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# Leveraging Blockchain for Data Storage in Information Utilities: A Legal-Technological Framework under Indian Insolvency Law

The Insolvency and Bankruptcy Code, 2016 (IBC) introduced Information Utilities (IUs) as centralized repositories for financial data to enhance transparency and expedite insolvency proceedings. However, IUs, in their current form, face several challenges, including centralized data storage, information asymmetry, low stakeholder trust, inefficiencies in information verification, and vulnerability to manipulation and delays.

This interdisciplinary research proposes to explore the integration of blockchain technology into India's Information Utility framework. Blockchain is a digital ledger that records transactions which allows the data storage to be immutable, transparent, decentralized, and secure. This technology presents an effective alternative for storing and authenticating financial data in the insolvency ecosystem. This research bridges a critical gap in the evolution of India's insolvency ecosystem as it seeks to develop a future-ready IU

## Statement of Problem

This study is positioned at the intersection of technology law and insolvency regulation, guided by the objective of legal-tech based institutional re-design and financial data. The IUs face functional impediments such as centralized data storage, limited stakeholder trust, and vulnerabilities in data integrity. With advancements in blockchain technology offering decentralized, immutable, and transparent data management, there exists a need to evaluate its

potential integration into the IU framework. This study seeks to address whether blockchain can provide a legally compliant, secure, and future-ready alternative to existing IU mechanisms.

Research Questions

1. Whether the integration of blockchain technology into Information Utilities can enhance data security, transparency, immutability and stakeholder trust?
2. Whether blockchain-based Information Utilities can effectively meet the evidentiary standards required under the Bhartiya Sakshya Adhiniyam, 2023 and the Insolvency and Bankruptcy Code
3. Whether blockchain-based Information Utilities can effectively meet the data protection standards required under the Digital Personal Data Protection Act, 2023?
4. What structural or legal reforms within the IBC framework are required for blockchain integration in IUs?
5. To what extent can smart contracts and decentralized ledger technology replace or augment the current processes of credit information verification, authentication, and storage in IUs?
6. What international examples or best practices exist for blockchain-based credit information systems, and how can they be adapted to suit India's legal and institutional environment?
7. What are the technical and operational challenges involved in migrating existing IU data onto a blockchain, and how can these be addressed within a legally permissible structure?
8. Which blockchain architecture is most suitable for Information Utilities in the Indian insolvency ecosystem, and why?

Research Methodology

The methodology comprises of the following:

A. Legal Doctrinal Research

The legal doctrinal research aspect of the research will include a detailed analysis of the Insolvency and Bankruptcy Code, 2016; The IBBI (Information Utilities) Regulations, 2017; the Digital Personal Data Protection (DPDP) Act, 2023; and the Bhartiya Sakshya Adhiniyam, 2023 with particular focus on Section 65B concerning electronic records. Further the research will

involve detailed analysis of the relevant case law, to understand judicial perspectives on data admissibility and digital documentation. The study will include a review of international models where technology-driven insolvency and data systems have been implemented, in order to examine and understand the global practices applicable to the Indian context.
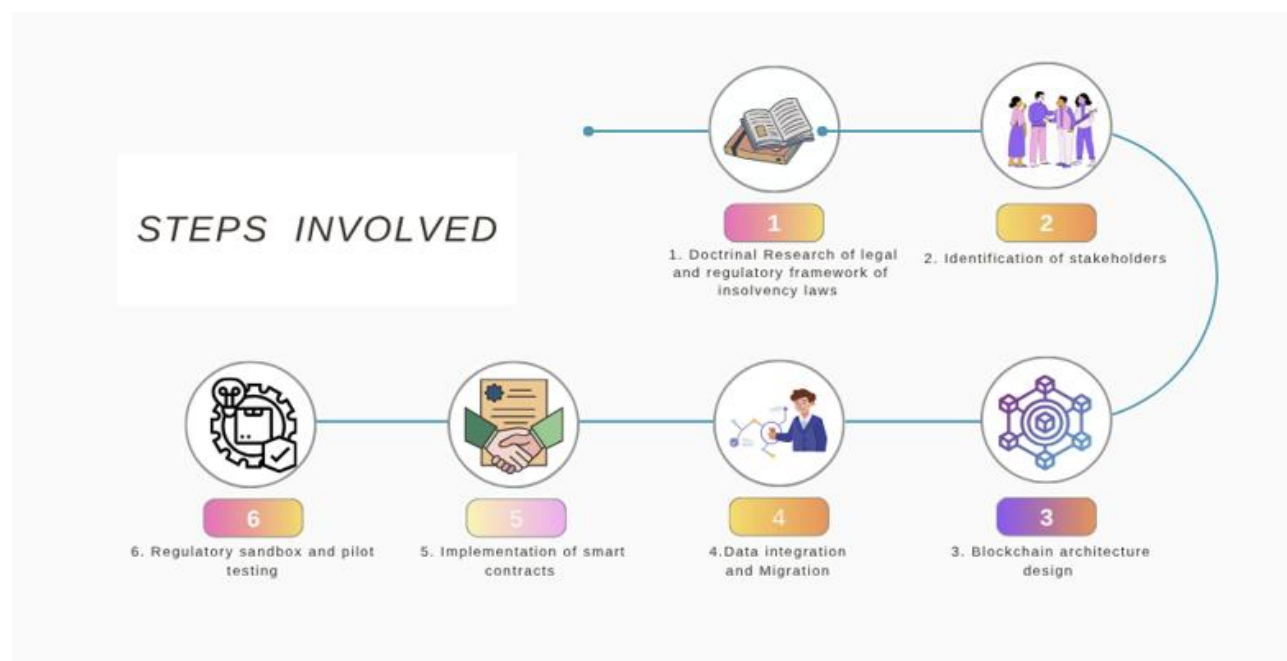
B. Empirical Study

The study will also incorporate data received from insolvency professionals, lawyers and policy analysts through structured surveys. This survey will provide practical perspectives on the feasibility and implementation challenges of using blockchain in the Indian insolvency ecosystem.

C. Technical-Experimental Research

The technical-experimental research will focus on the development of a prototype blockchain network. This will include the development of automated smart contracts that allows interactions among stakeholders, such as creditors, debtors, and adjudicating authorities. The prototype will simulate the process of information submission, authentication, and information sharing through the use of anonymized data to mimic a real-world scenario. This model will be tested for key performance metrics, including immutability, response time, and compliance with relevant legal standards. Additionally, data privacy mechanisms will be integrated to ensure secure and regulated data handling within the system.

Steps Involved:



STEPS INVOLVED

1. Doctrinal Research of legal and regulatory framework of insolvency laws
2. Identification of stakeholders
3. Blockchain architecture design
4. Data integration and Migration
5. Implementation of smart contracts
6. Regulatory sandbox and pilot testing

1. **Legal and regulatory assessment**: Analyze provisions of the Insolvency and Bankruptcy Code (IBC), 2016 and evaluate its compatibility with, Digital Personal Data Protection Act, 2023, Bhartiya Sakshya Adhiniyam, 2023 Indian Contract Act (for smart contracts), relevant IBBI regulations. The idea is to Identify required legal amendments or clarifications**.**

**2. Stakeholder Identification and Consultation:** Identify and consult the stakeholders such as financial creditors, debtors, Information Utilities (IUs), IBBI, insolvency professionals. These consultations are crucial for understanding the practical needs and concerns of the parties involved, and for establishing a framework.

3. **Blockchain Architecture Design:** Since the financial data is sensitive, a permissioned blockchain (such as Hyperledger Fabric or Corda) is recommended, allowing access only to verified participants. This design phase includes determining the network's node structure, selecting a suitable consensus mechanism, integrating cryptographic security protocols, and programming smart contracts to automate critical functions such as data submission, validation, and debtor consent.

4. **Data Integration and Migration**: The existing information held by IUs is securely transferred to the blockchain. This requires the development of tools for data hashing, encryption, and interoperability with legacy systems. This step ensures data integrity, authenticity, and privacy during migration thereby maintaining trust in the new system.

5. **Implementation of Smart Contracts:** These are designed to automate the routine processes like recording of default notices, confirmation of debt, and approval by debtors. These must be legally binding. Smart contracts not only streamline the process of data submission but also allows automated verification processes while reducing human error and administrative delays.

6. **Regulatory Sandbox and Pilot Testing:** This step is necessary as it helps validate the design and ensure legal and technical compliance of the project and is supervised by IBBI. A controlled environment is created to test the blockchain system using real or simulated data, involving a small set of financial creditors and IUs. Performance, security, legal admissibility, and stakeholder usability are evaluated during this trial phase.

Expected Outcomes

1. Identification of gaps and inconsistencies in the current IU system. and providing policy recommendations for regulatory integration of blockchain technology in the Insolvency ecosystem

2. Improved data integrity and trust through enhanced security, transparency, and immutability in IUs while complying with the legal standards pertaining to data protection and law of evidence.

3. A legal-technological model of a blockchain-integrated IU system tailored to Indian regulatory and infrastructural realities.

4. Improved Transparency and Data Integrity