VOLUME 17 ISSN 2456-9704

BLOCKCHAIN TRANSMOGRIFYING TECHNOLOGY: LEGAL CONSTRAINTS & ISSUES INVOLVED IN ITS IMPLEMENTATION

By Athith Pradeep
From Alliance School of Law, Alliance University, Bangalore

ABSTRACT

In a world of digitized business as a primary contributor to a potentially better and more fluid economy. There is a great demand for a more systematic arrangement and assessment in terms of regulation and governance so as to ease the intricacies. In a centralized payments network like PayPal. We instill trust in such payment companies to safeguard our money and the transactions that follow. They keep track of the money and have access to it. We ought to trust their ledger. But, in a decentralized payments network, there are thousands of computers around the globe; all trying to update the ledger. Whose ledger do we trust? That's the innovation we are seeking here. That is where 'Blockchain' comes in. In the IT sector, the term 'Blockchain' has been thrown around like confetti and used so extensively in recent years and continues to grow exponentially. In this paper, we discuss the various advancements in blockchain technology and how this technology network is going to redefine technology and e-commerce as it is today. The aim of doing so is to recognize prevalent analysis topics for open challenges for future studies in matters concerning various features of the blockchain technology such as - decentralization, smart contracts, enhanced security etc. the following is done by an in-depth research into four significant articles and journals consisting of an interdisciplinary array of topics which would result in the thorough completion of this study. The research stretches across a number of topics which include smart contracts based on blockchain technology, innovation of business through the application of blockchain, the role of blockchain in developing and remodeling today's e-commerce and the status check on the implementation of blockchain technology in India. Blockchain is a great tool that helps multiple parties to collaborate without having to instill trust in one another. For investors, developers & entrepreneurs, now would be the right time to step in and invest time and money in this treasured technology network. Blockchain is deemed to revolutionize the e-commerce sector by a mammoth proportion. There is now a technological institution that will fundamentally change how we exchange value, and it is called the blockchain.

1. INTRODUCTION

1.1. Background

Ever since the inception of internet, there has been a great degree of influx with regards to the number of websites catering to large groups of people. This insane and drastic growth of the electronic marketplace desperately calls for the implementation of a more secure, rigid and a stringent system that would be rid of the middle man and would not require a trust factor between the transacting parties. Ever since a plethora of infamous money laundering scams surfaced, people began to lose trust in the centralized system of transaction. Blockchain has emerged as a beacon of hope for the present and future generations. However, there are many significant aspects regarding blockchain one must consider looking into.

As of today this blockchain technology is gaining popularity and mainstream attention and it is already being used in numerous applications. This technology is considered as one of the most disruptive technologies over the years with regards to the number of industries, insurance, healthcare etc. Blockchain technology is deemed to change the internet towards a more cryptographic transparent network from a centralised server based internet system.

1.2. Research Problem

With the introduction of blockchain, there are new legal challenges yet to be explored and made aware of to the common people who have, though, heard the term 'Blockchain' thrown around, wouldn't claim to understand it in its entirety. Hence, it is significant to understand the legal constraints and elucidate the reasoning behind such constraints on the implementation of blockchain technology.

1.3. Rationale & Scope

The aim of this study is to discern legal actions concerning the legal limitations or restrictions on the implementation of blockchain technology & also to recognize prevalent research topics for open challenges for future studies in matters concerning – smart contract, status on the regulatory framework of the technology, data protection and other privacy issues.

1.4. Objective

The paper emphasizes on the following objectives:

- To determine whether blockchain, a disrupting technology, would affect the practice of law;
- To determine how the immutability of blockchain technology would manage to prevent security breaches;
- To determine the type and extent of data protection regulations which are or may be appropriate in the application of blockchain;
- To determine whether blockchain technology is truly a promising technology of the future.

1.5. Literature Review

Alharby M and Moorsel AV, 'Blockchain Based Smart Contracts: A Systematic Mapping Study' ***Computer Science & Information Technology (CS & IT)*****, 2017.**

This Article, as the title reads, deals in an eclectic systematic mapping study of research concerned with Smart Contracts from a technical perspective. As the significance of Smart Contracts powered by Blockchain technology is growing exponentially globally, the need for such awareness and understanding grows alongside. The article talks about a number of topics regarding the generic background of Blockchain & Smart Contract technology and their platforms, codifying issues, privacy issues, performance issues & security issues.

Zhu X and Wang D, 'Research on Blockchain Application for E-Commerce, Finance and Energy' (2019) 252 ***IOP Conference Series: Earth and Environmental Science***

The Article is mainly concerned with the plethora of applications of blockchain technology through research in areas of E-Commerce, Finance & Energy. The study of this article would help readers understand the many attributes to the blockchain network i.e. blockchain technology components, blockchain application programming interfaces, and applications. The blockchain based applications cover supply chain finance, e-commerce transactions, product

traceability, user credits, financial services, trust systems, new energy etc.

Shorman S, Allaymoun M and Hamid O, 'Developing The E-Commerce Model A Consumer To Consumer Using Blockchain Network Technique' (2019) 11 *International Journal of Managing Information Technology* 55

This Article elaborates on the globally changing trends mainly in the field of e-commerce and the various roles played by Blockchain networks in remodelling and developing the e-commerce model. The article discusses the advantages to the e-commerce operations through the proposed model & how the model facilitates business processes between consumer & consumer by eliminating the central role of large business companies in controlling and setting restrictions.

Vijaya Kittu Manda and Aruna Polisetty, 'Status Check on Blockchain Implementations in India' (2018) SSRN Electronic Journal

This paper attempts to do a status check on blockchain implementations in India by an in-depth analysis of significant corporate bodies such as – Mahindra group & IBM, Bajaj Electricals & Yes Bank, ICICI Bank & Emirates NBD. The Government of Andra Pradesh's role in the implementation and application of blockchain technology. The implementation of blockchain technology by the Telecom Regulatory Authority of India (TRAI). The massive application of demographic and biometric technology by the UIDAI in its Aadhar Project & the various challenges faced by government agencies and other corporate bodies in such implementation.

1.6. Research Methodology

This study is conducted by an in-depth research on blockchain technology and seeking assistance from 5 significant articles and journals consisting of an interdisciplinary array of topics which would result in the thorough completion of this study. Comprising exclusively of secondary data which stretches across a number of topics which include smart contracts based on blockchain technology, innovation of business through the application of blockchain, the role of blockchain in developing and remodelling todays e-commerce and the status check on the implementation of blockchain technology in India.

2. THE INCEPTION OF BLOCKCHAIN AND SMART CONTRACT

Every cryptocurrency we come across is wired with an underlying technology called the blockchain. The question of trust does not arise here as this technology helps related parties to the transaction to come to an agreement without having to believe in one another. The concept and idea behind blockchain technology was described in early 1991 when research scientists Dr Stuart Haber and Dr W. Scott Stornetta helped get rid of backdating and tampering of sensitive information by launching a computationally practical solution for timestamping digital documents. The timestamped documents were stored in a system which used a cryptographically secure chain of blocks. Furthermore, in the year 1992, a data structure used in computer science

applications called the Merkle Tree[1] was integrated into the conceptual design. This improved its efficiency by allowing the collection of numerous documents in just one block. Unfortunately, the patent lapsed in the year 2004 due to lack of utilization. In the same year a system called Reusable Proof of Work (RPoW) was brought to light by Dr Hal Finney. The system worked by registering and holding the ownership of tokens on a reliable server which was proposed to allow anyone across the world to authenticate its faultlessness in real time. Through this, the RPoW fixed the double spending complication. This RPoW was later considered as a noteworthy step for the inception of cryptocurrencies.

Later in 2008, a peer-to-peer and decentralized electronic money system called the Bitcoin was uploaded to a mailing list using cryptography by a group or a person going by the pseudonym Satoshi Nakamoto.[2] Here, bitcoin provided protection to the double spending problem by a peer-to-peer decentralized protocol for locating and authenticating the transactions. In the year 2013, Vitaly Dmitriyevich Buterin;[3] co-founder of Bitcoin Magazine and also a programmer, argued that a scripting language was necessary for the development of decentralized applications. Vitalik failed to gain the communities consensus on his ideologies and hence began developing a blockchain-based platform with a more general scripting language. This was known as 'Ethereum'. This blockchain-based platform is comprised of a scripting functionality called 'Smart Contracts'. These contracts are scripts or programs which are carried out on the ethereum blockchain. This ethereum cryptocurrency came to be known as Ether.

2.1. Smart Contract

During the process of a business transaction. The transacting parties instil trust in a centralized system in order to transact with one another. The centralized system acts as an intermediary between the two transacting parties and hence, it costs both; the business and the customer to make transactions in this manner. However, with the use of blockchain technology integrated with smart contracts, the smart contract acts as a contractual intermediary between the transacting parties.

The rules for negotiating certain contractual terms are stored in a particular type of software called the smart contract. It is an automated piece of software that automatically authenticates a certain contract and then executes the terms agreed upon. It could be better understood as an executable code that runs on a blockchain to facilitate, execute and enforce agreement terms. Thus smart contracts promise low transactions fees compared to traditional systems that require a trusted third party to enforce and execute the terms of an agreement.[4]

[1] Jake Frankenfield, 'Merkle Tree' (*Investopedia*, 2 Feb 2019) <https://www.investopedia.com/terms/m/merkle-tree.asp> accessed 6 November 2019.

[2] Satoshi Nakamoto, 'Bitcoin: A Peer-to-Peer Electronic Cash System' (2008) <https://bitcoin.org/bitcoin.pdf> accessed 6 November 2019.

[3] Vitalik Buterin 'Mechanism Design Challenges in Cryptocurrency and Blockchains' Proceedings of the 2018 ACM Conference on Economics and Computation - EC 18, <https://doi.org/10.1145/3219166.3277546> accessed 6 November 2019.

[4] Alharby M and Moorsel AV, 'Blockchain Based Smart Contracts: A Systematic Mapping Study'

Blockchain coupled along with smart contract technology annuls the requirement and dependence on the centralized systems by the transacting parties. Blockchain technology is immutable in nature i.e. If any party attempts to modify a contract or a transaction on a blockchain, all the other parties to the same contract or transaction can detect and prevent it.

A Brief History on Blockchain

1991	Research scientists Stuart Haber and Scott Stornetta elucidated the working of a secured chain of blocks through cryptography.
1998	Nick Szabo, a computer scientist worked on 'bit gold' and developed a decentralized mechanism for digital currency.
2000	Theory on cryptographic secured chains was published by Stefan Konst along with ideas for its implementation.
2008	There was a white paper released during this year by a person or a group going by the pseudonym Satoshi Nakamoto which set up the blockchain model.
2009	Bitcoins first transaction took place between Satoshi Nakamoto and Hal Finney for an amount of 10 BTC in turn implementing the first blockchain.
2013	Introduction of a cryptocurrency called Ether and the release of Ethereums White Paper by Viyalik Buterin.
2014	Birth of Blockchain 2.0 Blockchain began to recieve its own recognition distinguished from the currency

1. IMPLEMENTATION AND REGULATION OF BLOCKCHAIN TECHNOLOGY

Jamie Dimon the CEO of JP Morgan issued a fantastic statement[5] about bitcoin in 2017 by comparing it to Tulip Mania.[6] It is in my view that certain level of executives have cottoned onto a soundbite about a technology they don't fully understand and wheels it out every time they're asked about it; which is quite unfortunate because, JPMorgan has one of the most sophisticated developments concerning the blockchain as a Distributed Ledger Technology[7] (DLT). Their projects regarding the Quorum blockchain platform and Z-Cash headed by Amber Balbet is some really interesting work that is going on.

[2017] Computer Science & Information Technology (CS & IT) 127.

[5] Hughes Son and Hannah Levitt, 'Jamie Dimon Slams Bitcoin as a 'Fraud'' (*Bloomberg*, 12 September 2017) <https://www.bloomberg.com/news/articles/2017-09-12/jpmorgan-s-ceo-says-he-d-fire-traders-who-bet-on-fraud-bitcoin> accessed 11 November 2019.

[6] Adam Hayes, 'History of the Dutch Tulip Bulb Market's Bubble' (*Investopedia*, 25 June 2019) <https://www.investopedia.com/terms/d/dutch_tulip_bulb_market_bubble.asp> accessed 15 November 2019.

[7] 'Blockchain & Distributed Ledger Technology (DLT)' (*World Bank* 12 April 2018) <https://www.worldbank.org/en/topic/financialsector/brief/blockchain-dlt> accessed 17 November 2019.

It turns out that this Crypto Bubble was really useful for many and is the reason why the regulators are paying attention. Of course, that comes with a lot of problems. However, it exists for a reason. It is a reaction to far too much debt piling up in the economy and far too much quantitative easing being the only policy response and as a result we'll need some sort of a balance. Cryptocurrencies like bitcoin and other altcoins may seem like merely a bubble to some. It may seem like madness to others and may seem like they're at the fringe for those sitting in the C-suite of a bank. I have understood that maybe, just maybe there's something interesting and a new way of doing things. We can now come to an agreement that all bitcoins need blockchain, but not all blockchain's need bitcoin and to further understand that blockchain as a technology has managed to singlehandedly pave the way for other Distributed Ledger Technologies (DLT). Furthermore, my belief is that blockchain or decentralized ledger technology is the greatest thing since sliced bread. Both centralization and decentralization have its share of pros and cons. The mainstream problem related to decentralization is that it's risky with very little consumer protection, it's early, there's regulatory uncertainty, there's currency risk so on and so forth. Moving on to centralization related problems, such as; slow working of the banks, service costs, anticipation of a financial crisis and a number of other problems in the old world banking. Hence, the answer cannot be an either-or situation. The answer can't solely be decentralization or solely centralization.

1.1. Banking Through Blockchain

Up to this point we can agree that there are problems with the centralized systems and there are problems with banking today.[8] Some of those problems could be resolved by a simple upgrade to the way banks function and deal with each other. The idea is to automate inter organizational workflow that could put together a workflow across corporations and banks. Even so, it needs to be kept in mind that the idea of integration with old and overused systems is difficult. What excites me is dealing with something I could have full control over as an individual, a corporate or an organization. For as much as considering the fact that most banks do not have the strategies set up for the internet of things. The old conventional banking infrastructure just no longer measures up to the change brought about by new and upcoming technologies. This is where the blockchain is introduced as a technology which is fundamentally changing everyday life.

Blockchain is and will not just affect our business, but it will also change our day-to-day life dramatically. If we'd have to imagine blockchain as a game, it would be considered as a team sport. Most people believe, laypersons in terms of technology and programming need a PhD to understand a technology like blockchain. I believe this kind of thinking is erroneous. We can understand blockchain as a combination of three simple but significant concepts:

- Business Networks – Wealth is generated by flow of good and rendering of services across business networks e.g. customers, banks,

[8] Infosys (2001) BankAway! — Internet Banking — Issues & Challenges. In: SCN Education B.V. (eds) Electronic Banking. Vieweg, Teubner. Verlag

suppliers, government institutions, partners, cross geography and regulatory boundary.

- Digital Assets – Anything that is capable of being owned or controlled to produce value. Tangibles, e.g. a house, a car, real estate etc. Intangibles, e.g. bonds, stocks, patents, music etc.
- Ledger – It is the system of record for an institutions finances and totalling economic transactions and conditions for such transactions.

If we could put these three concepts into a jar and shake it up, we get the foundation for a blockchain – a shared ledger technology allowing any participant in a business to securely transact directly, with accountability and with higher resistance to malicious tampering. It's an environment where all the participants have control but alongside, none of them exclusively have control. Hence, I call blockchain transactions a 'team sport'.

With respect to the application of blockchain in a plethora of different fields and industries, the general public need to acknowledge and put up with this significant yet disruptive technology. This is due to the fact that lot of lower middle class and working class individuals would be affected by its widespread implementation. The use of blockchain technology is deemed to wipe out great many jobs and negatively affect employment in the corporate world. On the flip side, blockchain technology can revamp the working of many industries towards a more efficient and automated environment.

1.2. The Big WHY?

Blockchain has received a tonne of attention through the press, both in popular media and the legal circles. This system could be relied upon to remake institutions and industries throughout the world. Also, there are a variety of different ways in which blockchain technology can be used to make real-world improvements. Blockchain technology will surely move into areas way beyond the present digital currency movement Whether it is for transacting or saving money, the way we vote or even the way we practice the law. Most start-ups have begun integrating blockchain tech[9] into their business models resulting in the system having a widespread effect on the corporate world. Also, government bodies have begun looking into this technology which could again result in a fairly large transformation in the way a nation is governed. This surfacing wave of blockchain tech disruption would result in influencing many businesses and certain democratic processes like the elections and the way we cast our vote.[10] Illegalities like electoral hacks and voter frauds are major issues which has been discussed time and again. The proponents of blockchain technology believe that this peer-to-peer, decentralized and immutable technology if used as a public ledger voting system can not only help in faster counting of votes but also provide the governments with a system which is almost impossible to be hacked.

As blockchain continues to revolutionize business, more and more businesses like FedEx, IBM, Microsoft, MasterCard, KIK

[9] 'Tech Trends 2016' [2016] Innovating in the digital era 80 <https://www2.deloitte.com/content/dam/Deloitte/ie/Documents/Technology/ie-technology-DUP-TechTrends2016.pdf> accessed 19 November 2019.

[10] Fusco F and others, 'Crypto-Voting, a Blockchain Based e-Voting System' [2018] Proceedings of the 10th International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management.

and Walmart[11] are adhering to this technology by adopting the system due to its cheaper, faster and far more efficient methods of transaction. The idea of the blockchain being a public ledger is true to its word as all transactions on a blockchain are visible to users across the globe. Through this substantially transparent form of transaction between customers and their businesses, the demand for such a technology is sure to skyrocket. Apart from curbing illegal acts such as corporate fraud and other means of corruption this immutable, decentralized ledger system can be useful for preventing other unlawful activities like hacking, identity theft, phishing, scamming etc. Through the use of this system it would be impossible for hackers to tap into the various databases filled with sensitive information. This technology becomes a need of the hour as a plethora of infamous scams have surfaced over the years. Through the implementation of blockchain, thefts and breaches[12] affecting a large number of people would be a thing of the past. Businesses and its consumers can transact between one another with a feeling of safety and security.

2. BLOCKCHAIN AND THE LAW

With regards to the legality of cryptocurrencies like bitcoin and other altcoins, governments are always on their toes in order to curb such activity from advancing any further, the sole reason being; matters concerning lack of governance, regulation and control over the movement of digital currencies over various networks is believed to potentially instigate the masses so as to curtail government intervention and subservience, in turn resulting in the people lacking reliance on their governments followed by the enfeeblement of sovereign power. There is a certain degree of discontent expressed by government bodies in terms of fully understanding and coming to terms with the technology of today. The lack of understanding has unfortunately resulted in delaying the implementation of such technology and has the government drawing the short straw. On the other hand, blockchain technology has been lauded by millions including the governments of several nations. Though it is still acknowledged as the underlying technology behind bitcoin, there are far too many applications which are yet to be encountered by this transformational system in order to be acknowledged as an entirely distinctive system.

When we talk about the currently conspicuous legal issues involved in the application of blockchain technology, it is the usual suspects that you find on tech related aspects like:

- Data Protection in light of GDPR[13]
- How personal data is store on a blockchain node

[11] Christopher Tozzi, 'Walmart Explores Blockchain-Based Delivery System in New Patent' (*Nasdaq* 18 July 2018) <https://www.nasdaq.com/articles/walmart-explores-blockchain-based-delivery-system-new-patent-2018-07-18> accessed 3 November 2019.

[12] 'Equifax Data Breach Settlement' (*Federal Trade Commission* 23 September 2019) <https://www.ftc.gov/enforcement/cases-proceedings/refunds/equifax-data-breach-settlement> accessed 17 November 2019.

[13] Regulation (Eu) 2016/679 Of The European Parliament And Of The Council 'Official Journal of the European Union' [2016] <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0679> accessed 16 November 2019.

- Whether the data is regulated by privacy laws
- Awareness of end user rights
- The extent of the licence
- Ownership of Intellectual Property
- Options for the protection of Intellectual Property
- The indemnities and warranties provided by the supplier of the blockchain technology
- Whether there's an open source software being used and
- If this software is licenced under copyleft or permissive terms of licensing,

While speaking about the incorporation of distributed ledger technology (DLT) for application of data protection laws, we need to keep in mind that there are no actual global data protection laws. Though universal standards such as OECD Privacy Standards established in the 1980's and Article 12 of the Universal Declaration of Human Rights provide a common source for many data protection regimes, there is considerable variation worldwide.[14] The first international conference to assess the various effects of blockchain across a wide range of public concerns and government affairs was the OECD Blockchain Policy Forum.[15] Both the benefits and the risks of such a technology were discussed at the policy forum with emphasis on economic and community related topics in order to decide upon better approaches towards strengthening governance.

All distributed ledger technologies (DLT) which are used by an industry, organization or enterprise must adhere to the nations data requirements. Many individuals or corporations may not consider blockchain technologies for codebases of ethereum and bitcoin as the most suitable option for use in financial services in terms of easy access of private transaction data by all participants of the network.

In today's digital word, new technology is being developed each and every day and so is the need for a much more comprehensive regulatory measure and stringent legal requirements to evolve rapidly. It is crucial that the consequences of similar upcoming technologies need to be addressed by a more technologically sound and appropriate counsel. Lawyers have begun to pay more attention to this system and are researching the legal implications involved and the scope for advocating such technology.

Now, with respect to what this might all mean to business or corporate law, there are a number of different implications. What intrigues me the most is the idea of 'traceable shares'. Instead of having stocks mused together in a mutually interchangeable bulk by some centralized entity, we can consider a strategy for clearing stock on the blockchain. If a corporation 'A' were to issue stock, it would be issued in a way that would be referenced by the blockchain and we could now look back and have perfect historical provenance over who had owned any specific share of stock over any period in time. Here,

[14] 'Blockchains and Laws' (FinTech-Report-2017_CSB54240_JGarcia_GSManilaJuly 17AD) <https://www.bakermckenzie.com/en/-/media/files/expertise/fig/br_fig_blockchainsandlaws_jul17.pdf> accessed 28 October 2019.

[15] "OECD Blockchain Policy Forum 2018" (OECD 2018) <http://www.oecd.org/finance/oecd-blockchain-policy-forum-2018.htm> accessed 16 November 2019.

as far as corporate law is concerned I believe that there could be some really significant implications. Matters concerning shareholder voting issues can be conceivably alleviated because we would not have as many complexities trying to figure out who had the right to vote at any given moment in time. We could just look at the moment of the vote or who owned the shares by taking a peek at the blockchain and then giving them the voting rights and processing their votes. Similarly, if we were trying to figure out whether or not any individual shareholder had a legal right that required specific share identification we could just look at what shares they actually owned. Nevertheless, I feel it's more likely that we have a system where there continues to be intermediaries.

In the technical world, a smart contract is understood as an executable code that sits on top of a blockchain it is essentially a program running and interacting with the information on a blockchain. It is a code which may be employed to form an organization known as a Decentralized Autonomous Organization (DAO). This Decentralized Autonomous Organization[16] can be used to run similar applications. With regards to the case at hand, it can also be used to facilitate a legally binding contract. In 1996 Nick Szabo coined the term smart contract. He compared a smart contract to the functioning of a vending machine which is essentially an example of an electronic contract. Here, we have both offer and acceptance, the two significant elements of a legally binding contract followed by the dispensing of a particular food or beverage from the vending machine which satisfies the performance of the contract. Smart contract boasts an equal share as blockchain technology in terms of disruptiveness. It is known to disrupt many industries and affect many jobs from acting as an alternative to escrow agents to a decrease in the need for lawyers due to lack of lawsuits.

Anyhow, I believe that smart contract will certainly not disrupt the legal field by replacing lawyers in the short term. Firstly, smart contract integrated blockchain's would mostly work in very simple cases or very low budget transactions. The more complex cases and high budget transactions are still bound to lie on the desk at an advocates office. Secondly, smart contracts cannot ensure the enforceability for all contracts. For example – whether you can charge a prepayment penalty, whether the prepayment penalty can be treated as interest. Thirdly, Business contracts are replete with subjective language like 'reasonable', 'best efforts' or 'good faith', these are not things that can be codified. Hence, the technology lacks the understanding of acceptable performance.

3. BLOCKCHAIN AS A GAME – CHANGER FOR INDIA

While nearing the end of the year 2016, in the month of November, India experienced demonetization. This directed the country towards seeking any outcome which could likely be beneficial and hence resorted to adopting innovations like the blockchain and cryptocurrency which was a different approach involving a potentially disruptive and new form of technology which had the likelihood of being the best alternative to

[16] Chohan UW, 'The Decentralized Autonomous Organization and Governance Issues' [2017] SSRN Electronic Journal.

paper money. This alternative was also considered to be a safe means of transaction consisting of a built-in firewall which strengthened its reliability. This wave of change was seen to be a potential to transmogrify India into a cash free economy. This blockchain technology was known to make a huge impact on the Indian economy concerning areas related to stock trading and cross-border transactions. Smart contracts integrated with blockchain technology was known to improve the management of online identity with respect to credit ratings and banking.

We are all aware of the fact that India harbours a reputed number of skilled IT professionals. Despite the large population, India has managed to up-hold a very well regulated banking and financial sector with a decent banking penetration.[17] In this chapter we will discern whether blockchain is truly a game-changer for India.

- What if we could utilize this technology in order to save up on tonnes of paperwork and time. It can be an easy task when we speak about going to a bank to open an account. The difficulty sets in when it comes to providing KYC information every single time. Most financial institutions and banks would rather lean towards a concept involving a single identity who enjoys the rights to make changes to sensitive information like a private permissioned blockchain. Through the implementation of a common blockchain network connecting all banks of the same branch or different branches or even entirely different Lines of Businesses (LoBs), KYC details can be shared in a safe and secured manner without having to repeatedly provide such information.[18]
- Agro industries implementing agricultural technology into the supply chain comprising of farmers, suppliers, producers, processors, wholesalers, retailers and consumers could speed up the whole process from farm to shelf with a record of every transaction. The application of blockchain in such fields would help improve the sharing of data and subsequently resulting in the control of food quality by the consumers.[19]
- In terms of strengthening India's political structure due to the magnitude of corruption in the nation, blockchain technology implementation in democratic processes like voting would restructure and influence todays political system to a large extent in-turn making it more rigid and stringent.

Regarding already existing real world applications of blockchain technology, there are already a plethora of organizations which are incorporating this technology into their systems. To name a few companies which have already begun experimenting with blockchain tech:

- Telecom Regulatory Authority of India (TRAI)
- Government of Andra Pradesh

[17] Manda, Vijaya Kittu, and Aruna Polisetty. 'Status Check on Blockchain Implementations in India.' SSRN Electronic Journal, Jan. 2018, doi:10.2139/ssrn.3265654.

[18] Viswanathan, K S. 'Securing Trust through Blockchain: The Use Cases for India.' Economictimes.indiatimes.com, ET Rise, 1 Sept. 2018, <https://economictimes.indiatimes.com/small-biz/security-tech/technology/securing-trust-through-blockchain-the-use-cases-for-india/articleshow/65633798.cms?from=mdr> accessed 19 November 2016.

[19] Ibid.

- Institute of Development and Research in Banking Technology (IDRBT)
- ICICI Bank
- Mahindra Group
- Yes Bank
- Bankchain

In the year 2005 the Information Technology Act was formulated to provide the legal framework which accorded legal sanctity to all electronic records and activities carried out by electronic means. Amendments were made to The Indian Penal Code 1860, The Indian Evidence Act 1872, The Bankers Books Evidence Act 1891 and The Reserve Bank of India Act 1934 to bring them in line with the provisions of the Information Technology Act. The Information Technology Act of 2000 was amended by the Information Technology Amendment Act 2008 in order to provide additional focus on informational security. It also added several new sections on offences including cyber terrorism and data protection. Cases relating to offences[20] on creating false electronic records with the intent to commit fraud, damage or injury were brought under the ambit of Sec 463 of the IPC. Incidents of cyber fraud and cheating were held liable under Sec 420, web jacking under Sec 383 and email abuse under Sec 500 of the IPC. However, in today's techno savvy environment the world is becoming more and more digitally sophisticated and so are the crimes. This helps us understand where we stand as a nation and how far we are from technically related legislations and fully achieving regulatory control over the rapidly evolving digital world.

Today, blockchain has numerous applications as explicated previously in this paper. It's important to make this technology legal in its entirety so as to have complete access to the system. India is predominantly a cash based economy. Infrastructure and payment systems in India have been largely fashioned around the concept of cash transactions. In the last two decades, there has been a revolutionary change in the way we perform financial transactions. The internet's super connectivity opened up various opportunities for the use of new technology in financial services. Like other nations, India too is moving towards a cashless economy. An area that blockchain technology finds many applications in. This implementation strategy could significantly increase transparency in the governance and also position India at par with other global economies that are surging ahead on the path towards digitization.

4. CONCLUSION

We have witnessed many changes in innovation. Technology is improving the practice of law in general. It is helping lawyers deliver their services faster and cheaper. This does not merely benefit the lawyers and their clients but also the community at large in turn moving us closer towards a far better delivery of fair and speedy justice. This is definitely going to be an interesting area of study for lawyers.

Blockchain as a revolutionary technology is extremely intricate in itself and is believed to be in its nascent state. We can merely imagine the enumerated list of wide ranging

[20] *Mir Nagvi Askari v. Central Bureau of Investigation,* AIR 2010 SC 528.

applications for such a technology and the widespread corporate disruption it is capable of sallying forth. The future of this impressive technology is turning out to be greatly rewarding especially concerning governments and various enterprises; all, investing time and money in order to awaken this transmogrifying system.

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