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Implementation on Video Conferencing System

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ABSTRACT: Video conferencing is a technology that enables individuals or groups to attend virtual meetings using audio and video connections. With the rise of remote work and globalization, video conferencing has become an essential tool for connecting teams, clients, and partners across different locations.

The process involves setting up a video call through hardware, software, or online platforms, where participants can see and hear each other in real-time, collaborate in real-time, and share documents and screens.

Video conferencing has various advantages such as cost savings, increased productivity, better collaboration, and reduced travel expenses. However, it also comes with some challenges such as technical difficulties, bandwidth limitations, and security concerns. Nevertheless, video conferencing has become a critical communication tool for modern businesses and organizations, enabling people to connect and work together, regardless of their physical location.

I. INTRODUCTION

The use of technology in real teaching scenarios has only recently become feasible due to its increased stability, usability, and affordability. Video conferencing is being touted as the next advancement in electronic communication and many companies are developing systems to support virtual teams, telecommuting, and remote conferencing. Modern video conferencing units provide advanced video and audio quality due to efficient compression and can function over broadband internet connections. Cheaper accessories, such as web-cams, have also made it possible to participate in a video conference using dedicated software on a personal computer without any expensive special hardware. With tight budgets, many businesses and institutions are turning to web conferencing to save money and time.

Users can communicate with each other on this video conferencing platform in their own private room, companies can use it for project discussions or interviews, and schools and colleges can use it for online teaching by sharing virtual whiteboards and managing records of students.

Key features include screen recording, sharing YouTube videos, unlimited private rooms, inviting third parties, live chat rooms, muting audio, and disabling video.

Video conferencing is a communication medium used for lectures, tutorials, students, project reviews, remote visits, and more. Video conferencing can be either point-to-point or multipoint and can include data sharing, such as an electronic whiteboard or text-based real-time communication. Commercial companies advertise video conferencing as a new technology, but it is a purpose that can be hosted on a variety of technologies and has been for some years. The success of video conferencing in higher education may depend on factors

such as educational issues, student and lecturer attitudes towards the technology, and teaching methods adopted. There are still many unanswered questions from an educational and psychological perspective.

II. LITERATURE SURVEY

In times of pandemic, distance education is prevalent, and videoconferencing plays a significant role in the learning experience of students. ICT has contributed to new educational reforms. Google Meet is mostly used by students in work meetings, whereas teachers prefer Zoom for class meetings.

The Zoom Videoconferencing platform benefits both teachers and students in their work, teaching, and learning, allowing both parties to interact and learn about the platform's benefits, creating a positive learning environment. A quantitative approach is used in the studies, with statistical results showing that a good percentage of Zoom video conferences are accepted by students and teachers. However, there is a latent



concern about issues related to the laboratory, where students need instruments that only the university can provide. Videoconferencing has benefits, including cost-effectiveness, learning flexibility, and independence, in e-learning, the modern form of online learning. Discord can help students access requested activities and enhance learning effectiveness during online classes. The quality of network speed and self-conscious behavior hinder the reinforcement of learning. In contrast, videoconferencing tools improve students' behavior, encouraging them to overcome their shyness of speech and contribute their opinions. Greenberg (2004)

III. RELATED INFORMATION

Types of Videoconferences:

We have identified three main types of video conferences, each with its specific requirements:

- a. One-to-one conference
- b. One-to-many conference
- c. Many-to-many conference

Chapter 4 of this report suggests a particular system for each type of videoconferencing.

Recommended Criteria:

- a. Multi-platform compatibility: The videoconference system should offer a client distribution for various operating systems for peer-to-peer video conferences. For one-to-many or many-to-many video conferences, both the client and server should be provided under various operating systems.
- b. Communication Services: The videoconference system should offer a spectrum of communication services, such as file transfer, application sharing, audio and video transmission, and conference recording.
- c. User Classification: The videoconference system should allow the classification of users involved in a conference, including presenters, active presenters, and attendees.
- d. GUI Configurability: The videoconference system should provide the ability to arrange and control items of the videoconference system on a desktop for individual user convenience.
- e. Hardware and Software Requirements: The videoconference system should specify network connection speed and minimum hardware configuration required.
- f. Conference Creation and Setting Difficulty: The videoconference system should have a user-friendly process for creating and setting up new conferences and sending invitations to conference attendees.
- g. Conference Joining Difficulty: The videoconference system should have a simple process for users to join a conference.
- h. Installation Difficulty: The installation process of the videoconference system should be easy compared to other systems tested or known.
- i. Additional Network Requirements: The videoconference system should specify any network adjustments that need to be done before the conference transmission begins.

IV. EXISTING SYSTEM

The first known public use of video communications was in 1964 at the New York World's Fair by AT&T, with their motion video telephone. Initially, video calling was primarily used by businesses to save on the costs and time of travel.

In a research paper [1], the authors pointed out that internet access had become a major issue among students at UniversitiTeknologi Malaysia (UTM) as it was causing difficulties in discussions for tasks and assignments. To address this, they proposed a P2P audio and video calling application using the local area network of UTM that doesn't require any extra plug-ins. This application reduces the data usage of students and the cost of audio and video calling. The



proposed system enables real-time audio and video calling for students to interact with each other and allows them to chat using text and transfer files to each other.

In another paper [2], the authors highlighted the challenge faced by video conferencing today, which is the limited number of participants per session and the need for large and fully equipped conference rooms. To address this, they aimed to design and implement a video conferencing prototype (Open Meeting) with additional features that will solve the problems associated with traditional methods of conducting meetings.

Finally, in a third paper [3], the authors explored the use of P2P technology in a wide area network to transmit multimedia data. They observed that in a LAN, multicast data can be simultaneously sent to multiple recipients, thereby reducing bandwidth and greatly improving communication speed. Thus, they proposed combining multicast technology with P2P technology to fully utilize the strengths of both technologies and provide better service for video conferencing systems.

V. SCOPE OF PROJECT

Video conferencing is a widely used method of communication that enables people in different locations to meet face-to-face using video-enabled devices. It facilitates real-time transmission of audio, video, text, and presentations over the internet, making it ideal for team meetings, webinars, product demos, job interviews, and other collaborative activities. The primary objective of video conferencing is to connect people, regardless of their location. To enhance the video conferencing experience, an app has been developed that offers useful and beneficial features, including screen sharing, mute, pause, camera change, and the ability to record and live stream the video chat. This app is equipped with a high-security encryption algorithm to ensure that video chat rooms are secure and only accessible by those with the private room code. In addition to video chat, the app also allows users to send text, image, and voice messages to their friends.

Although video conferencing requires robust hardware, technology has made it more affordable, and Intel - the CPU giant - has recently announced a new Haswell chip that appears to be specifically designed to support video conferencing. The chip boasts impressive specifications that can help ensure network connectivity, audio-visual quality, and processing speed during video conferencing, making it a valuable addition to the market.



VI. PROPOSED MODEL

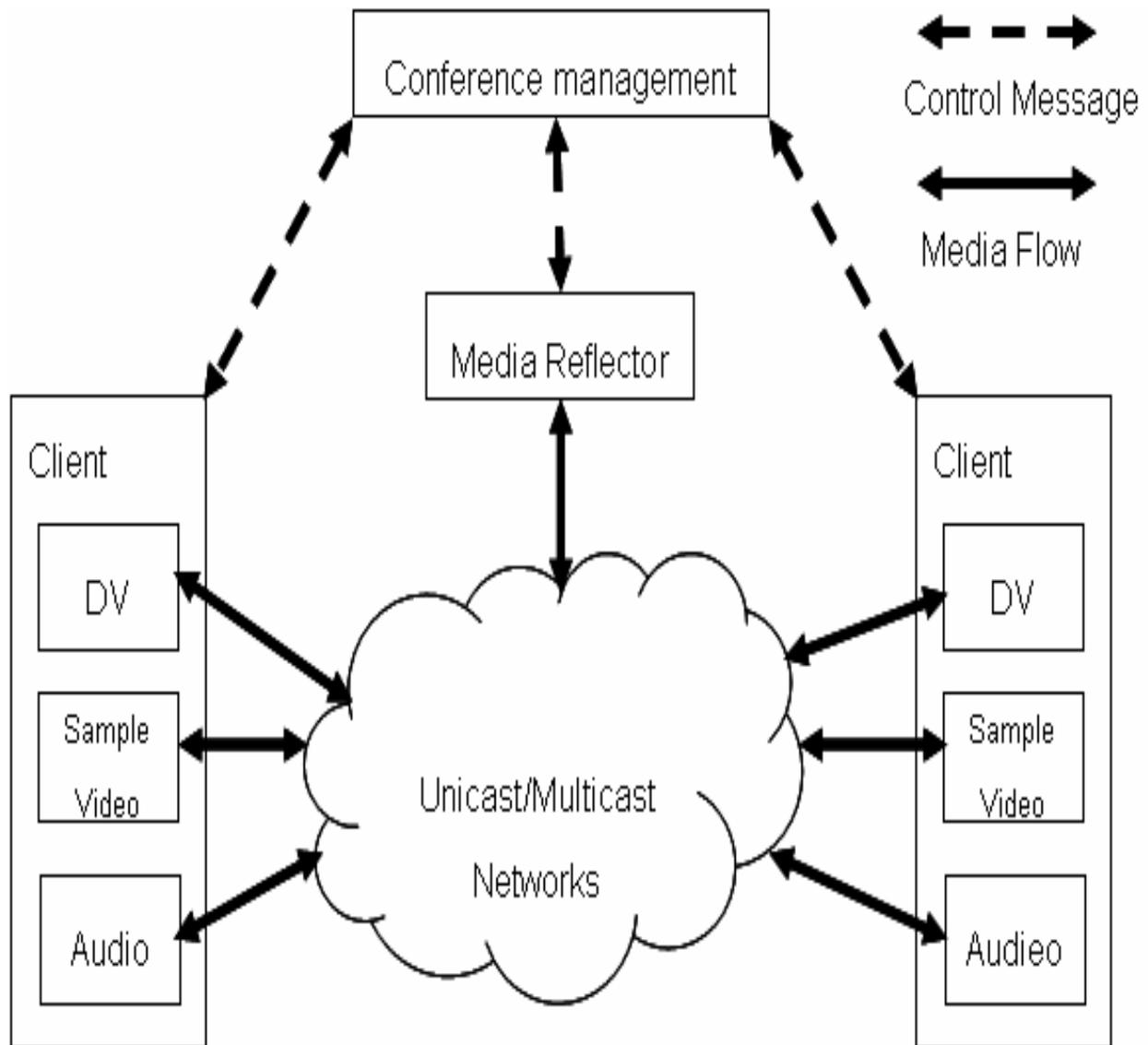


Figure 1: Uni-cast/Multicast Networks



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VII. ACTUAL RESULT

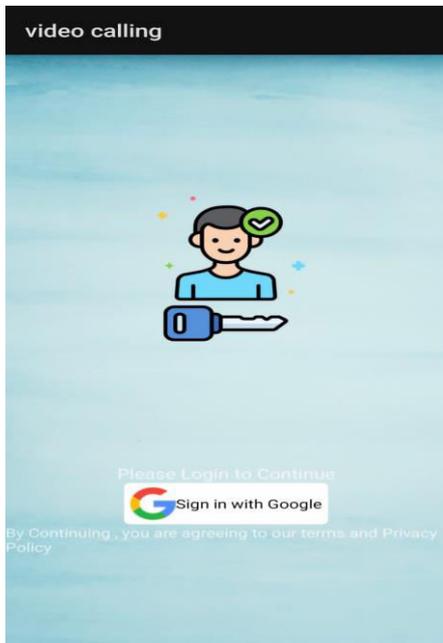


Figure 2 : Authentication page using Google sign-in option

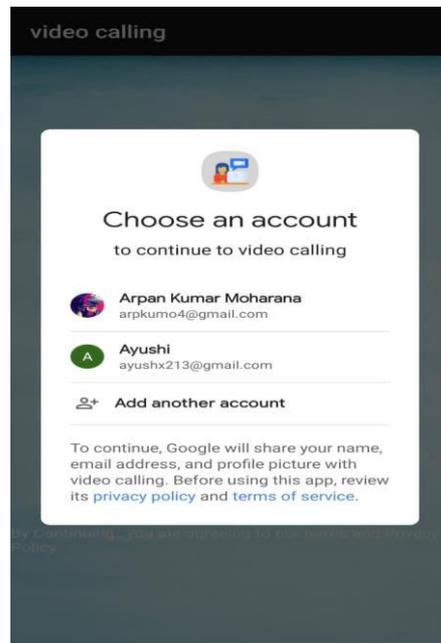


Figure 3: Select your Google account from the pop-up option

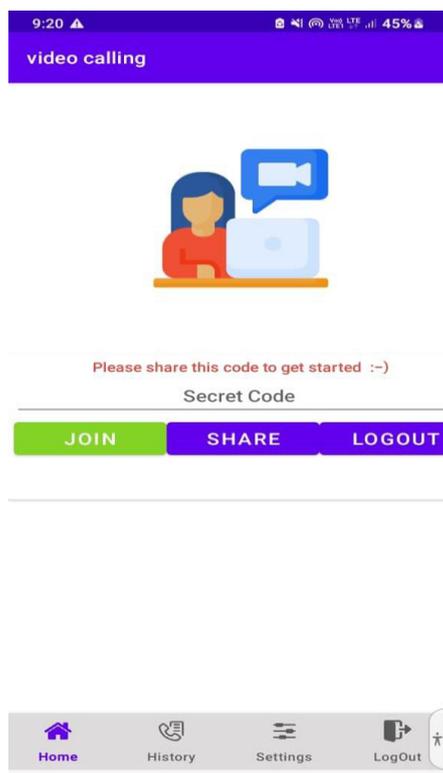


Figure 4: Joining page

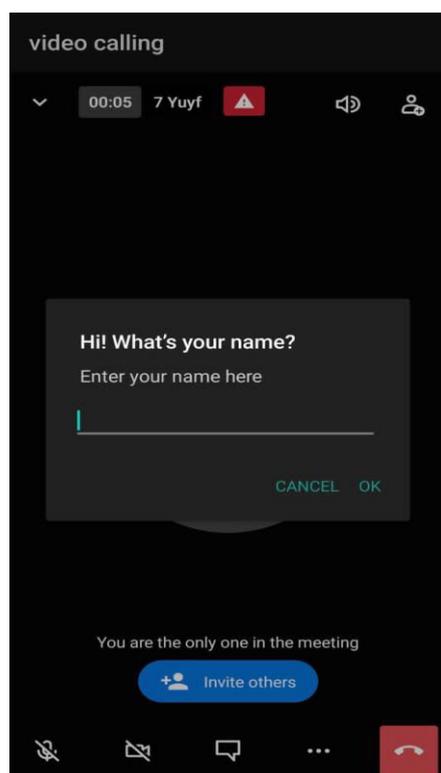


Figure 5: Main video conferencing UI



VIII. CONCLUSION

Video conferencing has the potential to facilitate a dual approach to education, empowering students to take on more responsibility for their own learning by working in groups and completing educational tasks. This can benefit traditional teaching methods, but video conferencing offers an opportunity to incorporate these methods in a new way. However, it should not be viewed as a replacement for print or other conceptualization processes. Instead, video conferencing can be used to promote constructive dialogue and increase opportunities for engagement. With the widespread availability of fast and affordable internet connections, it is likely that video conferencing will become increasingly popular, leading to greater interest and adoption of distance learning. This paper presents an overview of video conferencing and its potential applications in distance learning as an effective way to deliver subject matter in the classroom.

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