



BLOCKCHAIN APPLICATION IN THE BANKING INDUSTRY

**GROUP PROJECT CSC4500
COMPUTER SECURITY**



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INTRODUCTION

What is Blockchain

- Distributed digital ledger shared across network nodes
- Groups data into blocks linked in a chain
- Ensures security, integrity, and trustless data sharing

Why It Matters for Banking

- Backbone of economy
- China's banks face profit declines from interest rate liberalization, economic shifts, and fintech disruption
- Blockchain enhances efficiency by modernizing payment infrastructure

Challenges to Adoption

- High implementation cost
- Security risks in early stages
- Scalability & regulation issues
- Complex system integration

BLOCKCHAIN APPLICATIONS IN FINANCE

PAYMENT SETTLEMENT SYSTEMS

- Enables point-to-point transactions via a distributed ledger
- Eliminates intermediaries and central authorities
- Reduces processing time & lowers transaction costs

CREDIT INFORMATION SYSTEMS

- Stores encrypted, user-controlled credit data
- Allows secure cross-institutional data sharing
- Protects customer privacy and data ownership

SMART CONTRACTS

- Automates trade execution when conditions are met
- Removes paper documents and manual verification
- Increases efficiency, reduces fraud risk

CASE STUDY : JPMORGAN CHASE



- An American multinational finance corporation headquartered in New York City and incorporated in Delaware; largest bank in US.
- JPM Coin introduced by JPMorgan Chase is a digital token to facilitate instantaneous payments and transactions between institutional clients.
- The coin is part of Kinexys which is JPMorgan's blockchain-based digital payment system and infrastructure platform.

JPM COIN



- JPM Coin is a dollar-backed cryptocurrency or stablecoin built on a permissioned blockchain.
- Each JPM Coin token represents as one U.S. dollar
- JPM Coin objective's are:
 - Improve speed and transparency of interbank transactions.
 - Enable real-time and cross-border payments.
 - Lower down operational costs by eliminate middlemen in banking.

JPM COIN

Impact

- Reduces the settlement times from hours or days to seconds.
- Enable around-the-clock (24/7) transaction processing.
- Enhance transparency & reduces the counterparty risk in a large-scale corporate transactions.

Alignment with Broader Industry

JPMorgan's illustrates the move from theoretical exploration to tangible execution of blockchain as predicted by firms such as IBM and McKinsey.

BENEFITS OF BLOCKCHAIN IN BANKING

Transparency & Immutability

- Blockchain records cannot be changed or deleted.
- Ensures tamper-proof data and a trusted audit trail.
- Builds trust among banks, customers, and regulators.
- Promotes accountability and reduces fraud.

Cost Reduction

- Eliminates the need for intermediaries in clearing and compliance.
- Enables direct peer-to-peer transactions.
- Cuts costs in back-office operations and verifications.
- Supports a more efficient banking structure.

BENEFITS OF BLOCKCHAIN IN BANKING

Speed

- Speeds up transactions, especially cross-border ones.
- Enables near real-time settlement.
- Improves liquidity and customer satisfaction.
- Reduces delays caused by multiple parties and time zones.

Security

- Uses strong cryptography to protect data.
- Links each transaction securely in a chain.
- Reduces hacking, fraud, and identity theft.
- No central point of failure increases system resilience.

LIMITATIONS OF BLOCKCHAIN IN BANKING

TRUE DISINTERMEDIATION IS UNACHIEVABLE

- Must have centralized control
 - Regulatory compliance
 - Customer protection
 - Risk management
- Fully decentralized model exists but is not compatible with regulatory and operational needs of financial institutions
- Private blockchain model

EFFICIENCY CONSTRAINTS

- Banking is a high-volume, performance-critical environment
 - Each transaction must be validated by multiple nodes
 - Larger networks (more nodes) increase security, but slow down processing
- There's a trade-off between security and speed/responsiveness

LIMITATIONS OF BLOCKCHAIN IN BANKING

REGULATORY CONSTRAINTS

- Traditional banking system is governed by legal national frameworks
- Blockchain operates independently of jurisdictions, difficult to:
 - Ensure company follows the law
 - Monitor financial risks
 - Consumer protection

LACK OF STANDARDIZATION

- Lack of compatibility with existing systems
- Needs standardized protocols
- Integration raises concerns about security, scalability, and viability
- Uncertainty prevent adoption widespread

DATA IMMUTABILITY ISSUES

- Data cannot be altered
 - incorrect data inserted becomes permanent
- Requires thorough verification at data entry point
- Extra layer and tools built for data verifications
 - System becomes complex

FUTURE TRENDS OF BLOCKCHAIN IN BANKING

Consortium Blockchain

- Hybrid approach: Combines decentralization with oversight
- Ensures compliance while enabling shared control
- Example: R3 Corda & Canton Network

Sandboxes to Global Standards

- Early trials → now formal regulations emerging
- Example: EU's MiCA, Singapore's Project Guardian
- Provides legal certainty and fosters institutional trust

FUTURE TRENDS OF BLOCKCHAIN IN BANKING

CBDCs Based On Blockchain

- Central Banks use blockchain for secure, instant payments
- Example: European Central Bank's Digital Euro
- Enables real-time settlement without intermediaries

Asset Tokenization

- Converting traditional assets (e.g., bonds, real estate) into blockchain tokens
- Cuts costs, speeds up transactions, improves transparency
- Example: ECB testing blockchain for real-time settlements

CONCLUSION

Blockchain stands out as an optimal solution for advancing digital transformation

Ideal for industries requiring trust, data integrity, and resilience.

Issues like regulation and integration are common in all major financial innovations.

Blockchain adoption is expected to grow, becoming a key part of the digital transformation in financial services.



Thank You

For your time.
Any questions?



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