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Poornima Meeting App

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Abstract:

When travel is not an option, video conferencing has grown significantly in popularity and reliability over the past few years. Lockdown orders issued in response to the COVID-19 epidemic have also had a significant impact on how people operate. During the pandemic, there had been a huge increase in the number of persons working from home (WFH). In the midst of this current circumstance, the necessity for distant learning has also grown and has become a required educational system. At this time, the Companies are also using a cutting-edge hiring procedure. So, in order to solve this problem, our project seeks to create a useful conferencing app to enable real-time chat, screen sharing, audio conferencing, and video conferencing amongst individuals. By using WebRTC and socket programming, we have developed group video chat in this. Real-time conversation and screen sharing features have also been added. We used Angular for the web app's front end, Node.js, Express.js for the signaling server, and Firebase's real-time database to store chats and user data. We used sockets to communicate sdp packets and ice candidates after using WebRTC to establish a peer-to-peer connection.

Keywords:

Ionic Framework, Meeting calls, Screen Recording, Chat Room, Video, Audio, Social isolation, Remote learning, Online session

I. Introduction

Users can experience lag-free video calling thanks to it. By enabling them to speak via video chat or real-time instant messaging, it would be incredibly beneficial to connect people who reside far apart. It is also highly useful for bringing together people who live far apart by enabling video chat communication. Due to its design to use little data and function even in low bandwidth, mobile apps are typically particularly helpful to consumers with bad network connections.

When two or more users communicate through video conferencing, audio, video, and data signals are electronically exchanged to allow for user interactivity. Everyone present can see the facial expressions and body language that are so crucial to communication when compared to audio conferences. Several technologies can be used to implement video conferencing. Several of them are software-based, while others are based on hardware.

The ability to transmit a live video stream obtained from a computer camera to each participant is known as video conferencing. A video conference can connect several people or be held between two individuals. This allows people in different places to gradually see and hear one other.

Additionally, the reach and use of the video conferencing software have greatly expanded in recent years. It is primarily employed by businesses and multinational corporations. It is an excellent approach to involve mobile personnel, cut down on travel expenses, and improve communications between companies, partners, or clients. The field of education has seen a rise in the use of video conferences. Teachers can now disseminate knowledge across a wide range of subjects using this technology. These technologies have improved how we may spread knowledge and promote higher education, helping the education sector. Examples include online courses, interactive visual lessons, and other applications. Additionally, the need for it has grown in the healthcare sector. A video conference has increased access to health care worldwide, whether it is for doctors treating patients remotely or for remote doctors to consult with one another to decide on a course of therapy.

We therefore decided to move forward with developing our video conferencing web application, which primarily focuses on offering a platform where individuals can communicate in real-time over video and audio and can also talk with one another in real-time. This was due to its increasing popularity and demand in recent times.

Literature Review:

Angie Del Rio-Chillcce, Luis Jara-Monge, Laberiano Andrade-Arenas conducted research on virtual education. The objective of the research is to report on the impact of student learning using the videoconferencing tools. teachers and students agree that these tools are a great help for virtual classes.

Mansoori Mohd Nadeem, Shaikh Jamshed, Ansari Mohd Faiz, Dr. Varsha Shah conducted a study on video conferencing app. The aim for this video conferencing application is to provide a user-friendly platform where users can communicate with each other and have better communication and also schools and colleges can guide their students from a long distance.

Ganesh Vishnu Parbat, Altaz Altaf Daruwala, Omkar Vinay Joshi, Aman Sanjay Singh, Prof. Dr. K. C. Nalavade conducted study on webRTC. The objective of this study is providing various types of improvements that can be achieved by utilizing WebRTC's effective protocols.

Sudhir Soman conducted study on online meeting apps. The use of these cloud meeting applications is increasing day by day due to their convenience and user-friendliness. This comparative study will bring light on various factors, pros and cons of these online cloud meeting applications.

Jessica Herschman, Todd Kasenberg, Deborah Levy, Natasha Ruth, Christy Taberner, Miriam Kaufman and Andrea Regina conducted a study that focused on leveraging user-centered design methods to generate guidance to mobile app. This app provides a better way of learning the things and communication.

II. METHODOLOGY:

A live video-based meeting employing devices with video capabilities allows two or more people to meet remotely. Through the real-time transmission of audio, video, text, and presentations over the internet, video conferencing enables a group of people to interact and work together when separated by great distances.

A. Research the Market and Ideate

We made sure that our solution would meet market demand and the most fundamental needs of our users from the very beginning. We identified the app's use cases and user types. We believed that we could commercialize a video conferencing app through premium memberships or freemium.

Before we began creating our video conferencing app, we created a fast checklist of documents, which includes:

- Analysis of the market and rivals
- Vision and positioning for apps
- Client profiles
- Monetization methods: freemium, advertisements and premium subscriptions.

B. Define The Future Scope

We developed a feature scope and product plan for our video conferencing software. We may release the core functionality of our software and scale it via add-ons later. Customer profiles are useful in this situation because the feature selection is exclusively based on the needs of our users. In order to enhance the video chat experience, we are building a video conferencing programme that uses augmented reality capabilities. our basic kit of communication features may include:

- Users' profiles
- Voice and video calls
- Messenger
- Group phone calls
- Sharing a screen
- File sharing.

C. Tech Stack and Software

It's time to specify the platforms and technological stack now that the features are in place.

Platforms

The priority is accessibility.

It is a cross-platform solution that can be used on desktop, iOS, and Android devices.

Languages

Our video conferencing app works with iOS and Android devices natively. Swift, Objective C, Java, and Kotlin are the programming languages, correspondingly.

You can move code between platforms using cross-platform mobile frameworks like Angular or Ionic.

The primary technology for web video conferencing will be JavaScript, HTML5, and the frameworks Node.js and Spark.

WebRTC

Create online apps with real-time video, speech, and data using Google's open-source, cost-free WebRTC video call API.

The benefit of WebRTC in our app is that it allows video and audio calls to be made directly between web browsers without the need for any additional software, plug-ins, or applications.

All users will be able to access our app because it works with all devices and browsers.

Video Quality

Users of our video app may anticipate a stable and fluid experience.

As a result, make sure our video conferencing app has enough CPU power and bandwidth to enable HD video.

D. Ensure App Security

Our video call app will be entirely secure, and we are working to prevent data leaks.

End-to-end 256-bit TLS encryption is now being added. By locking away video calls, no one will be able to view personal content.

D. Design UI/UX

User interface (UI) contains visual components such as colors, fonts, and others. It has to do with how our app appears, and here you have complete creative control.
User Experience (UX) defines the user experience for your app.

We are taking UX design seriously since we need to create a video conferencing application that operates easily and logically.

- Ensure simple navigation and feature accessibility.
- Be mindful of it for both regular users and those who arrive via an invitation link.
- Pick video call SDKs or APIs that offer complete UX customization and programmable widgets.
- Follow the guidelines for the most widely used video call applications, such as Zoom, Skype, etc.

Test and Launch

Thorough app testing finds serious flaws and keeps you from losing users of your app after just one session. In order to evaluate a video conferencing app, we look at:

- **GUI testing** the app's user interface was simple to use and straightforward for both new users and frequent users.
- **Functional testing** to ensure that each component is present and complies with the standards.
- **Browser, platform,** and **device compatibility** to make sure the programmer functions properly everywhere
- **Stress testing** so, even with heavy user traffic, our video app remains stable.
- **Performance** aspects: audio, video quality, frame rate, and data usage.
- **Security** aspects. To determine what data, we gather and whether our app conforms with the App Store and Play Market's policies, carefully review the data policies of any third-party APIs we integrate into our app.

Discussion and Conclusion:

One of the finest methods of communication for large organizations is video conferencing since it gives everyone in the organization a quick and dependable means to connect, cooperate, and discuss. Aside from improving communication efficiency, comfort, and cost for the company, video conferencing systems also offer a number of intangible advantages, such as raising employee productivity across the board.

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