



SVPC Meet : A Video Conference System

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Abstract— Due to covid 19 pandemic, entire world came to standstill. Academics suffered a lot in the past two years. The education system moved to online mode for conduction of classes. Hence, video conferencing became valuable during these times. It became easy for teachers and students to meet virtually on a platform and keep studies upto-date.

Google Meet, Zoom, Cisco WebEx are some the online platforms where people can meet virtually. One can host a meeting and others can join that particular meeting from the comfort of their homes.

This project deals with one such platform which would help teachers connect with their students for meeting virtually. This system would be used exclusively for college and education purpose only.

I. INTRODUCTION

The aim of this project is to design & develop a video conferencing system to create virtual meetings for online classes and general meet. The main objective of this project is to develop a web system where users would be able to create a virtual meeting or schedule a meeting for later and

invite people in it according to his/her choice.

It is very difficult for faculties to create meetings for all the lectures they take and sending it to their students.

This platform works well for educational purpose and also provides a college a single platform where one can create a virtual meeting from a desired web app.

The live streaming feature comes handy when someone wants to host an event for everyone in the college. With

just one click, an event can be broadcasted on the platform and everyone can view it from their devices.

LITERATURE REVIEW

The current movement towards creating a comprehensive learning experience via the Internet, by most of the higher education institutions appears to be increasing the use of advanced Information and Communication Technology in higher education. This movement requires engaging the students in a learning space which is compatible with their abilities and surrounding context. The cognitive nature of a learning task demands an effective medium for creating and sharing ideas among a group. To create a comprehensive learning experience online, requires continuous updating of technology to ensure its integrity. From this, video communications technologies have been used to enable more authentic learner to learner interaction in virtual environments. In higher education, videoconferencing is considered one of the most commonly used tools for facilitating learners' self- directed use of technology in a synchronous mode.

In [1], author used an analysis of Twitter data to look into the usage of Web Conferencing System (WCS) during the Covid-19. According to the findings, WCS has evolved as a medium that makes daily activities and contacts more accessible.

Previous studies [2], on the effectiveness of videoconferencing in education have reported that various environmental and individual dimensions influence the learning experience of students.

Lawson, Comber, Gage, and Cullum-Hanshaw suggest

that individual's learning experiences can be changed by using different modes or forms of communication within different learning environments. In his research, Coventry demonstrates how videoconferencing can be put into a learning framework by taking a learner-centred rather than technology-centred approach. Hence, the effective use of teleconferencing services can be associated with the technological readiness of an organization. Pitcher, Davidson, and Napier on the other hand, address the need for exploiting opportunities offered by different videoconferencing systems to facilitate learner's interaction and collaboration. This requires a careful modification of conventional lecturing in order to meet the videoconferencing standards and needs. Thus, it is evident that video and audio conferencing are considered as more complex communication channels than face to face communication, where learning outcomes expected from using certain types of videoconferencing systems may vary from one context to another based on the available ICT resources.

Although the use of cutting-edge teleconferencing tools in different educational environments is increasing, there is still a lack of research in demonstrating the use of videoconferencing in the higher education of developing and developed countries. Moreover, previous studies have not sufficiently addressed the specific opportunities and challenges related to the use of videoconferencing systems in higher education. Research [3] shows that the impact of videoconferencing on how learners learn and interact is high and may serve certain educational objectives. Based on this, the research study at hand reviewed the existing literature concerning the use of desktop videoconferencing, interactive videoconferencing, and Web videoconferencing to identify how their use may contribute to the learning of students.

In [4], several video conferencing systems are discussed. It states that single-person-camera, voice switched, split-screen, continuous presence, and virtual space systems are a few examples of video conference systems and the more contemporary video conferencing

systems are given special attention.

In [7], it is discussed that for hassle-free online classrooms, class summaries, and discussion forums, an educational establishment may require a bespoke video conferencing solution. Students who skip classes can review the reports/summaries from the previous day's classes and learn more quickly. Teachers can log on, generate links for their classes, and distribute them to their students.

II. IMPLEMENTATION

The project is entirely made on Microsoft Visual Studio 2019 and VS Code. The hardware required is a computer system compatible with a web browser. The programming languages used in different modules are Asp.Net, HTML, CSS, JavaScript & C#. The frameworks used in the modules are WebRTC, NodeJS & Socket.io. The server used here is Ice Server which can be changed according to requirements.

Here are the implemented modules -

Module 1: Homepage

The homepage consists of a header, footer and body.

The header section has 3 logos to it. One each of SVPC Meet, TPDC and St. Vincent Pallotti College Logo.

The footer section has all the copyright information.

The main body has 4 flex cards to it. The flex cards contain all the other modules of the system. The first card has SVPC Live Stream to its name; Second is the SVPC Meet Module; Third SVPC Zoom & the last one SVPC JITSY.

Each card has the logos of the modules and below it is a button which leads to the individual front page of the respected modules.

Module 2: SVPC Meet

This module consists of a video conference platform built using Node.js, Socket.io & WebRTC.

A user can create an instant meeting by typing his/her name and setting the agenda for the meet and can invite other participants to join by sharing the meeting link.



We have used Ice Server for this project which supports 5-10 users at a time in a meeting which can be changed to a server of choice to support more users in a meet according to requirements.

This module has following features:

- Multiple participants
- Toggling of video stream (mute/unmutevideo)
- Toggling of audio stream (mute/unmuteaudio)
- Screen Sharing
- Text Chat
- Screen Recoding
- Video Recording

Module 3: SVPC Zoom

The third module in the system is a Zoom Clone built using Asp.Net, VB & Zoom API.

The front page of the module consists of a Create Button. By clicking the button, users can see two links generated on the screen. One link is for the host and the other for the participants. Users can copy the second link and share it with others to invite them in the meet. They can also copy paste the host URL to join the meet and get all the hosting rights for the created meet.

The Host API is with the name and email of Debanjali which can be changed to some other name and email as and when required.

The users on copying and pasting the link would then be redirected to the meeting through Zoom App if installed or they can also have the option to join through web app.

All the other features are same as we have in a Zoom Meeting.

Module 4: SVPC JITSI

The next module too is a video conferencing platform built using JITSI API.

The front page of the module consists of a create button which helps user start an instant meeting.

By clicking the button, the meeting would begin and the user would be asked to enter his/her name and join the meet. The user can then invite other participants by sharing the invite link with the participants. Other features in the platform are:

- Mute/Unmute Audio/Video
- Screen Sharing
- Recording
- Inviting Participants through different social media platforms
- Changing Background
- Raising Hand
- Live Chat
- Mute Everyone
- Disabling Everyone's Camera
- Toggle Tile View

Module 5: SVPC Live Stream

The last module of the system, which is an additional feature in the system is a live streaming platform built using Node.js, Socket.io & WebRTC.

The front page of this module consists of two buttons namely 'Start Stream' and 'Watch Stream'. By clicking on Start Stream Button, users would be able to start a live stream from their laptops or computers. They can also choose the audio and video source according to their choice to stream the required video or audio to their audience.

By clicking the Watch Stream Button, users can watch the ongoing live stream. They also have the option to enable audio of the stream or they can even watch the stream without audio.

III. RESULT & CONCLUSION

Users can create virtual meeting from any of the three modules according to their choice. Users can also create a live stream and watch an ongoing live stream from the system itself.

Having all these things in a single platform helps user use his/her choice's platform and interact with each other. On a future note, this platform can be made available on mobile devices as well. The participant size can be increased with a larger server. The live streaming platform can also be made available on a public platform.

ACKNOWLEDGMENT

A special thanks to Tech Pallottine Development Center (TPDC) of St. Vincent Pallotti College of Engineering & Technology, Nagpur for providing us the opportunity to work on this project. A big thanks to the industry mentors Prof. M.S. Ansari and Prof. Ajay Zope, who made this possible.

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