

Analysis: On Application Of Arbitration And Smart Contracts: An Indian Perspective

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Introduction

The 21st century had witnessed great evolution of technology with rapid changes and various innovations in it and has made life fast-paced as trait of this century. Technology has entered all the aspect of life as human beings are nowadays are mostly dependent on its utilities. With advancement from artificial intelligence to online classes, courts, etc. where the virtual platform is considered to be safe among all. When whole world is operating on technology then concept of e-contracts must be appreciated where parties enter into contract through electronic platform. Since, courts are no longer stranger to application of technology in their field, the alternative dispute mechanism has also adopted the same to solve the disputes. Arbitration is one of the ADR mechanisms where two parties solve their dispute amicably with the

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help of third party. Arbitration plays a great significance in resolving E-commerce disputes due to reasons such as it facilitates transnational transactions, provides flexibility in selecting forum and most importantly to avoid litigation. Thus, e- contract must contains arbitration clause or agreement in order to follow whole procedure of seeking relief through this mechanism. The concept of whole e- contract or Smart contracts are based on or comes as a small head of Blockchain which is wide field.

Literature review

The blockchain network is advanced technology that is used in business, financial services, etc. that is designed to reduce the role of person and use the technology effectively.¹ Smart contracts is one of the application of blockchain network which are self -executed.² Smart contract uses blockchain arbitration method to resolve dispute among parties where all proceeding are conducted based on code programme.³ However, there are some challenges with respect to formation, modification and

¹ Sayanika Dey & Sneha Chatterjee, Blockchain Arbitration and Smart Contracts in India, 2 NLR 1, 2-3 (2021)

² Arukshita Chauhan, Technology and arbitration: blockchain arbitration and smart contracts in India 5 ADR E-NEWSLETTER 14, 14-15 (2021)

³ Asmita Kaur Blockchain Arbitration: A Primer, 1 LEX FORTI (2020)

enforcement are associated with smart contract and blockchain arbitration.⁴

Blockchain

Blockchain is referred as the chain of blocks and it functions according to its name, in other words “blocks” of information are added to the “chain” of transactions. The block is inserted in the network through cryptographic mechanism and these blocks are chained to the earlier block. This blockchain technology stores information and makes impossible for third party to hack, access, corrupt or change the same.⁵ But this digital data is distributed securely over decentralized network that implies no higher authority implements or control rather algorithm guarantees security of system as identification of party is done by usage of private keys that are formed with algorithms and password in network⁶. Hence, blocks of information are secured, confidential and

⁴ Lowellmilkeninstitute.law.ucla.edu. 2022. [online] Available at: <<https://lowellmilkeninstitute.law.ucla.edu/wp-content/uploads/2018/08/Smart-Contracts-Whitepaper.pdf>> [Accessed 9 December 2021].

⁵ Asmita Kaur Blockchain Arbitration: A Primer, 1 LEX FORTI 1, 3 (2020)

⁶ Investopedia. 2022. Blockchain Explained. [online] Available at: <<https://www.investopedia.com/terms/b/blockchain.asp>> [Accessed 10 December 2021].

protected as well as eradicates chance of human error and influence that will results in accuracy of algorithm in the transaction.

Evolution of Blockchain

It originates from 1990s and in 21st century and is considered as greatest innovations. Two research scientist Stuart Haber and W. Scott Stornetta first developed the concept of cryptographically secured blockchain in 1991 for storing time-stamped documents. The blockchain worked efficiently when Merkle Trees upgraded system in 1992 by giving permission to collect several documents in one block. Next, the expansion of application of blockchain apart from cryptocurrencies was identified by Satoshi Nakamoto who also first time gave the concept of blockchain in 2008.⁷

Further, first phase of Blockchain was of transaction where emergence of Bitcoin was noticed from year 2008-2013, second phase was from 2013-2015 where smart contracts was evolved as biggest application of

⁷ www.javatpoint.com. 2022. History of Blockchain - Javatpoint. [online] Available at: <<https://www.javatpoint.com/history-of-blockchain>> [Accessed 11 December 2021].

blockchain technology by Ethereum blockchain platform. More recent applications of blockchain incorporates IOTA and NEO, MoneroZcash and Dash blockchains, etc.⁸

Legality

In existing legal framework there is no particular body or legislation that regulates and governs blockchain along with its several applications. However, the regulatory body of different sectors permits the authority to govern the utilization of blockchain and its applications related to different sectors. Various fields such as corporate filings, industry organisations, Smart contracts, law firm operations, etc. are favourable application that benefits of legal and judicial frameworks. For instance, usage of blockchain technology might govern by the Securities Exchange Board of India meanwhile cryptocurrency may be regulated by the Reserve Bank of India and insurance are governed by Insurance Regulatory and Development Authority of India.⁹

⁸101 Blockchains. 2022. History of Blockchain Technology: A Detailed Guide. [online] Available at: <<https://101blockchains.com/history-of-blockchain-timeline/>> [Accessed 19 December 2021].

⁹Singh, S., 2022. Blockchain Technology, Legal Framework and its application in the Legal System - Part I. [online] Legalbots.in. Available at: <<https://legalbots.in/legal-blog/blockchain-technology-and-its-impact-on-the-legal-system-part-i>> [Accessed 19 December 2021].

The whole system of blockchain technology ensures the data privacy, it uses the digital signatures and same are dealt under Information Technology Act, 2000(IT). The self-generated digital signatures have no recognition thus contract created with blockchain technology becomes invalid.¹⁰

Despite no laws involved w.r.t. security and privacy in blockchain though it has to adhere to general laws on privacy and cyber security i.e., Article 21, Section 43-A and section 72-A of IT Act, 2000 and rules under CERT-In¹¹. The decentralised nature of blockchain technology makes the enforceability of all rules challenging and inefficient.

Further, Section 65B of Indian Evidence Act, 1872 makes electronic evidence are admissible that might play important role for enforcement and jurisdiction of transactions through blockchain network. Consumer Protection Act, 2019 is relevant where goods and services are being

¹⁰ Information Technology Act, 2000, § 5.

¹¹Singh, S., 2022. Blockchain Technology, Legal Framework and its application in the Legal System - Part I. [online] Legalbots.in. Available at: <<https://legalbots.in/legal-blog/blockchain-technology-and-its-impact-on-the-legal-system-part-i>> [Accessed 19 December 2021].

transacted on blockchain platform.¹²

Arbitration and Blockchain

After the invention of cryptocurrency and bitcoins the concept of blockchain arbitration began to develop in 2009. The payments in cryptocurrencies happens digitally by anonymous parties entering into commercial relationships using anonymous money. So to resolve disputes arising out of this type of e-commerce two models were introduced firstly, an arbitrator platform and secondly a centralised administrator of the marketplace. In second model, the platforms permit anyone to be appointed as an arbitrator as it is governed by cloud arbitrations¹³.

Blockchain technology in Arbitration

The blockchain technology works on the principle where each transaction between two parties are recorded as a block implies that

¹²Mondaq.com. 2022. Indian Approach On Bitcoins & Blockchain – Legal & Practical Perspectives - Technology - India. [online] Available at: <<https://www.mondaq.com/india/fin-tech/1137020/indian-approach-on-bitcoins-blockchain-legal-practical-perspective>> [Accessed 20 December 2021].

¹³Sayanika Dey & Sneha Chatterjee, Blockchain Arbitration and Smart Contracts in India, 2 NLR 1,3 (2021)

platform has constant growth. After the updating of information same is available with the concerned parties.

Arbitration is one of the alternative mechanisms where third party resolves the dispute between two parties amicably. This method time and cost friendly unlike the litigation happens in court.

For trial procedure blockchain provides with ideal framework considering that mechanism neither require any permission nor any supervision at all stages and also intermediary institutions plays no role in this process.¹⁴ For instance, involvement of banks with legal and financial transactions as intermediary institutions where banks and credit institutions carries out the transactions and since the costs are incurred at any given time, the whole process of transactions takes long time to complete. The objective of blockchain platform is to work more efficiently by removing such institutions from the process.

No legal control is conferred upon digital authority thus, arbitral award must be passed by human, outside of blockchain platform. So, by

adopting blockchain network, the arbitrator gives input to fulfil obligations under smart contract by playing the role of “oracle”. By applying oracle external data which are not within the reach of blockchain network are accessible to the blockchain or smart contract.¹⁵ Therefore, blockchain Arbitration can be termed as “On-Chain Arbitration” as for the purpose arbitral award it is generated and executed automatically by smart contract without any involvement of third party.

Though arbitration is less time consuming but when compare with blockchain arbitration it saves more time of tribunals and parties. The blockchain arbitration is also cost-friendly as transactions are carried on this platform effectively. Also, privacy and security risks reduce by blockchain technology unlike when information are shared via e-mail and other similar means.

¹⁵Arbitration of Smart Contracts Part 2 - Recommendations for the Future Landscape of Smart Contracts - Kluwer Arbitration Blog, KLUWER ARBITRATION BLOG (2018), <http://arbitrationblog.kluwerarbitration.com/2018/08/27/arbitration-smart-contracts-part-2/>

Procedure of Blockchain arbitration

- The claimant start process by sending notice to respondent via blockchain. The tribunals and both parties will be provided with keys to access it and the confidentiality will be maintained since no outsider will have the access of same.
- The arbitrator can be appointed on blockchain where he receives the access of all documents. The proceedings will be automatically recorded via video conferencing that is done on blockchain platform itself.
- The stage of arguments containing claimant statement, defence statement, submissions, etc. can be uploaded online and same will be automatically served and provided with access to arbitrator and both the parties. In case of delay in submission it will amount to imposition of penalty.
- The examination of evidences can be done through gesture recognition tools where it will advise arbitrator whether evidences are appropriate or not. After all examination award will be generated based on proceedings happened on blockchain platform.

Smart Contracts

Smart contracts refer to the automatically or self -executed contract entered between buyer and seller by agreeing to terms of agreement written into computer code. It is counted among three pillars of blockchain and consists promising characteristic of block chain. The functions are fully based on computerized set of rules, data, operating programs, terms of agreement are inserted in form of codes in software of computer which is also present in blockchain network.¹⁶ Thus, these programs digitally automate enforcement, verification and performance of contract but once the operation is activated and process is started then parties cannot interfere with the process as result it make smart contracts irrevocable and irreversible.

The principle followed by smart contract is “if-then” principle which is conditional in nature. It implies that “if” a condition is fulfilled “then” the amount will be given, else it will be returned.

¹⁶The Harvard Law School Forum on Corporate Governance. 2022. An Introduction to Smart Contracts and Their Potential and Inherent Limitations. [online] Available at: <<https://corpgov.law.harvard.edu/2018/05/26/an-introduction-to-smart-contracts-and-their-potential-and-inherent-limitations/>> [Accessed 20 December 2022].

This execution is easily carried out under blockchain network. The automatic movement of amount on fulfilment of condition adds the assets as chain and on each transaction.¹⁷ Bitcoins, cryptocurrency, etc. are used in here. For instance, person pays to advocate in order to acquire the document in the case of traditional contracts but in smart contracts simply by paying digital asset into the platform the person receives his document. Moreover, smart contracts impose obligations automatically similar to the penalties granted under traditional contract.

History

An American computer scientist, Nick Szabo first described the term smart contracts in 1994. The idea behind making contract based on code was to remove ambiguity arising out of contractual relationships, eradicate trust issues among the parties. Thus, contract will function according to the programme. He compared smart contract to a vending machine where by inserting coin the requested goods is delivered. Similarly, smart contract also contains logic programme where by

inserting right input, output is guaranteed. Today, the Ethereum Virtual Machine combined with solidity programming language has become actual standard for developing smart contracts.¹⁸

Smart Contract V. Traditional Contract

Smart contract is based on computer programs that are automatically executed and enforced on the agreed term whereas traditional contracts are agreements that are enforceable by law and terms of contract are written in human language which can be changed with the consent of parties but same cannot be done in smart contracts. The chances of contracts being tampered and manipulated are higher in traditional contract as compared to other contracts. Further, in smart contracts human participation is very less as it is largely based on technology but in traditional contract, it's opposite.

¹⁸Filippi, P., Wray, C. and Sileno, G., 2022. *Smart contracts*. [online] Internet Policy Review. Available at: <https://policyreview.info/glossary/smart-contracts#footnoteref1_hjnasca> [Accessed 20 December 2021].

Legality

The word smart contract has neither been defined nor be governed in any Indian statute. There are certain laws and rules from which legal aspects of Smart contracts can be determined.

- The Indian Contract Act, 1872: In order to consider any contract valid, it has to fulfill all the essentials of contract i.e., free consent, competency, lawful consideration with a lawful object. The parties while entering into smart contracts fulfills the essentials¹⁹ thus, smart contracts are valid under the said Act.

- Information Technology Act, 2000: Various provisions of the Act deals with usage, authentication and importance of digital signatures.²⁰ In normal scenario when any kind of document is supplied any legal purpose then same has to be signed then only it will be valid. Similarly Act authentication of documents are also be done by digital signature²¹. Further, the digital signatures of parties implies their consent on electronic document. Smart contracts into

¹⁹ The Indian Contract Act, 1872, § 10, Act No. 9 Of 1872

²⁰The Information Technology Act, 2000, § 3, Act No. 21 Of 2000

²¹ The Information Technology Act, 2000, § 5, Act No. 21 Of 2000

the ledger based system uses crypto currency for coding and these contracts are authenticated and secured after providing with digital signature. However, the digital signatures are not recognized under the Act as these signatures developed by using blockchain technology and are self-generated. Hence, submission of documents, information or forms where affixation of signature is necessary that can be performed by Smart Contracts but same is not regulated under any statute thus its effect will be invalid.

- 2018 RBI Notification on Crypto currency: RBI prohibits services provided for facilitation of virtual currencies in its 2018 notification passed on April 6.²² A valid and lawful consideration is essential for valid contract and in smart contract as well the consideration is fulfilled in form crypto currency as virtual currency where the receiver automatically receive the same after fulfilling of contract. Therefore, RBI leaves the status of crypto currency unclear.

²² The Economic Times. 2022. *RBI says banks can't use its 2018 circular to ban crypto transactions*. [online] Available at: <https://rb.gy/12kwkg> [Accessed 21 December 2021].

Smart contracts and arbitration

Arbitration is alternative dispute mechanism which helps in resolving the dispute amicably among the parties in short period of time as compared to usual method of solving case in court. There are many advantages of adopting arbitration in resolving disputes arising out of the smart contract. The disputes may arise due to code entered into the software is different from the terms on which parties agreed for, standard of goods cannot be determined via program and as a result contract can be null and void. Thus, arbitration is required for the operation of smart contracts and problem may arise three times that of three parties in the contract, i.e. a buyer, a seller and the network in a smart contract which is produced on basis of code. At any stage of creation of contract, performance of contract or enforcement of contract issues can occur thus arbitration with a blockchain would be best alternative mechanism for resolving all these issues. Here terms of smart contracts are translated into block code and all the required information including submission of arguments, evidences, etc. are stored in the said platform and as stated earlier this mechanism works automatically.

Determination of jurisdiction is another dispute which can be resolved with help of arbitration. Since smart contracts works on blockchain technology, no question of jurisdiction arises as whole process of arbitration there happens digitally irrespective of the states in which parties resides as whole system of smart contracts are performed through nodes across different geographical areas across the globe. This whole arbitration process can be effective if arbitration clause is inserted in smart contract similar to the conventional arbitration where same happens if parties decide to resolve the dispute through arbitration. Moreover, clause regarding governing law is inserted in the smart contract then this uncertainty can be removed easily. Arbitration provides with lot of advantages in resolving disputes in terms of smart contracts.

The Process of Smart Contract

It begins with defining the terms and conditions with respect to transactions, type of currency used, etc. of the contract are done in the computer programming language. After this, triggering events that will lead to the enforcement of contract is determined and here same

principle of “if-then” like blockchain.²³ Next, all information relevant to the contract are stored in blockchain platform digitally with help of special code and this stage differentiate smart contract from traditional contract. The stage of execution is next where the enforcement of decision is self-executed on fulfilment of the conditions mentioned in contract and accordingly transaction amount is also transferred.

For instance, A and B entered into smart contract where A is supposed to pay B some amount on fulfilment of task. So until and unless B completes the task the said amount will be stored into A’s smart contract and in case of dispute arises, arbitration proceeding can be triggered by either parties due to which the amount automatically get freeze. After this parties can select the arbitrator to resolve their dispute and upon determination of the dispute sum would be credited to the wallet of either party. Here, the decentralised system of blockchain provides with the selection of random arbitrator. The arbitrator after going through all

²³ Search Compliance. 2022. What is a smart contract and how does it work? [online] Available at: <<https://searchcompliance.techtarget.com/definition/smart-contract>> [Accessed 21 December 2021].

the proceeding decides the matter. Lastly, settlement of the contract is completed. The decision in smart contracts is automatically enforced thus, making it more efficient.

Advantages

- The summary of all the documents and records are provided with the help of system from which both parties and arbitrator is benefitted.
- The system also arranges all the documents in chronological order that makes easier for the arbitrator to keep the record of the same.
- Parties can make their own smart contract without the involvement of any middle man with the help of blockchain technology.
- All the documents and information are securely stored in the blockchain platform. The data once entered cannot be changed or deleted except when authentication is given by parties and arbitral tribunal. The breach of data is impossible in this platform.
- The transactions happen at the time of execution of smart contracts are also stored securely in digital form.
- The blockchain platform helps the arbitrator to prepare awards and make sure that all the essentials and reasoning to provide the same

is mentioned.

- The parties predict the arbitration award based on the data available in the platform which help them to come to compromise and settle the matter.

Challenges

According to Article II the New York Convention, the arbitration agreement must be in writing.²⁴ This leads to problem in the enforceability of the agreement made in blockchain arbitration as it is totally made using codes. Thus, it is difficult to enforce the blockchain arbitration with smart contracts at international level and whole aim of resolving disputes across the globe via one particular platform becomes pointless as the terms of agreement are not in writing. However, in India the agreement made in electronic form is also valid along with agreement in writing as per the amendment took place in 2015 and

²⁴ PMB, S., 2022. Article II - Guide - NYCG 1958. [online] Rb.gy. Available at: <<https://rb.gy/sbdiiio>> [Accessed 22 December 2021].

electronic form is added in the Section 7 of the Arbitration and conciliation Act. As a result, the agreements made in blockchain arbitration would be valid but specific legislation must be enacted to govern and enforce blockchain arbitration.

In traditional arbitration system the physical copy of awards must be handed over the parties. But, in blockchain arbitration the awards are generated and issued in the platform itself to parties and arbitrator. However, the physical handing over of the awards becomes impossible as tracing out the country of parties is tough. Thus, in India enforceability of these awards is challenging. Moreover, the hard copy of original arbitral award is also not circulated in blockchain arbitration because entire proceeds are digital based and parties directly receive the electronic record in the blockchain platform.

The terms and condition mentioned in smart contract cannot be changed afterwards because in blockchain modification is impossible of once all the data are entered. The defect in coding may results in unnecessary transaction when the smart contracts are automatically executed. This leads to disputes between the parties. Further, competency of the parties are difficult to determine. Therefore, for regulation of smart contracts as

well a specific law should be enacted.

Recent Trends

The Covid-19 converted the operation whole world from offline to online or virtual mode. From schools to courts adopted the virtual mode to operate and rendered its services. All proceedings used to happen in online courts only including the arbitral proceedings.

Online dispute resolution system is not new in India as the Arbitration & Conciliation Act of 1996 provides that arbitration can be conducted through video conferencing and rest proceedings remains same. But this ODR is entirely different from blockchain arbitration. In order to save time and cost many countries like USA, UK, Singapore, European Union, Brazil, China, etc. have adopted the digital means of arbitration where the process involves more than just video conferencing. Singapore is the perfect example for adopting ADR mechanism that is fully software based where same like blockchain arbitration the information is provided to both the parties and arbitral panelist on digital platform. They can access to the documents at any time in between the proceedings and organise and share the same among authorised users

and whole process is completed in this platform only.²⁵

Suggestions

- First and foremost a specific statute should be enacted for regulating and governing the smart contracts and blockchain. This legislation should also cover the dispute resolution mechanism.
- The block chain network should incorporate certain way to identify the competency of the parties to enter into contract.
- Modification in terms of agreement and termination of contract should be allowed according to the convenience of parties.
- A separate arbitration entity should be established that will only deal with dispute arising out of smart contracts.
- The coding language should be programmed efficiently in order to prevent the implantation of bugs by hackers.

²⁵ Hub, C., 2022. Future of arbitration: A world view with an Indian perspective and the need for a new normal life. [online] World Commerce & Contracting. Available at: <<https://journal.iaccm.com/contracting-excellence-journal/future-of-arbitration>> [Accessed 25 December 2021].

Conclusion

Blockchain arbitration and smart contracts are boon to the Indian legal system both at national and international level especially when situation like pandemic affects the operation of whole world. There are a lot of benefits that can be obtained from the blockchain technology and smart contracts but proper regulating body is the needed in India to enforce such contracts. Even blockchain arbitration require separate legislation so that dispute arising out if smart contracts can effectively be solved. However, blockchain arbitration and smart contract also consist of some of challenges that must be kept in mind while enforcing the same.