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Research Topic: **Blockchain-based System for Secure Data Sharing in Cloud**

## FINDING

This research explores the integration of blockchain technology within cloud computing, focusing on enhancing security, privacy, and transparency. Blockchain, a decentralized ledger, is renowned for secure transactions beyond financial systems. In tandem, cloud computing provides scalable, cost-effective resources but introduces unique security and privacy challenges. Combining these technologies offers potential benefits such as improved data integrity, auditability, and trust. However, successful integration requires addressing critical challenges.

**Key Contributions**:

1. **Security-Enhanced Cryptography**: Introducing a blockchain-based cryptography model using Modified Infinite Chaotic Elliptic Cryptography (MICEC) to fortify cloud authentication, ownership validation, and identity mapping.
2. **Hybrid Encryption for Cloud Storage**: Implementing a secure cloud storage solution combining Elliptic Curve Cryptography (ECC), Flamingo search optimization, and Elgamal encryption for optimal key generation, data encryption, and enhanced security.
3. **Quantum-Resistant Data Verification**: A quantum-secure, blockchain-based model featuring lattice cryptography, blind signatures, and an upgraded Merkle tree structure to ensure robust data integrity and user privacy.

4. **Consensus-Based Verification Model**: Developing an advanced consensus mechanism employing an extended elliptic curve double-key algorithm and proof of verifiable quantum randomness to validate data integrity within blockchain securely.
5. **Anonymous User Authentication**: A privacy-centered approach using Hyperelliptic Curve-based Anonymous Ring Signature (HCARS) for decentralized and secure data management.

The findings suggest that blockchain integration with cloud computing holds significant potential for addressing the challenges of security, transparency, and efficiency in cloud environments. This work paves the way for further advancements in secure cloud-based services, emphasizing future research on emerging quantum-resilient cryptographic methods and enhanced user privacy.