**INVENTION DISCLOSURE FORM**

**MAJOR PROJECT ID PCS26-18**

**DEPARTMENT – COMPUTER SCIENCE**

**Ques.1. Title of your invention**

Enhanced security and blockchain based online meeting platform.

**Ques.2. Type of Invention**

The field of innovation lies in Computer Science, specifically in the subdomains of web development, blockchain technology, and secure communication systems. This solution integrates advanced technologies like end-to-end encryption, decentralized storage, smart contracts, and real-time communication to create a scalable, secure, and privacy-focused online meeting platform.

**Ques.3. Brief Description of your invention……………………………..**

This invention is a decentralized, secure online meeting platform that uses blockchain for immutable logging and decentralized identity verification. It ensures secure communication via encryption and decentralized storage, and supports real-time chat, video/audio calls, screen sharing, and voting mechanisms through interactive tools. The solution offers a scalable, transparent, and user-friendly experience while safeguarding sensitive data.

**Ques.4. Objective of your invention……………………………………**

The objective is to create a secure online meeting platform using blockchain as well as enhanced security protocol and technologies for privacy and safety. It will record meeting activities in a way that can’t be changed, ensuring trust. All communication, like video and files, will be encrypted. The system will use secure logins and store data safely in a decentralized way, making it easy to scale and adapt to different needs.

The system will include interactive features like voting through polls, allowing participants to make decisions collectively during meetings. Polls can be created instantly, enabling users to vote on various topics or questions in real time, making

discussions more dynamic and inclusive. Additionally, the platform will support real-time chat, providing a space for participants to share thoughts, ask questions, or discuss ideas without interrupting the ongoing meeting. These features enhance collaboration and ensure active engagement among all attendees.

**Ques.5. How to use the invention**

Flow for using the invention:

1. Users sign in securely using Google OAuth.
2. Meetings can be scheduled via Google Calendar or Calendly integration.
3. Participants join using modern browsers on any device.
4. All communication is encrypted using WebRTC and SRTP.
5. Meeting data is securely stored on IPFS and logged immutably on Solana blockchain.
6. Users can interact through chat, vote using polls, and share files or screens.
7. Access is controlled based on roles defined in the blockchain.

**Ques.6. Problem your invention is solving**

This invention addresses critical limitations found in traditional online meeting platforms, such as:

* Lack of security in traditional meeting platforms
* Risk of data breaches and unauthorized access
* Absence of tamper-proof logs
* Inadequate role-based access and identity verification
* Limited scalability and adaptability for various industries
* Centralized servers being vulnerable to single points of failure

**Ques.7. Purpose and object of Invention**

The primary purpose and objectives of this invention include:

* To create a **secure, decentralized** communication platform
* Ensure **privacy, transparency, and control** for users
* Provide tools for **efficient collaboration**
* Cater to industries requiring **confidential communication**, such as healthcare, law, education, and government

**Ques.8. Discuss potential commercial application of the invention.**

**The invention can be commercially applied across several domains where secure communication is critical, including:**

* **Healthcare**: Doctor-patient consultations with encrypted communication
* **Legal**: Confidential legal meetings with immutable records
* **Education**: Secure virtual classrooms and student-teacher interactions
* **Government**: Classified discussions with verified participants
* **Businesses**: Internal meetings and board discussions with full traceability
* **Remote Teams**: Secure, decentralized collaboration for distributed teams

**Ques.9.** **Provide any additional material (such as photographs, reports, publications, and references to texts or other information material) which may be helpful to an understanding of the invention identify and indicate the specific relevance of each.**

**The document includes:**

* **ER Diagram**: Explains backend data relationships.

These are crucial to understanding the system’s working and architecture.

* **Online Meeting Workflow Diagram**: Shows the functional flow of meetings.
* A diagram of a company

  Description automatically generated**Use Case Diagram** : For showing the involved users and their supposed actions.



A diagram of a company

Description automatically generated

A diagram of a company

Description automatically generated with medium confidence



**Ques.10. Abstract**

This decentralized online meeting platform integrates blockchain technology, real-time communication, and advanced security protocols to ensure privacy, transparency, and scalability. It offers features like end-to-end encrypted video, audio, and file sharing, along with role-based access control through blockchain-based identity verification. Immutable meeting logs stored on the Solana blockchain enhance accountability, while decentralized storage via IPFS secures sensitive data. The platform also supports real-time chat, voting through polls, and interactive tools for seamless collaboration. Built using React, Node.js, WebRTC, and MongoDB, it is adaptable across industries and provides a user-friendly interface for secure, efficient, and inclusive online meetings.

**Ques.11. Summary of the invention**

The platform combines blockchain, decentralized storage, and real-time technologies to enable secure and efficient online meetings. Key features include identity verification via blockchain, end-to-end encrypted WebRTC communication, decentralized IPFS storage, role-based access control, and tools for voting, chat, and transcription. Designed for scalability and industry adaptability.

**Ques.12. Detail description of invention with methodology**

**The invention presents a decentralized and secure online meeting platform that leverages blockchain technology, real-time communication protocols, and decentralized storage to address the growing demand for secure, private, and tamper-proof virtual collaboration.**

**This platform integrates various technologies to ensure the confidentiality, integrity, and availability of communications, documents, and logs within online meetings. Unlike conventional platforms relying heavily on centralized infrastructure, this solution adopts a hybrid architecture, combining WebRTC, Solana blockchain, IPFS, and modern web technologies to deliver an advanced, scalable system.**

**Methodology**

**1. Communication and Media Security**

**WebRTC is employed for peer-to-peer audio, video, and data communication between participants. This avoids server routing, reducing latency and central points of failure.**

**Media streams are encrypted using Secure Real-Time Transport Protocol (SRTP) to maintain confidentiality and data integrity.**

**2. Identity Verification and Authentication**

**User identities are authenticated using Google OAuth 2.0 for seamless, secure login.**

**A secondary, blockchain-based identity layer using Solana ensures verifiable, tamper-proof user credentials. This dual-authentication approach enhances security.**

**3. Immutable Logging and Audit Trails**

**All meeting-related activities (e.g., joining, speaking, file sharing, voting) are logged on the Solana blockchain.**

**This enables transparent, immutable records that cannot be altered, thus providing verifiable accountability.**

**4. Decentralized Data Storage**

**Sensitive files such as recordings and shared documents are stored on the InterPlanetary File System (IPFS).**

**IPFS provides content-addressed storage that is distributed, resilient to tampering, and fault-tolerant.**

**Key technologies used include:**

* **Frontend**: Built using React.js and JavaScript to create a responsive, interactive UI.
* **Authentication**: Google OAuth 2.0 is integrated for secure user sign-in.
* **Backend**: Powered by Node.js, Express.js, and MongoDB with support from Mongoose, Morgan, and Winston for monitoring, logs, and structured data handling.
* **Blockchain**: Solana is used for storing immutable meeting logs and managing identity verification via smart contracts written in Rust.
* **Storage**: IPFS (InterPlanetary File System) is used for decentralized and tamper-proof storage of meeting data.
* **Real-time Communication**: WebRTC and Socket.io enables secure, peer-to-peer video and audio streaming; SRTP ensures encrypted media transport.
* **APIs**: Google Calendar and Calendly APIs are used for meeting scheduling, while Google Text-to-Speech supports live transcriptions.

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