Survey Paper on Online Whiteboard – A Web App for online whiteboard sessions

Manvith P[1], Md Sujan[2], Nikhil Vasan[3], Prof. Harshavardhan J.R.[4]

Student, Dept of Computer Science Engineering. KS Institute of Technology, Bengaluru, India [1,2,3]

Associate Professor, Dept of Computer Science Engineering, KS Institute of Technology, Bengaluru, India[4]

Abstract: Human connection is more important than ever as the world battles COVID-19. The internet plays an important role in connecting people throughout the world. Many businesses have taken certain measures to connect and collaborate in these unwanted times. This has led to an increase in demand for online collaboration tools for connecting people throughout the world. A tool widely used in such places to collaborate and connect is a whiteboard. In this paper, we develop a tool to increase collaboration without restricting people to any location, any particular OS, or any particular device needed to be used. Our application allows users to interact and collaborate through visual explanations, especially regarding the writing of the text, making diagrams, uploading images and models/sketches interactively that can be shared with all participants connected over the network in real-time. The tool does not require any plug-in to be downloaded, it is easy to use and has no limit on the number of clients. We have implemented this system by using "Insert software we're going to use to create this".

Keywords: Online Whiteboard, NodeJS, Sockets, Transfer Control Protocol.

I. INTRODUCTION

It is a free and easy to use web application which allows the users to host an online whiteboard on which the users can collaborate and use it to annotate their ideas, explanations, drawings, presentations without the need of sharing the screen.

Meetings and classrooms demand the presence of the person in the room if he wants to participate. A tool widely used in such places is a whiteboard A virtual whiteboard is a shared whiteboard application where multiple clients can connect and write, share, and interact with each other in real-time without needing to be in the same physical location.

II. PROBLEM IDENTIFICATION

The main problem here is the inability to express ideas, facts and explanations visually during online meetings. These is also difficulty in collaborating with other parties of the meetings for sharing and expressing their ideas. If the program uses up a lot of memory due to high graphical interphase and other methods, this in turn will cause the system to hang. It needs to have good security measures so that nobody will be able to misuse the features which are available to them.

III. PROBLEM STATEMENT

Online meetings and video conferences have skyrocketed due to Covid-19, many systems cannot handle the high graphic interface of a few websites, our whiteboard consumes very little memory and bandwidth. Our whiteboard has a simple UI/UX which makes it very easy for the user to navigate and use the whiteboard. Another problem is that majority of the whiteboards have features but they need to be purchased to be usable, which makes it difficult for small organizations to afford the board.

IV. GOALS AND OBJECTIVES

The main goal is to provide a secure, reliable and user-friendly web application that enables a user to make host an online whiteboard session and annotate their explanations, facts and ideas to fellow members of the session. To create web app that users can access either via the website or online meeting platforms like MS Teams. Provide sufficient security features like verified joining of members and request and allow permission to annotate along with the meeting host to annotate together.

V. METHODOLOGY

The development method we will be using for this project overall is a waterfall model. Starting with the Zeroth Review to the First Review problem identification and analysis which is described in the Project Abstract followed by complete study and planning based on the Problem Scope and Statement. Following is diagram of our waterfall model:

Fig. 1: Waterfall Model and it's different stages

The first phase of the project will entail the Requirements Analysis and Application Design and a mockup design will be made and followed mostly into further development.

The second phase of the project will consist of Implementation where we will work towards building a Node.js App with security and MS Teams Integration added to it. Then the first demo will be done for the team to test how the web app is running and what problems it encounters.

After successful demo run, we will work on the fixing UI and UX errors and/or challenges among the team with help from the Project Guide.

VI. APPLICATIONS

An online whiteboard has many benefits, but perhaps the most helpful for a person is the ability to learn concepts or ideas more effectively by interacting with them. Sharing knowhow and ideas in an online meeting is challenging, our application has multiple features using which you can easily convey your ideas and concepts. An online whiteboard can also save a lot of time taken travelling and saving on the transport costs. Whiteboards allow students, tutors and artists to work collaboratively in small groups or solo and present their thinking in an easy visual way.

Notable applications of project are:

- Explaining a concept or a topic to someone over a virtual medium on the web.
- Anybody will be able to use this application for their purpose.
- They can be used for drawing or doodling on the web.
- It will be helpful for users such as Artists, friends goofing off and many more.
- Team members can hold discussions and use it to their advantage as it holds many features.
- The users here can be developers, Scientists, Researchers and many more.

VII. DRAFT MOCK-UP DESIGN

Our online whiteboard is still under development, and it will take a while before it is fully operational, here is mock-up for the basic interface we plan on using:
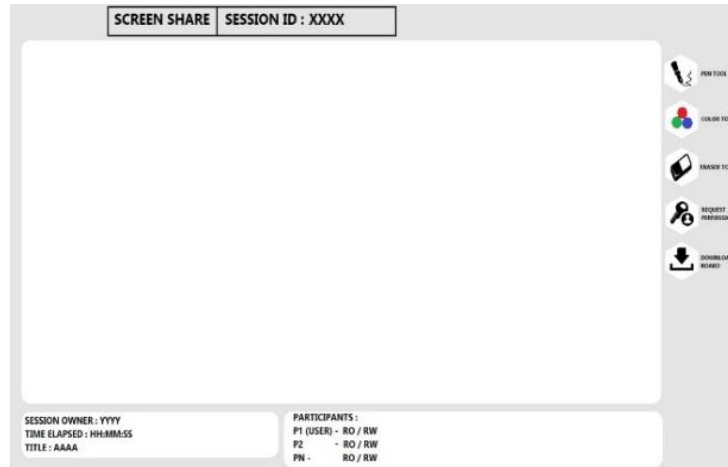
Fig. 2: Mock-up design for the web app

VIII. LITERATURE SURVEY

The following is our Literature survey and the key takeaways from it:

Table of Literature Survey

Base Paper Title	Authors	Key Takeaway
Online White Board [1]	Prakhar Gupta, Vasudha Bahl	Ability to attach files Collaboration features
Design Of Interactive Whiteboard to support E-Learning [2]	Didik Dwi Prasetya, Mohammed Ashar	Live Chat Board
Design and Implementation of Web based, Project based learning support system [3]	Hyosook Jung, Woochun Jun, Le Gruenwald	Links to web resources related to ongoing discussion
Interactive Whiteboard for teaching and learning science [4]	Liliana Mata, Gabriel Lazar, Iuliana Lazar	Color Blind-friendly mode

IX. REFERENCES

[1]. "Online White Board" by Prakhar Gupta, Vasudha Bahl, DOI: https://doi.org/10.46501/IJMTST061297
Available online at: http://www.ijmtst.com/vol6issue12.html
[2]. "Design Of Interactive Whiteboard to support E-Learning" by Didik Dwi Prasetya, Mohammed Ashar found in Advances in Social Science, Education and Humanities Research, volume 116, International Conference on Vocational Education and Training (ICOVET 2017)
[3]. "Design and Implementation of Web based, Project based learning support system" by Hyosook Jung, Woochun Jun, Le Gruenwald, DOI: https://doi.org/10.1007/3-540-47749-7_29
[4]. "Interactive Whiteboard for teaching and learning science" by Liliana Mata, Gabriel Lazar, Iuliana Lazar Journal of Innovation in Psychology, Education and Didactics Vol. 20, No. 2 2016 135 - 148

Books:
• Lant, Carol Le, and Michael J. Lawson. "Interactive Whiteboard Use and Student Engagement."
• Computer Networking: A Top-Down Approach Book by Jim Kurose
Online libraries and Docs:
• Node: https://nodejs.org/en/docs/
• Socket.io: https://socket.io/docs/v4/
• https://conceptboard.com/blog/virtual-whiteboard-for-better-teamwork-and-brainstorming
• https://www.collaboard.app/en/blog/what-is-an-onlinewhiteboard-and-how-to-use-it-in-your-daily-work
• https://developer.mozilla.org/en-US/docs/Web/API/Canvas_API
https://developer.mozilla.org/es/US/docs/Web/JavaScript/Reference/Statements/async_function