**Title: Blockchain-based Secure File Sharing and Communication App**

**Project Description:**

Blockchain-based Decentralized Secure File Sharing and Communication System aims to provide a secure, scalable, and efficient solution for sharing and communicating files using blockchain technology. It leverages Ethereum blockchain for transactions, IPFS (InterPlanetary File System) for decentralized file storage, and end-to-end encryption to ensure data privacy and security. The system will implement role-based access control (owner, viewer, editor) and integrate Ethereum-based payments (ETH) for file access. The goal is to eliminate reliance on centralized servers, reduce the risk of data breaches, and improve transparency in file-sharing systems.

**Group Members:**

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**Functional Requirements (FRs):**

**1. User Authentication & Access Control**

* User Registration/Login (with Multi-Factor Authentication - MFA)
* Role-based Access Control (Admin, User)
* Invitation-based User Onboarding via Email
* Session Management (Auto Logout on Inactivity)
* Password Recovery & Reset Mechanism

**2. Workspaces & Collaboration**

* Workspace Creation & Management (Team & Individual)
* User Permissions within Workspaces (Admin controls access rights)
* Sharing Files & Messages in Workspaces Only

**3. Secure Communication**

* End-to-End Encrypted Chat
* Screenshot (SS) Privacy Protection
* Voice Messages (Encrypted Storage & Transmission)
* Voice & Video Calls (Optional, WebRTC-based, Encrypted)

**4. Secure File Storage & Sharing**

* File Upload & Sharing within Workspace
* Files Stored on IPFS (Decentralized Storage)
* File Integrity Verification (Hash stored on Ethereum Blockchain)
* File Expiry or Self-Destruction Option

**5. Encryption**

* Encryption for File & Chat Data
* Blockchain Hashing for File Verification (Ethereum-based)

**6. Security**

* Admin Security Rating (%) for Users Based on Settings & Behavior
* Online Status Visibility Control (Show/Hide Online Status)
* Connection via Invitation Only (No Public Profile Listing)
* Admin Monitoring & Security Logs (Audit trail for user activities)

**7. Notifications & Alerts**

* Real-time Notifications for Messages & Files
* File Access Notifications

**8. System & Performance Optimization**

* Auto Cleanup for Old/Expired Data

**Non-Functional Requirements (NFRs)**

**1. Performance & Scalability**

* Fast & Efficient File Uploads/Downloads (Optimized IPFS handling, supports 3GB file)
* Scalable Infrastructure
* WebRTC Optimization for Video Calls

**2. Security**

* End-to-End Encryption
* Data Privacy
* Regular Security Audits & Penetration Testing

**3. Availability & Reliability**

* Uptime Guarantee
* Data Redundancy on IPFS

**4. Usability & Accessibility**

* User-Friendly UI/UX (Easy navigation, mobile responsiveness)

**5. Maintainability & Modularity**

* The code should be organized, making it easy to update or add new features.