International Research Journal on Innovative, Emerging and Future Engineering Trends
Available On https://irjifet.com/irjifet/index.php/irjifet/home

Bank Records Storage System Through Blockchain

Mr. B. AMARNATH REDDY[1], VARRA SAIKIRAN[2]
ASSISTANT PROFESSOR[1] PG SCHOLAR[2]
Department of master of computer Application
QIS COLLEGE OF ENGINEERING & TECHNOLOGY, ONGOLE
VENGAMUKKAPALEM (V), ONGOLE, PRAKASAM DIST., ANDHRA PRADESH

ABSTRACT

Financial service providers find block chain technology useful to enhance authenticity, security, and risk management. Several institutions are adopting block chain in trade and finance systems to build smart contracts between participants, improve efficiency and transparency, and open up newer revenue opportunities. Block chain's unique recording capabilities make the existing clearing and settlement process redundant. Banks and other financial entities are adopting block chain-enabled IDs to identify people. Better results come from organizations' capacity to foresee emerging trends in financial blockchain applications and develop blockchain functionality. The transfer of asset ownership and addressing the maintenance of a precise financial ledger. Measurement, communication, and analysis of financial information are three significant areas to be focused on by accounting professionals. Blockchain clarifies asset ownership and the existence of obligations for accountants, and it has the potential to improve productivity. This paper identifies and studies relevant articles related to blockchain for finance. This paper focuses on Blockchain technology and its importance for financial services. Further takes up various tools, strategies, and featured services in Blockchain-based financial services. Finally, the paper identifies and evaluates the significant applications of Blockchain technology in financial services. Credit reports Significantly impact the financial lives of customers. Recent data breaches demonstrate the superior security of blockchain-based credit reporting over conventional server-based reporting. Blockchainbased systems enable the faster, more cost-effective, and more customized issuance of digital securities. With its adoption, the market for investors can be expanded, costs for issuers can be reduced, and counterparty risk can be reduced due to the ability to customize digital financial instruments to the demands of investors.

It uses mutualized standards, protocols, and shared procedures to give network users a single common source of truth. Participants in the business network can now more easily collaborate, manage data, and agree with this technology's application.

INTRODUCTION

Users can update the block chain network using a decentralized approach provided by block chain. Block chain networks are free from financial institutions' intervention. Block chains can be used to store information, and the distributed ledger technology makes it easier to share information. It can be used to have direct communication with network users. Block chain offers a safe network for conducting transactions. Block chain technology appeals to a variety of enterprises due to its strong security system. As a result of the independence of each company's accounting operations, data reconciliation takes time and resources. By enabling the real-time recording of transactional, contractual, and other information in a shared ledger, block chain technology can solve this problem. It alludes to the possibility of improving the customer experience and making data transfers and identities more secure. Wire transfers, which require time, and money, however, cannot be combined. Block chain technology payments eliminate these issues and boost client confidence. Real time cash transfers between financial institutions are made feasible by technology, which reduces friction and speeds up

settlement. This technology is excellent for tracking transactions and has the potential for automation. Smart contracts can be used by financial service providers to track customer payments and seller deliveries This article examines block chain technology, including its benefits, uses in banking, and tools and features.

LITERATURE SURVEY

1. Blockchain Technology for Secure Record Keeping

Authors: David Melo et al. (2024)

Description:

This study explains blockchain as a distributed ledger system that securely stores and verifies transactions across multiple nodes. It highlights how decentralized storage ensures data integrity and prevents tampering, making it suitable for sensitive records like banking data.

Techniques Used:

- Distributed ledger technology
- Consensus mechanisms
- Cryptographic hashing

Pros:

- High security and immutability
- Decentralized storage
- Transparent audit trails

Cons:

- Storage overhead
- Scalability issues

2. Bank Record Storage Using Blockchain

Authors: Shiwangi Tiwari et al. (2023)

Description:

This paper focuses specifically on blockchain-based banking systems, emphasizing secure financial record storage, smart contracts, and improved transaction transparency. It shows how blockchain eliminates intermediaries and enhances financial record management.

Techniques Used:

- Smart contracts
- Blockchain-based identity systems
- Financial ledger management

Pros:

- Improved transparency
- Reduced fraud
- Faster transaction processing

Cons:

- Implementation complexity
- Regulatory challenges

3. Blockchain in Banking Sector: Systematic Review

Authors: Multiple (2025 Review Study)

Description:
This review analyzes 38 research papers on blockchain adoption in banking, highlighting improvements in efficiency, compliance automation, and transparency. It also discusses challenges such as interoperability and privacy concerns.

Techniques Used:

- Distributed ledger systems
- Smart contracts
- Financial compliance automation

Pros:

- Increased efficiency
- Better compliance tracking
- Reduced operational cost

Cons:

- Privacy vs transparency trade-off
- Integration difficulties

4. Blockchain Storage Systems: Security and Scalability

Authors: MDPI Study (2024)

Description:
This paper reviews blockchain storage methods, focusing on on-chain and off-chain storage models. It emphasizes the importance of balancing security, cost, and scalability when storing large datasets such as banking records.

Techniques Used:

- On-chain storage
- Off-chain storage (IPFS-like systems)
- Hybrid storage architectures

Pros:

- Improved scalability with off-chain storage
- Enhanced data security

Cons:

- Increased system complexity
- Storage cost issues

5. Blockchain Design in Banking Systems

Authors: Mafike & Mawela (2022)

Description:
This study reviews blockchain design techniques in banking and highlights implementation challenges such as lack of technical expertise and limited real-world deployment.

Techniques Used:

- Private and permissioned blockchain
- Banking architecture design models

Pros:

- Cost reduction
- Efficient banking services

Cons:

- Skill gaps
- Limited adoption

6. Blockchain Storage Scalability Review

Authors: Boughdiri et al. (2025)

Description:
This research focuses on scalability challenges in blockchain storage systems. It emphasizes that storage limitations are a major barrier to large-scale adoption in data-intensive sectors like banking.

Techniques Used:

- Data sharding
- Layer-2 solutions
- Storage optimization

Pros:

- Improved system scalability
- Better performance

Cons:

- Complex implementation
- Trade-offs in decentralization

SYSTEM ANALYSIS

EXISTINGSYSTEM

Blockchain-based technologies may potentially aid in the development of capital markets. Traditional trade financing techniques have long been a source of annoyance for firms, as the lengthy processes frequently disrupt operations and make liquidity challenging to manage. Blockchain can ease cross-border operations and streamline trade finance transactions. It facilitates business transactions beyond regional or geographic boundaries in a secure manner. Blockchain is particularly suited to tasks like real-time tracking commodities as they move and change hands across the supply chain due to its immutable record. Using a blockchain gives businesses that deliver various items and possibilities. Events in a supply chain, such as allocating arriving items to different shipping containers, can be queued up using entries on a blockchain. A novel and flexible method of organizing and utilizing tracking data are provided by blockchain technology. The primary research objectives of this paper are as under:

RO1: - to brief about Blockchain technology and its need for financial service;

RO2: - to discuss the tools and strategies in Blockchain for financial services;

RO3: - to study the various featured services of blockchain technology in the financial domain;

RO4: - to identify and study the significant applications of Blockchain technology in finance service.

Disadvantages

• In an existing system, public blockchains depend on a consensus mechanism, usually proof of work, which is inefficient, has slower transaction times and requires high power consumption compared to permissioned blockchains.

• An existing systems that don’t preserve the privacy of the Bank Records fail to prevent unfair Storage.

PROPOSED SYSTEM

Blockchain is a digital database that enables simultaneous storage of certain operation records across numerous machines. Digital data on transactions, contracts, and contact databases are stored using this technology as a series of interconnected blocks. The absence of transparent and unambiguous financial system regulations exposes the business to common mistakes and inaccurate information interpretation [27,28]. Blockchain technology addresses the majority of these problems and dramatically lowers financial risk.

The importance of Blockchain technology is becoming more widely known. It is surrounded by a small number of people trying to figure out how to adopt and use this technology’s advantages in their companies. The main goal of founding banks was to unite the population and make it possible for them to engage safely and efficiently through trade and commerce. A creation that makes it easier to complete various activities on a global scale is the blockchain

platform.

ADVANTAGES

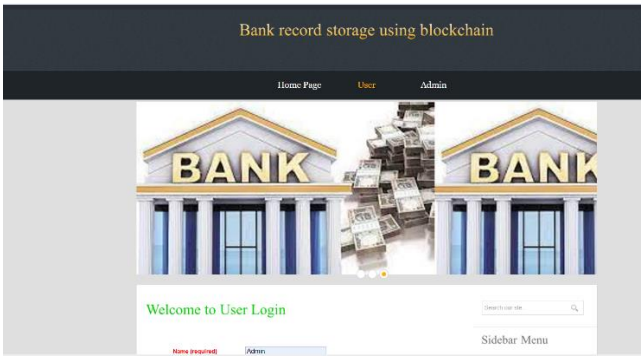
In the proposed system,Blockchain technology can reduce costs for financial services providers and end users while enhancing payment transparency, efficiency, trust, and security. Before the advent of blockchain technology, payments between banks could take up to a week to transfer. Through digital currencies and distributed ledger technologies, payments are quicker, less expensive, and more convenient.

Central banks are testing the possibility of incorporating distributed ledger technology into redesigned payments. Leaving a digital trace on the Blockchain will also help items whose provenance determines their worth. A platform for truth and trust is an immutable, unhackable, distributed ledger of digital assets.

IMPLEMENTATION

Main Modules

- User Registration Module
- Bank Records Collection Module
- Blockchain Network Module
- Smart Contract Module
- Data Encryption Module
- Access Control Module
- Audit and Reporting Module



The architecture ensures data integrity and secure banking operations.

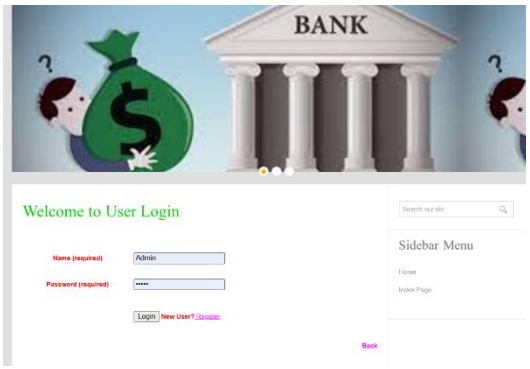
Bank Data Collection

The system collects banking records from financial institutions.

Collected Data

- Customer account details
- Transaction records
- Loan and credit information
- KYC documents
- Account balances

- Audit logs



The collected data is prepared for secure storage.

Data Preprocessing

The collected banking data undergoes preprocessing before blockchain integration.

Preprocessing Steps

- Data validation
- Duplicate record removal
- Data normalization
- Error correction
- Format standardization

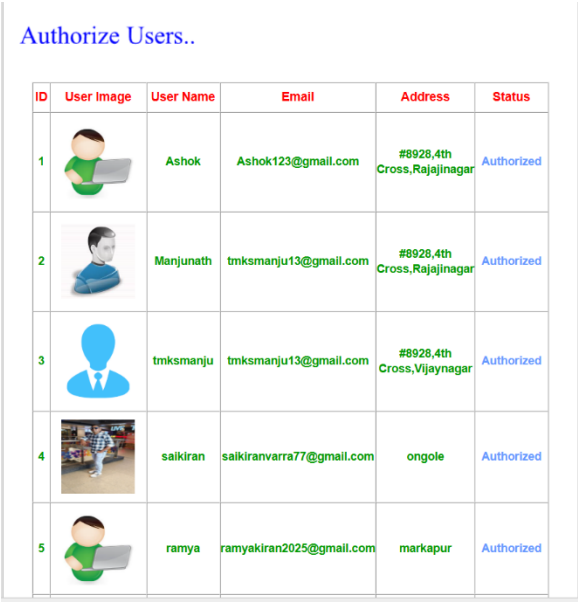
These steps ensure accurate and consistent data storage.

Data Encryption

Before storing records on the blockchain, sensitive banking data is encrypted.

Encryption Techniques

- AES (Advanced Encryption Standard)
- RSA (Rivest–Shamir–Adleman)
- Hashing algorithms (SHA-256)



Authorize Users..

ID	User Image	User Name	Email	Address	Status
1		Ashok	Ashok123@gmail.com	#8928,4th Cross,Rajajinagar	Authorized
2		Manjunath	tmksmanju13@gmail.com	#8928,4th Cross,Rajajinagar	Authorized
3		tmksmanju	tmksmanju13@gmail.com	#8928,4th Cross,Vijaynagar	Authorized
4		saikiran	saikiranvarra77@gmail.com	ongole	Authorized
5		ramya	ramyakiran2025@gmail.com	markapur	Authorized

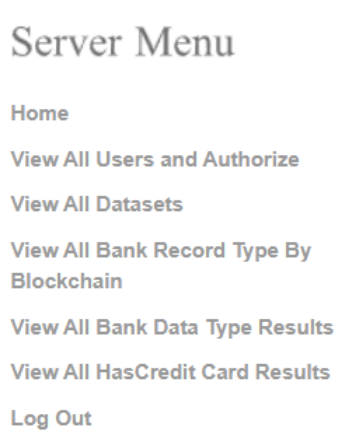
Encryption ensures confidentiality and protection against unauthorized access.

Blockchain Integration

Blockchain is used to store and manage banking records securely.

Blockchain Features

- Decentralized ledger
- Immutable data storage
- Transparent transactions
- Distributed consensus



Each banking record is stored as a blockchain transaction.

METHODOLOGY

1. Banking Data Acquisition

The methodology begins with collecting banking records from financial institutions.

Data Sources

- Bank databases
- Customer account systems
- Transaction logs
  - Loan management systems

This data forms the basis for blockchain storage.

2. Data Cleaning and Preparation

The collected data is cleaned and standardized before encryption.

Processing Operations

- Remove duplicate entries
- Validate transaction data
- Normalize formats
- Handle missing values

These steps improve data quality.

3. Data Encryption Process

Sensitive banking data is encrypted before storage.

Encryption Workflow

1. Input banking records
2. Apply encryption algorithms
3. Generate secure hash
4. Store encrypted data

This ensures data confidentiality.

4. Blockchain Transaction Creation

Encrypted records are converted into blockchain transactions.

Transaction Components

- Encrypted data
- Timestamp
- Digital signature
- Hash value

Each transaction is securely stored in the blockchain.

5. Smart Contract Execution

Smart contracts automate record validation and access control.

Workflow

- Verify user request
- Validate transaction
- Grant access permissions
- Record audit logs

This ensures automated and secure operations.

6. Secure Access Control

The system manages user access using authentication mechanisms.

Security Measures

- Role-based access
- Identity verification
- Digital authentication
- Authorization control

This protects sensitive banking data.

CONCLUSION

Block chain technology is being adopted by factories worldwide as they get more and more connected. The future factory will comprise a vast network of equipment, accessories, goods, and value-chain partners, like equipment suppliers and logistics companies. The main goal of this technology is to develop a tamper-proof ledger for digital assets like crypto currencies. Block chain applications maintain data integrity, enabling marketers to target the relevant consumer segments and musicians to obtain fair royalties for their original compositions. This technology is gaining ground in banking payments. People exchange money mainly through their bank accounts; therefore, payments are crucial. Banks have long been at the forefront of the digital revolution, accepting disruptive developments in exchange for reliable payments and printing their digital currencies. Block chain technology allows banks to track every transaction in real-time. This technology will enable banks to settle transactions on a public block chain. Banking executives need to fulfill several requirements to become a widely used technology in the banking sector. Block chain's ability to share information and temporarily make the property available to someone else would dramatically change our mobility. By utilizing intelligent contracts over the Block chain, it would be feasible to directly pay for and utilize a car while finding solutions to issues like electro mobility. Smart contracts can be used by businesses using Block chain in finance to upload invoices to the Block chain. The Block chain can contain data like payment due dates, amounts, and client information. The smart contract updates the invoice status to paid when the customer pays the bill and notifies the businesses that the payment has been received. Blockchain in financialservices can assess a client's trustworthiness before trading. In the future, blockchain will play an importantrole and manage various activities in the finance sector.

REFERENCES

[1] M. Kowalski, Z.W. Lee, T.K. Chan, Blockchain technology and trust relationships in trade finance,Technol. Forecast. Soc. Change 166 (2021) 120641.

[2] S. Trivedi, K. Mehta, R. Sharma, Systematic literature review on application of blockchain technology in E-finance and financial services, J. Technol. Manag. Innov. 16 (3) (2021) 89–102.

[3] P. Treleaven, R.G. Brown, D. Yang, Blockchain technology in finance, Computer 50 (9) (2017) 14–17.

[4] V. Chang, P. Baudier, H. Zhang, Q. Xu, J. Zhang, M. Arami, How Blockchain can impact financial services–The overview, challenges and recommendations from expert interviewees, Technol. Forecast. Soc. Change 158 (2020) 120166.

[5] M.J. Lahkani, S. Wang, M. Urbański, M. Egorova, Sustainable B2B E-commerce and blockchainbased supply chain finance, Sustainability 12 (10) (2020) 3968.

[6] A.I.N.O. Nordgren, E.L.L.E.N. Weckström, M.I.N.N.A. Martikainen, O.M. Lehner, Blockchain in the fields of finance and accounting: a disruptive technology or an overhyped phenomenon, ACRN J. Finance Risk Perspect. 8 (2019) 47–58.

[7] M. Poongodi, A. Sharma, V. Vijayakumar, V. Bhardwaj, A.P. Sharma, R. Iqbal, R. Kumar, Prediction of the price of ethereum blockchain cryptocurrency in an industrial finance system, Comput. Electr. Eng. 81 (2020) 106527.

[8] A.V. Bogucharskov, I.E. Pokamestov, K.R. Adamova, Z.N. Tropina, Adoption of blockchain technology in trade finance process, J. Rev. Global Econ. 7 (2018) 510–515.

[9] E. Hofmann, U.M. Strewe, N. Bosia, Discussion—how does the full potential of blockchain technology in supply chain finance look like? in: Supply Chain Finance and Blockchain Technology, Springer, Cham, 2018, pp. 77–87.

[10] X. Zhu, D. Wang, Research on blockchain applications for E-commerce, finance and energy, IOP Conf. Ser.: Earth Environ. Sci. 252 (4) (2019) 042126.

Author Profile :

Mr.B. AMARNATH REDDY is an Assistant Professor in the Department of Master of Computer Applications at QIS College of Engineering and Technology, Ongole, Andhra Pradesh. He earned his M.Tech from Vellore Institute of Technology (VIT), Vellore. His research interests include Machine Learning,Programming Languages. He is committed to advancing research and fostering innovation while mentoring students to excel in both academic and professional pursuits.

Mr.VARRA SAIKIRAN is a postgraduate student pursuing a MCA in the Department of Computer Applications at QIS college of Engineering & Technology, Ongole an Autonomous college in prakasam dist. He completed his undergraduate degree in Bsc (computers) from ANU. With a keen interest in research and practical activities related to his field.