Peer Learning Platform

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Abstract - The Peer Learning Platform is an online tool that allows users to learn and code together simultaneously through group video calls and a shared code editor. It utilizes various technologies like HTML, CSS, JavaScript, Node.js, Express, Socket.io, Jdoodle, and WebRTC. Additionally, it supports multiple programming languages.

The Peer Learning Platform offers several advantages, including enhanced collaboration, convenience, support for various programming languages, and real-time feedback. However, it also has certain limitations, such as reliance on internet connectivity, potential drawbacks of group video calls, possible distractions, and security considerations.

In conclusion, the Peer Learning Platform has the potential to offer a valuable learning experience for users who prefer collaborative learning and coding. Nonetheless, it is crucial to be mindful of the platform's limitations and security concerns, and to take necessary precautions to ensure a secure and seamless learning journey.

1.INTRODUCTION

The Peer Learning Platform is an interactive web-based application designed to facilitate real-time collaboration and learning in coding. It offers users a collaborative environment where they can engage in group video calls, chat with one another, and collaboratively edit code using a shared code editor.

The rising popularity of online education has led to an increasing demand for effective tools and platforms that address the challenges faced by learners. These challenges include managing time effectively, maintaining motivation, fostering communication, and dealing with technical obstacles. The Peer Learning Platform aims to tackle these issues by providing a specialized solution that promotes real-time communication and collaboration in coding and learning.

By leveraging technologies such as WebRTC, the Peer Learning Platform empowers users to engage in group video calls, fostering a sense of connection and reducing feelings of isolation. The chat function enables instant communication, allowing users to exchange ideas, ask questions, and receive real-time feedback. The shared code editor, powered by Jdoodle, enables seamless code collaboration, allowing users to work together on coding projects in real-time.

IMPLEMENTATION OF PROPOSED METHOD/MODEL/ALGORITHM

1.1. Perspective

The Peer Learning Platform is a web-based application that enables users to code and learn together in real-time. It is built using HTML, CSS, JavaScript, Node.js, Express, Socket.io, and Jdoodle, and supports a wide range of programming languages. It leverages technologies such as group video call powered by WebRTC, chat function, and shared code editor to facilitate real-time code collaboration and communication among users

1.2. Scope

This document encompasses the design and implementation aspects of the Peer Learning Platform. It covers various components such as the user interface, data flow, use cases, and algorithms associated with functionalities like setting up group video calls and executing code. Furthermore, the document includes a thorough evaluation of the platform, including an in-depth analysis of the advantages and challenges of online education. It also discusses the potential future enhancements and scope for the project.

1.3. Authentication

Authentication in a peer learning platform refers to the process of verifying and confirming the identity of users who access the platform. It is crucial for ensuring security, maintaining the integrity of the platform, and protecting the privacy of its users. Here is some information about authentication in a peer learning platform:

User Registration: The authentication process typically begins with user registration. Users provide their personal information, such as name, email address, and password, to create an account on the platform.

Account Verification: Platforms may employ account verification procedures to confirm the authenticity of user-provided information. This can involve email verification, where users receive an email with a verification link upon registration, or other methods to ensure the user is genuine.
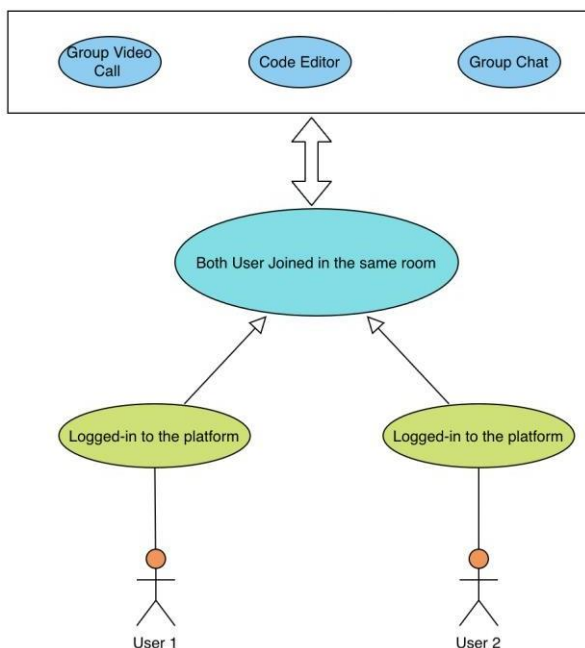
1.4. Database

In a peer learning platform, a database plays a crucial role in storing and managing various types of data related to users, courses, content, interactions, and more. Here are some key aspects of the database in a peer learning platform:
The database stores information about users, including their usernames, passwords (preferably stored in encrypted form), email addresses, profiles, and any additional personal details provided during registration. User data may also include preferences, progress, achievements, and other relevant information.
The database may store various types of learning materials such as documents, videos, images, quizzes, assignments, and discussions. These resources are typically associated with specific courses or modules and are retrieved when users access or interact with them. Messaging and Communication: Peer learning platforms often include messaging or communication features for users to interact with instructors or fellow learners. The database stores messages, notifications, and related metadata to facilitate communication and ensure a seamless exchange of information

2.1 User Case Diagram

The use case diagram includes following main use cases:

2.2 DFD:

[Peer Learning Platform]

[Students] --> [Join Group Session] --> [Peer Learning Platform]

[Students] <-- [Group Video Call] <-- [Peer Learning Platform]

[Students] --> [Edit Code] --> [Peer Learning Platform]

[Students] <-- [Code Editor] <-- [Peer Learning Platform]

[Students] --> [Send Chat Message] --> [Peer Learning Platform]

[Students] <-- [Chat] <-- [Peer Learning Platform]

Algorithm

1) Users are prompted to either enter their login details or sign up for the Peer Learning Platform.
2) The algorithm initiates the setup of a group video call utilizing the WebRTC technology.
3) To include additional members, the room code for the video call is shared, enabling them to join the session.
4) The algorithm proceeds to initialize the code editor using Jdoodle, providing a platform for collaborative code editing.
5) Continuous monitoring of user input in the code editor is conducted by the algorithm.
6) Whenever a user modifies the code, the algorithm promptly broadcasts the edit to all other users in real-time.
7) Upon a user's request to execute the code, the algorithm leverages the Jdoodle API to compile and run the code in the chosen programming language.
8) The algorithm instantly delivers the output and any accompanying errors to the user in real-time, facilitating prompt feedback.

In summary, this algorithm outlines the necessary steps to enable real-time code collaboration and communication among users within the Peer Learning Platform. It encompasses processes such as login/sign-up, video call setup, shared code editing, real-time broadcasting of code edits, code execution utilizing the JDoodle API, and instantaneous delivery of output and errors to users.

2. CONCLUSIONS

The web-based Peer Learning Platform is an application designed to foster collaborative coding and learning experiences. It offers users a shared virtual environment where they can interact and exchange ideas in real-time. The platform incorporates various technologies, including group video calls, chat functions, and a shared code editor, to facilitate seamless code collaboration and communication among its users.

In our research, we have discovered several obstacles commonly associated with online education and real-time collaboration. These challenges encompass areas such as time management, motivation, effective communication, and technical difficulties.

REFERENCES

1. HTML, CSS, and JavaScript:
   W3Schools. (n.d.). HTML. Retrieved from https://www.w3schools.com/html/
   W3Schools. (n.d.). CSS. Retrieved from https://www.w3schools.com/css/
   W3Schools. (n.d.). JavaScript. Retrieved from https://www.w3schools.com/js/
2. Node.js and Express:
   Node.js. (n.d.). Node.js. Retrieved from https://nodejs.org/en/
   Express. (n.d.). Express. Retrieved from https://expressjs.com/
3. Socket.io:
   Socket.io. (n.d.). Socket.io. Retrieved from https://socket.io/
4. Jdoodle:
   Jdoodle. (n.d.). Jdoodle. Retrieved from https://www.jdoodle.com/
5. WebRTC:
   WebRTC. (n.d.). WebRTC. Retrieved from https://webrtc.org/