SMART CONTRACTS: FUNCTIONING AND LEGAL ENFORCEABILITY IN INDIA

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INTRODUCTION

In the words of Milton Friedman, the 1976 Nobel Laureate for Economics, "The three primary functions of a government are law and order, defence, and contract enforcement." The last function is generally performed through deterrence, wherein penal provisions are set for parties who violate the terms and conditions laid down in the contracts; and such provisions are enforced through adjudication, upon their violation. However, keeping the traditional methods of contract enforcement aside, there exists a lot of potential in technology to revolutionise the way contracts are performed. Smart contracts provide the platform to do exactly that.[2]

They are essentially self-executing, digitally encrypted contracts, which make use of block chain technology to ensure due performance and execution of contracts virtually, so as to provide a smooth and trouble-free experience.

Although so far, there is no concrete legislation which deals with smart contracts, the Telecom Regulatory Authority of India (TRAI) released a notification in 2018 which briefly defined the term. It stated that they work on a programmable code which can implement pre-determined tasks or rules so as to check regulatory compliance in advance, in the absence of human intervention. Further, it mentioned that such contracts are suitable for a DLT (Distributed Ledger Technology) system to formulate a digital agreement, with certainty (owing to cryptography) that the agreement has been executed in the ledger of every party to the agreement.[3]

Through this paper, the researcher aims to study the following objectives:

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[2] Punit Shukla, "How India's government can build better contracts with block chain", World Economic Forum (October 4, 2019).

[3] Telecom Regulatory Authority of India, "The Telecom Commercial Communications Customer Preference Regulations, 2018", Gazette of India (July 19, 2018).

- To understand the operation and functioning of smart contracts.
- To analyse the pros and cons of switching to smart contracts.
- To examine whether there are any statutory provisions which could potentially govern contracts in digital form.
- To gauge the applicability of smart contracts across various sectors.
- To ascertain the legal validity and enforceability of smart contracts in India.

WHAT ARE SMART CONTRACTS?

In 1994, it was uncovered that since cryptography is decentralized in nature, it could be used to improve the process of execution of a contract virtually. This took the shape of 'smart contracts'. Block chain technology eliminates the requirement of any intermediaries (and subsequently, unnecessary human interaction in the form of calls and emails) owing to its decentralized nature. Thus, they operate on P2P (Peer-to-peer) technology instead of being maintained under a central server. As a result, a lot of time is saved and it leads to avoidance of any conflict which may arise owing to a third party.[4] They rule out room for human intervention of any sort, thereby eliminating the risk of human error. Further, they cannot be altered once the agreement is finally codified, even if either party wishes to modify the terms in their favour.[5] Additionally, they help in doing away with transactional and procedural costs associated with negotiations (paperwork) and verification (commissions); since there is no intermediary.[6]

The key feature of a smart contract is that it is self-performing in nature, i.e. the terms of the agreement between the parties to the contract are directly incorporated into lines of the code. The code is contained in a distributed block chain network, and it comprises all the agreement terms. Apart from the agreements, it consists of information that enables execution of the transactions and makes sure that these transactions are fully tracked, permanent, irreversible and time stamped. [7] Every transaction carried out by the smart contract is placed as a block

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[4] STA Law Firm, "The Enforceability of Smart Contracts in India", "Mondaq (December 13, 2019)."
[5] Vijay Pal Dalmia, "India: Blockchain And Smart Contracts – Indian Legal Status"', Mondaq (February 5, 2020).
[6] *Id*.
[7] *Supra* note 3.

on the platform, which helps in establishing a clear audit trail, and erasing or wiping- it out is an arduous task. [8]

The important characteristics of a smart contract are as follows:

- Once it has been released, it is not possible for anyone, including the owner or creator to alter its terms.
- Its performance and completion do not require submission of any physical documents.
- Although users may be anonymous, the details of each transaction are recorded and registered.
- Transactions under smart contracts are irreversible in nature.[9]

There can be two types of smart contracts, the first one being contracts which are entered into in the absence of any enforceable text-based contract governing them. For instance, when two parties agree in oral terms, the business relationship they wish to maintain and proceed to capture that understanding into executable code; it is termed as a "code-only smart contract". The second type of contract can be used to execute certain clauses of a conventional text-based contract when it consists of provisions for the same. They may be termed as "ancillary smart contracts".[10]

The main point of difference between a smart contract and a traditional contract is that the former is a self-executing computer programme, which cannot be tampered with by parties and works on complicated block chain technology. On the other hand, the latter relies on the performance of the legal terms agreed upon by the parties, which can be modified at any given parties with their mutual consent and leaves room for conflicts.[11] Further, the risk factor associated with conventional contracts is very high, as there are chances of non-performance. Whereas in case of smart contracts, since they are automated, the risk is minimised.[12]

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[8] Rishi A, "The Legality of Smart Contracts in India", India Corp Law (December 10, 2017).
[9] *Supra* note 3.
[10] Stuart Levi and "Alex Lipton, "An Introduction to Smart Contracts and Their Potential and Inherent Limitations", Harvard Law School Forum on Corporate Governance" (May 26, 2018).
[11] *Supra* note 4.
[12] Kashish Khattar, "Everything you need to know about Smart Contracts", iPleaders (June 2, 2018).

HOW DO SMART CONTRACTS WORK?

The code contains the terms of the smart contract. Thus, the contract comprehends, approves and automatically executes any transaction which in line with the terms. The contract triggers itself once the predetermined terms and conditions are met. Moreover, once the contract is executed, the obligations (which are encoded) cannot be paused mid-way; making the contract self-enforcing.[13]

At present, such contracts can smoothly carry out two types of transactions that are present in numerous contracts: ensuring the payment of funds post the occurrence of a certain event; and imposing monetary penalties upon lack of fulfilment of certain conditions.[14]

For instance, if a contract of rent is converted into a smart contract so as to assess its effectiveness and efficiency; then the tenant will pay the rent to the landlord in cryptocurrency. Once the payment is made, the code will carry out the respective transaction according to the terms of the contract that were entered into the code. If the said transaction is successfully carried out, a receipt will be delivered to the landlord. Post that, they will release the key to the house. This system is based on the 'If-then' principle, and everyone involved in the block chain will observe the transaction and become witness to the contract. If the landlord releases the key, then they will definitely receive the amount. Likewise, if the tenant pays the rent amount, they will definitely receive the key. Therefore, one transaction cannot be completed in the absence of the other, which ensures effectiveness and efficiency of this mode of transaction.[15]

The if-then principle can be explained best by- "If 'x' condition is fulfilled, 'then' y obligation must be enforced". This feature makes smart contracts extremely lucrative for the insurance industry and the financial services sector. Moreover, creation of smart contracts is easier when there are bare minimal to none non-operational clauses involved. Since such clauses are ambiguous and leave room for interpretation, they are unsuitable for smart

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[13] *Supra* note 7.
[14] *Supra* note 9.
[15] *Supra* note 3.

contracts[16]. They are well suited for cases where the agreement has mechanical and straightforward clauses, and well defined outcomes".[17]

The functioning can be further explained with the help of another example. Say, one A wishes to buy a flat in a building being constructed by B, but is unable to afford the full price of the flat. Thus, they avail the loan facility from C, which is a bank. Conventionally, A would have to provide personal information to verify their identity, and also undergo a credit verification process. The process would be time consuming, and it would involve multiple people who would demand compensation in the form of commission for the services rendered. All this would add to the overhead costs. However, with the help of block chain technology, C would be able to download the required information from one of A's blocks so as to make a quick decision about their identity and credibility; thereby significantly reducing the turnaround time for all parties involved. Post this verification, all parties to the transaction would enter into a smart contract wherein the loan amount will be disbursed by C to B, and ownership of the flat will be transferred to A. However, C would hold charge on the flat till the full and final repayment of the original loan amount is made. The transfer of ownership is automated as the transaction gets recorded on a block chain, which is visible to all the participants on the block and its status can be viewed at any given point.[18]

Apart from listing the rules and penalties in relation to an arrangement (similar to a traditional contract), smart contracts perform the function of executing these obligations automatically. Implementation of these contracts is carried out through a platform called "Ethereum", which comprises two key elements: currency and contracts.[19]

HOW DO SMART CONTRACTS ENSURE SECURED TRANSACTIONS?

They enable the enforcement of a safe and secured transaction between the two parties to the contract. Further, they ensure that while one party gains something of value from the other party for some collateral, the other party is the only prioritized party to that specific

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[16] *Supra* note 4.
[17] John Ream et al., "Upgrading blockchains: Smart contract use cases in industry", Deloitte Insights (June 8, 2016).
[18] Sanmith Seth, "What's blocking the chain?", India Business Law Journal (July 20, 2020).
[19] *Supra* note 3.

collateral. Implementing the same in case of traditional would undoubtedly be difficult, as several other factors would come into picture, such as third parties partaking in the contract.

Further, data protection is ensured through cryptography and the operation of the distributive ledger system. Every block consists of information and in order to modify that, each block in a chain will have to be hacked since they are related to each other.

This has been transformed into reality by Ethereum. Its network is very transparent and possesses the ability to determine and formulate which party has priority over the specific collateral. Thus, it can conveniently accept or reject that collateral, and enable faster and more efficient implementation of contracts.[20]

SMART CONTRACTS IN INDIA: A STATUTORY OVERVIEW

Section 10 of the Indian Contract Act of 1872 (hereinafter referred to as the 'ICA'), predominantly governs contracts in India. Section 10 of the Act lays down that "all agreements are legally binding contracts, provided they are entered into with free consent of parties to the contract, for a lawfully accepted consideration and in order to achieve a lawful object."

The essential features of a traditional contract are: a legitimate offer; acceptance which is duly communicated; consideration which is lawful and pertinent to the subject matter; consideration; and free consent of all competent parties to the contract with regards to all aspects of the contract.[21] Thus, by definition, it would seem that a smart contract is legally permitted under the ICA, since it fulfils the above mentioned essentials to a contract. However, since they are not legally recognised in India yet, such a proclamation would be too bold and immature, since several factors come into play while determining the legality and enforceability of smart contracts.

For instance, 'consideration' aspect is problematic, because if it is in the form of cryptocurrency, then it further raises the question as to whether cryptocurrency is accepted as

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[20] *Supra* note 3.
[21] *Supra* note 3.

valid consideration under Indian law.[22] The ambiguity surrounding legality of cryptocurrency poses as one of the many challenges to the usage of smart contracts in India. The Supreme Court, in a March 2020 judgement, lifted the ban on cryptocurrency imposed by the RBI, which forbade banks and other financial institutions from providing banking services to those individuals and business entities which were engaged in dealing in cryptocurrency. Prior to that, trading was restricted to crypto-to-crypto, and not crypto-to-INR.[23] However, the Indian Government's stance towards cryptocurrency is not very forthcoming, owing to concerns such as safety of consumers, market integrity and white collar crimes such as money laundering. A lot of prominent media houses have reported in the recent past that the Government is planning to introduce a law which bans trading in cryptocurrencies. If implemented, it could severely hamper the functioning of smart contracts.[24]

Furthermore, there is no governing authority to evaluate whether the object is lawful or not. All these factors raise doubts about the legal validity of smart contracts. [25]

Some of the more pertinent questions with regards to enforceability are:

1. Will an electronic signature generated through the block chain technology deemed to be valid for authenticating an agreement under a smart contract?

2. Can a smart contract be placed as an evidence on record in a Court of Law if a dispute arises?[26]

It is imperative to analyse the Information Technology Act, 2000 (hereinafter referred to as the 'IT Act') and the Indian Evidence Act in order to arrive at suggestive answers to the above.

Section 5 of the "IT Act permits digital signatures and holds a contract to be legitimate and enforceable." It states that under any law, when a document or information produced needs

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[22] *Supra* note 4.
[23] Dipen Pradhan, "Supreme Court Allows Trading In Cryptocurrency", Outlook Money (March 4, 2020).
[24] Archana Chaudhary and Siddhartha Singh, "India Plans to Introduce Law to Ban Cryptocurrency Trading", Bloomberg Quint (September 15, 2020).
[25] Alok Vajpeyi and Gauri Bharti, "India: Smart Contracts: a Boon or a Bane?", Mondaq (December 3, 2019).
[26] *Supra* note 7.

verification or authentication through attachment of signatures, the requirement shall be considered to be fulfilled if it is done by means of a digital signature. Thus, a digital signature helps in proving consent to an electronic document.[27] Further, Section 65B of the Indian Evidence Act 1872 states that electronic records, i.e. documents signed digitally shall be admissible in the Courts. [28]

However, as per Section 35 of the IT Act, an electronic signature certificate can be obtained only though a certifying authority designated by the Government. In order for a smart contract to commence, the generation of a hash key is required, which is done by block chain technology. The same is used as an identifier to authenticate the contract instead of any legal authority. Thus, the electronic signature created by block chain technology is self-generated, and in contrast to the one authorised by the IT Act. [29] Moreover, "Section 85B of the Indian Evidence Act states that an electronic document will be deemed valid only if it is authenticated with a digital signature."[30]The problem is further compounded by "Section 88A of the Indian Evidence Act whereby it is mentioned that the Court presumes that an electronic record placed as evidence is genuine, but does not make any presumptions about the originator of the message." Thus, if a signature for authenticating the smart contract is obtained through block chain technology, the admissibility of the document will only become more problematic as the signature was not obtained under the IT Act. Not only does this impair the legal validity of the method of encryption used for smart contracts, but it also impedes the "admissibility of such contracts as evidence in a Court of law", as uncertified signatures do not hold much value.[31]

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[27] *Supra* note 4.
[28] *Supra* note 3.
[29] *Supra* note 3.
[30] Anirudha Bhatnagar, "India: Smart Contract In The Indian Crucible", Mondaq (June 19, 2018).
[31] *Supra* note 3.

AREAS OF CONCERN WITH RESPECT TO SMART CONTRACTS

An important question for business entities looking at the technology as a prospect is whether the regulatory and legal compliances are being met. Thus, in order for parties to enter into a binding contract, enforceability is a key aspect which must be looked at. [32]

One significant legal question which subsequently arises is that of fixing the responsibility. In case an incorrect code is entered owing to its complexity and an error of judgement, then it will become difficult to determine the Defendant party in that case, or the person who could be held liable for committing a negligent or wrongful act, since there is no governing body to do the same.[33]

Though automating a transaction is easy, remedies for non-performance or breach of contract are difficult to code in a smart contract. In specific contracts such as insurance, this problem is further compounded by "insurance-specific aspects such as pre-contractual disclosure obligations." Further, since it is a regulated industry, concerns of regulators must be taken into account.[34] Artificial Intelligence is infamous for the risks it poses to humankind. Since smart contracts leave limited room for human intervention or revocation of control, there is a high possibility of the computer wrongfully assessing a particular situation and implanting an incorrect step. This could result in multiple ramifications for either the parties to the contract, as once the damage is done, it cannot be reversed. Therefore, a high degree of caution is required to be exercised. [35] Furthermore, entries on the block can be tampered with by bad actors, be it contracting parties or miners who add past transaction records to block chain ledgers. A study discovered that close to 3.4% of Ethereum smart contracts are vulnerable to hacking. [36]

Smart contracts enable "provision of a platform for parties who may or may not know each other" to enter into a contract. Excessive caution is required to be maintained while contracting with another party, as in case of a failed transaction, the cost must be borne by the

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[32] Norton Rose Fullbright, "The future of smart contracts in insurance" (2016).
[33] *Supra* note 24.
[34] *Supra* note 31.
[35] *Supra* note 24.
[36] Kati Suominen et al., "Top 10 big questions and myths surrounding block chain", JSTOR (2018).

suffering party alone. The Indian legal system provides no legal recourse with respect to such contracts as there is a dearth of regulatory framework to govern the same.

For ensuring consumer protection, there must be a redressal mechanism that the aggrieved parties can resort to. However, there exists no such provision, which stirs doubts in the minds of the potential users. Further, force majeure events might lead to frustration of a contract in case conventional contracts; or either party, in order to maintain good business relations, may condone the other party's performance. But in case of smart contracts, this is not possible since the contract is automated. Thus, cordial business relations may be compromised at the cost of effectiveness. [37]

Moreover, conventional contracts provide for termination of the contract at either party's behest, the option is not available in case of smart contracts. If a party comes across an error in an agreement, which leads to the counterparty gaining more rights than intended, or would result in greater costs if fulfilled; they cannot terminate the contract. [38]

Furthermore, although the 'automatic payment' feature of smart contracts is revered, it does not rule out the adjudication of payment disputes in case of complex commercial contracts. For example, the chances that the party obtaining the loan will deposit the entire loan amount in a specified wallet linked to the contract, are low. Instead, the required repayments would be funded on an ad hoc basis. However, if the borrowing party does not fund the wallet regularly, a smart contract may not be able to find the necessary funds for transfer of money from that wallet or any other source specified to be used in case a contingency arises.[39]

Smart contract writers also need to be mindful of the semantics and foresee how words can be interpreted by the smart contract, since it does not possess the human intuition to deduce the intentions or behaviour of parties. For instance, technology may not be able to interpret open ended terms such as "reasonable efforts". Thus, the language of the contract needs to be adjusted according the limited vocabulary of the code. [40] This makes the application of smart

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[37]J Dax Hansen, "Legal Aspects of Smart Contract Applications, Perkins Coie (2017).
[38] *Supra* note 9.
[39] *Supra* note 9.
[40] *Supra* note 35.

contracts is restricted to standardized processes. It cannot be extended to agreements where evaluation of the terms and conditions might be required.[41]

When it comes to code-only smart contracts, the execution of the code and its outcome would be the only objective evidence of the terms of the contract, since no paperwork is involved. E-mail exchanges between the contracting parties regarding the functions which the smart contract should carry out, or verbal discussions would determine the code and represent their intent. Lack of evidence could serve as another barrier.[42]

All these factors combined posit a very bleak scenario for the adoption of smart contracts in India, currently.

REGULATION OF SMART CONTRACTS IN THE US

In 1999, 47 states in the United States adopted the "Uniform Electronic Transactions Act" (UETA), which governs laws relating to e-contracts, electronic records, electronic signatures and so on. The Act approves of the usage of an electronic signature as a valid method of consenting to contracts. However, to keep up with the technological advancements, in 2017, several states in the US felt the need to draft separate regulations for the adoption of smart contracts on a larger magnitude. Consequently, Arizona passed laws recognizing digital signatures for smart contracts via block chain technology, and granting them enforceability. Vermont and Nevada also gave recognition to smart contracts.[43] Thus, it is high time that the Indian Government steps up and provides some clarity on how the feasibility of operation of smart contracts in the country, since the benefits are immaculate.

POTENTIAL APPLICABILITY OF BLOCK CHAIN- BASED SMART CONTRACTS

In 2018, what was considered as a giant technological leap forward, the SBI legitimised sharing of KYC data among banks through block chain technology through the conglomerate of 27 banks called 'BankChain'. [44] Even the pharmaceutical industry makes use of this

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[41] Anirudha Bhatnagar, "India: Smart Contract in the IPR paradigm", Mondaq (June 19, 2018).
[42] *Supra* note 9.
[43]*Supra* note 7.
[44] ET Bureau, "SBI to use block chain for smart contracts and KYC by next month" "Economic Times (November 20, 2017)."

technology for record-keeping. Unfortunately, however, the acceptance has been restricted to information sharing and maintenance of records, and the Government is evidently not inclined towards cryptocurrency, which poses as an obstruction for smart contracts. There exists a lot of untapped potential in the Indian market with respect to these contracts, and it could change the way that household supplies are purchased and e-commerce is carried out by streamlining the entire process and reducing costs substantially.[45]

Furthermore, they could revolutionise how trading systems on the securities markets work; by taking on the arduous function of managing approvals between market players; estimating accurate trade settlement amounts; and ultimately transferring the funds automatically once the verification and approval of transaction is carried out. The purpose of settlement is to ensure irrevocable delivery of a security to a buyer from the seller, for which the latter receives final and irreversible payment of money. The possibility of settlement failures could be negated with the help of smart contracts, since they are irreversible in nature. In *status quo*, parties engage in expensive labour-intensive methods to corroborate each other's performance and reconcile records. Thus, the problem of lack of trust between the parties could also be solved by trusting the smart contract.[46]

CONCLUSION

A study conducted by Capgemini reported that the effective adoption and implementation of smart contracts could help retail banking and insurance companies save around 3 to 11 billion in USD as a result of diminished overhead costs, which in turn could help every individual customer save up to USD 980. This proves that the execution and growth of smart contracts could undoubtedly become the 'next big thing', resulting in savings of billions of overhead costs, while making the entire procedure more efficient. Block chain can be a complete game changer when it comes to the execution of contracts. However, the grey areas with respect to the law, make it a less lucrative option in India. Owing to the absence of a regulatory body that certifies the admissibility and enforceability of a smart contract under the existing legislations, smart contracts have not gained the traction they deserve; with uncertainty

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[45] *Supra* note 29.
[46] Adam David Long, "How Smart Contracts for Finance Will Make Stock Markets Faster, Cheaper and Less Error-Prone", Medium (September 17, 2018).

looming large. A pressing question which needs to be answered is that, "Is a smart contract purported to constitute a contract, or to simply carry out the aspect of one?" This could possibly clarify whether the current legal provisions can govern smart contracts or not.

Since the entire process is decentralized, and there is no single entity which handles the data arising out of any transaction, the imposition of "reasonable security practices and procedures" as prescribed under the IT Rules, 2011 remains a challenge. The aforementioned rules set out various guidelines in order to protect sensitive personal data, and safeguard the same from any potential damage by third parties through a computer resource.

Several sectors (for instance, syndicated loans) still rely on faxes and paperwork, which results in inefficiency. It is high time they start adopting innovative technologies such as smart contracts. But in order for this transition to take place, the Government needs to break its silence on this topic and come up with ways to permit businesses and individuals to make the switch to efficient, cost-effective systems.

Undoubtedly, smart contracts do not have a pervasive applicability, i.e. they cannot be blindly applied to every industry, since they come with their own set of limitations and risks which have been discussed in the paper. They are more suitable where calculation of risks is relatively easier, and the limited vocabulary of the code is able to interpret the commands given.

Smart contracts are a part of the surging wave of technological advancements which seek to minimise the risks and costs associated with human capital. Indeed, they do minimise the risk of human error to a great extent but it is an undeniable fact that machines come with their own set of biases and errors; in addition to the Herculean task of regulating their operations. Thus, there are innumerable challenges when it comes to establishing legal accountability.

Currently, smart contracts are in a nascent stage, and they require an impetus to penetrate the Indian market. In order to facilitate the same, lawmakers must be vocal about their stance on the various legal questions postulated in this paper.

SUGGESTIONS

A major hindrance to smart contracts being viewed as a norm is that the Government and lawmakers may not be willing to invest the requisite financial and human capital to pave way

for their development; especially in developing nations. However, the potential benefits of switching to this technology must not be ignored.

Furthermore, regulatory concerns pose a major threat in the Indian market. Even if no separate regulation is developed, the Government must amend the relevant provisions of the Indian Evidence at, 1872 and the IT Act; so as to incorporate smart contracts into their purview and keep up with the changing times. For smart contracts to become operational in India, the Government will have to amend certain existing statutory provisions and confront challenges on multiple fronts. It will be interesting to see whether the lawmakers are able to keep up with the ever-expanding realm of block chain and smart contracts.

The precarious status of the legality of cryptocurrencies also serves as a major roadblock to progress in the field of smart contracts. Thus, a clear stance must be adopted by the Government, when it comes to its legal validity.

If smart contracts do become a reality in India, on a large scale, then the legal industry would have to keep up with changing demands of clients. This paradigm shift could potentially lead to loss of jobs and make professionals in the legal sector rethink the way they function. But on the bright side, it could also encourage collaborations between law firms, software firms and start-up companies, for the greater good. Embracing technology and using it in their favour would help legal professionals in rendering improved services. Thus, smart contracts must not be looked at as a potential threat.