# INDIAN JOURNAL OF LEGAL REVIEW

VOLUME 5 AND ISSUE 1 OF 2025

INSTITUTE OF LEGAL EDUCATION

# INDIAN JOURNAL OF LEGAL REVIEW

**APIS – 3920 – 0001 | ISSN - 2583-2344**

**(Open Access Journal)**

**Journal's Home Page – https://ijlr.iledu.in/**

**Journal's Editorial Page - https://ijlr.iledu.in/editorial-board/**

**Volume 5 and Issue 1 of 2025 (Access Full Issue on - https://ijlr.iledu.in/volume-5-and-issue-1-of-2025/)**

**Publisher**

Prasanna S,

Chairman of Institute of Legal Education

No. 08, Arul Nagar, Seera Thoppu,

Maudhanda Kurichi, Srirangam,

Tiruchirappalli – 620102

Phone : +91 94896 71437 - info@iledu.in / Chairman@iledu.in


INDIAN JOURNAL OF LEGAL REVIEW [IJLR – IF SCORE – 7.58]

VOLUME 5 AND ISSUE 1 OF 2025

APIS – 3920 - 0001 *(and)* ISSN - 2583-2344

Published by

Institute of Legal Education

https://iledu.in

# A STUDY ON THE CONCEPT OF BLOCKCHAIN TECHNOLOGY AND ITS APPLICATION IN LEGAL SECTOR

**AUTHOR -** N. SETHUPRIYA, STUDENT AT SCHOOL OF EXCELLENCE IN LAW, THE TAMIL NADU DR AMBEDKAR LAW UNIVERSITY, CHENNAI.

**BEST CITATION** - N. SETHUPRIYA, A STUDY ON THE CONCEPT OF BLOCKCHAIN TECHNOLOGY AND ITS APPLICATION IN LEGAL SECTOR, *INDIAN JOURNAL OF LEGAL REVIEW (IJLR),* 5 (1) OF 2025, PG. 1403-1415, APIS – 3920 – 0001 & ISSN - 2583-2344.

**ABSTRACT**

Blockchain is a distributed ledger technology which was first introduced in the design and development of cryptocurrency, Bitcoin in 2009 by Satoshi Nakamoto. Blockchain is an amalgamation of various innovations. Data and transactions executed over the network are stored in the ledger in a decentralized manner over a peer-to-peer network. Blockchain eliminates the need for a central entity to validate the transactions. Data and transactions stored in blocks of Blockchain are secured against tampering using cryptographic hash algorithms. Each block contains details of transactions, hash of the previous block, timestamp etc. It is difficult for an adversary to modify the stored details at majority points. Therefore, Blockchain provides better security when compared with a centralized system. Blockchain has emerged to become a potentially transformative force in multiple aspects of government and private sector operations. This Technology has applications in various domains such as education, governance, finance & banking, healthcare, logistics, cyber security, media, legal, and power sector. As Blockchain technology is an emerging area, there are various challenges that need to be addressed to adopt and effectively use it in different applications. The judiciary, often seen as the bedrock of society, stands as the guardian of justice, equity, and the rule of law. Legal industries are also looking to revolutionize their operations with distributed ledger technology, where data from multiple entities such as police, judiciary, legal department, etc., needs to be stored in a coordinated manner, where the requirement may be fulfilled effectively using Blockchain technology. This article discusses the importance and uses of blockchain technology and its impact and application in molding the next generation of smart courts.

**KEYWORDS -** Blockchain, Innovation, Legal sector, Transaction, Courts.

## I. Introduction:

In this growing digital era, Data is asset. Storing data in a most secure way and providing highest level of security to the collected data is essential. In order to secure a thing or money or data in physical world we use vaults and locks. In digital world cryptography technology is used to provide security to data. Blockchain uses this technology to store data securely. Therefore, Blockchain is basically a repository of digital records which are cryptically stored using a cryptographic hash. In simple words, blockchain is a method of securely storing data into blocks which eventually form a chain. For each data stored in the block, a hash is generated. Hash is a process algorithm which turns a large amount of data into a fixed length. Once a particular amount of data is added to the chain and a hash is generated and that information becomes final and irreversible. This feature provides extra security to the data and makes it less prone to be hacked. Therefore, if any information stored in the blocks is tampered then, consequently, all blocks in the chain will automatically change and the hash value will also get changed. However, that does not mean

INDIAN JOURNAL OF LEGAL REVIEW [IJLR – IF SCORE – 7.58]

VOLUME 5 AND ISSUE 1 OF 2025

APIS – 3920 - 0001 *(and)* ISSN - 2583-2344

Published by

Institute of Legal Education

https://iledu.in

that the information/data stored in blocks cannot be altered. The consensus algorithm provides the participants with an option of changing or modifying the data in the blockchain. Although in order to alter or add or modify the data in the blockchain, the consensus of at least 51% of the participants in the blockchain is required[2720]. Blockchain can be used in both Permissioned and Permissionless models. These models have applications in various domains such as education, governance, finance & banking, healthcare, logistics, cyber security, media, legal, power sector, etc. Data and transactions executed over the network are stored in the ledger in a decentralized manner over peer-to-peer network. Transactions are validated and verified through consensus across nodes of the Blockchain network[2721]. Blockchain technology harnesses the distributed software architecture and provides a shared ledger with a single source of truth for the recorded transactions without depending on a centralized entity for trust. Hence, it helps in enabling trust in the digital world using technology. Any tangible or intangible asset of value can be represented and tracked on a Blockchain network, which brings transparency, increases processing speed and reduces cost. So, when this blockchain technology is integrated in judiciary, it will enhance the efficiency, transparency, accountability, accessibility of justice delivery system.

## II. What is Blockchain

Blockchain is part of a broader suite of technologies called Distributed Ledger Technologies (DLT). Blockchain can be considered a subset of distributed ledger technology in which multiple transactions are stored in 'blocks' and cryptographically linked to the previous block by a 'chain'. Blockchain technology, simply stated is the use of distributed databases to store information about transactions between parties. The use of cryptographic functions ensures that transactions can be authenticated as originating from a particular identity and transactions completed without the need for any central authority. The first use of this technology that emerged in the public consciousness was by the Bitcoin. For long the terms 'blockchain' and 'bitcoin' were used interchangeably without the realization about blockchain is technology and bitcoin is type of cryptocurrency that uses blockchain technology. The technology through its recent development in various fields has developed an identity of its own[2722].

## III. Origin of Blockchain

David Chahum in his paper titled "Computer Systems Established, Maintained and Trusted by Suspicious Groups" explained about Blockchain technology as a computerized channel maintaining security and transparency through Distributed Ledger Technology (DLT). In 1991 Stuart Haber and W. Scott Stornetta introduced "Untampered records of information in the form of blocks which cannot be altered in the backdates" which materialize the idea of distributed ledger fetched cryptographically. In 1992 Merkel Trees also known as hash trees gave a new enhanced efficiency to the security of the cryptography structure. In 2004, Haber and Dave introduced efficiency in recording and verification of input data through this model. The digital Cash prototype introduced by Finney by the name "Reusable Proof of Work" significantly contributed to blockchain introduction in 2004 which popularized the Distributed Ledger Technology (DLT). In 2008, the first large-scale successful implementation of Blockchain based Distributed Ledger Technology was reported in 2008 by Satoshi Nakamoto.

[2720] Harmeet Khanuja, *Blockchain Technology in Education System: A Review*, Vol 178 International Journal of Computer Applications Page No. 38 (August 2019).

[2721] Kinza Yasar, Nick barney, *"What is blockchain? Definition, examples and how it works"*, TechTarget, (Last visited 25th March), https://www.techtarget.com/searchcio/definition/blockchain.

[2722] Bhakti, *The Advent and Legality of Blockchain Technology*, (Last visited 25th March), https://www.legalserviceindia.com

INDIAN JOURNAL OF LEGAL REVIEW [IJLR – IF SCORE – 7.58]

VOLUME 5 AND ISSUE 1 OF 2025

APIS – 3920 - 0001 *(and)* ISSN - 2583-2344

Published by

Institute of Legal Education

https://iledu.in

## IV. Structure of the Blockchain

Blockchain is made up of two different words: Block and Chain. The word blocks are referred to as the small units of individual transactions done in the crypto currency via many computers across the globe. The word chain is referred to as the linkage of all the network computers that combines all the transactions and forms a ledger of all the records. Blockchain is the record of all the small units of transactions done on the cryptocurrency on a particular network that is connected with all the computers performing these transactions.

Three major components were involved in each block are:

(1) Block-Data: a set of messages or transactions;

(2) Chaining-Hash: a copy of the hash value of the immediately preceding block; and

(3) Block-Hash: the calculated hash value of the data block or messages plus the chaining hash value.

Blockchain consists of different blocks of sequence, which actually records the entire list of transactions such as public ledger that is conventional in nature. The Genesis block is the first block of the sequence of the blockchain, which doesn't have any parent block[2723].

### A. Block

A block in blockchain technology includes two parts; they are header of the block and the body of the block. The header of the block consists of different components such as Block version, Parent block hash, Merkle tree root hash, Timestamp, nBits, Nonce. The body of the block actually consists of a transaction. The size of the block and also the transaction size determine the number of transactions continued by a particular block. To validate authentication of transactions, asymmetric cryptography mechanism is used in the blockchain technology. A pair of public and private keys is owned by each user in blockchain technology. Transactions are signed by using the private keys. In this case, the signature is done using the private key. These digital signatures can be accessed by the public keys and they are spread through the entire network and are visible to everyone. This digital sign can be further classified in the two stages: the signing stage and the authentication stage[2724].

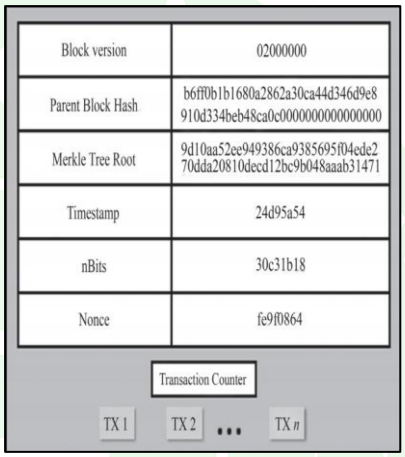


**Figure 1. block structure[2725]**

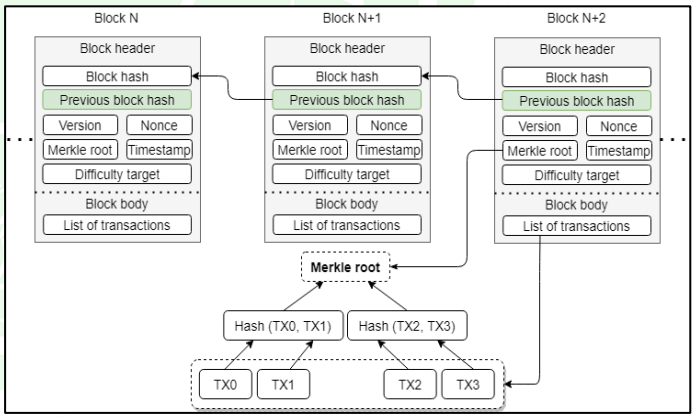


**Figure 2. Block structure[2726]**

[2723] P. S. Aithal, *Architha Aithal& Edwin Dias, Blockchain Technology - Current Status and Future Research Opportunities*, Vol. 5 International Journal of Health Sciences and Pharmacy (IJHSP) No. 1 (June 2021).

[2724] Harmeet Khanuja, *Blockchain Technology in Education System: A Review*, Vol 178 International Journal of Computer Applications Page No. 40 (August 2019).

[2725] A Study on Blockchain Technology: Application and Future Trends - Scientific Figure on ResearchGate, Available at https://www.researchgate.net/figure/Block-structure_fig2_347192831 (last visited 26 Mar 2025).

[2726] Blockchain for Dynamic Spectrum Management - Scientific Figure on ResearchGate, Available at https://www.researchgate.net/figure/The-structure-of-a-Blockchain-A-block-is-composed-of-a-header-and-a-body-where-a-header_fig1_337306138 (last visited 26 Mar 2025).

INDIAN JOURNAL OF LEGAL REVIEW [IJLR – IF SCORE – 7.58]

VOLUME 5 AND ISSUE 1 OF 2025

APIS – 3920 - 0001 *(and)* ISSN - 2583-2344

Published by

Institute of Legal Education

https://iledu.in

**V. How Blockchain works:**

Blockchains act as a shared database, distributed across vast peer-to-peer networks that works in a decentralized system. No individual entity can own a blockchain network, and no single entity can modify the data stored on the block unilaterally without consensus of peers. New data can be added to a blockchain only through agreement between the various nodes of the network, this mechanism is known as distributed consensus. Each node of the network keeps its own copy of the blockchain's data [2727]. Blockchains record information on a timestamped chain and that helps o create an alphanumeric string called a hash. After the first block has been created, each subsequent blocks uses the previous block's hash to calculate its own hash. New data is added to the block and the block is added at end of the existing blockchain after validation or consensus. Once a block is added, it is permanent and immutable. Older data can neither be removed nor modified. New block can be referenced in subsequent blocks, if someone attempts to modify the transaction without consensus, the hashes for previous and subsequent blocks will also change and disrupts the ledger's shared state. Blockchains uses cryptographic techniques to sign every transaction with a unique digital signature belonging to the user who initiated the transaction. These signatures are held privately but are publicly verifiable[2728].

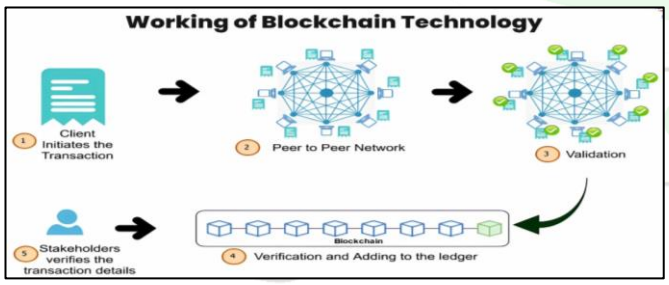


**Figure 3. Working of blockchain technology.**

The major five steps involved in blockchain technology are[2729],

1) An authorized participant or clients initiates the transaction, which must be authenticated by the blockchain technology.
2) After initiation of transaction, a new block is created that represents the specific transaction or data.
3) Once data is stored in the block details regarding the transaction is shared in the distributed peer to peer network. The block is sent to every computer node in the network.
4) Authorized nodes validate transactions and add the new block to the existing blockchain.
5) The updated is distributed across the network, which finalize the transaction.

**VI. Characteristics of Blockchain**

Blockchain technology is built on a foundation of unique characteristics that differentiate it from traditional database. The following are some of the important characteristics of blockchain,

- **Decentralized System & transparent:**

Blockchain decentralization is one of the important characteristics of the technology. Decentralized systems usually provide many advantages over the traditional centrally managed systems. In centralized database the central authorities like bank, etc., controls and verify the transaction. Blockchain operates on a distributed ledger. It provides the power to the actual owner of the data to access and control the data over the blockchain network. In decentralized system, multiple transparent participants called Nodes verify and update the transactions in the ledger.

- **Peer-to-Peer network & traceability:**

In decentralized blockchain network, multiple transparent participants called Nodes verify and update the transactions in the ledger. Participating nodes communicate with each

[2727] Akash Santosh Loya, *Blockchain Technology: Usages and Legal Implications in India*, Volume 39, Issue 3, business law review, pp. 79 – 83 (2018) https://doi.org/10.54648/bula2018015 (Last visited 26th March 2025).

[2728] Kinza Yasar, Nick barney, *supra* note 2, at 2.

[2729] Id.

INDIAN JOURNAL OF LEGAL REVIEW [IJLR – IF SCORE – 7.58]
VOLUME 5 AND ISSUE 1 OF 2025
APIS – 3920 - 0001 *(and)* ISSN - 2583-2344
Published by
Institute of Legal Education
https://iledu.in

other directly without the need for a central node, so blockchain technology operated on peer-to-peer network (P 2 P network). As each and every transaction in the blockchain which is spread in the network needs to be authenticated by the participants of the network so it is very difficult to tamper the transaction. Other nodes in the network will be verifying the broadcasted block and each transaction will be checked. So, it becomes easy to detect the falsification. Every block in a blockchain is time stamped. It also provides traceability.

- **Faster Settlement**:

In the traditional systems usually the settlement cost is more. In central authority-based systems the settlement time is more compared to the distributed networking in the blockchain. The blockchain is a decentralized system so we do not need to depend on the central authorities and it will overall decrease the settlement cost and time and also increase speed and efficiency of transactions[2730].

- **Immutability**:

Immutable ledgers are one of the important aspects in blockchain technology. Any addition to the block chain is permanent and Immutable. Usually, any database which has a central system is prone to attack. In the blockchain the data is stored as in the distributed ledgers system which will make it more tamper proof and transparent among all the parties. As all the ledgers are kept up to date and have all the copies shared among all the nodes in the corresponding blockchain network it is difficult to alter/ modify the contents of the block.

- **Cryptography technology & better security:**

Blockchain uses cryptographic technology is secure the blocks. The trust and validity of Blockchain transactions are due to the cryptographic algorithms, which provide security to transactions. Data is stored in blocks are linked together using cryptographic hashes, each block has unique hash values. If one block is compromised the hash value of subsequent blocks will be changed. This cryptographic technology allows the owner of the block and participants of the network to access and control the block using private and public keys.

- **Consensus algorithm:**

Blockchain network uses consensus algorithms like POW (Proof of Work) and POS (Proof of Stake) which helps in verifying transactions in the blockchain. Blockchain technology provides more security to the data compared to the central data storage. In order to gain access to the overall blockchain network we need to gain the access the 51% of the network and which is quite impossible to perform[2731]. blockchain is secured by many numbers of the active nodes in the blockchain network. The consensus algorithm provides the participants with an option of changing or modifying the data in the blockchain. Although in order to alter/add or modify the data in the blockchain, the consensus of at least 51% of the participants in the blockchain is required.

## VII. Types of Blockchain

Blockchain can be set up either in Public / Permissionless or Private / Permissioned configurations, each of which has its own advantages and disadvantage[2732].

### A. Public Blockchain

These blockchains are completely open and follows the idea of decentralization. They don't have any restrictions; anyone can participate in the network. The public blockchain is open to the public, which means it is not owned by anyone. Anyone having internet and a computer with good hardware can participate in this public blockchain network. All the computer in the network holds the copy of other

[2730] Krishna, *Artificial intelligence and blockchain: The tools of modern era for speedy justice*, (Last visited 25th March 2025), https://www.legalserviceindia.com/legal/article-10136-artificial-intelligence-and-blockchain-the-tools-of-modern-era-for-speedy-justice-.html.

[2731] Kinza Yasar, Nick barney, *"What is blockchain? Definition, examples and how it works"*, TechTarget, (Last visited 25th March), available at https://www.techtarget.com/searchcio/definition/blockchain.

[2732] NATIONAL STRATEGY ON BLOCKCHAIN, Towards Enabling Trusted Digital Platforms, MINISTRY OF ELECTRONICS & INFORMATION TECHNOLOGY, Government of India, December 2021.

INDIAN JOURNAL OF LEGAL REVIEW [IJLR – IF SCORE – 7.58]
VOLUME 5 AND ISSUE 1 OF 2025
APIS – 3920 - 0001 *(and)* ISSN - 2583-2344
Published by
Institute of Legal Education
https://iledu.in

nodes or block present in the network. In this public blockchain, we can also perform verification of transactions or records.

**B. Private Blockchain**

These blockchains are not decentralized as the public blockchain. Only selected nodes can participate in the process, making it more secure than the other blockchain. These are not open like a public blockchain. They are open to some authorized users only, who are allowed to participate in a blockchain network within a company or organization. These blockchains are operated in a closed network.

**C. Hybrid Blockchain**

Hybrid blockchain is a mixture of both private and public blockchain features, where some part is controlled by some organization like a private blockchain and other parts are made visible to public like a public blockchain. It is a combination of both public and private blockchain.

**D. Consortium Blockchain**

Consortium blockchain is a creative approach that solves the needs of the organization. This types of blockchain are also known as Federated Blockchain. In this type of blockchain, more than one organization manages the blockchain. Some part is public and some part is private. This blockchain validates the transaction and also initiates or receives transactions.

## VIII. Legality of blockchain technology in India

The Blockchain Technology is absolutely legal in India. In India, there is currently no legislation that regulates and keeps a check on blockchain technology and its numerous applications. However, the existing sector's regulatory bodies may have the authority to govern the use of blockchain-related technologies, depending on the sectoral applications. For example, The **Securities Exchange Board of India ("SEBI")** regulates the use of blockchain technology in capital markets. **The Reserve Bank of India ("RBI")** regulates cryptocurrency and **The Insurance Regulatory and Development Authority of India ("IRDAI")** regulates insurance-related applications. The legal profession's use of technology has progressed through time[2733].

Smart contracts are lines of code on Blockchain technology that execute automatically after meeting the predetermined conditions. **Section 10 of the Indian Contract Act, 1872** which defines elements of a valid contract, which must be fulfilled by a smart contract in India in order to be valid and enforceable. While the Indian Contract Act only regulates physical contracts, the validity of contracts formed through electronic means can be drawn from **Section 10 A of the Information Technology Act, 2000**. After providing detailed recommendations, the government may issue a directive to support smart contracting. Smart Contracts are legal instruments; however, additional clarity can be gained after the legislature takes appropriate measures to define and codify them.

The IT Act allows digital signatures to be used to authenticate documents. According to the Information Technology Act, 2000, digital signatures mean authentication of any electronic record by a subscriber by means of an electronic method or procedure in accordance with the provisions of **Section 3**. Further, the IT Act, 2000 deals with digital signatures under **Sections 2(1)(p)**, and **Section 15**. The IT Act comprises laws governing certifying agencies' authority, procedures for granting licenses, and responsibilities. For authentication and limited access, the smart contracts use digital signatures. Despite the above-mentioned method of employing self-generating digital signatures, the IT Act does not clearly ban the use of self-generating digital signatures via blockchain technology. However, because there is no option for express recognition of the same, any contract created with blockchain technology that requires a signature to authenticate, is effectively invalidated. While there is no law mandating

[2733]Karthick bora, *Laws and regulation of blockchain along with its status in India*, (Last visited 25th March 2025), https://blog.ipleaders.in/laws-regulation-blockchain-status-india/.

INDIAN JOURNAL OF LEGAL REVIEW [IJLR – IF SCORE – 7.58]

VOLUME 5 AND ISSUE 1 OF 2025

APIS – 3920 - 0001 *(and)* ISSN - 2583-2344

Published by

Institute of Legal Education

https://iledu.in

blockchain networks to safeguard data privacy and security, they may nonetheless be required to follow the general principles and laws governing cyber security and privacy in India. Due to the fundamental decentralization of blockchains, challenges with enforcement are expected to arise[2734].

Indian government has taken various initiatives to promote the use of blockchain technology in various sectors. National Blockchain Portal (https://blockchain.gov.in) was developed on the theme based on Content Management System to manage the contents related to the National Blockchain Framework initiative and to facilitate access and integration of various blockchain resources. The Ministry of Electronics and Information Technology (MeitY) launched the National Blockchain Framework (NBF), Vishvasya-Blockchain Technology Stack (blockchain-as-a-service), National Blockchain Framework Lite (NBFLite) – blockchain sandbox platform designed for startups and academia , Praamaanik (enabling blockchain technology to verify mobile app origin). NITI Aayog has developed " National blockchain strategy". Centre of Excellence in Blockchain Technology was developed in Bangalore by National Informatics Centre (NIC) which provide world class blockchain services to the government by identifying and sharing suitable data for the use of government departments and aims to provide Blockchain as a Service (BaaS) for efficient hosting of Blockchain network and allowing all stakeholders to benefit from shared learning, experiences and resources[2735].

## IX. The Indian judiciary and Blockchain technology

The Indian judiciary is one of the 3 pillars of the Indian democracy. It operated through court complexes and helps citizens to seek justice. In **Swapnil Tripathi v. Supreme Court of India** (2018), the Supreme Court recognized the importance of live-streaming court proceedings, highlighting the potential for technology to increase judicial efficiency[2736]. Technology can play a pivotal role in transforming the judiciary by enhancing efficiency, transparency, and accessibility. Indian judiciary has adopted ICT (information communication technology) through e- court project that enable the court to record case details, create digital legal documents, maintain ledgers and store judgements digitally. The use of ICT brought transparency and more accessibility in Indian judiciary as the citizens can access cause list, case details and judgements online. **The e-Courts Project (2005)**, initiated under the Supreme Court of India, is a transformative initiative aimed at modernizing judicial functions through digital innovation. The project aims to integrates various digital technologies like blockchain, AI to enhance case management and administrative efficiency across courts in India. This digital transformation efforts helps in delivering a more responsive and effective judicial system[2737]. Blockchain technology also facilitate exchange of information or data among stakeholders which is essential for Indian criminal justice system.

The major challenges that Indian judiciary faces are high turnover time, Scrutiny of cases after filing is more time consuming and involves multiple iterations causing delay in posting of cases. Missing of legal documents or delay in service of summon or notice delays legal proceedings. Maintenance of multiple physical document or records manually is more cumbersome process and may end up in unnecessary delay in justice delivery. Lack of tamper proof mechanism for data and document exchange mechanism among stakeholders causes delay and inefficiency in overall execution of a case. Different bodies/

[2734] Apurava Agarwal, *"Blockchain technology, legal framework and its application in the legal system"*, (Last visited 25th March 2025), available at https://www.linkedin.com/pulse/blockchain-technology.

[2735] Kshitij Singha, *"Government launches Vishvasya -Blockchain Technology Stack; To offer Blockchain-as-a-Service with a geographically distributed infrastructure"*, (last visited 25th march 2025), available at https://pib.gov.in/PressReleasePage.aspx.

[2736] Astha Srivastava, *"Role of technology in transforming the Indian judiciary"*, LAWFULLEGAL, (last visited 26th march 2025), available at https://lawfullegal.in.

[2737] Digital Transformation of Justice: Integrating technology in India's Judiciary and Law Enforcement, (last visited 26th march 2025), available at https://pib.gov.in.

INDIAN JOURNAL OF LEGAL REVIEW [IJLR – IF SCORE – 7.58]
VOLUME 5 AND ISSUE 1 OF 2025
APIS – 3920 - 0001 *(and)* ISSN - 2583-2344
Published by
Institute of Legal Education
https://iledu.in

agencies/ systems in judiciary are not connected to each other and data needed to be manually transferred or entered into various system. There is no common and trusted location for sharing and storing of documents among agencies which eventually delays the decision-making process. Therefore, blockchain technology can be integrated into Indian judiciary, which will be the best solution to overcome all the above challenges.

## X. Application of Blockchain Technology in Legal Sector

**"Technology will integrate police, forensics, jails, and courts, and will speed up their work as well. We are moving towards a justice system that will be fully future-ready."**

**- *Prime Minister, Shri Narendra Modi***

Blockchain technology is driving a transformative shift in India's judiciary and law enforcement, enhancing efficiency, accessibility, and decision-making. Blockchain can democratize access to the justice system by reducing complexity related to availability of Trusted, Immutable, time-stamped data and documents. The Hon'ble Supreme Court of India in **Internet and Mobile Association of India v. Reserve Bank of India**[2738] has brought the legal sector's attention back to the distributed ledger technology that formed the very basis of bitcoin and other cryptocurrencies. Even though the law to regulate cryptocurrencies is still in its early stage, the underlying blockchain technology has taken the front with its widespread application in almost all sectors, including the legal sphere. **Justice D.Y. Chandrachud**, the former Chief Justice of India, has advocated for embracing technology, including blockchain, in the judiciary to enhance efficiency and accessibility, but also emphasized the need for ethical considerations and robust auditing mechanisms[2739]. Blockchain technology can be used under the following scenarios for the Judiciary.

### A. Judicial Deposits maintenance:

Under certain circumstances, a party is ordered to deposit the money or property with the court. The money / property that is placed in temporary custody of the court. The registry then puts the money in fixed deposits in the banks. At various stages in the hearing of the cases, the court might also order that a portion of the judicial deposit be given to the other party. The Registry in the courts maintains these ledgers. There are instances when the deposits are not claimed by the parties due to various reasons. Maintaining the judicial deposit transactions in the blockchain to ensure that it is not tampered and easily managed. This also facilitates automatic refund processes.

### B. Transfer of FIR, Charge-sheet & traffic challan data from the Police:

The FIR and charge-sheet are issued by the Police. These documents need to be presented to the court within a stipulated time. The charge sheet is submitted by the police to the prosecution after validating the admissibility and then it is handed over to the court. The Court then acknowledges the receipt and the charge sheet is admitted. Instead, the police / traffic police department software can store the FIR, charge-sheet, traffic offense details & fine amount in the blockchain. The Court can refer to the FIR metadata from the blockchain for further processing without waiting for the hard copy of the FIR. Storing Certified copies of the FIR / charge sheet documents in the blockchain will facilitate the downloading of soft copies by the agencies which need these documents. Blockchain enables instant transfer of important legal documents (FIR, charge-sheet, challan) to various stakeholders. This reduces delays caused by manual processes and improves coordination between agencies and courts. Citizens can easily access public records related to FIRs and traffic challans, ensuring transparency in law enforcement and reducing complaints of unfairness or corruption.

[2738] (2020) 158 SCL 448.
[2739] Courts should embrace technology to enhance accessibility, efficiency: CJI Chandrachud, (last visited 26th march 2025), available at https://www.indiatoday.in/law

INDIAN JOURNAL OF LEGAL REVIEW [IJLR – IF SCORE – 7.58]

VOLUME 5 AND ISSUE 1 OF 2025

APIS – 3920 - 0001 *(and)* ISSN - 2583-2344

Published by

Institute of Legal Education

https://iledu.in

**C. Legal documents, notices and summons management:**

The time and effort needed to issue summons and notices to parties can be greatly reduced by using blockchain technology. Storing of the documents like legal notices and summons in blockchain by the registry enables the police staff to download these documents easily without the need to visit the court every day. It also saves time of police and court staffs.

**D. Issue of bail orders by the Court:**

Bail orders issued by the court are required to be presented in prisons in the shortest possible time. Storing of Bail orders in the blockchain will facilitate in-time retrieval of the bail order document by prison authorities and parties. The immutability of these documents ensures that the authorities at the prison and the parties involved can trust the digital document.

**E. Land record management:**

Land records in India are often prone to fraud. By implementing blockchain technology, the government can maintain an immutable record of land ownership, transaction and encumbrances. These land records & registration data on the blockchain can be used by the Judiciary during the different stages in the case proceedings to check for the transaction details and ownership of the land or property.

**F. Court Case tracking:**

Blockchain technology offers transparency and decentralized platform for tracking court cases. All parties like lawyers, public, litigants, court staff, judges can access real time updates about the case progress which reduces delays and enhances accountability.

**G. Decentralized court judgement and data storage:**

The judicial records in India are stored in a centralized system, which can be subject to hacking, tampering, or corruption. Blockchain can decentralize this storage, ensuring that court judgments and legal documents are stored securely and are publicly accessible. Court judgments and legal precedents could be permanently recorded on a blockchain, with public access through a secure and transparent platform. This ensures that historical records are not lost or altered.

**H. Government and Public records management:**

Blockchain can be used to securely maintain and update various public records, such as birth certificates, marriage certificates, death certificates, income details , Marksheet etc,. This would improve the credibility of public data and reduce instances of fraud. Citizens can access these records through a decentralized system, ensuring that there is no risk of tampering or manipulation. For example, birth certificate could be issued and stored on the blockchain, where it can be validated by relevant authorities in real-time. These documents can be used by the Judiciary as proof of claims.

**I. Digital Evidence management:**

Digital evidence stored conventionally on a CD or pen drive is more susceptible to data loss. The disc may be damaged or misplaced, whereas the data stored on a centralized system could be tampered with more easily. Blockchain could be used for securing evidence to be presented in court proceedings such as screenshots of websites, photos or any other digital or digitized content, and contracts without getting tampered. Uploading evidence to the blockchain in real-time, allows for reliable sourcing as well as storage. Even the forensics reports that are relied upon by the Judiciary can be stored and retrieved from the Blockchain database.

**J. Smart contracts:**

Smart contracts are one of the most recognized use cases for blockchain in the legal industry. These are digitally created contracts which can be automatically executed when specified condition is fulfilled. It automates legal processes like execution of agreement and settlement in commercial or financial disputes. These smart contracts help lawyers and

INDIAN JOURNAL OF LEGAL REVIEW [IJLR – IF SCORE – 7.58]
VOLUME 5 AND ISSUE 1 OF 2025
APIS – 3920 - 0001 *(and)* ISSN - 2583-2344
Published by
Institute of Legal Education
https://iledu.in

reduces their time which they spend to drafting legal documents.[2740].

**K. Corporate Filings:**

Corporate filings and other records may be maintained on blockchain platforms. Corporate document and transaction can be recorded on a blockchain so that there is an immutable record of all corporate acts. Governments may eventually provide blockchain platforms for companies to submit their corporate registrations and documents. This will create a permanent, immutable, and transparent record of any changes. These documents can be used by judiciary in resolving corporate disputes.

**L. Blockchain based arbitration:**

Arbitration became a popular method for businesses to resolve disputes without engaging in litigation. Many aspects of the arbitration process, such as documentary evidence, transmittal of correspondence, and satisfaction of awards, could be automated with smart contracts. Even the appointment of the arbitrator could be done through blockchain when the parties agree on a process and a smart contract executes the selection. Blockchain based arbitration could also offer enhanced confidentiality[2741]. Online Dispute Resolution (ODR) platforms powered by blockchain can help resolve disputes without the need for traditional court hearings. Through smart contracts and blockchain's transparency, disputes can be settled quickly, reducing backlog and ensuring a more efficient process[2742].

**M. Property managements:**

Blockchain technology enables real estate transactions to use fewer intermediaries, thereby selling and buying property in a transparent and immutable way can be more efficient. Blockchain based ledgers offer a new form of property rights management by being able to both time and date stamp the record when the intellectual property (IP) has been lodged/ sent to a third party. Blockchain can be used to protect intellectual property rights, including patents, trademarks, and copyrights. By storing the metadata of IP assets on a blockchain, creators and inventors can prove ownership and the timestamp of their creation. This reduces IPR related disputes[2743].

## XI. Benefits of Blockchain Technology in The Legal Sector

Overall , implementation of Blockchain technology in Indian judiciary can help to,

1. Increase transparency in Legal system,
2. Improve Efficiency of judicial system,
3. Reduces dependency on Physical documents,
4. Improve faster processing of data,
5. Reduce delay & inefficiency in execution of cases,
6. Eliminate tampering and manipulation of legal records,
7. Reduces potential human error & biases while processing documents,
8. Improve real time legal document storage, transfer and access,
9. Eliminates certified copies of legal documents at each level of proceedings,
10. Increase faster decision making,
11. Participating agencies can directly access, download, verify copies of documents which saves time and administrative burden,
12. Reduces transfer of documents between different stakeholders of criminal justice system can be reduced,
13. Preserve data integrity,
14. Increase automation in Indian judiciary which reduces time and cost of proceeding,
15. Increases Automated data sharing.

## XII. Challenges of Blockchain Technology in The Legal Sector

Blockchain technology has immense potential to transform the Indian judiciary at the same

[2740] Anushruti Shah, *BLOCKCHAIN TECHNOLOGY AND CRYPTO ASSETS: CURRENT LEGAL POSITION IN INDIA*, SUPREMO AMICUS, (Last visited 5th March 2025), www.supremoamicus.org.

[2741] Id.

[2742] Legal Framework for Cryptocurrency and Blockchain in India, VISHALSAINIADV, (Last visited 25th March 2025), https://vishalsainiadv.com.

[2743] Chandan Goswami & Eeshan Pandey, *Effective Use of Blockchain in the Legal Sector*, (Last visited 25th March 2025), https://tytpartners.in/2021/03/12/blockchain-in-legal-sector.

INDIAN JOURNAL OF LEGAL REVIEW [IJLR – IF SCORE – 7.58]
VOLUME 5 AND ISSUE 1 OF 2025
APIS – 3920 - 0001 *(and)* ISSN - 2583-2344
Published by
Institute of Legal Education
https://iledu.in

time its implementation and adoption faces several challenges. The key challenges in implementing blockchain to the judiciary are[2744],

**A. Lack of digital infrastructure**

One of the primary challenges in implementing blockchain in the Indian judiciary is the lack of robust digital infrastructure across the country. Many courts and police stations still rely on traditional paper-based systems for record-keeping and case management. The transition to a digital, blockchain-powered system requires significant investment in technology. Proper digital database , high speed internet connectivity, hardware infrastructure development is necessary. Without proper digital infrastructure blockchain adoption would be difficult.

**B. Lack of digital literacy**

The Indian judicial system is deeply rooted in traditional processes. Resistance to adapt to the changing digital era by judicial officers, law enforcement agencies and legal professionals would hinder the adoption of blockchain technology. Legal professionals, judges, police officers, court staff lacks understanding of the blockchain concept which prevent them from using this technology.

**C. Lack of legal framework and legal validity of blockchain records**

The Indian legal system does not have any legislation related to blockchain technology. Blockchain operates on decentralized, immutable principles, which may rise legal and regulatory issues. In India, traditional records are often stored in paper form or electronic formats, recognized by the judiciary as legally binding. The Indian legal system needs to explicitly recognize blockchain-based records (e.g., FIRs, charge-sheets, judgments) as valid in court. This would require a legal framework that defines blockchain records authenticity, admissibility, and legality. The use of smart contracts is still a relatively new concept in Indian law. To ensure that blockchain-powered smart contracts are legally enforceable, Indian laws would need to be revised or amended to include provisions for their use.

**D. Scalability and performance issue**

Blockchain technology faces scalability and performance issues. In the context of the judiciary, the volume of cases, legal documents, and transactions is very high . Blockchain's transaction throughput that is the number of transactions that can be processed in a given period can be significantly lower than traditional centralized databases. This could lead to delays especially when dealing with large amounts of data, such as court filings, judgments, or evidence.

**E. High implementation charges and energy consumption**

Blockchain integration requires high initial setup costs for developing the required infrastructure, software, and training programs. This can be a significant barrier for the Indian judiciary as there are large number of courts, police stations, and legal bodies across the country. Blockchains require proper computing power to process transactions, which could result in high energy consumption and slow processing times.

**F. Privacy and ethical concern**

Blockchain's transparency feature could raise ethical and privacy concerns in the judiciary. Legal records such as FIRs, case details, charge-sheets, and judgments, which would be stored on a public or semi-public blockchain, are often sensitive. If these records are publicly accessible, it could compromise the privacy rights of individuals involved in legal matters, including the accused, victims, and witnesses.

**G. Lack of public trust**

Although blockchain provides transparency and security, the technology's adoption will depend heavily on the trust and acceptance of the public. Since the judiciary often deals with sensitive matters, such as criminal cases or personal data, the public may have concerns about the confidentiality of their information on

[2744] Garima Singh , *Blockchain Government use case: Revolutionizing Justice and Law Enforcement with Blockchain Technology*, (Last visited 25th March 2025), https://www.linkedin.com/pulse/revolutionizing-justice-law-enforcement-blockchain-technology-singh.

a blockchain. Establishing clear regulations, maintaining best security practices, and educating the public about the benefits of blockchain technology is vital.

**XIII. Conclusion:**

Blockchain technology holds immense potential to revolutionize the justice and law enforcement sectors by enhancing transparency, streamlining legal processes, and improving access to justice. Governments around the world are beginning to recognize the benefits of integrating blockchain into their legal systems, paving the way for a more efficient, secure, and fair justice system. As blockchain continues to evolve, its impact on the justice system will likely grow, offering new opportunities for innovation and reform in this crucial sector. From the above, we can conclude that blockchain can revolutionize the legal sector if it is utilized properly. Blockchain will also reduce costs and time in the legal industry as most of the manual tasks can be automated. It will make the legal industry more efficient and productive and also bring data integrity and transparency though optimizing the decentralized and distributes ledger. It is also evident that there are many pertinent risks in managing these blockchains, but by identifying the potential risks and legal issues accurately and mitigating them will help in easy implementation of the technology. blockchain can address many existing issues in the legal system. However, successful adoption would require overcoming technical, regulatory, and infrastructural challenges, careful planning, legal reforms, widespread adoption across the system , along with a strong commitment from legal authorities to embrace this transformative technology. This requires collaborative efforts from the Indian government, legal experts, technology providers, and judicial bodies to create an environment conducive to blockchain integration. With the right investments in technology, infrastructure, and training, blockchain could play a crucial role in modernizing and streamlining the Indian judicial system, ultimately leading to faster, fairer, and more accessible justice for all citizens.

**XIV. Reference:**

**Webliography:**

**Journal:**

1. Akash Santosh Loya, Blockchain Technology: Usages and Legal Implications in India, business law review, Volume 39, Issue 3 (2018) pp. 79 – 83, https://doi.org/10.54648/bula2018015 (Last visited 6th March 2025).
2. Harmeet Khanuja, Blockchain Technology in Education System: A Review, International Journal of Computer Applications (0975 – 8887) Volume 178 Page No. 38, August 2019.
3. Neha Kukrety, Pitresh Kaushik and Shashank Shekhar Pande, Blockchain Technology and Legal Framework in India: A Systematic Review, Empirical Economics Letters, 22 (Special Issue 1): (January 2023) ISSN 1681 8997 https://doi.org/10.5281/zenodo.8360087
4. P. S. Aithal, Architha Aithal& Edwin Dias, Blockchain Technology - Current Status and Future Research Opportunities, International Journal of Health Sciences and Pharmacy (IJHSP), ISSN: 2581-6411, Vol. 5, No. 1, June 2021.

**Article**:

1. A Study on Blockchain Technology: Application and Future Trends - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/Block-structure_fig2_347192831 (accessed 26 Mar 2025).
2. Anushruti Shah, BLOCKCHAIN TECHNOLOGY AND CRYPTO ASSETS: CURRENT LEGAL POSITION IN INDIA, SUPREMO AMICUS,www.supremoamicus.org (Last visited 5th March 2025).
3. Astha Srivastava, "Role of technology in transforming the Indian judiciary", LAWFULLEGAL, https://lawfullegal.in (last visited 26th March 2025).

4. Apurava Agarwal, "Blockchain technology, legal framework and its application in the legal system", available at https://www.linkedin.com/pulse/blockchain-technology (last visited 26th march 2025).
5. Bhakti, The Advent and Legality of Blockchain Technology, available at https://www.legalserviceindia.com, (Last visited 5th March 2025).
6. Blockchain for Dynamic Spectrum Management - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/The-structure-of-a-Blockchain-A-block-is-composed-of-a-header-and-a-body-where-a-header_fig1_337306138 (last visited 26 Mar 2025).
7. Chandan Goswami & Eeshan Pandey, Effective Use of Blockchain in the Legal Sector, https://tytpartners.in/2021/03/12/blockchain-in-legal-sector/(Last visited 6th March 2025).
8. Gurinder Singh, Vikas Garg and Pooja Tiwaria, Study on Blockchain Technology, https://www.researchgate.net/publication/347192831 (Last visited 6th March 2025).
9. Karthick bora, Laws and regulation of blockchain along with its status in India, https://blog.ipleaders.in/laws-regulation-blockchain-status-india/ (Last visited 5th March 2025).
10. Krishna, Artificial intelligence and blockchain: The tools of modern era for speedy justice, https://www.legalserviceindia.com/legal/article-10136-artificial-intelligence-and-blockchain-the-tools-of-modern-era-for-speedy-justice-.html,(Last visited 5th March 2025).
11. Kshitij Singha, "Government launches Vishvasya -Blockchain Technology Stack; To offer Blockchain-as-a-Service with a geographically distributed infrastructure", available at https://pib.gov.in/PressReleasePage.aspx (last visited 25th march 2025).
12. Legal Framework for Cryptocurrency and Blockchain in India, VISHALSAINIADV, https://vishalsainiadv.com, (Last visited 5th March 2025).
13. NATIONAL STRATEGY ON BLOCKCHAIN, Towards Enabling Trusted Digital Platforms, MINISTRY OF ELECTRONICS & INFORMATION TECHNOLOGY Government of India, December 2021.
14. Prasanth Chauhan, Blockchain in Indian Legal System, https://bwlegalworld-businessworld-in., (Last visited 5th March 2025).
15. Prateek tripati, the growing role of blockchain in Indian governance, ORF, https://www.orfonline.org, (Last visited 5th March 2025).
16. Vijaya Kittu Manda, Status Check on Blockchain Implementations in India, (Last visited 5th March 2025).