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Abstract— We offer a web application for Web-Conferencing in this study. This tool allows you to hold online meetings, participate in meetings, and make polls. This tool will allow users to hold different types of online meetings. The application's accessibility in rural areas has been carefully considered, and it has been developed in a way that makes it simple to use and distinguishes it from its competitors.

Key words: Web-Conference, Online Meetings, WebRTC

I. INTRODUCTION

Researchers in the 1980s and 1990s concentrated on "media spaces" that can offer audio-video communication between people in different geographical locations.[1][2][3]. However, despite the fact that this technology is being researched for decades, it has become widely used in recent years. Audio-video communication is more important since it is the closest thing to "being there." The nature of the application and the people associated in its use, rather than system subtleties and features, determine the technology's success. A lot of audio-video communication systems are part of bigger, more sophisticated systems.

Recently, the focus in the field of remote coordinated effort has shifted to web collaboration frameworks, which are modern frameworks that include, in addition to sound (typically voice over IP, but occasionally communication) and video correspondence parts, instruments that aid collaboration (for example, application sharing, white board-ing/explanation, public and private talk, data on participants, mysterious democratic, device accessibility control for remote coordinated effort). Because colleagues frequently collaborate with a great deal of jumbled data, these frameworks offer capacities that take into account the combined use of distinct depiction structures (for instance, text, different sorts of pictures, and activities).

The use of various softwares for student education is rising globally as a result of the new pandemic known as COVID-19. Videoconferencing was once solely used to minimise unnecessary expenses on business travels, so saving money on housing and time. With the emergence of this new virus, there was a dramatic transformation. As a result, there is a rising requirement for all students (from kindergarten to university) to create and get comfortable with this new teaching and learning process, resulting in increased use of these platforms.

II. PROBLEM STATEMENT

The majority of today's online meeting solutions are built on the assumption of reliable Internet connections with enough of bandwidth. The user's experience is substantially impacted by low bandwidth conditions, and the product's usability suffers, making it unreliable. Internet conferencing software creates a virtual environment with tools and capabilities for people to meet remotely. Audio-video communication, slide presentations, text chat, agenda, and whiteboard sharing are examples of these functionalities. Those functionalities are directly impacted when the Internet connection quality deteriorates. Indeterminate audio, frozen presentation slides, and very low video quality are all possible issues that might make for a bad user experience. These issues can wreak havoc on communication, rendering the online conferencing option nearly unusable.

III. PROPOSED STATEMENT

A web conference is a form of video conference that takes place in real time over the internet using audio or video transmission. We'll be using WebRTC to create a video conferencing web app for this project. It will have audio, video, presentation slides, chat, desktop sharing, hand-raising, and a participant list, among other things. The goal of this project is to create these features in such a way that they can function successfully and efficiently in low-bandwidth environments. Modern JavaScript frameworks such as React, Next, and Express will be used to build and develop the web project. The web app will be hosted on Amazon Web Services (AWS). Our online conferencing app's brain will be Twilio, it is a cloud communications platform as a service startup based in San Francisco, California. Twilio's web service APIs enable software developers to programmatically make and receive phone calls, send and receive text messages, and do other communication tasks. Twilio, which is built on top of WebRTC, allows you to focus on creating one-of-a-kind video apps. Using APIs and SDKs that work across all major browsers and devices, create personalised video experiences with custom layouts and virtual backgrounds. Twilio Programmable Video is built on the concept of a Room. A Room, on the surface, appears to be a virtual environment where end-users can chat. A Room is a computing resource that, through a series of APIs, delivers Real-time Communications (RTC) services to client applications[4].

The main objectives of this project will be:

1. Developing an audio-video conferencing tool that works well in low-bandwidth environments.
2. Managing authentication of users.
3. Building features like screen sharing, hand-raising, video annotations and file-sharing.
4. Building chatting feature where users can send and

receive text messages publicly or privately.

A. Architecture:

1) Presentation Layer:

Thin clients will be provided by web browsers which is in charge of delivering portable presentation logic. Users will engage with the web client to use functionalities of our app.

2) Business Layer:

Between the display layer and the database layer, the business

layer (web service) sends the client's request to the database. The web service will be in charge of retrieving data from clients, processing it, and storing it in a database. Web services serve as a bridge between the application and the database.

3) Database Layer:

The database is in charge of storing all data in a well-defined manner. This will be responsible for storing informations about the users, meeting details and meeting recordings. We used the Twilio's own DB to store the data and AWS to host the application on the server in our project

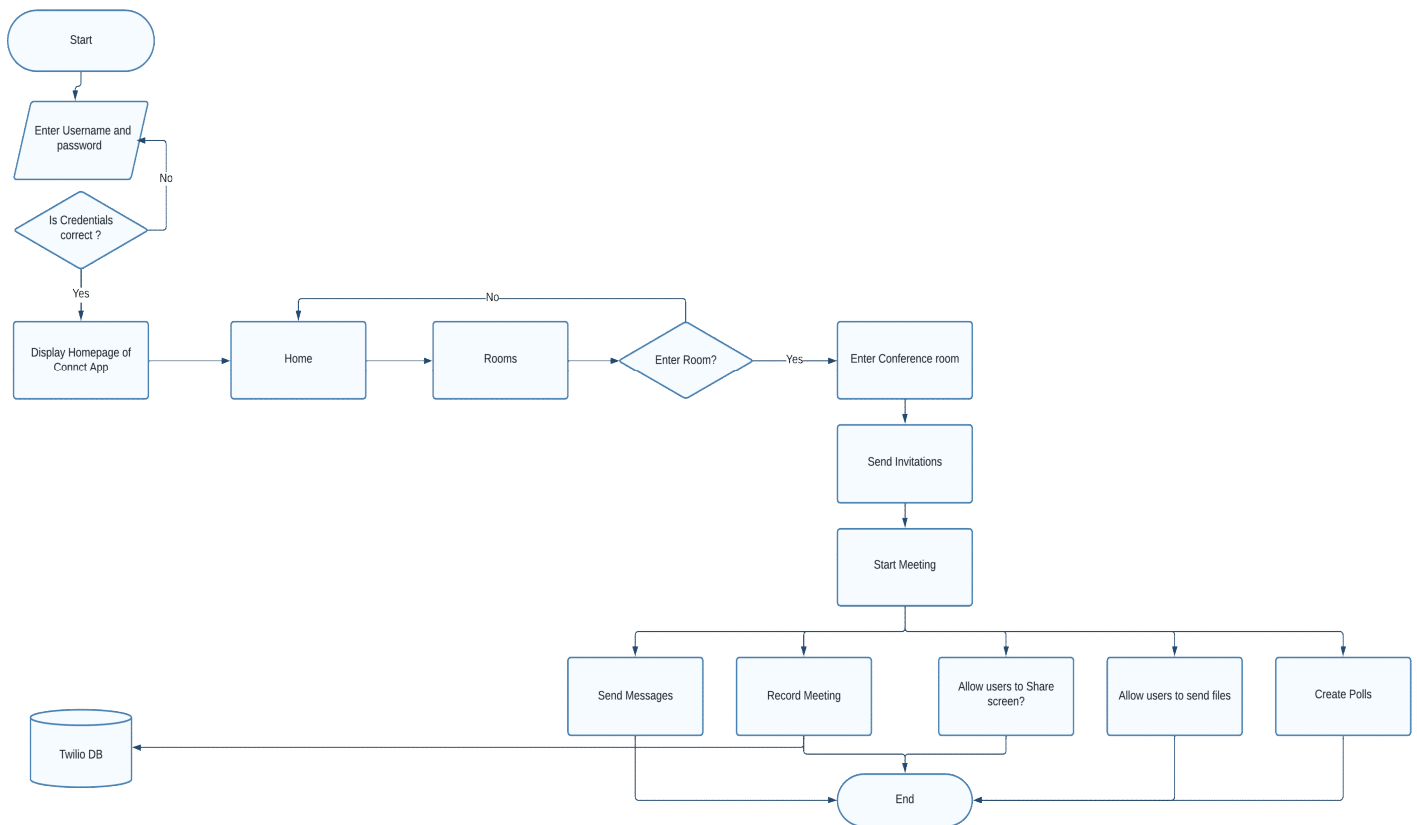


Figure 1: Data Flow Diagram

IV. BENEFITS OF WEB CONFERENCING SOLUTIONS

1) Enable the Digital Workforce

Video conferencing software not only enables today's modern workplace, but it also fosters a much more productive meeting environment within your organization. Video meetings enable teams to maintain personal bond irrespective of their physical locations, speeding up decision-making and increasing global collaboration.

2) Simplify Management and Usability

Audio conferencing, video calls, screen sharing, real-time instant messaging, and other collaboration tools are required by teams. Using too many desperate measures, on the other hand, can make things excessively complicated. By creating a centralized virtual meeting platform with a simple Interface that is centrally maintained, teams can focus on their meetings rather than being swamped with debugging every meeting.

3) Rally Communication and Culture

Today's workforce prefers mobility, flexibility, and novel communication methods above private offices and isolation. Integrating remote workers face - to - face with in-office professionals can boost productivity while cutting travel costs on both ends. When trip expenditures are compared against video conferencing costs, it is evident that video conferencing is the definite victor. Whether your company is made up of remote

workers, is widely spread, or just values a healthy work/life balance, video conferencing has the unique potential to bring the social touch of face-to-face interaction to every engagement.

4) Increase the Reliability of Communication

You can communicate with your team quickly and securely through video conferencing. As multimedia becoming more of a business-essential function, it's critical that your solution prioritizes enterprise-class services and support reliability.

5) Reduce Redundancy and Increase Value

Companies are switching from traditional audio or video conferencing to comprehensive video conferencing solutions that incorporate audio and video conferencing, window sharing, chats, meetings recording, and events live streaming. The overall cost of maintenance and authorization for many companies simply adds extra costs and complexity for end consumers of the product.

V. FUTURE SCOPE

The future work on which we are currently concentrating is to develop and measure the performance of our proposed system so that we can demonstrate that it is superior to all prior proposed systems in web conferencing. Create an environment around our web conferencing tool so that it can be scaled into a collaborative platform rather than just a web app for online meetings.

VI. ACKNOWLEDGMENT

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