International Journal for Multidisciplinary Research (IJFMR)



E-ISSN: 2582-2160 • Website: <u>www.ijfmr.com</u> • Email: editor@ijfmr.com

Block Chain Technology and Its Integration in Sbi Banking

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Abstract

The Indian banking industry is witnessing a major disruption with the advent of blockchain technology. With more and more frauds and anomalies getting detected every day, the need to secure the systems and the processes for higher efficiencies is crucial to gain momentum in the industry. Furthermore, there are many use cases for blockchain technology; with blockchain, banks can securely store records and provide faster and more reliable services to their customers. Hence, this study aims to present a riveting view of different applications of blockchain in the Indian banking industry to understand the impact it may produce once this technology becomes mainstream. This study uses the SCOPUS database to synthesize the systematic review. The outcome of this study provides a blueprint for further research in the area of advancing blockchain in the banking industry.

Keywords: Block chain, Electronic Money Banking, industry.

INTRODUCTION

Block chain technology is an advanced database mechanism that allows transparent information sharing within a business network. A block chain database stores data in blocks that are linked together in a chain. The data is chronologically consistent because you cannot delete or modify the chain without consensus from the network. As a result, you can use block chain technology to create an unalterable or immutable ledger for tracking orders, payments, accounts, and other transactions. The system has built-in mechanisms that prevent unauthorized transaction entries and create consistency in the shared view of these transactions.

Traditional database technologies present several challenges for recording financial transactions. For instance, consider the sale of a property. Once the money is exchanged, ownership of the property is transferred to the buyer. Individually, both the buyer and the seller can record the monetary transactions, but neither source can be trusted. The seller can easily claim they have not received the money even though they have, and the buyer can equally argue that they have paid the money even if they haven't.

To avoid potential legal issues, a trusted third party has to supervise and validate transactions. The presence of this central authority not only complicates the transaction but also creates a single point of vulnerability. If the central database was compromised, both parties could suffer.

Block chain mitigates such issues by creating a decentralized, tamper-proof system to record transactions. In the property transaction scenario, block chain creates one ledger each for the buyer and the seller. All transactions must be approved by both parties and are automatically updated in both of their ledgers in



real time. Any corruption in historical transactions will corrupt the entire ledger. These properties of blockchain technology have led to its use in various sectors, including the creation of digital currency like Bitcoin.

STATEMENT OF PROBLEM

State Bank of India (SBI), as a leading financial institution, faces several challenges in effectively leveraging block chain technology:

- Limited Scalability and Performance:
- SBI's existing systems may struggle to handle the high transaction volume and processing speed required for widespread block chain adoption.
- Current block chain technology may not be sufficiently scalable to meet the demands of a large institution like SBI.
- Interoperability Challenges:
- Integrating block chain solutions with SBI's existing legacy systems and with other financial institutions and networks poses significant technical hurdles.
- Lack of standardized protocols and data formats hinders seamless data exchange across different block chain platforms.
- Regulatory Uncertainty:
- The evolving regulatory landscape surrounding block chain and crypto currencies creates uncertainty and potential legal and compliance risks for SBI.
- Clear and comprehensive regulations are needed to guide the responsible development and deployment of block chain applications within the banking sector.

• Security and Privacy Concerns:

- Ensuring the security and privacy of sensitive customer data on the block chain is paramount.
- Potential vulnerabilities in block chain technology could expose SBI and its customers to cyber threats and data breaches.

OBJECTIVE OF STUDY

- 1. Enhancing Security and Transparency in Transactions
- 2. Improving Efficiency and Reducing Costs
- 3. Enhancing Cross-Border Payments
- 4. Smart Contracts and Automation of Banking Processes
- 5. Improving Customer Experience.
- 6. Regulatory Compliance and Auditing
- 7. Exploring Decentralized Finance (De Fi) Opportunities
- 8. Data Management and Privacy
- 9. Block chain for Supply Chain Finance
- 10. Innovation and Competitive Advantage

SCOPE OF STUDY

- 1. Technological Aspects:
- Block chain Fundamentals:

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- Understanding core concepts like distributed ledger technology, cryptography, consensus mechanisms (Proof-of-Work, Proof-of-Stake, etc.), and smart contracts.
- Exploring different types of block chain networks (public, private, consortium) and their suitability for various banking applications.
- Technical Feasibility and Integration:
- Evaluating the technical feasibility of integrating block chain solutions with SBI's existing IT infrastructure and legacy systems.
- Assessing the scalability and performance of block chain platforms to handle SBI's high transaction volumes.

2. Business Applications:

- Payment Systems:
- Exploring blockchain's potential to enhance domestic and international payments, remittances, and cross-border transactions.
- Investigating the use of stablecoins and other blockchain-based payment solutions.
- Trade Finance:
- Streamlining supply chain finance, letter of credit issuance, and trade settlement processes.
- Reducing fraud and improving transparency in trade finance operations.

• KYC/AML:

- Enhancing customer onboarding and anti-money laundering processes through secure and efficient data sharing and verification.
- Loan Origination and Processing:
- Streamlining loan application, approval, and disbursement processes.
- Improving credit risk assessment and fraud detection.

LIMITATION OF STUDY

Data Availability and Access:

- Limited access to internal SBI data, such as transaction volumes, processing times, and cost structures, may restrict the depth of analysis.
- Data privacy and confidentiality concerns may limit the availability of sensitive customer data for research purposes.

Dynamic and Evolving Technology:

- Block chain technology is rapidly evolving, with new innovations and developments emerging constantly.
- This dynamic nature makes it challenging to conduct a comprehensive study that remains relevant over time.

Focus on Specific Use Cases:

- A deep dive into specific block chain applications within SBI may limit the overall perspective and understanding of the technology's broader potential.
- A narrow focus may overlook potential synergies and cross-functional applications.

Resource Constraints:

- Limited time, budget, and human resources may constrain the scope and depth of the study.
- Conducting thorough research and analysis requires significant time and resources, which may not always be readily available.



Internal Resistance to Change:

- Overcoming internal resistance to change and fostering a culture of innovation within SBI can be challenging.
- Employees may be resistant to adopting new technologies, particularly those that disrupt existing processes and workflows.

Unforeseen Challenges:

• The study may encounter unforeseen challenges, such as unexpected technical issues, regulatory changes, or changes in business priorities.

RESEARCH METHODOLOGY

The research methodology for any project is the systematic approach used to collect and analyze data to answer a research question or solve a research problem. It is the framework that guides the entire research process, from defining the problem and objectives to drawing conclusions and providing recommendations.

The methodology ensures that the research is conducted in a structured and scientific manner, with appropriate data collection and analysis methods chosen based on the research design. The research methodology also takes into account ethical considerations, such as obtaining informed consent from participants and ensuring confidentiality.

Literature Review

A systematic review of academic literature, industry reports, and regulatory documents to establish a theoretical framework and understand the current state of blockchain technology.

Case Studies

Analysis of SBI's pilot blockchain projects and comparative case studies of blockchain implementations in other major banks.

Qualitative Interviews

Semi-structured interviews with SBI executives, IT professionals, and relevant stakeholders to gather insights into their perspectives and experiences.

Data Analysis

Analysis of available transaction data to evaluate the efficiency and impact of blockchain-based solutions.

REVIEW OF LITERATURE

The StateBank of India has joined hands with JP Morgan to accelerate overseas transactions by using blockchain .The partnership is aimed at reducing overall transactions fees for SBI customers as well as the time it takes for payments.

SBI's use of blockchain is expected to reduce the customers' transactions costs and time taken for payments. Time taken to resolve cross-border payments-related inquiries can be reduced to a few hours from up to a fortnight, sources told ET, which first reported the development.

The **State Bank of India (SBI)** has shown a growing interest in blockchain technology over the past few years, especially as part of its drive to enhance digital banking services and improve efficiency in financial transactions. While SBI was not one of the early adopters of blockchain in India, it has progressively explored and implemented the technology in several key areas, including cross-border payments, fraud prevention, and smart contracts.



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OVERVIEW OF STUDY

SBI offers many benefits for customers who use their technology, including a secure digital bank that offers fast access to banking services with convenient features. Customers can benefit from the convenience of managing their finances on the go with SBI's mobile app, which allows them to transfer funds and pay bills quickly and safely. With integrated security measures in place, customers can also enjoy peace of mind knowing that sensitive financial data is stored safely within SBI's secure network. In addition, customer service teams are available 24/7 to provide timely help should any issues arise during transactions or account management. Finally, users have access to an extensive range of online products such as loans and investments along with multiple payment options available in both traditional banking branches or through its digital banking platform.

Technology can help SBI save money, without sacrificing any of the advantages of traditional banking. By utilizing online solutions and automated processes, the bank is able to reduce its operating costs significantly. In addition, customers benefit from increased convenience when using technology in banking transactions. They are able to access their accounts quickly and easily while also having access to real-time updates on their finances without the need for physical presence or manual entry into databases The State Bank of India (SBI) has been proactive in adopting blockchain technology to enhance various banking operations. In November 2017, SBI announced plans to implement blockchain-enabled smart contracts and Know Your Customer (KYC) processes, aiming to improve efficiency and security in these areas.

SBI also played a pivotal role in establishing BankChain, a consortium of 27 banks, including both Indian and Middle Eastern institutions, dedicated to exploring and developing blockchain solutions for the banking sector. This initiative focuses on applications such as trade finance, cross-border payments, and secure document exchange, with the goal of reducing fraud and streamlining banking processes.

Furthermore, SBI has been working on deploying blockchain technology in functions like reconciliation, remittances, and trade finance operations, with full-scale implementation targeted for the fiscal year 2019. The bank anticipated that this deployment would lead to a 40-50% reduction in costs associated with these functions.

FINDINGS

The State Bank of India (SBI) has been a pioneer in adopting block chain technology to enhance various banking operations, aiming to increase efficiency, transparency, and security. In 2017, SBI initiated 'Bank Chain', a consortium comprising 27 banks from India and the Middle East, to explore and implement block chain solutions in the banking sector.

Key Implementations:

- 1. **Smart Contracts:** SBI has been developing block chain-enabled smart contracts to automate and secure agreements between parties, reducing the need for intermediaries and streamlining processes.
- 2. **Know Your Customer (KYC) Processes:** The bank has been working on block chain-based KYC solutions to enhance the efficiency and security of customer verification procedures, aiming to simplify the onboarding process and reduce compliance costs.
- 3. **Trade Finance and Loan Syndication:** SBI has been exploring the use of block schain for trade finance and loan syndication, aiming to enhance transparency and efficiency in these processes.
- 4. **Document Security:** The bank has been working on solutions to secure and authenticate documents using block chain technology, aiming to prevent fraud and ensure the integrity of documents.



These initiatives reflect SBI's commitment to leveraging emerging technologies to modernize banking operations and improve service delivery. By adopting block chain, SBI aims to address challenges such as fraud prevention, operational inefficiencies, and regulatory compliance, positioning itself at the forefront of technological innovation in the banking sector.

TABLE NO: 1RECOMMENDATIONS OF SERVICES

S.No	Criteria	No of Respondents	Percentage
1	Cross Border Payments	23	21.5%
2	Loan processing	27	25.2%
3	Trade Finance	35	32.7%
4	Digital Currency	22	20.6%
	Total	107	100%



TABLE NO: 2

TABLE SHOWN THE CRITERIA OF THE RESPONDENTS

S.No	Criteria	No of Respondents	Percentage
1.	Privacy and data protection	21	19.6%
2.	Regulatory issues	21	19.6%
3.	Lack of understanding about the technology	35	32.7%
4.	Risk of cyber attacks	16	15%
5.	Others	14	13.1%
	Total	107	100%

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SUGGESTIONS

1. Cross-border Payments & Remittances

- Solution: SBI could leverage block chain to facilitate faster and cheaper cross-border payments. Traditional international transfers can take days and incur high fees. By using block chain, SBI could streamline the process, enabling near-instantaneous transactions with lower costs and eliminating intermediaries.
- Benefits: Reduced transaction costs, improved transfer speed, and greater transparency.
- 2. Smart Contracts for Loan and Credit Agreements
- Solution: Implementing smart contracts on block chain for loan agreements, mortgage processing, and • credit facility management could automate the execution of contractual terms once predefined conditions are met.
- Benefits: Reduced paperwork, faster processing, enhanced accuracy, and minimized human error. •
- 3. Block chain-Based KYC (Know Your Customer)
- Solution: SBI could build a decentralized KYC solution on the block chain, where customer • information is securely stored and shared across institutions with customer consent. This would avoid the need for redundant KYC processes each time a customer applies for a service.
- Benefits: Faster onboarding, enhanced privacy, and reduced fraud risk. It also provides a seamless • experience for customers who move across different banks or services.
- 4. Trade Finance and Supply Chain Management
- Solution: Using block chain to digitize and streamline trade finance could reduce the risks and • inefficiencies involved in international trade transactions. Smart contracts could be employed to automate payments once goods are delivered, and block chain can be used for tracking goods in realtime.
- Benefits: Increased transparency, improved security, reduced fraud, and a more efficient process for both customers and businesses.



5. Fraud Prevention and Security

- **Solution**: Block chain's immutable nature could be used to protect financial data and transactions from tampering and fraud. SBI can implement a decentralized ledger to ensure that transaction histories are transparent, traceable, and secure.
- Benefits: Increased trust, reduced fraud, and enhanced data integrity.

CONCLUSION

- Block chain offers significant improvements in security by creating immutable records of transactions that are transparent and traceable. This would help SBI reduce fraud, ensure data integrity, and improve trust in financial services, benefiting both the bank and its customers.
- By automating processes such as cross-border payments, loan agreements, and KYC verification, SBI can reduce operational costs and increase transaction speed. The decentralized nature of block chain eliminates intermediaries, streamlining operations, and providing a more cost-effective banking experience.
- Block chain can simplify customer-facing processes, such as digital identity management and realtime transactions, leading to faster services and better customer satisfaction. The ability to offer services like decentralized finance (De Fi) or block chain-based loyalty programs could attract new customers and retain existing ones.
- Block chain can enable SBI to explore new financial products, such as tokenization of assets, digital currencies (CBDC), and decentralized finance, opening new avenues for growth and innovation in financial services. These technologies can also drive the bank's digital transformation efforts, making it more competitive in the evolving financial ecosystem.
- While the benefits of Block chain are clear, SBI must navigate regulatory challenges. The evolving landscape of Block chain regulations in India and globally could pose hurdles. Coordination with regulators and compliance with legal frameworks will be crucial to ensuring a smooth implementation of Block chain -based solutions.
- Block chain technology will require integration with SBI's current banking infrastructure. This can be complex and expensive, requiring careful planning, technical expertise, and investment in infrastructure. However, the long-term benefits may outweigh the initial investment and integration challenges.
- Block chain 's decentralized and distributed nature offers scalability potential, but it also comes with challenges related to energy consumption, especially for certain consensus mechanisms like Proof of Work. SBI would need to explore environmentally friendly Block chain solutions to ensure sustainable implementation.
- Block chain can help SBI offer more inclusive financial services, particularly in under banked regions, by reducing barriers to entry and lowering the costs of banking services. Technologies like smart contracts and decentralized finance could make financial products

Limitations and Future Scope of Study

This paper describes the basics of blockchain application adoption in the banks. Author has studied BCT adoption but not BCT implementation and BCT continuance. It was limited to drivers like technical competence, organization competence, and Environment factors for BCT adoption. Future research to evaluate measures such as the effect of bank category like the public/private/co-operative can be studied.



The study can be with respect to cost estimates of block chain implementation. The development and adaptation of digital technology by the government of India for implementation of its public policies and schemes using TOE technique can be elaborated.

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