INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD)
© 2026 IJNRD | Volume 11, Issue 2, February 2026 | ISSN: 2456-4184 | IJNRD.ORG

A Blockchain-Based Cryptocurrency Framework for Secure and Transparent Indian Financial Ecosystem

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***Abstract*— India has made fast progress in digital payments using UPI, mobile banking, and online transactions. However, problems like online fraud, fake accounts, slow settlement, and lack of transparency still exist. Block chain and crypto currency technologies can help solve these problems by providing a secure, transparent, and tamper-proof digital payment system.**

This paper proposes a block chain-based crypto currency framework for the Indian financial ecosystem. The system uses a permissioned block chain network, smart contracts, digital wallets, and built-in KYC and AML compliance. It ensures fast transactions, secure payments, and transparent audit records. The proposed system can be used in banking, government payments, MSME transactions, and cross-border remittances.

Keywords—Blockchain, Cryptocurrency, Digital Payments, Financial Security, Smart Contracts, India

Introduction

India is one of the fastest growing digital economies in the world. Digital payment systems like UPI, internet banking, and mobile wallets are widely used. Millions of people use online banking every day.

I. THE CURRENT SYSTEM PROBLEM

- *Online fraud and hacking*
- *Fake accounts and money laundering*
- *Delay in settlement between banks*
- *High cost of international money transfer*
- *Lack of transparency in large transactionsMaintaining the Integrity of the Specifications*

Blockchain technology provides a decentralized and secure digital ledger where all transactions are recorded permanently. Cryptocurrency uses blockchain to transfer money directly between users without intermediaries. This paper studies how blockchain and cryptocurrency can improve the Indian financial system. not revise any of the current designations.

II. RELATED WORK

Many researchers have studied the use of blockchain in banking and finance. Bitcoin introduced the idea of decentralized digital money.
Ethereum introduced smart contracts for automatic transactions. Central banks are developing Digital Currency (CBDC).

III. PREVIOUS RESEARCH SHOWS THAT BLOCKCHAIN CAN IMPROVE

A. Security

B. Speed

C. Transparency

D. Cost

most systems are not designed specifically for Indian regulations and compliance. This paper proposes a framework suitable for India.

IV. PROBLEM DEFINITION

The current financial system in India faces the following problems:

1. **Security Issues**
   - Online fraud
   - Account hacking
   - Fake transactions
2. **Transparency Issues**
   - Difficult to track public fund usage
   - No real-time audit
3. **Compliance Issues**
   - Manual KYC verification
   - Delay in fraud detection
4. **Settlement Delay**
   - Interbank transactions take time
   - Cross-border transfers are slow

V: Proposed Blockchain-Based Framework

The proposed system is based on a **permissioned block chain network** where only authorized banks and financial institutions can participate.

1. **User Wallet**

I. Mobile or web wallet for users

II. Stores digital currency

III. Uses private keys for security

2. **Smart Contracts**

I. Automatically validate transactions

II. Check balance and compliance rules

III. Execute payments

3. **Block chain Network**

I. Stores transaction records

II. Maintains immutable ledger

III. Prevents data tampering

4. **Compliance Engine**

I. KYC verification

II. AML monitoring

III. Fraud detection

5. **Regulator Dashboard**

I. Real-time audit access

II. Transaction monitoring

VI : System Architecture

1. Users initiate transactions through wallets
2. Smart contracts verify transaction rules
3. Blockchain records transaction permanently
4. Compliance engine checks for risk
5. Regulators can audit in real time

VI*: Security and Privacy Design*

The framework follows strong security practices:

- End-to-end encryption
- Digital signatures for authentication
- Secure private key storage
- Tamper-proof blockchain records
- Role-based access control

User identity data is stored securely off-chain. Only authorized regulators can access sensitive data when required by law.

VII*: Implementation Model*

Technology Stack

Layer	Technology	
Blockchain	Hyperledger Fabric / Private Ethereum Backend	Node.js / Spring Boot
Smart Contracts	Solidity / Chaincode	
Wallet	React Web App / Android App	
Database	PostgreSQL + IPFS	
Security	AES, SHA-256	

VIII*: Transaction Process*

a. User logs in using KYC verified wallet

b. User initiates payment

c. Smart contract validates transaction

d. Compliance engine performs risk check

e. Blockchain records transaction

f. Regulator can audit anytime

IX. Results and Discussion

The proposed system provides:

a. Faster transaction processing

b. High security against fraud

c. Complete transaction transparency

d. Automatic compliance checks

e. Reduced settlement time

X: This framework is suitable for:

Banking transactions

a. Government subsidy payments

b. MSME business settlements

c. International remittances

XI:. Limitations

a. Requires regulatory approval

b. Needs reliable internet connectivity

c. Initial deployment cost

d. User education is necessary

XII : Conclusion

Block chain and crypto currency technologies have the potential to transform India's financial ecosystem. The proposed framework provides a secure, transparent, and efficient digital payment infrastructure. With proper regulation and adoption, this system can strengthen trust in digital finance and support India's digital economy growth.

X1II. Future Scope

a. Integration with Digital Rupee (CBDC)

b. AI-based fraud detection

c. Offline blockchain payments

d. Cross-border blockchain networks

e. Tokenized digital assets

XIV: References

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