

INTERNATIONAL JOURNAL OF LEGAL SCIENCE AND INNOVATION

[ISSN 2581-9453]

Volume 3 | Issue 4

2021

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Blockchain in Corporate and Law Application

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ABSTRACT

In the last few decades, several technologies have been introduced to alleviate the workload. One such technology is Blockchain which was introduced first time by Stuart Haber and W Scott Stornetta in 1991 through a paper and a model of blockchain was established in 2008 by a developer or group of developers working under the pseudonym Satoshi Nakamoto. and to affirm transparency among peers. Blockchain is distributed ledger technology that uses cryptographic hashing to encrypt data in blocks. Each node gets updated whenever any transaction occurs and each node must authenticate every transaction which affirms transparency among peers. Blockchain technology has gained its popularity in a trice due to bitcoin which is a mere application of the technology. The quality of assurance of blockchain has made many corporate leaders avidly interested in adopting the technology.

The paper will be elucidating the working of Blockchain technology to understand its industrial application, use cases in the legal field and corporate. Also elaborating upon challenges in its implementation which include cybersecurity, privacy, etc. escorted with some recommendations to escalate the use of technology.

Keyword(s): Bitcoin, Distributed Ledger Technology, Cryptographic hashing, Node, Law, Corporate, Cybersecurity.

I. NATIONAL BLOCKCHAIN INTRODUCTION: A BROADER PERSPECTIVE

Blockchain technology or blockchain has emerged a lot in the past few years. The subject has gained interest first due to the growing popularity of Bitcoin, based on a peer-to-peer electronic finance system. In the year 1991 Stuart Haber and W Scott Stornetta first time introduced a “cryptographically secured chain of blocks”.³ In 2008 a developer or a group of developers, Satoshi Nakamoto, whose identity is still unknown published a paper introducing the application of blockchain as Bitcoin named, “Bitcoin: A Peer to Peer Electronic Cash

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³ Tech Faculty, Deloitte, History of Blockchain, ICAEW, (Nov.30, 2018) [icaew.com/technical/technology/blockchain/blockchain-articles/what-is-blockchain/history](https://www.icaew.com/technical/technology/blockchain/blockchain-articles/what-is-blockchain/history).

System” that described Bitcoin as a “purely peer-to-peer version of electronic cash”.⁴

However, Blockchain is beyond bitcoin and other cryptocurrency models, cryptocurrencies are mere applications of blockchain. The technology has acquired specific importance in the digital world as developers and researchers are studying its aspect and application all over the world. It is conceptually accepted that blockchain has emanated as an unconventional technology with the potential to shake the foundation of existing venerable economic systems and data assemblage systems. The technology has gained endorsement in several fields and is being used like a database, such as in the medical field to store data of patients, in transactions, data sharing, digital voting, etc. Blockchain can be simply defined as “Distributed Ledger Technology” (DLT) in which the ledger is accessible to all the peers and hence, providing decentralization of the system, decentralization is the independence from any kind of central authority for approval and assign control among peers. It creates a transparent and unalterable history of any digital transactions or other digital assets in a way that makes it almost impossible to hack or cheat the system. The stored data is encrypted using cryptographic hashing, Cryptographic hashing is a method that encrypts given data in a manner to make it unreadable for a human while still storing the data and not allowing inversion of output for the data. If a person with malicious intentions attempts to alter the chain by adding a block with some self benefiting information, or rather just false information referencing to some existing block as the previous block then instead of just merging in the chain, the chain branches parallel and as time passes new blocks are added to the leading branch (the branch with most blocks is considered leading branch) so the person (hacker) will have to keep pace with rest of the peers to maintain his practically impossible branch. And this nature of blockchain makes it immutable to any alteration. Blockchain is a kind of database but there is a key difference between blockchain and database and that is the way in which data is structured. Blockchain collects digital information together in groups, also referred to as blocks and blocks have the collection of sets of information. Blocks have certain storage capacities and when it exceeds the capacity, the information chains to the previously filled block. Hence, the formation of a chain of data took place and is known as the “blockchain.” It protects digital assets and helps to reduce risk and stamp out fraud. Generally, we distribute files among peers to share the digital information which can be altered but digital information created by blockchain can be distributed without copying and transferring. It is a digital ledger of transactions and whenever a new transaction occurs on the blockchain it duplicates and distributes records across the entire network on the

⁴ Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System*, <https://bitcoin.org/bitcoin.pdf>.

blockchain which makes the entire system transparent.

Blockchain technology has huge potential to initiate a revolution in the digital world and create transparency. However, a certain set of misleading information and ignorance of the subject is creating havoc among neophytes. According to a survey done by HSBC in 2017, it was found that 60% of the population said that they have not heard of Blockchain and most surprisingly 80% of people who *have* heard of blockchain do not understand it at all.⁵

(A) How does Blockchain work?

Let's simply understand the working of blockchain by relating it with the physical ledger of transactions. A physical ledger of the transaction is generally administered by an authority and participants do not have to play an important role in the administration. However, blockchain can be referred to as a ledger that is distributed among peers and resides on each device that is connected through a particular network, and here does not exist no authority. Each individual gets updated whenever a new transaction or set of transactions is added and every node, which is the device of each participant or user connected in the blockchain, must authenticate every transaction in the network. In a blockchain network whenever a new node joins the entire record of transactions gets downloaded to the system of the node.

The process of authentication in the blockchain is based on advanced cryptography, it is a process of protecting any information and communications using algorithms. In order to maintain the privacy and security of users' access and users' rights, the decentralized system is customized in two variants, Public blockchain, and private blockchain. Public blockchain can also be referred to as a "permissionless" blockchain; it has no owner or operator whose permission is needed to enter or exit the network. The most familiar example to understand this kind is Bitcoin, where anyone, anywhere in the world can create data on it. A private blockchain can also be referred to as "permissioned" blockchain. In this blockchain, there are a certain number of owners or operators who give permission for accessing and creating data. This is basically a partially decentralized system. Financial institutions generally prefer working in this type of setup. Linux Foundation is one of the examples of private blockchain. Some blockchains amalgamate both public and private to form a "hybrid blockchain" model. For instance, XinFin works on both Ethereum and quorum which is a public blockchain and private blockchain respectively.

⁵ *Trust in Technology*, HSBC, (2017) <https://www.hsbc.com/-/files/hsbc/media/media-release/2017/170609-updated-trust-in-technology-final-report.pdf>. (Last visited Jul 05 2021)

Blockchain works with three core components, data, hash, and hash of the previous block. For instance, cryptocurrency blockchain contains data of transactions, hash, and hash of the previous block. Hash is a unique text string that is the output of any kind of data stored in a block.

There are few drawbacks to the blockchain as in any other technical setup. Once a transaction is processed on the blockchain, it cannot be reversed which results in difficulty in reversing any fraudulent transactions. To avoid such complications in fraudulent transactions in common, it is advisable that blockchain should be used in particular kinds of transactions like if there are multiple parties in transactions if the transactions need to be recorded in a permanent manner in the absence of central authority. It can be used in transactions where there are multiple parties and lack trust among each other and want transparency.

Blockchain works on the “Consensus Algorithm and protocol”, which utilizes algorithm and protocol for agreement of nodes on the same state of the Blockchain even without trusting each other. Steps which are followed by any standard blockchain in any transactions, first a transaction request made by nodes transmitted to all users in the network and verified by consensus algorithms. The verification is based on two algorithmic techniques, private or public key infrastructure or cryptographic hash. Then the Verified transactions in combination with other related transactions form a block and new blockchains with older blocks. The chain of blocks keeps the record as a ledger of all past transactions and is shared by all related nodes. And hence the transaction takes place.

(B) Corporate structure of Blockchain

Blockchain is a very powerful tool and has the potential to automate contractual transactions and legal supervision. Blockchain has gained a lot of popularity and blockchain models are being developed and tested in several sectors such as governance, media, medicine, finance, business, etc. In the corporate world as compared to typically centralized databases blockchains can introduce very powerful business models. Blockchain-based technology has struck the market and offered alternatives to the existing corporate governance solutions. Blockchain technology is widely accepted for its transparency policy and it can facilitate the removal of intermediaries in corporate governance through peer-to-peer connectivity and ensure that no participant in business and contractual transactions can escape the set of rules and law.

According to a global market survey by Juniper Research (2017), 60% of large corporations

are considering blockchain deployment during the next 2 to 10 years.⁶ Some feature of blockchain technology which elevated its value in the corporate world are:

1. It maintains data with accuracy without involving any central authority or intermediary which never existed before in any network on the internet.
2. It allows for secure transactions and transfer of ownership in a peer-to-peer model without a central authority.
3. Before storing the data is encrypted using cryptographic functions and algorithms with the help of private and public keys, hash algorithms, and time stamping.
4. Blockchain is more resistant to cyber-attacks compared to centralized systems where important data are kept at one node and in it There is no such single point or head in the system which can be attacked with malware and also its built-in consensus mechanism is able to detect malicious attacks and also isolate them. A public blockchain is more resilient than a private blockchain against cyber malware.
5. Blockchain can provide an efficient platform for the development of new applications such as “smart contracts” or digital agreements, “tokens” and “Decentralized Autonomous Organizations” (DAOs).

II. LEGAL INCORPORATION OF BLOCKCHAIN

Blockchain technology is spreading its reign in almost every industry and also gaining its possession over the legal industry with its ability to store information in a transparent and immutable ledger. Blockchain has a great potential to incorporate into law. Most importantly in corporate law as most of the corporate activities are dependent on contractual transactions and interpreting that with smart contracts in order to make it more secure. In corporate law, the blockchain is used to store and validate records of transactions and it helps legal firms to maintain an accurate chain of custody and other legitimate activities on the blockchain. It will allow lawyers to form a ledger of various legal activities and data, like property records, court records, filings of the case, funds transfers, legal codes, and contracts. Blockchain can offer several services in the legal fraternity-like working in smart contracts, property registries, intellectual property rights, and contractual transactions. And the application of smart contracts in the general corporate world will make it secure in a manner like if a code of law or any regulation can be embedded as a smart contract in a blockchain, then it will be

⁶ Vedat Akgiray, *Blockchain Technology and Corporate Governance*, OECD, (Jun. 08, 2018), [https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/CA/CG/RD\(2018\)1/REV1&docLanguage=En](https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/CA/CG/RD(2018)1/REV1&docLanguage=En).

quite impossible to break the law as when some node will try to breach the law then the whole system will get to know and is tantamount to breaking the code of blockchain. It can be also understood simply, that the only way to breach the law is to “crack” the computer code. Blockchain is potentially a very powerful tool to automate contractual transactions and bind legal supervision and enforcement with code. And automation of contracts also helps in storing huge historical records and will help in avoiding excessive paperwork. In 2017, the time for change PwC law firms’ survey revealed that 70% of surveyed law firms would utilize smart contracts for transactional legal services.⁷

(A) Application of Blockchain in Law

- **Litigation and Blockchain:**

Litigation is a proceeding initiated by petitioner and respondent where they establish and safeguard legal rights of themselves in court. Litigation involves various steps and procedures while filing lawsuits like pre-suit negotiations, appeals, and arbitrations. The procedures may be time-consuming by the involvement of a lot of paperwork and may lack some transparency which also encourages corruption. Adopting blockchain in litigation can help to reduce the documentation work and time consumption and could help to bring transparency to the system. Application of blockchain can be introduced in litigation in the following manner:

The process of signing up Lawyers to the platform

On a blockchain-based platform for lawyers, Lawyers should register with relevant information like their professional skill and experience and contact details which can be accessed by all members of the network.

Plaintiff and defendant on the platform:

If a plaintiff has decided to file a complaint then they can sign up to the platform with personal information which must include identity proof. After signing in to the platform they can find the lawyers registered on the platform for their specific case.

After choosing a lawyer, the plaintiff would have to file a complaint about an incident that has harmed their legal rights and also details of the person against whom the claims are being made on the blockchain.

⁷ David Snell, et. al., *Time for change PwC Law Firms’ Survey 2017*, PWC, 26th ed. 2016 <https://www.pwc.co.uk/industries/law-firms/law-firms-survey-report-2017.pdf>.

When the complaint is filed then the defendant would be notified and given credentials to join the platform and respond to the same with facts from their side.

Due to the technology of blockchain to maintain immutable records and transparency in the network, neither a plaintiff nor a defendant can manipulate the legal documents.

Here the judge would access the network and after hearing both sides can issue a verdict which would be uploaded to the network and will be available to each participant and also potential participant which may help in any case in the future. This system of settling can bring transparency to the whole legal system.

- **Blockchain and IP industry:**

An Intellectual Property transaction involves various aspects, like assignment of a patent, validity of the patent, negotiating a sales transaction, and finally informing all relevant patent offices about the transaction. And, as blockchain technology advances, smart contracts will be widely used in the IPR domain, as they can be useful in legal and binding contracts. Some important aspects that are promoting this aspect of technology are PATENTICO, Bernstein IP, and IPwe.

Blockchain for determining Proof-of-Ownership:

Blockchain technology has the potential to revolutionize the verification of the authenticity of an IP work's ownership. And in this era of the internet, the main hurdle is exercising copyright and, in this instance, the blockchain can be a game-changer as it provides both security and proof of ownership of intellectual assets. Some state-of-art tools in this sector are Orbit Blockchain, Bernstein IP, PT & S Intellectual Property, Binded, Vaultitude, Artizyou, and the NPER Project.

Blockchain for enabling the IP marketplace:

A blockchain is a kind of Distributed Ledger Technology (DLT). And this DLT technology utilizes multiple nodes to record, share and synchronize transactions in their respective ledgers. And in this case, the blockchain can serve as a potential platform for inventors to post their inventions with a brief description, thereby creating a potential marketplace for intellectual property. As a result, this network can be used to disseminate information about the IPR domain to a larger potential audience while maintaining transparency, security, and time-frames. Some current state-of-the-art tools are DEIP Ledger, IPwe, GoChain, and IPChain.

The blockchain is being used to unify global patents.

With the advancement of blockchain technology's immutability, security, and transparency, it has established itself as a potential global platform for the protection of all digital assets. Various laws and governments are gradually accepting and incorporating the blockchain as proof of evidence, and Section 65B of The Indian Evidence Act, 1872⁸ (Admissibility of electronic records) of Indian legislation could be critical.

Blockchain for maintaining version control of digital assets:

Patents, copyrights, publications, and other digital assets have multiple versions, and the blockchain will connect all of them by preventing any kind of malfunction, allowing all versions to be controlled. The state-of-art tool for this is Bernstein IP.

- **Smart Contracts:**

Contracts are the agreement between parties which are enforceable by law. Typically legal contracts are drafted manually which require a significant amount of time and mostly the physical presence of the party. Manual processing of legal contracts makes it vulnerable to error. With blockchain, such errors can be avoided as it can automatically execute contracts when certain specific requirements are fulfilled. Legal contracts can be generated in blockchain when both parties, their lawyer and signing authorities register themselves to the platform with valid identity proof for individuals, licenses of signing authority, and other important documents. The most interesting thing is here that even a small change will require the permission of each individual involved.

III. MORE APPLICATIONS OF BLOCKCHAIN

(A) Banking system

While researching blockchain applications in the core banking system, it is common for people to fantasize about global cryptocurrencies (such as bitcoin, ether, Libra, etc.), international trade finance, or international money transfer. It can be said without an iota of doubt that there is a barrier to cross-border value transfer and here comes the role of a blockchain that provides a smooth tunnel to erase this barrier. And here is a factual question: how can the blockchain help national banking systems? Can it renovate a national payment gateway, i.e. interbank payment?" Blockchains have a huge potential market in the banking industry. As mentioned in the introduction, Infosys and TCS are two of the largest companies that have integrated blockchain technology into the core banking system. The entry of the

⁸ The Indian Evidence Act, ACT NO. 1 OF 1872, § 65 B(Ind.).

blockchain into the public lexicon with an effective rise in bitcoin is nonetheless controversial yet revolutionary. Most banking systems and financial institutions have yet to join the open-ledger bandwagon, despite recent developments in this sector demonstrating how technology can be reintroduced as a means of addressing various aspects of the financial system. According to a Santander Bank study, the blockchain could reduce the cost of financial infrastructure by 15 to 20 billion USD by 2022.⁹ The same can be done by adding a smart contract to the ledger functionality of a blockchain that will allow various kinds of self-executing instructions and ultimately reduce manual verification as it eases the calculations and also the cost and labor-intensive task of manual work. The same thing was traced by the FICCI in its report. It has also become more effective due to its security, as it is a difficult-to-breach, decentralized data system, and streamlined transactions alleviate many of the top security concerns for banks. Several financial institutions, investment funds, and other financial structure institutions have also considered the potential impact of blockchain on the banking system. JP Morgan Chase, which has spun off a division dedicated solely to blockchains and focuses on a variety of smart contracts, is one of the most prominent financial infrastructures that have incorporated blockchains into their financial systems. Goldman Sachs has launched a circle project to investigate blockchain technology and digital currency. The Bank of America has created a single blockchain network to authenticate data from banks and personal data. In addition, seven major European financial institutions, including BNP Paribas Securities, announced the formation of a venture called "liquid share" to investigate blockchain-based infrastructure for Europe's small and medium infrastructure.

Coming to the Indian banking system, as mentioned above, in India, the banking sector is going through a transformative period as it is in a race to adopt new technologies, mainly the blockchain, to provide a lubricant for the banking transaction channels. In 2019, 11 leading Indian banks, including ICICI, Axis Bank, HDFC, Mahindra, Standard Chartered, RBL, and South Indian Bank, formed a consortium to introduce and operate a blockchain-linked loan system for small and medium-sized businesses in the country. The Bank of Baroda, the State Bank of India, and Indus Bank later joined this race as outsiders. Later, a push was given to the technological aspect of blockchains in the banking system when ICICI Bank, Axis Bank, and Yes Bank joined the league of blockchains from the front lines by joining "the Interbank Information Network (IIN)" and JP Morgan's blockchain network. Aside from that, to connect with foreign banks, SBI has begun to establish a wide range of networks to lower the

⁹ Yessi Bello Perez, *Santander: Blockchain Tech Can Save Banks \$20 Billion a Year*, Coindesk, (Jun. 16 2015), <https://www.coindesk.com/santander-blockchain-tech-can-save-banks-20-billion-a-year>.

rate of lending. Even the Ministry of Electronics and Information Technology (MeitY) has prepared a draft framework to work upon blockchain technology.¹⁰

Furthermore, as stated by IDRBT in its January 2017 report, confirming the cost-saving transparency and efficiency, stating the benefit of having a blockchain observed, and having a good understanding of various aspects of blockchain technology, we recommend that the time is ripe for its adoption in India.

(B) Securities

With the increasing capabilities of the stock market across the globe, the leverage of blockchain has also. However, the question here is how the blockchain will catalyze the next generation of security markets. This question can be answered by various aspects of the blockchain available on the market.

Because of the role of intermediaries, operational trade, and the regulatory process, stock market participants such as traders, brokers, regulators, and stock exchanges must go through a time-consuming process that can take up to 3 to 4 days to complete a transaction. And in this instance, the blockchain can make the stock exchange much more optimal by decentralizing it. The Blockchain assists in lowering the cost of commissions levied on customers during the transaction settlement process. The use of blockchain technology is not limited to transactions only, as the technology can be of viable use as it eliminates the need for third-party regulation to a large extent, as the rules and regulations would be in-built in the smart contract and each trader needs to register themselves with the blockchain network as a regulator for all transactions. Thus, the blockchain, by its viable method, securely automates the post-trade process and eases the paperwork of trade and legal ownership.

The Indian stock exchange has also taken some detours in the development of blockchain technology. As in 2015, Nasdaq has announced an initiative to leverage blockchain technology as it offers an efficient fully-electronic service that facilitates the issuance, transfer, and management of private companies. Later on, in 2016, Nasdaq announced an end-to-end solution for its financial infrastructure clients across the world, "Nasdaq Financial Framework and Nasdaq the first-ever multinational company to introduce blockchain in a non-currency manner. Following in the footsteps of such adoption, various potential security exchanges such as the National Stock Exchange, Bombay Stock Exchange, London Stock Exchange, Deutsche Borse, and the Japanese Stock Exchange have invested in blockchain

¹⁰ Madhura Karnik, *Blockchain technology is the coolest thing in Indian finance right now but nobody really gets it*, Quartz India, (Apr. 25 2017), <https://qz.com/india/966629/blockchain-technology-is-the-coolest-thing-in-indian-finance-right-now-but-nobody-really-gets-it/>.

technology in various forms.

The Securities and Exchange Board of India (SEBI) established the Committee on Financial and Regulatory Technologies (CERT) in August 2017 to conduct extensive research into blockchain technology to improve asset management and post-trade settlement.

The Japan Exchange Group has already completed proof of concept testing to use blockchain technology in its capital market. Likewise, SBI Holdings has reportedly partnered with Sumitomo Mitsui Financial Group (SMFG) to launch a digital stock exchange slated for spring 2022. SBI owns 60%, SMFG owns 40% of Osaka Digital Exchange (ODX), which the two firms are about to launch.¹¹

It should be noted that, in addition to India, several other countries are on the verge of establishing a secure network for security exchanges by leveraging blockchain technology, which necessitates a redefinition of the current legal framework to act more appropriately.

(C) Derivatives

A derivative is a financial security with a value that is reliant upon being derived from an underlying asset or a group of assets. The derivative itself is a contract between two or more parties, and the derivative derives its price from fluctuations in the underlying asset.

The most common underlying assets for derivatives are stocks, bonds, commodities, currencies, interest rates, and market indexes.

Blockchain and insurance:

Blockchain can be a potential platform to enable new insurance practices to build better products and markets. The cost-effectiveness of blockchain can be used in one of the initial areas of blockchain i.e. it can be used in the automation of paying claims. Blockchain has the ability to automate claims by verifying coverage between companies and reinsurers. It will also help to automate payments between parties and also helps to settle claims by lowering the administrative cost for companies. According to Magdalena Ramada-Sarasola, Ph.D. (InsurTech Innovation Leader EMEA, Willis Towers Watson) writes that blockchain has the potential to generate disruption in the insurance industry in six ways:

1. Disintermediation
2. Better Pricing and risk management
3. Increasing back-end efficiency

¹¹ *Proof of Concept Testing for Utilization of Blockchain / DLT in Capital Market Infrastructure*, JPX, <https://www.jpx.co.jp/english/corporate/research-study/dlt/index.html> (Last visited Jul. 07 2021).

4. Event-triggered smart contracts
5. Reaching the underserved
6. New types of insurance

IV. REGULATORY FRAME WORK

Blockchain creates an infrastructure or a medium still it is yet to stir up various regulatory controversies with various governments across the globe. Government organizations will pave the way to adopt blockchain technology in mainstream financial transactions.

As the flag led by UK many countries including Australia, US, Hong Kong, Malaysia, Singapore, UAE are exploring and to a length have implemented the idea of 'regulatory sandboxes' for blockchain innovation. Regulatory Sandbox is basically a method used by financial regulators to test innovative products and services as long as they meet consumer protection norms. In India, the RBI report of a working group of Fintech and Digital Banking indicates RBI consideration of sandboxes for India. The draft Payment and Settlement Systems Bill 2018 also has the concept of a regulatory sandbox.

The committee constituted by the Ministry of Finance, chaired by Mr. RatanP. Watal and in its report in 2016 noted the benefits of blockchain technology. In addition, it is to be noted that it has been recommended by IDRBT that the time is ripe for the adoption of blockchain technology in India. An agreement was signed by the Andhra Pradesh government with FinTech corporation in October 2016 with Montreal Authority of Singapore to, *"promote innovation in financial services in their respective markets[,]explore joint innovation projects on technologies such as digital payments and blockchain[,]collaborate on the development of education programmes/curricula on FinTech[, and] discuss emerging FinTech trends and exchange views on regulatory issues related to innovations in"* financial services.¹²

To examine the regulation of virtual currency an inter-disciplinary committee was set up by the Ministry of Finance in April 2017 chaired by Special Secretary (Economic Affairs) and represented by various Central government departments, including CBDT, NITI Aayog, State Bank of India, and the RBI.

Apart from all these some regulatory officials made comments in varied tones as:

As stated by H.R. Khan former Deputy Governor in 2016, *"Blockchain is one thing that has*

¹² *Andhra Pradesh, Singapore's MAS pact for financial services*, Business Standard, (Oct. 22 2016) https://www.business-standard.com/article/pti-stories/andhra-pradesh-singapore-s-mas-pact-for-financial-services-116102200578_1.html.

come out of Bitcoin which provides a lot of flexibility in terms of financial transactions. So, we need to study... how this blockchain technology can be used in financial transactions where the entire data systems move to some more levels."¹³

In 2017 the then RBI Deputy Governor R.S. Gandhi said, "Blockchain, the foundation for bitcoins-like innovations, is touted to be the death knell of currency. I believe its potential is being overstated. We can see that in these types of solutions for virtual currency, there is no central bank or monetary authority. They pose potential financial, operational, legal, customer protection and security-related risks." However, he opined positively towards the research of IDRBT's blockchain project.¹⁴

In a report RBI of the Working Group of FinTech and Digital Banking, it has identified Blockchain as one of the three pillars in Banking, Financial Services

In its budgetary speech of February 2018, Finance Minister stated,

*"Distributed ledger system or the blockchain technology allows organization of any chain of records or transactions without the need of intermediaries. The Government does not consider crypto-currencies legal tender or coin and will take all measures to eliminate the use of these crypto-assets in financing illegitimate activities or as part of the payment system. The Government will explore the use of blockchain technology proactively for ushering in digital economy"*¹⁵

The future of blockchain at this stage cannot be predicted as there are some negative opinions within officials and some hurdles in form of legal authority. There still a requirement of pro bono research in blockchain technology reform in all aspects and to eliminate defects if any.

V. GLOBAL DEVELOPMENT

Authorization of blockchain by Government of UK:

UK government in 2017 has granted a blockchain-based finance startup Tramonex a small Electronic Money Institution (EMI) regulation. Tramonex offers to provide, *"single centralised payment hub [that] can reduce the cost of your banking infrastructure and*

¹³ RBI to study Blockchain technology to curtail paper currency, Livemint, Jun 24 2016 <https://www.livemint.com/Politics/0Ie2NO4WLcJUT8sL3FctUN/RBI-to-study-Blockchain-technology-to-curtail-paper-currency.html>.

¹⁴ Himadri Ghosh, *Bitcoin surpasses \$12,000: RBI issues warning, says issued no licence to operate virtual currencies*, IBT, (Dec. 06 2016) <https://www.ibtimes.co.in/bitcoin-surpasses-12000-rbi-issues-warning-says-issued-no-licence-operate-virtual-currencies-752107>.

¹⁵ Natasha Lomas, *PSA: No India Hasn't banned Bitcoin- But it's still talking though on crypto*, Techcrunch, (Feb. 03 2018) <https://techcrunch.com/2018/02/03/psa-no-india-hasnt-banned-bitcoin-but-its-still-talking-tough-on-crypto/>.

*increase efficiencies”*¹⁶

French Government Authorization:

In 2017 French government become one of the first countries in the world to, “*regulate the recording and transfer of securities on a shared electronic recording device, such as blockchain*”.¹⁷ The government also issued ‘mini bonds’ in April 2016 which is basically a type of corporate debt instrument facilitating crowdfunding. The order explicitly permits the transaction using blockchain technology. The first known regulatory definition was also propounded in the order: “*a shared electronic recording system allowing for authentication.*” Apart from this French government has also started working over the legal framework in 2017 when the bubble of Initial Coin Offerings (IOC) and renewed cryptocurrencies. In 2020 in its report, the French Financial Markets Authority (AMF) identified legal obstacles to the development of security tokens suggested for the creation of a European ‘Digital Lab’ that shall facilitate transactions involving security tokens. In all, it can be said that the French government has taken major steps in removing the legal obstacle.

On November 26, 2020, a notification of the Ministry of Finance relating to Digital Assets business was published in the Thai Government Gazette. Two new categories of digital assets business were prescribed in the Royal Decree on Digital Asset Business as:

1. Digital Asset fund Manager
2. Digital Asset Advisory Service

This new notification requirement for granting license for Digital Asset Business Licensing Notification includes:

- The licensee must never have been denied or revoked in the last six months.
- The licensee’s application must not be a replacement of a previous application that has been withdrawn by the licensee
- the licensee must not currently be under any legal proceedings for any violation of the law.

The digital asset must commence within 180 days of receiving licensing approval. The move by the Thai government is a step in recognizing digital assets and business in the new age

¹⁶ Nishith Desai, *The Blockchain Industry Application and Legal perspective*, Nishith Desai Associates, (Nov. 2018) <http://www.nishithdesai.com>, (Last visited Jul. 12 2021)

¹⁷ New “*blockchain*” regulation related to ownership and transfer of securities: the upcoming end of printed securities registers for French companies, Lexology, (Feb 08 2018) <https://www.lexology.com/library/detail.aspx?g=abbf3f48-0933-497c-8a11-580a79341266>.

of technology.¹⁸

Malta Regulatory Framework:

Malta has passed three new laws namely, The Malta Digital Innovation Authority Act, The innovation Technology Arrangements, and The Virtual Financial Assets Act for regulating cryptocurrency and the blockchain ecosystem.

1. Malta Digital Innovation Authority Act: The MDIA Act provides for the establishment of the MDIA, the Authority that will regulate innovative technologies, and introduces a new level of communication between national competent authorities.
2. The innovation Technology Arrangements and Services Act: This act is intended to meet the standards of legality, integrity, transparency, compliance, and accountability. These shall be assessed by the Authority based on its own reviews of all persons involved, all documentation available, and the software it may access as would any user thereof.¹⁹
3. The Virtual Financial Assets Act: It provides a framework for the issuance of DLT assets through ICO and crypto exchanges and their operation. Malta has divided to replace the word 'cryptocurrency with Virtual Financial Asset' ("VFA")²⁰

VI. JURISDICTIONAL QUESTION

Blockchain has nodes that can be located anywhere in the world thus it has the ability to cross jurisdictional boundaries. But this poses a number of complex jurisdictional issues as this requires careful consideration to relevant contractual relationships. Due to differences across the jurisdictional principle of contract and title, it needs to identify appropriate governing law. In a decentralized system like blockchain, it is difficult to appropriate rules as in conventional it was easier as there was a need to locate the faulty bank irrespective of transactional mechanism and location. Here requires the demand of a competent forum.

(A) Competent Forum

The method for determining an adjudicating forum for blockchain is still not clear. Firstly, due to the absence of an intermediary in the blockchain network, one has to rely on external agencies to adjudicate blockchain disputes. This becomes a bone of contention as it creates two kinds of conflicts one is lack of knowledge and another is the conflict of

¹⁸ Teelada Rujirawanichtep et.al. *New Digital Asset Business Requirements for Business in Thailand*, Tilleke & Gibbins, (Jan 14 2021) tilleke.com/insights/new-digital-asset-business-requirements-for-businesses-in-thailand/.

¹⁹ <https://mdia.gov.mt/legislation/> (Last visited Jul 08 2021).

²⁰ *Malta's New regulatory framework built for blockchain technology*, PWC, <https://www.pwc.com/mt/en/publications/technology/pwc-malta-blockchain-alert.html>. (Last visited 08 Jul 2021).

sovereignty. Thus the jurisdictional issue in blockchain will form an integral issue until a clear mechanism is established to determine the residence of distributed ledger for jurisdictional purposes. And the advent of the internet shall trigger various questions like, should we apply, 'lex loci deficit, the lex loci protections' or the 'lex loci contracts'?

Who shall hold Liability:

As the system of blockchain is decentralized and no single user controls the outcome of the ledger and thus creates a serious problem in pinpointing the liability in case of a dispute. And if there any malfunction or data theft in blockchain it will be unclear that on whom the liability shall be imposed or who will be liable – owner, operator, software developer, or the nodes in the network.

VII. CHALLENGES BEING OBSTACLES IN IMPLEMENTATION

Blockchain is acquiring different territories around the world. In some fields, it is being practically explored and in some, it is still thriving in theory. Blockchain has the potential to revolutionize the entire world with its advent in fields like the corporate world, legal premises, medical field, banks, etc. but it is a known fact that any technology with such transformative potential and being in its initial stages of development and also with a very few applications faces several challenges in implementation. Here are Some challenges which are obstructing the application of blockchain in several fields:

CyberSecurity: Blockchain technology is based on principles of cryptography, decentralization, and equal participation, which ensure trust in transactions. It is a transparent system and a single node cannot alter any record of a transaction and enables decentralization through the participation of each member across a distributed network. Even with such transparency and being almost immutable, blockchain technologies face some security issues. Someone with knowledge of its vulnerabilities can manipulate and can hack the infrastructure, it can be hacked by manipulating private keys or digital signatures or by code exploitation. While using blockchain one of the most vulnerable things which can be a threat to cybersecurity is the devices of members of the network. Members who lack a complete understanding of the technology can be easily tricked by hackers. According to the DI-CIR global blockchain survey, 2020 Approx 58% of participants expressed that cybersecurity is one of the several issues that is affecting blockchain-related strategy.²¹

²¹ Linda Pawczuk et. al., *Deloitte's 2020 Global Blockchain survey*, Deloitte, https://www2.deloitte.com/content/dam/insights/us/articles/6608_2020-global-blockchain-survey/DI_CIR%202020%20global%20blockchain%20survey.pdf, (Jul. 09 2021).

Privacy complications: Transparency is the essence of blockchain technology, also combined with the ability to trace participants with their real identities which may lead to privacy implications. According to the Deloitte blockchain survey, 41% of participants cited concerns over the sensitivity of their proprietary information as a cause of the narrow adoption of blockchain.²²

Lack of adoption: As it is a new concept a lot of corporate firms are not familiar with its functioning and hence are not adopted by a majority. Blockchains are like ecosystems that are based on peer-to-peer networks to work which effectively work in a broad network. For instance, let's consider the application of blockchain in law, when a large number of qualified lawyers will join the network and also the complainant and defendant will be akin with the functioning then it will work effectively.

Trust issues: Blockchain technology connects peers through a network and huge numbers of nodes connected do not know each other in person and this leads to trust issues among peers. Only the lack of trust among peers does not conclude trust issues but also there is another huge obstacle in the implementation of blockchain, that several organizations do not believe in this emerging technology. According to a survey by APQC, 41% cited trust issues among users as a challenge in the adoption of blockchain. Although it was observed through polling of supply chain professionals.²³

VIII. RECOMMENDATIONS

Blockchain has the capacity to create a transparent and corruption-free ecosystem in almost every field which works with the involvement of a group of people. But implementation of blockchain is encountering certain challenges which when cleared up will result in a reformed consumerist society. Some recommendations to untangle the issue of Implementation:

- The intricacy of the technology: Implementing and managing a blockchain is a little tricky and without a thorough knowledge of its use and application one may end up losing their data and also face some technical problems. There should be organized sessions to create awareness about the technology. When the application of blockchain is limited to the corporate world then mandatory tutorials do not make a difference but when it comes to application in law, voting, and other such activities involving common people then it becomes a basic need.

²² *ibid*

²³ *Ibid* at 18.

- **Resolving trust issues:** Blockchain technology is still in its developing age and it is quite difficult to gain trust at this stage. Blockchain is a completely web-based system and peers cannot identify each other and this may lead to a lack of trust among them. It seems that to avoid trust issues in blockchains, it is necessary to have some connection among peers in the real world to get information about assets, a trusted authority may be required to connect without any threat to privacy.

- **Legal enforceability:** The construction of believing in something needs an assurance that whenever some issue will arise an established system will protect us like in general we make a legally enforceable contract and when a condition is not fulfilled we approach a court for its enforceability but in the case of blockchain if such condition will arise then it will be difficult to overcome it as it is not a regulated system. Legal recognition is needed.

IX. CONCLUDING REMARKS

From the above article, it can be concluded that Blockchains act as a shared database and are distributed across peer networks. It is transparent and entries and data stored in blocks cannot be modified by a single entity, it requires consensus of peers to carry out such actions, and also adding some new data in the blockchain needs an agreement between nodes. It can be undoubtedly said that blockchain technology has the potential to revolutionize the whole existing system. Blockchains have the potential to revolutionize the banking system, legal system, corporate system, legal system, etc. Among the fields mentioned above, blockchain has been used in a very few of them and the rest are just fascinating in theory, and theories are clearly explained in the paper. As an aspiring member of the legal fraternity, it is clearly visible that several legal grey areas along with the deployment of blockchain in various industries. Like every other new technology, this innovative technology is also accompanied by some challenges in its implementation like some strategic, technical, and legal issues in the form of trust, security, adoption, privacy, etc. Challenges that are becoming an obstacle in the way of implementation of blockchain need to be addressed properly to spread the reign of such a transparent and decentralized system. Blockchain implementation and regulation will not harm any corporate firm in any manner when it has complete knowledge of the application of the technology. After resolving the challenges mentioned, blockchain has the potential to set up a world with transparency which will boost development.
