International Journal for Modern Trends in Science and Technology, 7(12): 82-84, 2021

ISSN: 2455-3778 online
DOI: https://doi.org/10.46501/IJMTST0712014
Available online at: http://www.ijmtst.com/vol7issue12.html

Digital Whiteboard

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To Cite this Article
Krishna Gupta, M. L. Sharma and Krishna Chandra Tripathi. Digital Whiteboard. *International Journal for Modern Trends in Science and Technology* 2021, *7* pp. 82-84. https://doi.org/10.46501/IJMTST0712014

Article Info
Received: 24 October 2021; Accepted: 01 December 2021; Published: 04 December 2021

ABSTRACT

This research paper focuses on a digital whiteboard project, which was made by using front-end technologies like Html-5, CSS, JavaScript,etc., and Socket.io for real-time connection, and express.js was used for the establishment of the server. Digital whiteboard is a real-time application that allows users to work simultaneously on both the receiver and sender sides and it permits users to write, draw any important point on the canvas. Digital whiteboard can be used in the online class or in the presentation where the people can discuss or explain the topic in detail to other members of teams. It also allows users to save the canvas which can be directly accessed through the gallery and it has a very unique feature that allows users to attach sticky notes to the screen which can be dragged and dropped very easily at any place on the canvas.

KEYWORDS: Whiteboard, Canvas, JavaScript, Socket.io, Digital Whiteboard, Node.js, Express.js

1.INTRODUCTION

In response to the COVID-19, schools and offices are adopting online modes of instruction. Thousands of students and teachers are making the most use of the digital whiteboard, which allows them to make their classrooms as engaging as possible.

Digital whiteboards are very useful to support distance education because learning in online mode requires a tool that helps collaboration between educators and learners. The use of interactive online whiteboards can support many different learning styles and is used in a variety of learning environments.Onlineinteractive whiteboards have several impacts on learning, among which are increasing student engagement in the classroom, motivating students, and increasing focus and their enthusiasm for learning.

Our Whiteboard has a very Institutive interface through which the users can easily use it and Our whiteboard can take online learning tonew heights.

Our Whiteboards offer a new way to create, engage, and brainstorm in real time with the whole class. Everyone can use this online whiteboard for free without paying huge amounts of money.

The project is designed to be independent of any prerequisites.You should not require any logging in or download any apps, invite guests or coworkers, and quickly share ideas or draw visual explanations.The whiteboard is designed for instant access and ease of use.

II. SCOPE AND FEATURES

- **Sticky Note**: With this feature, users can **create notes, type, link, or add a picture, move them around freely on screen, and can put them anywhere on the canvas.**
- Any number of Sticky notes can be used.

- **user can minimize the note if, not needed that time or can permanently remove it from the canvas with one click.**
- **Draw and Erase**: Users can write/draw with multiple colors and the thickness of the pen can be adjusted by a slider, given below the pens.
- The Thickness of the Eraser also can be adjusted by another slider.
- **Collaboration Feature**: You can invite anyone on your team with quick links and members can work on both the receiver and sender sides simultaneously.
- **Screen Save**: You should be able to save your canvas in image format, so that it can be accessed later from the gallery and referred to or used for notes.
- **File Attachment**: Your whiteboard should allow you to attach links, images, and other files so that you can quickly access them.
- **Undo/Redo**: We have implemented this feature to make working smoother and provide a better experience.
- There are some animations in the toolbar to enhance the experience.

III. IMPLEMENTATION

The whiteboard was made interactive using EventListners and data structures combined with the toDataURL() function was used to implement the Undo/Redo functionality.

To add collaboration functionality and for real-time sharing, socket.io was used that is a library that enables real-time, bidirectional, and event-based communication between the browser and the server.

To draw and erase Canvas API was used.

IV. TECHNOLOGY USED

The code for the whiteboard was written using the **Visual Studio Code**.

- JavaScript: JS is a lightweight, interpreted, or just-in-time compiled programming language with first-class functions. While it is most well known as the scripting language for Web pages, many non-browser environments also use it, such as Node.js
- Node.JS: Node.JS is an open-source, cross-platform, back-end JavaScript runtime environment that runs on the V8 engine and executes JavaScript code outside a web browser.

- Canvas API: The **Canvas API** provides ameans for drawing graphics via JavaScript and the HTML<canvas> element. Among other things, it can be used for animation, game graphics, data visualization, photo manipulation, and real-time video processing.
- Socket.IO is a library that enables real-time, bidirectional and event-based communication between the browser and the server.
- HTML – To provide structure
- CSS – to provide design.
- Express will be used to provide server.

V.FUTURE SCOPE

This Application possessa great scope the future:

- Online chatting could be added during presentation.
- Direct Integration with social networking and virtual meeting appscould be provided.
- Video calling could be added.
- Creating cloud storage for the board.
- Security could be enhanced with login requirements.
- Code editor could be integrated to help programmers and teachers.
- These are just a few features, the plethora of features can be added.

VI.CONCLUSION

Whiteboards are an application that allows users to draw/write important points during meetings. They can also be used to teach while taking online classes since they enable teachers to go into greater detail about specific topics. The interface is intuitive and allows users to communicate in real-time. Firms can use a whiteboard to enhance collaboration, make mind maps, and share information.

The uses of an online whiteboard are as limited as your imagination.

The following diagram makes it easier to understand how we proceed.

ACKNOWLEDGEMENT

Foremost, we would like to express my sincere gratitude to My mentorsM. L. Sharmaand Krishna Chandra Tripathifor the continuous support of during the project and research paper, for their patience, motivation, enthusiasm, and immense knowledge. Their guidance helped in all the time of research and writing of this paper. We could not have imagined having a better advisor and mentor for our research-based project.

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