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System Like Webex for Conducting Meeting, Training and Conference

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Abstract - *The recent research in this area can be clumped into three major realms. The first is research into rate adaptation schemes, which aim to provide the highest quality multimedia stream to multiple receivers while making the best use of usable bandwidth.*

The tremendous development in the means of communication has effectively contributed to reducing travel effort and mobility between different areas of the meeting, educational, health, etc. The aim of the study is to establish a video conferencing system using (WebRTC) technology.

Our findings after designing the web-based video conference system users can create a video conference or join an existing video conference. They can also record and keep this conference, share files, take attendance, share desktop, training conference room, chat with conference members.

***Key Words*: Video conferencing, kurento, file share, webrtc**

1.INTRODUCTION

We live in a world where individuals are connected by technology. With the advancements in communication technology, we now have access to more sophisticated and effective methods of communication. Meetings and conferences may be held in a number of ways, with participants in various places at the same time. Technology has made it possible for us to communicate with people of our choosing from anywhere in the world at any time.

Web conferencing services are built on the Internet tools that provide a remote-access virtual world meetings and collaboration among geographically dispersed individuals. Remote conferencing can save money and time on travel expenses by minimizing the need for face to face meetings.

This helps to understand why web-based conferencing tools have become so popular around the world. Video conferencing has enabled businesses and organizations to hold meetings face to face with people without having the need to move to one particular location. Audio and video telecommunications are used in videoconferencing to bring people from various sites together. It is as easy as a having a conversation between two people in separate offices, or it can involve multiple sites in large rooms in different locations.

Video conferencing is one of the efficient and time saving methods to conduct meetings lecture or informal family greeting. With the rapid advancement of technology, especially the sophistication of video conferencing, more businesses are choosing video conferencing as a convenient and efficient way to communicate with their employees, clients, friends, and partners. Application similar to WebEx is a versatile conferencing solution for companies of all sizes. It's a video and audio forum for video conferencing combines key resources to allow users to hold meetings over the internet using voice, video, and other data.

2. LITERATURE SURVEY

EVOLUTION OF VIDEO CONFERENCING

Video conferencing will soon no longer be a bonus for companies; it will be an essential requirement for those who wish to remain relevant. Currently, 59% of employees use video communications at work, with 45% doing so on a regular or weekly basis. Almost 50% of respondents cite a growth in video usage at work compared to just two years ago, also 27% report that personal use has decreased over the same time span.

Some Video Conferencing Systems

There are many video conferencing systems such as Skype, Q audio Conf, Cisco WebEx Meeting

Skype

Skype is an app intended for making audio/video calls and exchange text messages or files over the Internet. The first version of this software, which was originally adapted for voice communication, was launched in 2003. Since then, it has grown in popularity as one of the first sites to introduce VoIP technology.

Q audio Conf

QCONF uses WebRTC technology to provide international audio conferencing that is safe and high-quality at the most cost-effective price solution possible In over 50 countries around the world, audio conferencing is available via secure local access numbers. You'll only have to pay one flat rate per conference call, regardless of how many people enter or

how long you chat. Scheduling & meeting management from easy- to-use web and mobile apps.

Cisco WebEx Meeting
Cisco WebEx Meeting Cisco WebEx is a versatile audio and video conferencing solution for organizations of all sizes. Cisco WebEx can host several meetings same time, giving users a real-time experience. This web conferencing platform is also highly recommended for large-scale product releases and educational sessions.

Google Meet
Google Meet is a Google-developed video-communication service. It's one of two applications that take the place of Google Hangouts, with Google Chat being the other.

3. PROPOSED SYSTEM

This project describes the solution for problem by developing a similar web application using WebRTC. Web Real-Time Communications (WebRTC) is a Application Programming Interfaces and it enables web developers to develop Real Time Communication (RTC) features into their web-based application without bother any complexities of plugins. Peer- to-peer (P2P) architecture is better as it is scalable and reliable than client-server architecture as single nodes failure will not affect against the whole system. Besides, WebRTC system consist of web server and browser with different operating system, workstations, tablets, mobile phone.

WebRTC is used for real-time audio and video transmission, and Node.js is used as a web and signaling server in the web-based system. WebRTC is a protocol that enables web applications and sites to capture and optionally stream audio and/or video media, as well as share arbitrary data between browsers, without the need for a third-party server..

WebRTC is a standard that allows users to exchange data and conduct peer-to-peer teleconferencing without having to install any plug-ins or other third-party applications. A server is required to establish a remote connectivity with two or more devices (users) which is done using Node.js. You'll need a server that can manage real-time communication in this case. Node.js is developed for scalable, real-time applications.

Using Web Sockets, which enables a client and a server to open a communication session, develop two-way link apps with free data exchange. Client requests are processed as a loop, specifically - the event loop, which makes Node.js a good choice. Because it takes a “non-blocking” approach to serve requests and thus, achieves low latency and high throughput along the way.

4. SYSTEM DESIGN

A. Architecture

1. The browser receives access to the media devices (the camera and the microphone).
2. Login/Signup >>>Create/join room>>Handshake
3. After signaling, peers connect directly and communication begins

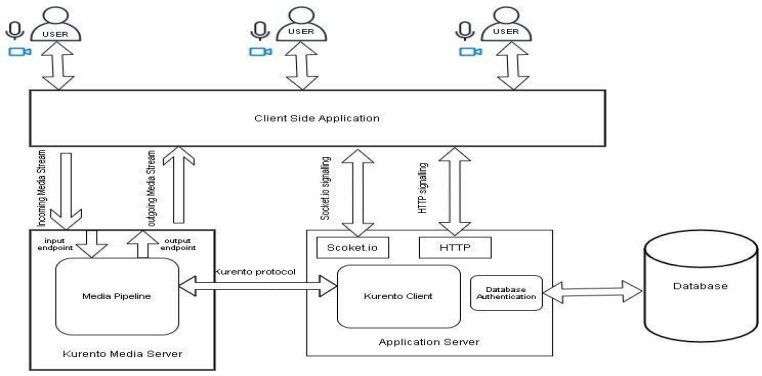

Fig. Architecture

The major 4 components of the proposed system are the client- side application, application server, kurento media server and the database. The Client-Side Application acts as the interface between the Client and the backend. Signaling takes place at the Application server which is connected to the Database for storing and retrieving client data an is also connected to the kurento media server. Media transmission, encoding, loading, and recording are all handled by the Kurento media server.

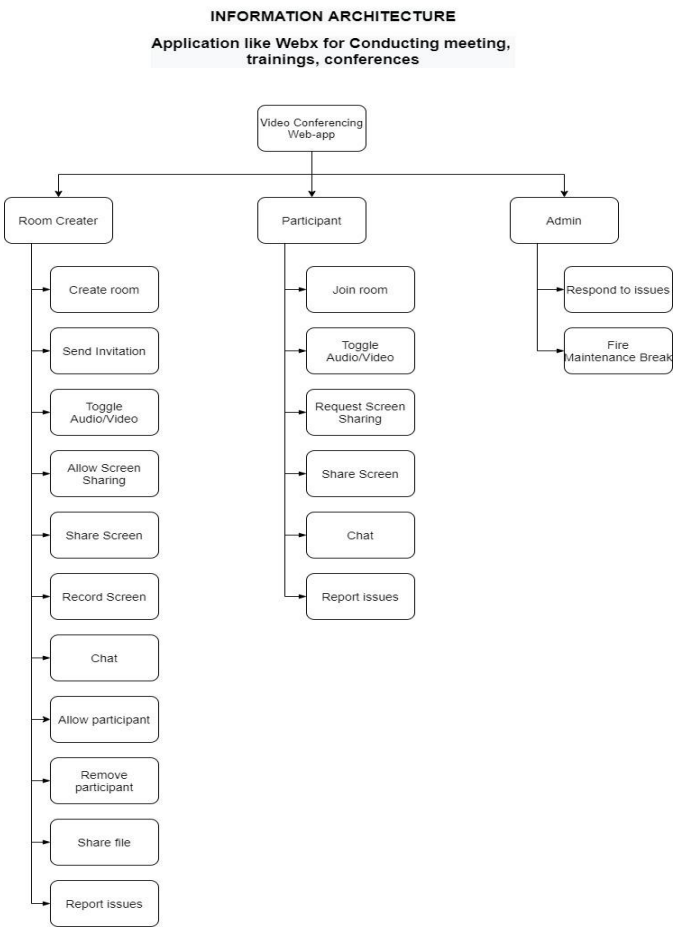

Fig. Information Architecture

Information Architecture (IA) means defining the different types of users for your system and what each user type can do in the system. That is defining the different actions he can take.

This system has two users namely,

- User
- Admin

Fig represents the IA for the proposed system which includes two users. Depending upon the membership, user can perform all the actions such as registration, login, browsing other profiles and chatting with the other users.

If user has free membership plan, he/ she will be able to access all the basic features of the system right from the registration to chat feature. But as mentioned above in the system features, user will not get access to some additional things such as use of stickers and emojis.

If user has paid membership plan, he/she will get access to all additional features such as customer care, view horoscope and use of stickers, emojis while chatting.

Admin can perform actions like view all users, manage database, manage events.

5. SYSTEM IMPLEMENTATION

The web-based system is build using WebRTC for the transmission of audio and video on real-time and Webrtc Media server as Kurento Media Server, Node.js as a web and signaling server.

WebRTC is a collection of protocols and APIs that enable web browsers and mobile apps to communicate in real time over peer-to-peer connections. It is built to link browsers without intermediary helpers or utilities, but in reality, when attempting to build more complex applications.

Though the original purpose of WebRTC was to build a peer-to-peer direct connection, a media server can be used to add advanced features to the call, such as recording, multi-party, and custom processing. To add support for more than two users to our programmed, we'll use Kurento, an open-source media server.

Kurento is a WebRTC Media Server and a collection of client APIs that make creation of advanced video applications for the web and mobile platforms much easier. Group communications, recording, transmitting, mixing, and audio-visual flow routing, transcoding, are among its functions. As a result, in the vast majority of cases, a central media server is needed.rjet template sample paragraph

Develop web-based system provide real time communication between participants with desired features such as:

1.Video calls.
2.Voice calls.
3. Share desktop.
4. Share files.
5. Video recording.
6.Audio recording.

6. RESULTS AND DISCUSSION

A. Discussion

With the rapid advancement of technology, especially the sophistication of video conferencing, more businesses are choosing video conferencing as a convenient and efficient way to communicate with their employees, clients, friends, and partners. WebEx, for example, is a versatile conferencing solution for companies of all sizes. It's a video and audio online web conferencing application that combines key resources to allow users to hold meetings over the internet using speech, video, and other data.

B. Results

•Following are some snapshot of the proposed system which includes registration process, login process, dashboard etc.
•This gives the clear idea of how system will look like.

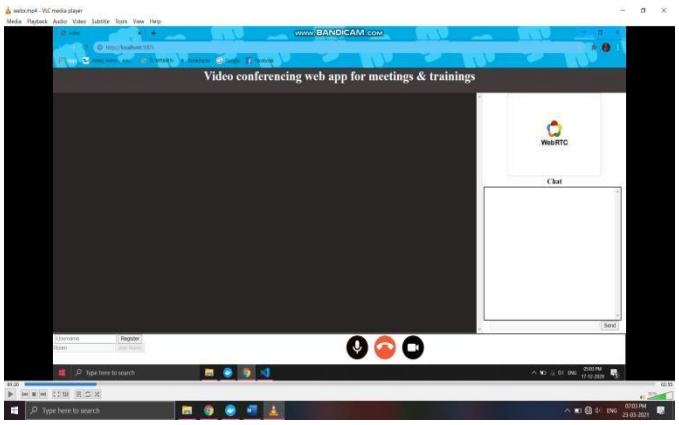

Fig. Home Screen

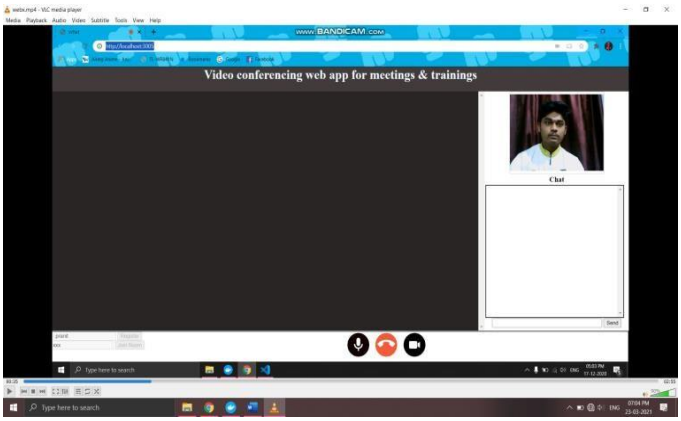

Fig. Login and register screen

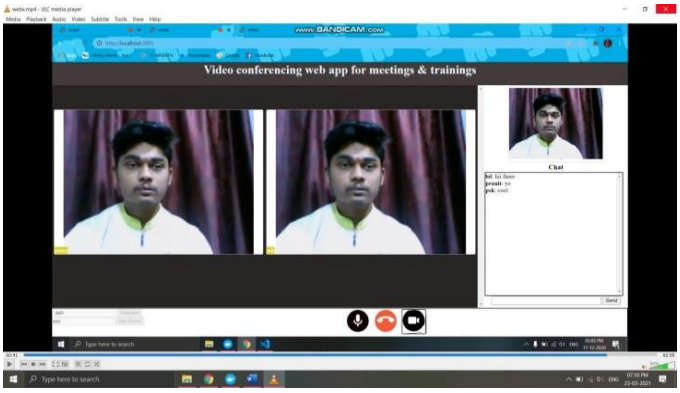

Fig. Responsive window according to number of users

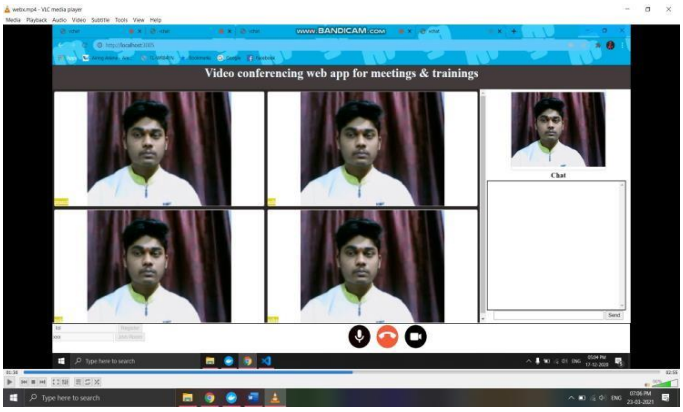

Fig. Multiuser Video Conferencing

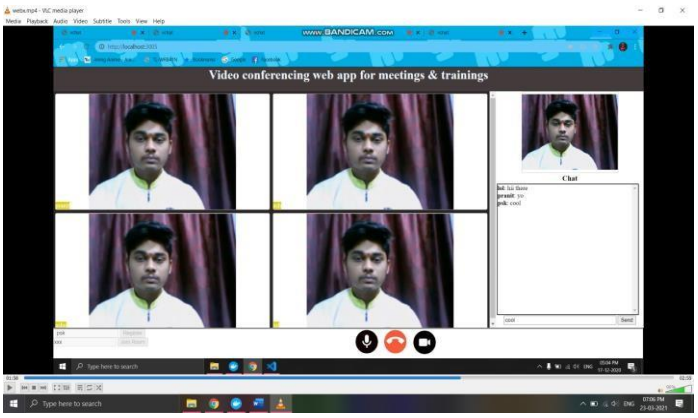

Fig. Live Chat

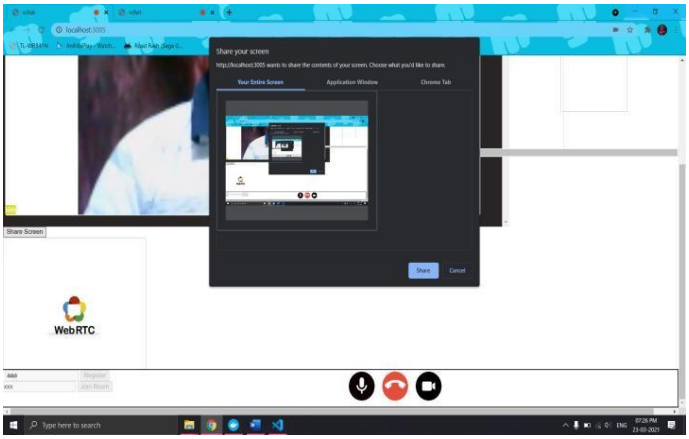

Fig. Share Shreen

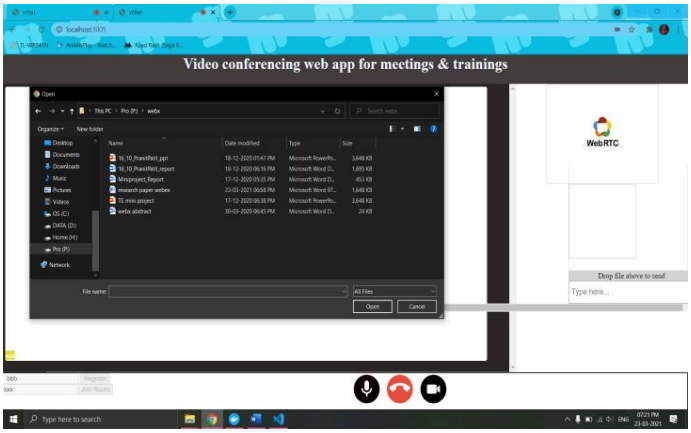

Fig. File Share

7. CONCLUSIONS

The main components of our projects are flexibility to adapt to the changing circumstances; adaption to the environment, where the system is used; universality, comprehensive usability; early warning about any deviations; modularity, a stepwise processing principle of the work packages.

Employees' expectations are changing. This is happening due to the increased use of mobile devices and communication means. Businesses must look beyond the conference room to meet the demands of the workforce and the needs of a growing company's global footprint, enabling workers to interact with their colleagues, suppliers, partners, and consumers from anywhere.

When it comes to business needs, the ability to build custom apps that meet your unique requirements, high reliability, and data protection are all important features to consider. Creating your own private WebRTC video chatting app won't lead to significant losses regarding money or time since the Google company has done everything possible to simplify the development process.

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