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LEGAL IMPLICATIONS OF BLOCKCHAIN TECHNOLOGY IN INDIA

-Kalyani Chaple

ABSTRACT

Blockchain is one of the most revolutionary breakthroughs of the digital age. While blockchain initially was launched as the underlying technology for digital currency solutions like Bitcoin¹, it has already matured into a versatile technology having applications across finance healthcare creative industries and legal fields. Its core characteristics of decentralization, transparency and increased security have positioned blockchain as a highly promising technology to address issues of efficiency and corruption in digital transactions. In India, the public sector and private sector alike are diligently researching the scope of blockchain-based applications across land records banking health care, digital identity management systems, etc.

But, throughout its development, the blockchain Technology world has generated major legal and regulatory concerns. The Indian legislation applicable to the applications of the blockchain Technology, the IT Act 2000, the Bharatiya Sakshya Adhiniyam 2023, the Digital Personal Data Protection Act, 2023 and the regulations- in specific sector, issued by the Reserve Bank of India, the Securities and Exchange Board of India and the Ministry of Electronics and Information Technology, have provided only limited details related to the specific scope of Blockchain projects. Some practical issues faced and yet to be faced include whether the smart contracts are enforceable, jurisdictional issues, data privacy policies or handling issues and evidential requirements of a blockchain-related case.

This report, in particular, explores the legal challenges posed by the use of blockchain technology in India by analysing the current regulatory structure, highlighting important legal risks and compliance issues as well as assessing real-world applications and uses cases in the various industries and sectors involved. It discusses the ongoing judicial proceedings and

¹ Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2008), <https://bitcoin.org/bitcoin.pdf>

policy measures as well as includes recommendations for a comprehensive regulatory structure in the field of adoption of blockchain technology for the future.

KEYWORDS

Blockchain, Legal Regulation, Information Technology Act, Digital Personal Data Protection Act, Smart Contracts, Blockchain Evidence, Cryptocurrency.

INTRODUCTION

The rapid development of the use of digital technology has brought tremendous changes to business, government and legal systems in the world. One of these major revolutions is the development of blockchain technology. It is a form of recording and verifying transactions or data, which is comparable to a computerized incorruptible transparent, decentralized or distributed form of database.² It offers a new, secure and transparent way of recording data which may be adopted in banking hospitals supply chain systems, land registration, digital identifications etc. Within India, there is a gradually increasing acceptance and incorporation of blockchain technology by the government, financial institutions, and private sector entities.

The primary areas of application are aimed at attracting the innovations of this technology for streamlining processes, eliminating data frauds, providing better transparency in corporate and government transactions, and enhancing the efficacy of record keeping practices. Even though the technology has immense potential, the associated legal issues also need to be addressed, like validity of smart contracts, privacy of data, liability in a distributed platform, regulatory concerns of virtual digital assets, and validation of evidence comprising of blockchains.

While some laws such as Information Technology Act 2000³, Digital Personal Data Protection Act, 2023⁴ and the Bharatiya Sakshya Adhiniyam, 2023⁵ regulate some part of the digital transaction's world, India remains without a proper set of legal standards in particular about the use of blockchain technology. This article analyses the legal issues related to blockchain on India by exploring the regulatory standards and solutions which are currently applicable and deducing the interpretative issues from those. It also discusses the practical usage of the technology and suggests regulated measures.

² IBM, *What Is Blockchain?* <https://www.ibm.com/topics/blockchain> (last visited Aug. 1, 2026)

³ Information Technology Act, No. 21 of 2000 (India).

⁴ Digital Personal Data Protection Act, No. 22 of 2023 (India).

⁵ Bharatiya Sakshya Adhiniyam, No. 47 of 2023 (India).

UNDERSTANDING BLOCKCHAIN TECHNOLOGY

Blockchain is a type of Distributed Ledger Technology (DLT)⁶. It allows data to be stored, shared, and recorded securely on multiple computers on a decentralized network. It differs from a regular database by keeping multiple identical copies of data on the network and making a permanent ledger to be shared with different users. Before information is stored on the blockchain, it is validated using a consensus protocol, and linked to prior transactions using cryptography. Blockchain was originally defined in 2008 via the whitepaper of Bitcoin by Satoshi Nakamoto.⁷

While blockchain was initially developed for use with cryptocurrencies, it is now a general technology applied in many diverse industries including finance, health care, supply chain management government education and intellectual property. The major features of blockchain that make it unique are decentralization transparent immutable, security and traceability. These characteristics eliminate reliance on intermediaries, improve trust, avoid tampering of the data and facilitate digital transactions.

On top of that, smart contracts⁸ are enabled by blockchain and they are used to make digital contracts drive automatically when predefined terms and conditions satisfied. Blockchain, with its potential to securely, transparently and efficiently ensure records, is being used as an important tool for digital transformation in many fields and will have far reaching legal and regulatory implications in India.

TYPES OF BLOCKCHAINS

There are many different types of blockchain networks, each serving different functions and which are subject to different legal and regulatory regimes. Some of these are below:

- I. PUBLIC BLOCKCHAIN:** A blockchain that is fully decentralized and entirely available to all interested parties. Anyone is allowed to join the network to validate transactions and gain access to particular data freely without permission from a central bank authority. Examples would be Bit coin or Ethereum.⁹

⁶ IBM, *What Is Blockchain?* <https://www.ibm.com/topics/blockchain>.

⁷ Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2008).

⁸ Nick Szabo, *Smart Contracts*, https://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart_contracts_2.html.

⁹ Ethereum Foundation, *Ethereum Whitepaper*, <https://ethereum.org/en/whitepaper/>.

While as a public blockchain security, decentralization, and transparency are advantageous features, they can bring legal issues involving jurisdiction, responsibilities, regulation and money laundering regulation (AML). As the parties can be scattered through many countries by their skeleton anonymous identities, it may be difficult for the concerned authorities or the plaintiff to find the right defendant.

- II. PRIVATE BLOCKCHAIN:** The private blockchain allows a single organization to manage the blockchain network; it decides who could join and make transaction on the network. The users need to be authorized to view the network. That means, the private blockchain is more applicable to business that deals with sensitive information.¹⁰

Financial institutions hospitals multinationals generally prefer private blockchains to oversee their handling because private blockchains are getting better control, more privacy and compliance. Legally, private blockchains are easier in calling organizations to be responsible for the misuse and violation.

- III. CONSORTIUM BLOCKCHAIN:** Multiple organization managing the same network, although the network is not as open to all, i. e. there must be a membership organization to approve new participants. Similar to public, but in a different way.

Consortium blockchains are popular in banking insurance logistics and health sectors where multiple organizations need a secure platform to share data, and regulators also need oversight. Their collaborative governance is usually compliant with contracts and regulations.

- IV. HYBRID BLOCKCHAIN:** A hybrid blockchain combines elements of both public and private blockchains. Sensitive information is kept within a private environment but certain information might be put on the public domain.

State and enterprise are often applying hybrid blockchain technology system in the land registry, digital identity, taxation and procurement, which granting the government or enterprise the ability to balance between disclosure of public information and client privateness issue under the regulation of law.

LEGAL FRAMEWORK GOVERNING BLOCKCHAIN TECHNOLOGY IN INDIA

India does not yet have specific legislation dealing with or governing blockchain technology. Yet, various aspects of blockchain technology can still be subjected to existing rules on information technology contracts data protection, electronic evidence, taxation and

¹⁰ IBM, *What Is Blockchain?* <https://www.ibm.com/topics/blockchain>.

financial regulation. Although the Indian state government has amplified its support for utilization of blockchain technology in governance and entrepreneurship, the regulators have been extremely wary of its application in the contexts of cryptocurrencies and decentralized finance system. The businesses deploying blockchain applications are mandated to adhere to various legal setups depending upon the activities involved

1. INFORMATION TECHNOLOGY ACT, 2000¹¹: The Information Technology Act, 2000 (IT Act) is the main governing legislation applicable to electronic records, digital signatures and cyber space activities. While it was passed before the time when blockchain technology gained popularity, some sections of it are still applicable and useful.

The Act also recognizes the legal validity of an electronic record and electronic signature and makes provision for transactions to be deemed legally valid through the use of electronic records and electronic signatures, if certain statutory requirements are met. Blockchain records are stored electronically and This way will probably fit the requirements of an electronic record.

In addition, the IT Act also mandates responsibility to network security hacking security protection of data and cybercrime. A blockchain solution provider would, that means, be required to have sufficient security arrangements in place for security of the network infrastructure to prevent cyberattacks.

But the IT Act does not delve any deeper for the implications and applicability of the Act from technology such as blockchain, distributed ledger technology, decentralized networks, smart contracts etc. It shall be interpreted through general principles of electronic governance and contract law.

2. DIGITAL PERSONAL DATA PROTECTION ACT, 2023¹²: The Digital Personal Data Protection Act, 2023 (DPDP Act) is a newly enacted law regulating personal data processing in India. It takes effect whenever personal data is processed through digital channels.

Blockchain technology presents unique challenges under the DPDP Act because one of blockchain's defining features is immutability- once information is recorded; it cannot easily be altered or erased. With the DPDP Act, an individual has the right of correction, updating and even erasure of his personal data under certain specified circumstances. This creates a potential conflict between blockchain architecture and statutory data protection obligations. If personal

¹¹ Information Technology Act, No. 21 of 2000 (India).

¹² Digital Personal Data Protection Act, No. 22 of 2023 (India).

information is permanently stored on a blockchain, complying with requests for deletion or correction may become technically difficult.

To address these concerns, organizations increasingly adopt privacy-preserving techniques such as:

- storing only encrypted references or hashes on the blockchain;
- maintaining sensitive personal information outside the blockchain in secure databases;
- implementing permissioned blockchain networks with restricted access.

For these reasons, companies using blockchain applications will have no choice but to create their systems in respect to the new rules introduced within the data protection standards in India.

3. BHARATIYA SAKSHYA ADHINIYAM, 2023¹³: The Bharatiya Sakshya Adhiniyam, 2023 (BSA) is responsible for the regulation of evidence admissibility in Indian courts and it has substituted the Indian Evidence Act, 1872.

Courts may receive blockchain records in disputes that have commercial transactions, smart contracts, intellectual property, financial fraud, supply chain verification, or digital identity systems as their central issues. Their acceptability is contingent upon the fulfilment of legal requirements for electronic records.

Blockchain offers several evidentiary advantages:

- immutable transaction history;
- reliable timestamps;
- cryptographic verification;
- protection against unauthorized alteration.

Nevertheless, courts must still determine issues relating to authenticity, authorship, reliability, and procedural compliance before admitting blockchain records as evidence. The legal position continues to evolve as Indian courts increasingly encounter blockchain-based documentation.

¹³ Bharatiya Sakshya Adhiniyam, No. 47 of 2023 (India).

4. INDIAN CONTRACT ACT, 1872¹⁴ AND SMART CONTRACTS: One of blockchain's most significant innovations is the smart contract.

Sometimes referred to as digital agreements, smart contracts are essentially computer programs that are stored on a blockchain. These programs are designed, apart from storing the agreement on the blockchain, to carry out the functions of one or more parties of a transaction automatically and without any interference. That is, the smart contract is a self-executing set of rules that triggers contractual actions once certain predefined circumstances are fulfilled.

Although Indian law does not specifically regulate smart contracts, they may be legally enforceable if they satisfy the essential requirements of a valid contract under the Indian Contract Act, 1872, namely:

- free consent of the parties;
- lawful consideration;
- lawful object;
- certainty of terms.

Therefore, blockchain technology does not replace contract law; rather, it provides a technological mechanism for executing contractual obligations.

However, several legal challenges remain:

- interpreting coding errors;
- identifying parties in decentralized networks;
- modifying contracts after deployment.

Indian courts have not yet developed extensive jurisprudence concerning smart contracts, making this an evolving area of law.

5. TAXATION OF VIRTUAL DIGITAL ASSETS: Although blockchain technology extends beyond cryptocurrencies, virtual digital assets (VDAs) remain one of its most visible applications.

¹⁴ Indian Contract Act, No. 9 of 1872 (India).

The Finance Act, 2022 introduced a taxation framework for VDAs in India. Key features include:

- income arising from transfer of VDAs is taxed at 30%;
- losses cannot generally be set off against other income;
- 1% Tax Deducted at Source (TDS) applies on specified transfers exceeding prescribed thresholds.

This regulation, though not legalizing or banning cryptographic money, ensures proper taxation of income generated from blockchain technology-based business and asset trade transactions.

Different blockchain companies dealing in such areas as crypto exchanges, NFT marketplaces, tokenized assets, or DeFi platforms are bound to obey the relevant tax legislation.

6. RESERVE BANK OF INDIA (RBI): The Reserve Bank of India (RBI) plays a central role in regulating India's financial system.

The RBI has constantly raised concerns about the dangers of private cryptocurrencies like the potential facilitation of: money laundering, terrorist financing, lack of consumer protection, threats to financial stability, cyber security, etc. The RBI at the same time recognizes that blockchain technology may have positive outcomes as well.

The RBI has actively explored blockchain applications in:

- trade finance;
- banking infrastructure;
- cross-border payments;
- Central Bank Digital Currency (CBDC).

The introduction of the Digital Rupee (e₹) demonstrates India's interest in leveraging blockchain-inspired technologies within a regulated financial framework while maintaining sovereign control over monetary systems.

7. SECURITIES AND EXCHANGE BOARD OF INDIA (SEBI): The Securities and Exchange Board of India (SEBI) oversees India's securities markets.

Blockchain technology has significant potential in:

- securities trading;
- settlement systems;
- share transfers;
- compliance reporting.

SEBI has encouraged financial market participants to explore technological innovations while ensuring compliance with securities laws.

As tokenized securities and blockchain-based investment platforms continue to emerge globally, SEBI is expected to play an increasingly important regulatory role in developing appropriate legal standards.

SMART CONTRACTS: LEGAL VALIDITY AND CHALLENGES

Smart contracts provide one of the most important legal purposes of blockchain. While most agreements are written as Arabic text in natural language, smart contracts do that through computer programming language that executes automatically.

For example, an insurance smart contract might automatically make a payment to a policy holder upon the validation of authenticated data that a covered event has taken place. Same thing, a supply chain agreement might automatically issue a payment after blockchain entries validate receipt of a shipment.

The primary advantages of smart contracts include:

- faster execution of agreements;
- elimination of intermediaries;
- increased accuracy;
- reduced risk of manual errors.

But, a number of legal issues are still encountered:

- I. LACK OF SPECIFIC LEGISLATION:** There is no special law or any express provision for recognition and validity of smart contracts in India. The provisions of Indian contract law will have to be applied.
- II. CONSENT AND INTERPRETATION:** With traditional contracts, the courts tend to support the parties' intention in case of ambiguity in the contract. With smart contracts,

since the contract automatically executes the instructions by programmers, there is no room for reinterpretation and miscalculation of algorithms.

- III. JURISDICTION:** Blockchain networks are often international. There is a great deal of uncertainty as to which country's courts would have jurisdiction for disputes over a decentralized transaction.
- IV. LIABILITY:** If the automation results in a financial loss via a bug in the software, or a flaw in the code, it may be hard to determine who is liable. Brokers, parties to contracts, the operators of the blockchain infrastructure, or the programmers themselves may all be liable in different circumstances.
- V. DISPUTE RESOLUTION:** A standard smart contract may also provide arbitration and dispute resolution clauses. These clauses should be included in a smart contract as well.

Even with these limitations, smart contracts reflect a huge business potential. As banking logistics insurance, real estate and online shopping is integrated with Blockchain technology, India will Definitely need to introduce legislations that acknowledge smart contracts in particular and put in place guidelines for their implementation without exploitation of the consumers.

LEGAL RISKS AND CHALLENGES OF BLOCKCHAIN TECHNOLOGY IN INDIA

Despite there being many benefits to using blockchain technology, the legal and regulatory concerns cannot be overlooked. One of the main issues is the decentralized and immutable attribute of blockchain that is contrary to the conventional legal principles and make it challenging for the regulator to encounter the pre-existing legal system.

- I. ABSENCE OF A COMPREHENSIVE LEGAL FRAMEWORK:** India faces the challenge of not having a specific structure of law dedicated to blockchain technology. The Information Technology Act 2000, the Digital Personal Data Protection Act, 2023, and the Bharatiya Sakshya Adhiniyam, 2023 deal with digital transactions but do not to be exact deal with the subject of blockchain or distributed ledger technology. This legal uncertainty discourages businesses and investors from adopting blockchain solutions on a large scale. It also creates ambiguity regarding the rights and obligations of participants using blockchain-based platforms.
- II. DATA PRIVACY CONCERNS:** Blockchain is immutable, which means that one information cannot be tampered nor erased after being written. The blockchains offer

transparency and security, but it poses an issue with data regulations, per what comes next.¹⁵

The Digital Personal Data Protection Act, 2023 provisions that individual shall have the right to rectify or delete personal data under certain conditions. If personal data is stored permanently on a blockchain, it may be practically difficult to follow in the end. To address this challenge, institutions will have to rely on privacy-preserving mechanisms like encryption, off chain storage or permissioned blockchain.

III. JURISDICTIONAL ISSUES: If the computer users participate in a blockchain-based transaction are located within different states, the issue may arise as to which state's law should apply in determining legal questions under the terms of a blockchain when there is no particular physical location for the technology.

Problems of choice of law, jurisdiction and recognition and enforcement of judgments are mostly relevant in cross-border transactions involving crypto assets or crypto-currencies, smart contracts and defi platforms.

IV. CYBERSECURITY RISKS: Even though, network sharing is one of the excellent features of blockchain but still it cannot be secured from cyber-attack like hacking into cryptocurrency exchanges, theft of private keys, phishing attacks, smart contract bugs and ransomware. For which huge money has been lost worldwide.

Any organization using blockchain will need to ensure strict cybersecurity measures are put into place, conduct periodic security audits and adhere to relevant cybersecurity-related rules and regulations to mitigate their legal liability.

V. MONEY LAUNDERING AND FINANCIAL CRIMES: The pseudonymous transactions running on Blockchain might lead to transaction that could be used for money laundering, terrorist financing, tax evasion as well as other illicit activities in the absence of adequate regulatory measures.¹⁶

Because of this to tackle these issues, the Indian cryptocurrency exchanges and virtual digital asset service providers are subject to AML/KYC requirements. The regulators are further upgrading their regulation to put a check on misuse of the decentralized financial system that sits atop the blockchain.

¹⁵ Digital Personal Data Protection Act, No. 22 of 2023 (India).

¹⁶ Prevention of Money Laundering Act, No. 15 of 2002 (India).

VI. SMART CONTRACT DISPUTES: While the execution of smart contracts is automated, disputes may occur, for example over coding mistakes, the meaning of contractual provisions, software bugs, fraud or some other unexpected event.

Many classic remedies would not work in automated transactions. So, recognizes some other established methods of dispute resolution like arbitration and supervised judicial proceedings in case of smart contract.

VII. REGULATORY UNCERTAINTY REGARDING CRYPTOCURRENCIES: The Government has not yet enacted any comprehensive legislation around cryptocurrencies. Although, Taxation rules have been put into place and regulatory authority gained, the ambiguity about validity of private cryptocurrencies hampers blockchain innovation and investment.

A well-defined regulatory system that separates blockchain technology from risky virtual currencies would help foster responsible innovation and prevent abuse, providing safety for consumers and soundness of the financial system.¹⁷

RECOMMENDATIONS

To benefit most from blockchain technology with minimal legal exposure, India needs to implement comprehensive regulatory approach. What comes next recommendations could be the guide for policy makers:

- I. ENACT DEDICATED BLOCKCHAIN LEGISLATION:** To make blockchain technology operational, a law defining it, setting legal standards, defining duties of the parties, and regulating blockchain services should be enacted.
- II. RECOGNIZE SMART CONTRACTS:** Parliament should by law acknowledge smart contracts while laying down their legal validity as well as enforceability, and at the same time also provide that for dispute resolution there will be the use of smart contracts.
- III. STRENGTHEN DATA PROTECTION COMPLIANCE:** Blockchain systems would need to be developed with a Privacy layer technology in such a way that it complies with the Digital Personal Data Protection Act, 2023.
- IV. CREATE REGULATORY SANDBOXES:** Regulatory sandboxes which are restricted test areas should permit startups and financial institutions to carry their blockchain experiments with regulatory supervision.

¹⁷ *Internet & Mobile Ass'n of India v. Reserve Bank of India*, (2020) 10 S.C.C. 274.

- V. ENHANCE INTER-AGENCY COORDINATION:** To have a uniform blockchain regime RBI SEBI MeitY, Ministry of Finance, and other regulatory authorities should coordinate their regulatory actions.
- VI. PROMOTE PUBLIC AWARENESS:** Government bodies, universities and educational institutions, and industries should all have education or training sessions to enlighten people about blockchain, cybersecurity, and legal rules.
- VII. ENCOURAGE INTERNATIONAL COOPERATION:** Blockchain is borderless technology so besides the local regulatory work, India's involvement in international forums where legal norms and codes of conduct are being formed would help the harmonization of those legal standards in the country.

CONCLUSION

Blockchain represents an amazing technological advancement that brings about more transparent secured decentralized and faster ways of doing business in fields like banking medicines law and regulations etc. It would only be a small step for India if government as well as industry together move forward with blockchain as a tool for the country's digital revolution.

There are, of course, several reasons to doubt that it is not a magic solution that will solve all the problems. There are issues to be legally regulated which include data privacy, smart contracts jurisdiction cybersecurity, taxation and regulatory oversight. The existing laws like the Information Technology Act 2000 Digital Personal Data Protection Act, 2023, and Bharatiya Sakshya Adhinyam, 2023 give only a partial picture but India has not yet put together a full legal structure for blockchain technology.

To be able to drive innovations it would be necessary to frame regulations in such a way that both parties, the innovator and the regulator, will be protected. Through laws made on regular intervals, blockchain could in fact make government more transparent, the society less corrupt and the businessmen much more effective, thereby making a substantial and valuable addition to India becoming a country of safety and with digital empowerment.