8bab2")	ObjectId
joinedRooms	[ 1 element ]	Array
[0]	ObjectId("636004117b4a012bf0284329")	ObjectId
name	Ritesh Arora	String
email	a@a.com	String
password	\$2a\$10\$kO/PE9guFXjYnlSqKgQlie1FFLYFMZjyAgx69Hc4...	String
createdAt	2022-10-31 07:58:40.700Z	Date
updatedAt	2022-10-31 17:21:21.736Z	Date
_v	0	Int32
> (2) ObjectId("635f8084b5d40b4744d8bab3")	{ 8 fields }	Object

### User schema

```
db.getCollection('chatrooms').find({})
```

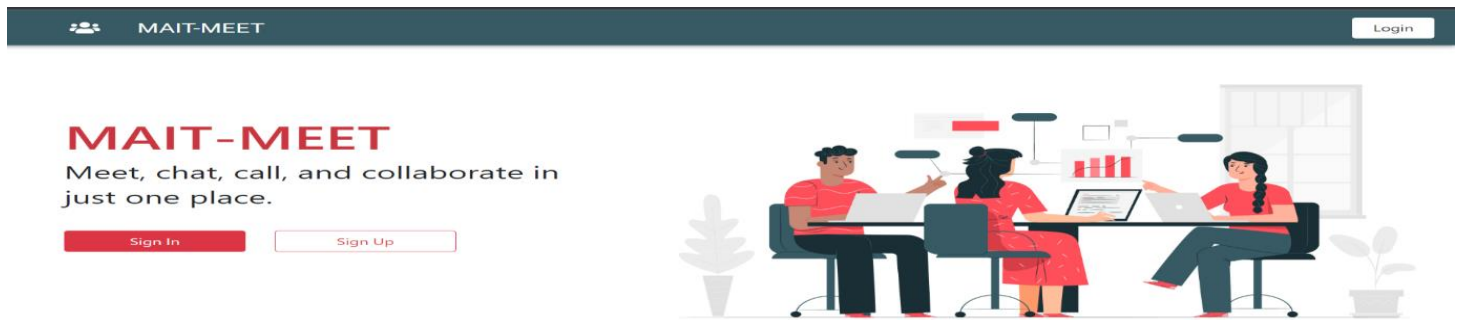
Key	Value	Type
(1) ObjectId("636004117b4a012bf0284329")	{ 7 fields }	Object
_id	ObjectId("636004117b4a012bf0284329")	ObjectId
joinedUsers	[ 1 element ]	Array
[0]	ObjectId("635f8030b5d40b4744d8bab2")	ObjectId
title	local_test	String
msgArray	[ 1 element ]	Array
[0]	{ 6 fields }	Object
_id	ObjectId("636004217b4a012bf028432a")	ObjectId
userId	635f8030b5d40b4744d8bab2	String
userName	Ritesh Arora	String
chatMessage	hello my name is Ritesh Arora	String
chatTime	22:51	String
userMail	a@a.com	String
createdAt	2022-10-31 17:21:21.677Z	Date
updatedAt	2022-10-31 17:21:37.618Z	Date
_v	0	Int32

### Chatroom schema

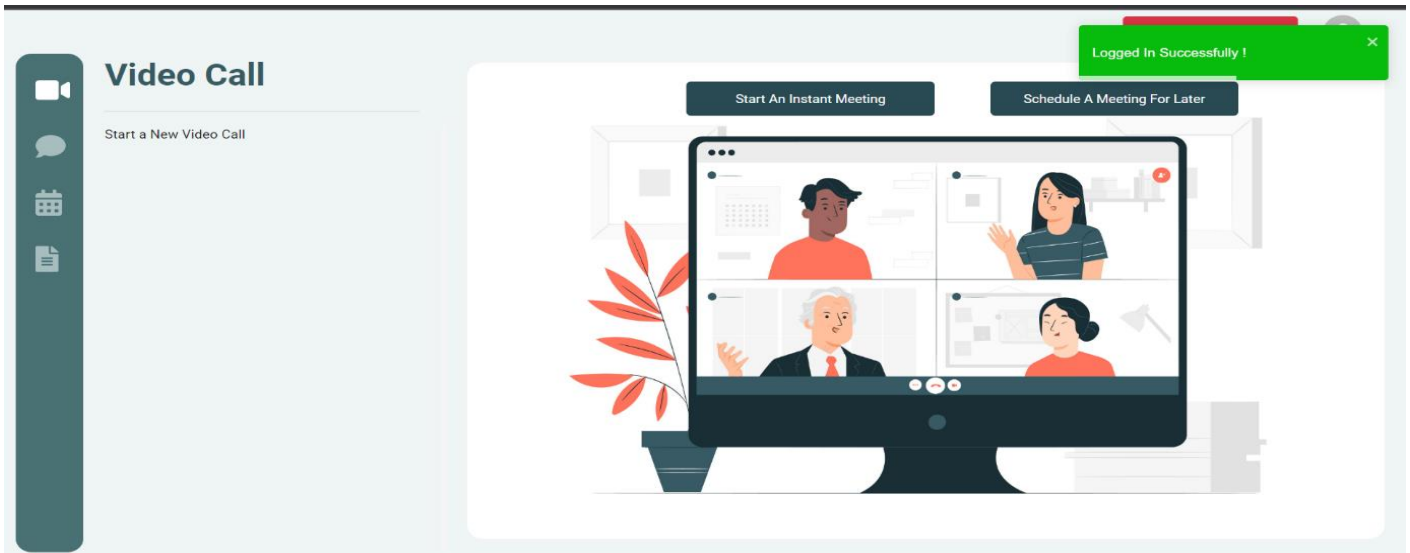
### System implementation

This section presents the proposed work deliverables along with the implementation that followed the analysis and design of the system. The results of system analysis and configuration of the proposed system are presented. It uses the JavaScript, HTML, MongoDB, Node.js, and React.js programming languages and relies on properties suitable for this task. To start using the proposed system, users must register on platform. After logging in they have

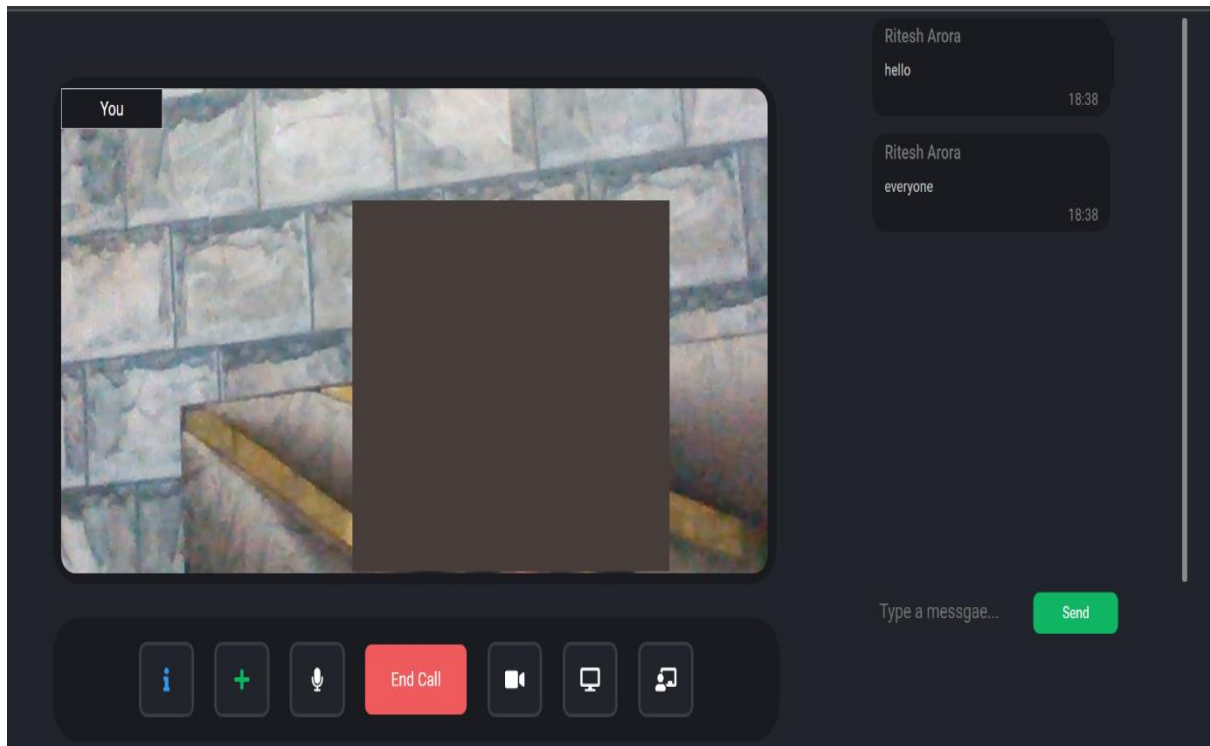
options to start an instant meeting or schedule it for later. They can start a chat room and share files also from the options available in left task bar. User can see all the scheduled meeting for him by clicking on the calendar icon on the left. In the meeting user can toggle audio, video, send invite, live chat, share file, record the session and can also have host controls over the meeting.



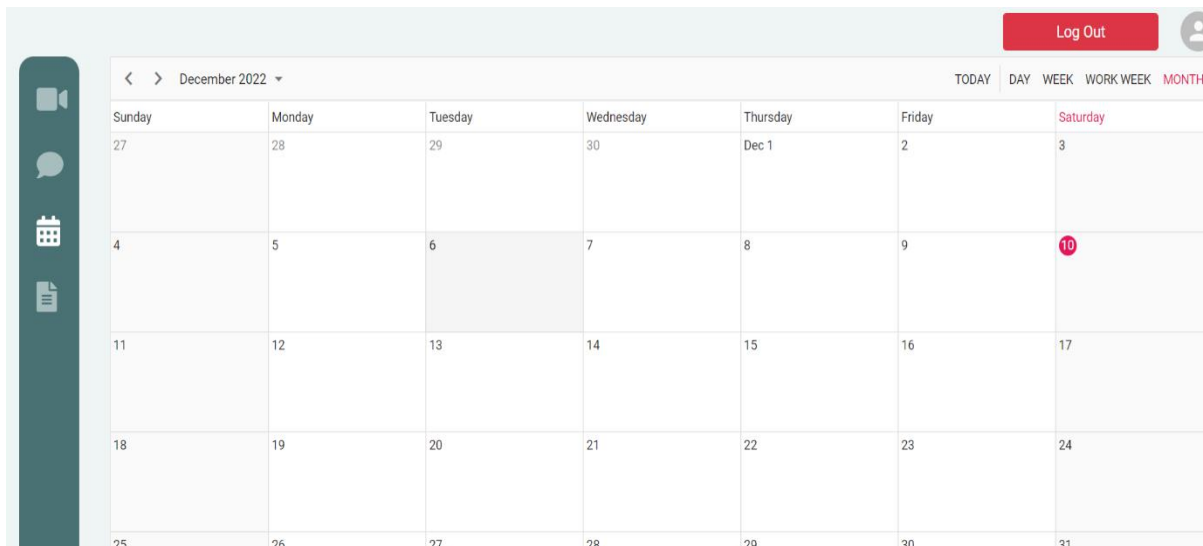
Login/ Sign up Page



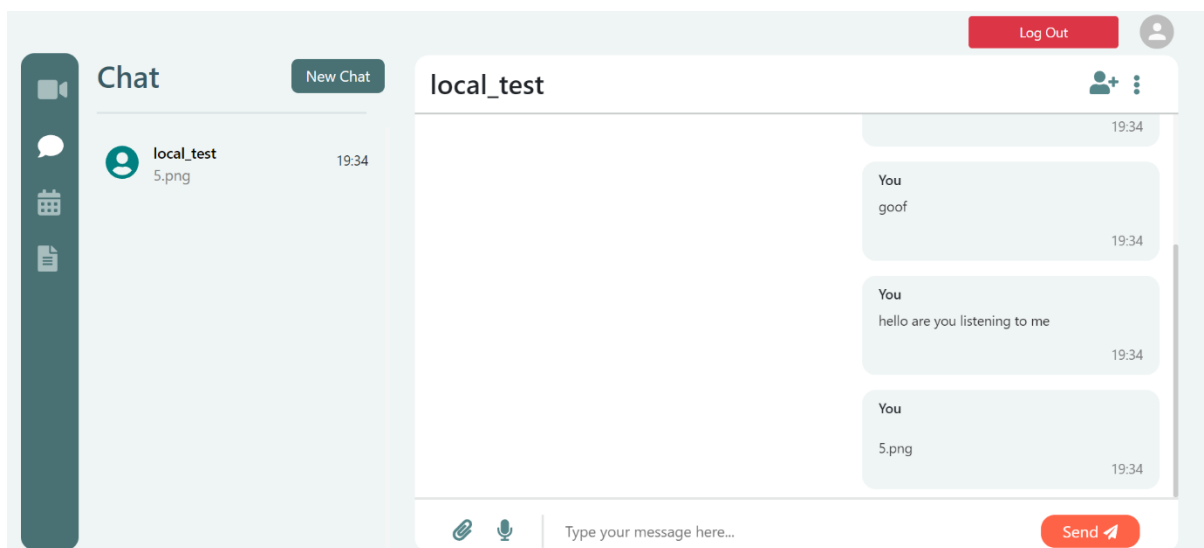
**Home Page Once Logged In**



**Meeting Room**



### Reminder Page



### Chat Room Page

#### Result and Discussion

The system of Online Meeting Application website, Mait-Meet has been tested in order to measure its usability, the application Mait-Meet was tested by operating on Microsoft Edge, Google Chrome with the local host server. Many students evaluated the system prototype from Maharaja

Agrasen Institute of Technology (MAIT). After given a description about how to use the system, the students have been tested the application and asked to fill out review. The main aim of the survey is to measure the usability of Mait-Meet and the user satisfaction about the Mait-Meet. The results obtained shows a high percentage of the students agree with the

usability of Mait-Meet and the study achieves the main project target.

## Conclusion

This research paper describes best practices for building and designing online meeting application. In this paper, I designed and implemented a meeting application using UML, the programming language JavaScript, and the frameworks React.JS and Node.JS. In the proposed application, UML provided several diagrams and made it easy to update and add new features such as use case diagrams, sequence diagrams, class diagrams, user interface, etc. Proposed application helps users to connect over the globe effortlessly, increase in productivity, seamless video and audio meeting with live chatting, file sharing and scheduling meeting for later, and all that too on one platform.

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