

WEB-BASED VIDEO CONFERENCING

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Abstract- Web-Based Video Conferencing intends to run a video-based web application in a web browser. In this work, we developed a web-based video conferencing application. Here we use BigBlueButton (BBB) Application programming Interface (API) for interactive video communication and file sharing purpose. In video conferencing, the participants in different locations can work on the same electronic document.

Web-Based video conferencing allows interactive and effective presentation of data in the real-time world. It also allows desktop sharing that can be used in times of troubleshooting the technical difficulties, faced by the users. By this application, we can also make use of whiteboard and other necessary interactive applications that will make the user's interaction feasible to the environment.

Keywords: BigBlueButton Application Programming Interface, File sharing, Interactive application. Video Conferencing, The Web.

1. INTRODUCTION

Video Conferencing is a vehicle for interactive communication. And is the conduct of a video conference by a set of telecommunication technologies which allow two or more locations to communicate by simultaneous two-way video and audio transmissions.

In many situations, video conferencing is the next best thing to a face to face meeting. Video conferencing are of two types.

- a) Point-to-Point
- b) Multi-Point

a) Point-to-Point:

Point-to-Point video conferencing means a video conference that connects two locations. A point-to-point video conference is a type of video conference that is limited to two locations as shown in Fig.1.



Fig.1: Point-to-Point video conference

Video-enabled meetings happen in two distinct ways: either Point-to-Point or with Multi-Point. In Point-to-Point, the simplest scenario is where one person or group is connected to another. The physical components (i.e. microphone and camera) that enable the meeting to take place are often integrated into desktop computing solutions like a laptop or tablet or can be combined into dedicated, room-based hardware solutions [1, 2].

b) Multi-Point:

Multi-Point videoconferencing means a video conference that connects more than two locations as shown in Fig.2.



Fig.2: Multi-Point video conference

Multi-Point videoconferencing involves situations where video conferencing equipment and systems are set up to serve more than two locations. By contrast, traditional point-to-point video conferencing is a simple video conference between two specific locations.

In general, multipoint video conferencing requires more resources and more accurate setups than a point-to-point video conferencing system. Multipoint video conferencing relies on something called a multipoint control unit or MCU that acts as a kind of bridge for the various pieces involved. This requires particular setups of local area networks and other methods to provide calibrated real-time data streaming to and from each location [3].

1.1 Motivation

The motivation for doing this work was primarily connecting more than two people from different locations in a video conferencing. This is very useful for communicating with more people and easy way to discuss the subject or anything. This work should be done for better communication between the lecturers and students for learning classes or clarifying their doubts through the online classes.

Another motivation is interacting with new people from different locations, and they feel as comfortable to discuss.

1.2 Objectives

In this work, the primary goals are creating a video conference with multiple participants and sharing of files.

Before joining the conference, a moderator can schedule a meeting. After Schedule a meeting we have to invite the people to the conference through the E-mail.

2. Literature survey

The main initiation of this work is to create video conferencing with multiple participants, file sharing as well as power point presentation of that shared file, group chat and screen sharing. Prerequisites for this work launch need PC (or) Laptop, Camera, Speakers/Headphones and the Internet [4, 5].

Laptop/PC is used for to display video conference that we participate in conferences. The purpose of Camera is to capturing a meeting. Speakers (or) Headphones which are used to listening to the participant's voice as well as talking vice versa. Finally, the Internet is helpful for streaming of video from client side to server side [6, 7].

The common description of how to perform the work is:

- Initially, we have to create an account.
- After successful creation of account then log in.
- Then schedule a meeting.
- Next, have to invite participants or join into the video conference.

After performing those steps now, you are ready to participate in the conference. And discuss any topic to each other or presenter giving their presentation to the participants.

Finally, all the participants are participating in a video conference and presenting their papers and discuss on those topics or articles as well as they used to group chat for asking queries to each other.

Now a day's video conferencing and video calling are the most popular applications in the internet world. Most of the people prefer to talk and discuss through the video calling rather than a voice call. In many of the video calling or conferencing applications doesn't have all user requirements suppose one application had point-to-point conference and another application had a multi-point-point conference without sharing of files and group chat. So in this work, we include these features like multiconference, file sharing and group chat.

The limitations of the existing systems have the following.

- a) Multiple participants
- b) Conference with the presentation.
- c) Conference with file sharing
- d) Group chat

a) Multiple participants

In some of the application doesn't have the multiple participants should not participate in meeting at a time. Also, there is only one moderator or presenter. Multiple participants help to discuss on any topic easily and share ideas on it. In a video conference, multiple participants should lead to good topic discussion.

b) Conference with presentation

Conference with the presentation means during the video conferencing a presenter can explain their presentation. In some existing applications doesn't have this feature. And this will helps more useful for understanding a conference.

c) Conference with file sharing

While the conference in progress at that time, we have to share a file for explaining a conference topic. This might be helpful for easy explanation and understanding. This feature is not presented in some applications.

d) Group Chat

In video conferencing group chat was an important thing for asking queries in text format when the presenter can't understand your question. Some of the applications don't have a group chat. Group chat can improve the accuracy of a discussion.

The above some of the features are added to this work for improving the communication and conducting conferences within the stipulated time.

3. Web-Based video conferencing using BigBlueButton

Here, we use BigBlueButton API for better video conference. A moderator can send a link to people for joining the conference. Once the participant clicks on that link, he will go directly to the BigBlueButton server for video conference. Videoconferences are scheduled in advance; please take a look at your Canvas schedule for the date and time. About 10-15 minutes before each conference, the teacher starts up the conference and you will receive an invitation via e-mail and a message in Canvas. You can join the conference either by clicking the link in the E-mail or by going to the course in Canvas where you: Go to Conferences or Click the 'Join' button for joining into the conference.

After entry, you are asked if you want to participate by using audio (you can broadcast sound via your microphone) or not. Choosing 'Audio' will lead you through a brief audio check procedure. When entering a conference that already started, you can avoid this by choosing 'Listen only' as shown in Fig.3.

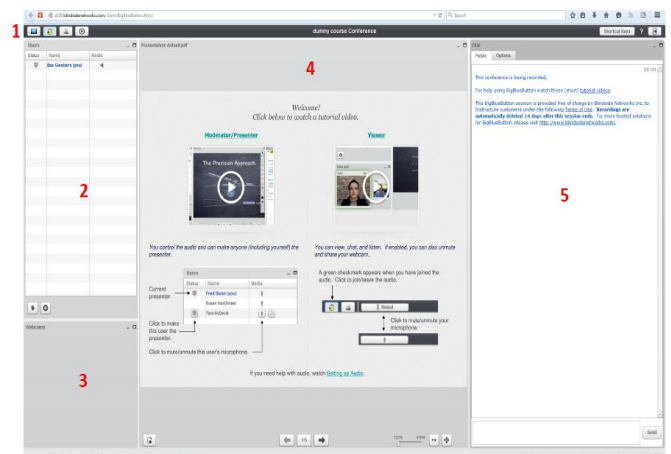


Fig.3: BigBlueButton Presenter

1. Allow you to share your webcam, audio and screen (if you are a presenter).
2. This is the area where all participants are listed, including their status (presenter or participant) and the media is share.
3. By default, these should be turned off to avoid distraction.
4. Shows the item that is shared, e.g. a presentation, whiteboard or desktop.
5. The large right-side part is the chat area
6. The layout can be changed according to specific needs or. Screen parts can be enlarged manually, or a different layout can be chosen, thereby changing the entire screen setup
7. Signing out can be done via the sign-out button or simply by closing the screen.

Here the moderator manages the whole conference. Moderator will create a meeting. After successful creation of meeting moderator can send an invitation link to the people for joining.

In a video conference, a moderator can give permissions to the participants for explaining their presentations. The moderator may upload a presentation, remove people from the meeting. Multiple moderators may be in the meeting room, but there may only be one presenter. In meeting a moderator can have permissions like mute the participant or permitting presenter. Here the participant can act as a presenter or listener. In conference, a participant will ask permission to the moderator by shaking their hand.

In conference, the presenter should explain their topic through the presentation as well as he can upload the PDF for that topic.

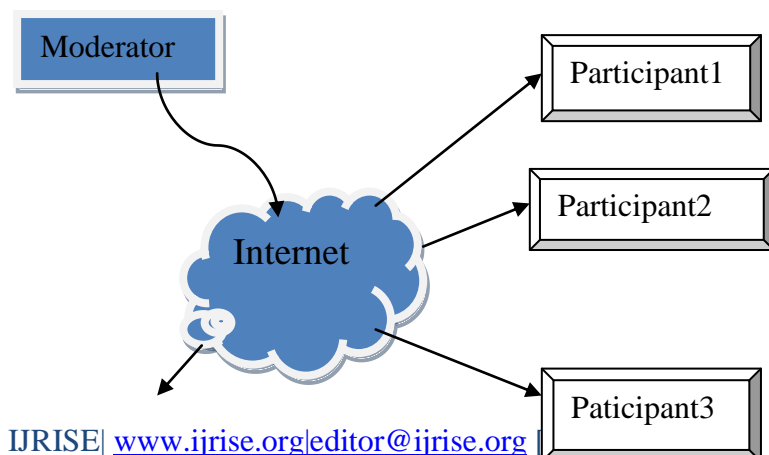
4. Result Analysis

Here in this work, we are using HTML, CSS for front-end designing and MySQL for database design and BigBlueButton API is for a video conference.

BigBlueButton is for video conference, and it contains the file sharing, video sharing as well as audio. Mainly it contains presentation board which is for giving your presentation about the conference for easily understanding of participants. The meeting occurs at one location, but people should join to meeting from different locations through the invitation link. The whole meeting is under control of BigBlueButton server.

Creating and joining into meeting room:

The following Fig.4 shows how to create or join into the meeting room.



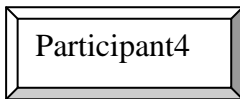


Fig.4: Meeting room design

Moderator: Schedule a meeting room and invite participants to conference. Also, permit participants as a presenter.

Internet: Moderator sends meeting link through the internet. The invitation link is sent by the moderator to the participant through the internet. This video conference should be work only with the internet for data transfer from one to another places and participants.

Participants: participants are in different locations. Once the meeting link receives then the participant can join the meeting. Sometimes Participants are acted like the presenter.

Initially, we have to create an account for login into the conference. After successful creation of an account, we need to login into the web conference as shown in the Fig.5.

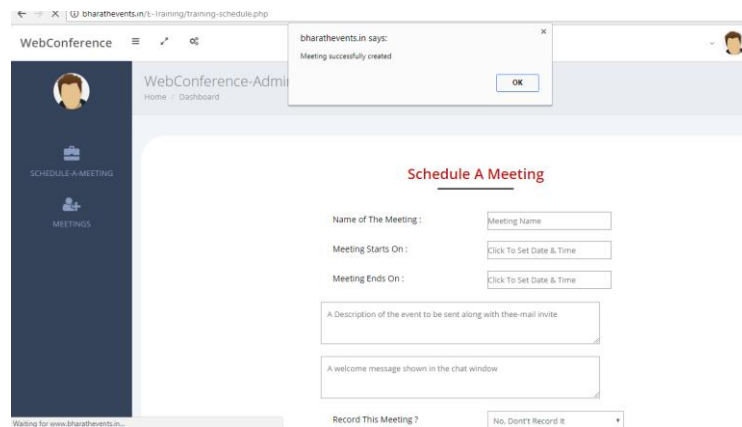


Fig.5: Schedule a meeting

Inviting the people to the meeting as shown in the below Fig.6.

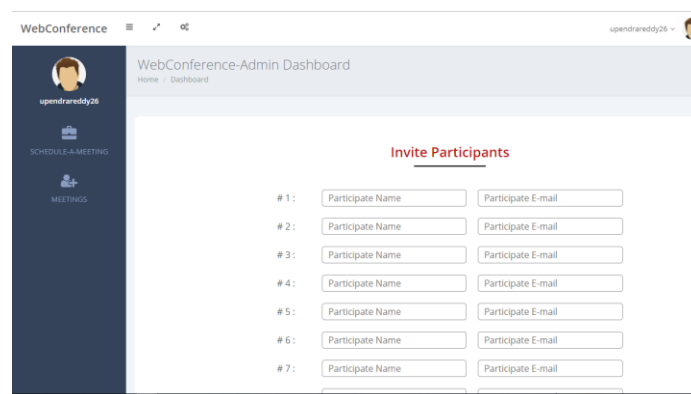


Fig.6: Inviting the people

After successful completion of the scheduled meeting, you need to invite people through the invitation link send it via the E-mail. Then click on the link you can directly joining to the meeting room as shown in the Fig.7.

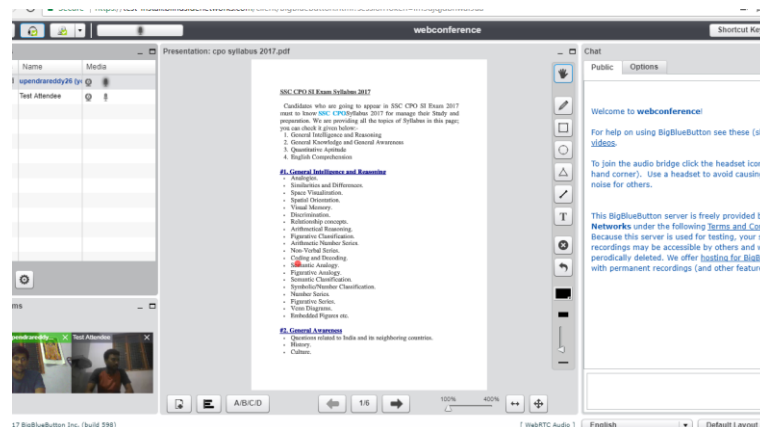


Fig.7: Meeting server

After clicking on the link was sent to the moderator the meeting room will be displayed as shown in the above figure. In which the participants are going to discuss the topic and giving their presentations as well. The whole meeting should be done and control with the BigBlueButton server.

5. Conclusion

Video conferencing plays a key role in the present online classes and group discussions. As well as video conferencing makes an excellent communication between the people or students with lecturers. Video conferencing can save the travel time, cost and effort. In future era video conferencing makes a crucial role in the fields like IT, Research and Development, Education System, Hospitals and the personal calls also apart from the audio call.

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