

Journey with Microsoft Teams Clone Project

My journey with Microsoft Teams Clone Project started after I cracked the first round for Microsoft Engage - 2021. This project was made under the guidance of two mentors from Microsoft.

The Agile methodology -

The agile methodology that I applied was scrum and sprint. We had four weeks for this project. I divided my work according to weeks into four sprints. In every particular week I completed the work that I decided for that week. The plan for the completion of the project and each weeks goal were as follow -

- **In first week -** The goal for the first week was to complete the minimum required feature of one-to-one video call
- 1) First day I decided what all features I will compulsorily be including alongwith the minimum criteria of one-to-one video call like making chat rooms, user authentication and having more than two people video call, mute mic and camera options and planned out my project accordingly like the tech stack I will be using and all.
 - 2) On the second day I started developing UI for the project. I have made a react app hence I started making the components beforehand which were not functional at that time. Like making a navigation bar, header, main body, side bar, buttons like video call button, chat button, rooms button, side rail list item components, video call window and chat window and other items.
 - 3) Along with building the non-functional UI in react js I was learning how to use socket.io, webrtc and simple peer and all necessary knowledge for the making of the minimum feature for making a one-to-one group video call.
 - 4) I implemented the one-to-one video call feature in another small react app apart from my main project just to learn how to implement and not make my main project messy.
 - 5) Then I made the buttons and all the components in the web app functional by hardcoding the functionality and hardcoding the necessary variables like users List,

user Info, opening the video window on clicking the video icon button without connecting with another person.

- 6) Then I developed the Redux Store, reducers and their actions.
- 7) On the seventh day of the week I had completed the necessary requirements that is learning and trying the video feature and making the UI. Hence I proceeded and incorporated the functionality of video call into my main app accordingly.

- **In Second week -** The goal for the second week was to complete the extra features that I had decided to incorporate and implement it such that my project was scalable.

The features that I completed this week were mute mic, mute camera, leaving call, creating and joining both private and public rooms, chatting with a single person, chatting in a room.

I used redux store for storing information like chats, user info, users List. Alongwith creating these features I had to solve the errors and fix the bugs which were coming along with making of the project.

- **In the third week -** The goal for this week was to add user authentication and many people group video calls along with invite links. I also resolved and fixed many bugs that were coming. I also added some small features and improved some css.
- **In fourth week -** The goal for this week was to adapt the new feature being announced. We were given to incorporate chat during the video call which can be started before joining the call and can be continued after leaving the call. Since I had already made rooms, incorporating this feature was easy for me and I completed it in a half day. I had created the invite link option so I just added the feature of creating a private room on every new invite link being created and added that room to the private room reducer. Everything else like chatting and sending messages were similar to the rooms that I had created before so I did not have to add anything extra or code anything more. In short I only have to code for adding a new room for every new link being created which was also easy since I reused the functions which I had coded before.

Then the next day I created the option for logging out. I also added the copy link button, room item dropdown and copying room name and password, option to join and unjoin the room.

Then on the third day of the week I finalized my project after testing it, removing errors, fixing bugs, and adding some small UX and UI things.

On the fourth day of the week I hosted my project and wrapped it up finally after testing it from all sides and fixing any glitch if found.

On the fifth day I had my mentor meet and we had a testing meet on the Teams clone that I made. I also had to make a demo video and write the Readme and Docs.

- **The things that I learned -**

In terms of technical I learned a lot as given below -

1) Many React Js concepts -

- useEffect usage
- Batching in react
- useRef usage
- React redux
- Event listeners added inside useEffect
- Cleanup function in react useEffect
- React rendering cycle
- And many other

2) What is server and what is client

3) What are websockets

4) Many libraries like socket.io, simple-peer, webrtc

5) Using material-UI in react app

6) Node Js

- 7) How to write good code by properly dividing your project into a better folder structure, writing comments, documenting your code, better naming conventions for variables, functions, file names etc., DRY principle.
- 8) Writing a Readme.md file
- 9) Using Git and Github for your work - push, pull, branching, merging, going back to previous commits.
- 10) Overall my coding and my concepts of many technical skills and tools became better.

In terms of other things also I learnt a lot -

- Talking with mentors and other mentees and asking them questions improved my communication and decreased my fear of talking to people and my shyness.
- How to connect with people.
- What is agile methodology and how to implement it in your project.
- Through various leader talks I learned about the corporate world.
- Overall I had a fun learning during this one month project.

Errors that I faced and solved -

- Many times I was unable to set peer connections and destroy them. Then I understood how we should remove event listeners accordingly.
- I faced an error in resolving how to run my web app on different devices and establish connection. Then I learned about https, hosting your local server on ngrok and deploying it on heroku and firebase.
- I faced errors when pages were reloading and I learned about Protected React Routes.
- There were many errors related to React implementation and hence during resolving them I learned many react concepts given above thoroughly.

New Features that I am planning to add to my project in future -

1. Making Room admins
2. Adding and removing users from rooms by admins
3. Screen sharing
4. Call recording
5. Deleting messages once sent
6. Changing Languages like Hindi, english, spanish etc.
7. Light and dark themes
8. Raise hand during video call
9. Kicking out people from a meeting
10. Sharing Files
11. Avatars like in snapchat
12. Posting like in twitter, facebook
13. Sending sms to mobiles
14. Notify using a green exclamation mark showing that new unread message is received from this user
15. Disabling people to chat except admin in the room
16. Making multiple people admin of the room other than who created the room
17. Saving user info and messages to database
18. Marking certain messages as important and many more