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# Blockchain Enabled Authentication for Social Media Platform

Mrs. Veerendeswari J[1], Karthikeyan G[2], Dhinakaran S[3], Sathish S[4]
[1]*Assistant Professor (SG), Department of Information Technology, Rajiv Gandhi College of Engineering and Technology, Pondicherry, India*
[2,3,4]*UG, Department of Information Technology, Rajiv Gandhi College of Engineering and Technology, Pondicherry, India*
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***Abstract*—The rapid growth of social media platforms has raised concerns regarding data privacy, content ownership, and centralized control. Traditional social media systems store user data in centralized servers, making them vulnerable to data breaches, censorship, and unauthorized manipulation. This paper proposes a decentralized social media platform using blockchain technology to ensure secure, transparent, and tamper-proof data management. The system allows users to create, share, and interact with content while maintaining full ownership of their data. Each post is stored as a transaction in the blockchain, ensuring immutability and traceability. The platform also integrates authentication, decentralized identity management, and content verification mechanisms.**

***Index Terms*—Blockchain, Social Media, Decentralization, Data Security, Smart Contracts, Web Applications**

## I. INTRODUCTION

Social media platforms have become an essential part of modern communication. However, most existing platforms are centralized, meaning user data is controlled by a single organization. This leads to several issues such as data breaches, lack of transparency, censorship, and misuse of personal information. Blockchain technology offers a decentralized and secure alternative. It enables data to be stored in a distributed ledger where each transaction is immutable and verifiable.

The main objectives are:

- Build a decentralized social media system
- Ensure data integrity and security using blockchain
- Provide transparency and user data ownership

## II. LITERATURE REVIEW

Recent studies highlight the limitations of centralized social media platforms, including privacy concerns and lack of user control. Blockchain-based systems have been proposed to address these issues by providing decentralization, transparency, and immutability.

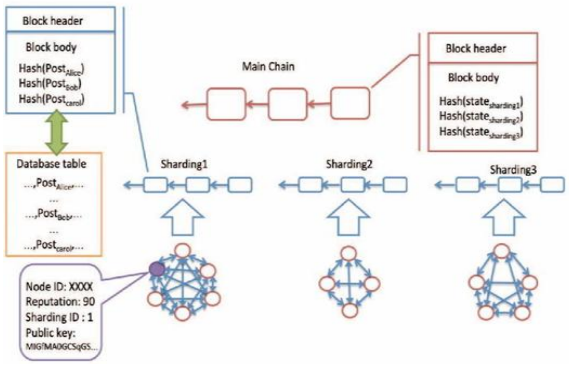
Existing approaches include:

- Decentralized social networks using blockchain
- IPFS-based content storage systems
- Smart contract-based interaction systems

However, many systems lack scalability and user-friendly interfaces. This work focuses on combining blockchain security with a practical web-based implementation.

## III. PROPOSED SYSTEM ARCHITECTURE

### A. Architecture Overview




### B. Detailed Module Description

The proposed system consists of multiple modules:

1) User Module: Allows users to register, login,

and manage profiles.

2) Post Management Module: Users can create, edit, and view posts. Each post is stored as A blockchain
3) Blockchain Module: Ensures secure and immutable storage of posts using hashing.
4) Database Module: Stores user credentials and metadata for fast retrieval.
5) Interaction Module: Handles like, comments, and shares.
6) Security Module: Implements authentication and encryption mechanisms.

## IV. PROPOSED SYSTEM ARCHITECTURE

As shown in Fig. 1, the proposed system processes social media platform using blockchain models to prevent unauthorized access

## V. BLOCKCHAIN MODEL

As shown in Fig. 3, blockchain ensures secure and tamperproof storage of social media using cryptographic hashing.

## VI. ENCRYPTION MECHANISM

As shown in Fig. 4, secure communication is achieved using public and private key encryption techniques.

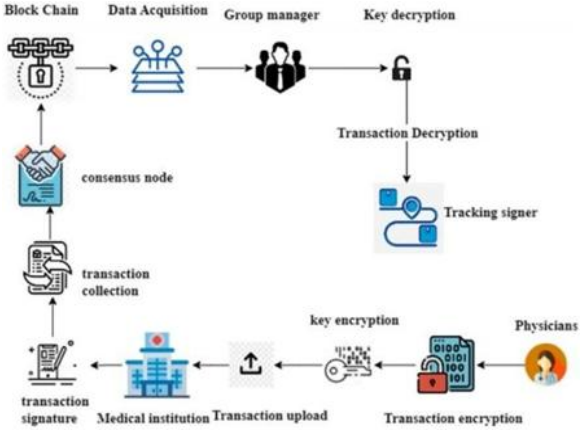



Fig. 3. Blockchain-Based Secure Social Media Data Storage and Transaction Flow

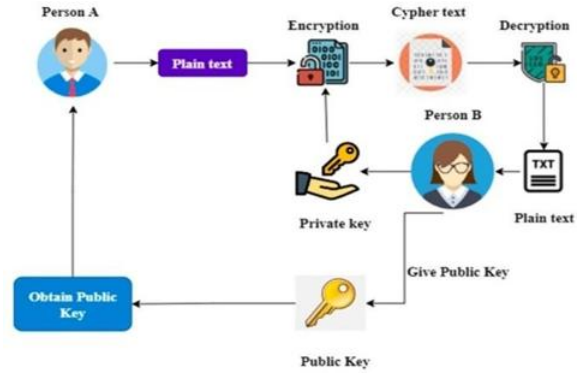
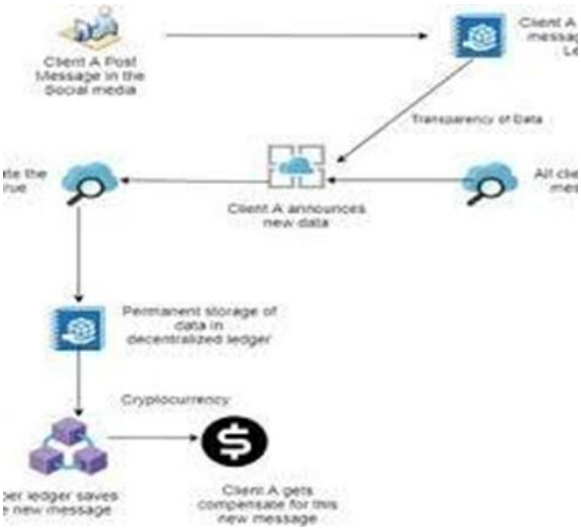



Fig 4. Public Key Encryption and Decryption Process for Secure Data Transmission

## VII. SYSTEM WORKFLOW

As shown in Fig below, the system integrates social media with blockchain to provide secure and efficient medical diagnosis.




## VIII. METHODOLOGY

The methodology of the proposed system involves multiple stages including image acquisition, preprocessing, feature extraction, classification, and secure storage using blockchain. Each stage is carefully designed to ensure accuracy, efficiency, and data security.

### A. User Registration

Users first create an account using their details. Passwords are securely stored using hashing mechanisms. After successful login, a user session is created.

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B. Post Creation
Users can create text-based or media-supported posts. The content is validated before storage.

C. Blockchain Storage
When a post is submitted:
- A new block is generated
- Previous block hash is fetched
- Current block hash is calculated
- The block is added to the blockchain

D. Feed Generation
Posts are retrieved from the database and displayed in reverse chronological order.

E. User Interaction Other users can:
- Like posts
- Comment on posts
- Visit user profiles

F. Blockchain Verification
The blockchain is verified regularly by checking:
- Previous hash consistency
- Current hash correctness
- Block linkage integrity

## IX. BLOCKCHAIN MODEL

Blockchain is the foundation of the proposed system. Instead of storing social media posts only in a database, each post is also stored as a block in a blockchain.

A. Block Structure
Each block contains the following fields:
- Index – Unique block number
- Timestamp – Time of post creation
- User ID – Creator of the post
- Content – Text or media reference
- Previous Hash – Hash of the previous block
- Nonce – Number used in hash generation
- Current Hash – Hash of the current block

B. Hash Generation
The SHA-256 hashing algorithm is used to generate a secure and unique hash value.
Hash = SHA256(Data + PreviousHash + Timestamp + Nonce)
This ensures that even a small change in data produces a completely different hash.

C. Immutability
Once a post is added to the blockchain:
- It cannot be modified silently
- It cannot be deleted without trace
- Any tampering attempt can be detected immediately This provides trust and transparency in content management.

## X. ALGORITHMS

This section describes the core algorithms used in the proposed system, including Smart Contract detection, blockchain mining, and SHA-256 hashing. These algorithms ensure accurate diagnosis and secure storage of Social Media records.
a. function
- Update hash values
- Concatenate final hash values
- Output final hash

b. Blockchain Block Creation Algorithm
This algorithm describes how a new block is created and added to the blockchain.
Algorithm Steps:
Input: Report Data
Output: New Block
- Get previous block hash
- Generate timestamp
- Initialize nonce = 0

A. Post Storage Algorithm
Input: User Post
Output: Post Stored in Blockchain Steps:
1. Read user input
2. Validate content
3. Fetch previous block hash
4. Generate timestamp
5. Initialize nonce
6. Compute SHA-256 hash
7. Create new block
8. Store block and post details
9. Return success status

B. Blockchain Verification Algorithm
Input: Blockchain
Output: Valid / Tampered Steps:
1. For each block in chain
2. Recompute current hash

3. Compare with stored hash
4. Verify previous hash linkage
5. If mismatch found → Tampered
6. Else → Blockchain Valid

C. SHA-256 Hashing Algorithm

The SHA-256 algorithm is used for secure hashing of block

Steps:

1. Accept input block data
2. Convert to binary format
3. Perform padding
4. Divide into fixed-size chunks
5. Process using SHA-256 rounds
6. Produce final 256-bit hash

## XI. IMPLEMENTATION

The proposed system is implemented using a combination of modern technologies including Python, Flask, OpenCV, PostgreSQL, and a custom blockchain framework. The implementation is designed to ensure efficient processing, secure storage, and user-friendly interaction.

The proposed system is implemented using modern web and backend technologies.

A. Development Tools

- Programming Language: Python
- Frontend: HTML, CSS, JavaScript
- Backend Framework: Flask
- Database: PostgreSQL
- Blockchain Module: Custom Python implementation

B. Frontend Implementation

The frontend provides:

- Registration page
- Login page
- Feed page
- Profile page
- Post interface
- Wallet/transaction-like post integrity display

C. Backend Implementation:

- Request routing
- Form processing
- Session handling
- Database operations
- Blockchain generation and verification

D. Database Implementation

The database contains tables such as:

- Users
- Posts
- Comments
- Likes
- Blockchain Records

E. Blockchain Implementation

Each new post is converted into a blockchain block and linked securely using SHA-256 hashes.

## XII. RESULTS AND DISCUSSION

The proposed system was tested using Many accounts. The system successfully analyzed the account and produced accurate results along with additional insights such as severity level, confidence score area, and threads availability

A. Observed Results

The system successfully supports:

- User registration and login
- Post creation and display
- Likes and comments
- Blockchain-based secure post storage
- Data verification

B. Security Analysis

The blockchain implementation ensures:

- No silent post tampering
- Transparent data flow
- Improved trust between users and system

C. Performance Analysis

The system performs efficiently for small to medium-scale usage. Database indexing and optimized queries help improve feed loading and interaction speed.

D. Discussion

The proposed system demonstrates that blockchain can be effectively integrated into social media applications to improve:

- Data integrity
- Transparency
- Security

## XIII. ADVANTAGES

The proposed system offers several advantages:

- Decentralization – No complete dependency on a single server

- Security – Data is protected using blockchain
- Transparency – User actions are traceable
- Immutability – Posts cannot be altered secretly
- Data Ownership – Users retain control over their content
- Trust – Builds a reliable digital communication platform
- Scalability – Can be extended with more blockchain features

## XIV. LIMITATIONS

Despite its advantages, the system has certain limitations:

- Blockchain operations can introduce additional computational overhead
- Storage requirements increase as blockchain size grows
- Full decentralization requires advanced distributed infrastructure
- Performance may reduce with extremely large user bases

## XV. FUTURE ENHANCEMENTS

The system can be improved further by adding:

- Smart contract integration
- IPFS-based decentralized media storage
- NFT-based ownership for content
- AI-based fake content detection
- Real-time messaging system
- Mobile application support
- Cloud deployment with distributed blockchain nodes

## XVI. FUTURE WORK

Future improvements include:

- Integration of deep learning (CNN)
- Cloud-based deployment
- Real-time hospital integration

## XVII. CONCLUSION

This paper presents a Decentralized Social Media Platform Using Blockchain that combines the usability of a modern social networking system with the security and transparency of blockchain technology. The system allows users to register, create posts, interact with content, and securely store data in a tamper-proof blockchain structure. By replacing centralized control with blockchain-backed verification, the platform improves trust, privacy, and data integrity. The implementation demonstrates that blockchain can play a significant role in the future of social networking by empowering users and ensuring secure digital communication.

Overall, the proposed system provides a practical and effective solution for building a secure, transparent, and user-centric social media platform.

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