



# Blockchain Dispute Resolution

*Traditional institutions for modern disputes*

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29AUG2021

## Abstract

Contrary to general belief, the legal industry stands to gain much from technological innovation, notably from Blockchain and the self-executing smart contracts for which it serves as a foundation. These types of contracts create a whole set of dispute resolution challenges as they are very particular in their nature. Smart contracts differ in presentation from traditional contracts. What makes smart contracts legally binding? How does a court of law interpret smart contracts? Is it possible to resolve legal disputes arising from these smart contracts?

This article begins by defining the terms *blockchain* and *smart contract* before addressing the challenges that these instruments pose to jurists. These include the anonymity of the parties to the transaction, making crypto transactions less traceable and less accessible. The existence of self-executing smart contracts thus eliminates the need for intermediaries, and indicates an absence of traditional contractual elements. There are also issues on using these instruments as proof, and the incompatibility of blockchain with certain personal data rights. We will finally provide a set of possible solutions to mitigate these challenges and maybe lead to further development of this technology within legal frameworks. Proposed solutions include a contextual fix that involves solving individual problems as they come along in a case-by-case scenario, or a one solution fits all AI governing body that is programmed to mitigate disputes arising from this advanced technology. There also exists the need for legal reforms to better accommodate this technological development.



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## Definition of Terms

Smart contracts have been proposed as a way of revolutionizing transactions between persons, supplanting existing traditional contracting instruments. However, their technical nature requires sufficient levels of certainty and prudence to be completed. By analyzing the technical characteristics of blockchain and smart contracts, we could identify potential sources of uncertainty that could prevent these technologies from fitting in the existing judicial institutions. The more intricate and distinctive a transaction is, the harder it is to mitigate through its risk and to achieve its desired outcome.

Therefore, due to the complexity of transactions and the lack of required information, traditional contract governance institutions are no longer able to provide the same level of protection needed for blockchain and smart contracts. It is natural to resist change; ergo the power of institutional resistance might delay the vast adoption of the smart contracts.<sup>1</sup>

### Blockchain

The idea behind blockchain was to do away with traditional third-party intermediaries and build alternative arrangements for ensuring the reliability of information.<sup>2</sup> This creates a trustless system. To achieve this result, blockchain technology possesses the following qualities: it is decentralized, it is anonymous, and it is irreversible.<sup>3</sup> Blockchain technology allows secure electronic transactions without a centralized ledger. When two parties desire to participate in a transaction, they ought to broadcast it to the entire network, effectively asking participants to validate this transaction's authenticity through a "proof-of work" validation system. Thus, the

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<sup>1</sup> (Kraus et al., 2019).

<sup>2</sup> (Rabinovich-Einy & Katsh, 2019)

<sup>3</sup> (Gatteschi et al., 2018).

entire network shares the accounting responsibility in what is called a decentralized public ledger (DPL) – a full record of all past transactions on the network. The DPL constantly and automatically updates itself with each transaction via a cryptographic mechanism. This ensures that no party can alter or reverse a transaction, thus eliminating the need for trust between parties. Its decentralized nature makes it almost impervious to hacking, especially when compared to traditional databases.<sup>4</sup>

## Smart Contracts

Consensus does not thus far exist on a definition of smart contracts. Smart contracts have become a way of simplifying complex contracts and reducing the cost of transactions in industries. Smart contracts are designed to operate within the blockchain framework and therefore share many of their properties.<sup>5</sup> Despite their being no single definition for smart contracts, several have attempted to implement a one-size-fits-all definition.

*"A smart contract is an electronic transaction protocol that executes the terms of a contract. The general objectives are to satisfy common contractual conditions (such as payment terms, liens, confidentiality, and even enforcement), minimize exceptions both malicious and accidental, and minimize the need for trusted intermediaries. Related economic goals include lowering fraud loss, arbitrations and enforcement costs, and other transaction costs" – cryptographer Nick Szabo.<sup>6</sup>*

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<sup>4</sup> (Masters et al., 2017).

<sup>5</sup> (Wang et al., 2019).

<sup>6</sup> (Szabo, 1997).

Scrutinizing this definition further shows that a smart contract is a protocol that operates via a sequence of message exchanges. To simplify the smart contract transactional process one must keep in mind the following four steps:

- 1- **Consent:** The seller makes general conditions available; the buyer accepts the general conditions and issues a standard order form.
- 2- **Integration:** The issued order is plugged into the buyer's order system and bank accounts.
- 3- **Self-execution:** The order is automatically and autonomously executed, and the general conditions are implemented. The smart contract command bank accounts and guarantees payments.
- 4- **Tracking:** Data provisioning, in another terms, making data available to users and consumers and giving access to this data for reporting.

Moreover, this contract is written in a language that is only processed and understood by a targeted machine, regardless of its form. The enforcement of a true smart contract is based on the principle *Pacta sunt Servanda*.<sup>7</sup> In other terms, no third party controls the execution or the enforcement of the contract, minimizing the need for trusted intermediaries like ESCROW agencies or others.<sup>8</sup> This definition lacks the security concept that is inherently found within all traditional contracts. A smart contract shall also be a secure contract where lies a process that enables the operating system to respond to a failure or malfunction thus the ability to continue operating despite these crashes. In the physical world, security requires signatures or locks; in the

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<sup>7</sup> Latin for "pacts must be kept".

<sup>8</sup> (Bashir, 2018).

digital world, it requires techniques for securing digital transactions and information. Therefore, there must be some sort of validation that the digital signature is associated to the legal entity in question.

Furthermore and as is well known, the special thing about smart contracts is that they obsolete enforceability:<sup>9</sup> the prevailing party no longer has to enforce the court's decision, if it ever existed. The smart contract's self-execution mechanism guarantees enforcement, which absolves the need for third party interference to enforce the contract. The fundamental idea behind a smart contract resides in its full automation on all accounts, from start to finish.

This technological evolution has digitized business transactions and has made them speedier, less costly, and more efficient, and yet has created a plethora of legal issues specific to its unique and nascent nature.

## Limitations of Traditional Jurisdictions

Traditional internet transactions are characterized by numerous features that make them fully adaptable to traditional jurisdictions. First, traditional internet transactions do not use decentralized distribution networks used by blockchain, rather opting for centralized server networks. Traditional transactions are denominated in fiat currencies like the dollar, which makes them more traceable and accessible when compared to crypto currency transactions. Furthermore, the parties to a traditional internet transaction are usually identified or identifiable, either by each other or by the supplier or third-party service suppliers. However, if they weren't to be known,

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<sup>9</sup> (Kaulartz, 2019).

each IP address of each party's computer engaged in the internet transaction will probably be identified.

Conversely, blockchain contracting and transactions are radically opposite. As to the ID or IP of the parties to a blockchain-based transaction, they are technically unknown, as explained before the use of cryptography make it impossible to identify them. The same applies to the location of the party. On another hand, the use of cryptocurrency with no governing body leads to the inability of a court to access and order restitution. Additionally, blockchain smart contracts are self-executing, meaning all parameters are coded and only when all parameters of the smart contract are fulfilled that the contract is executed and added to the particular blockchain. The interference of traditional legal infrastructure is eliminated in smart contracting since it is the blockchain-based system that executes the contract.

With all what was stated, traditional jurisdictions have limited applicability in the context of blockchain technology. The essential elements of contract (e.g. consent) are unknown, the domicile is additionally unknown and therefore a competent jurisdiction cannot be chosen. Therefore, the requirement that a given court have power to hear the specific kind of claim that is brought to that court is inapt since no given law would be able to authorize such power; it is hard to see how the court would in fact exercise such authority.

On the other hand, the enforcement of smart contracts with traditional legal means is limited. The prevailing legal infrastructure cannot take up legal disputes produced by crypto transactions. As mentioned before, it is difficult and even impossible to constantly identify the parties to a dispute in the context of crypto transactions on the blockchain. It is also however impossible to breach a smart contract due to its automated execution, thus it simply will not be executed if a parameter is not satisfied. The Courts alone cannot alter or otherwise interfere in the



coded transaction since the transaction inevitably executes on the blockchain making it non-reversible as soon as its parameters are satisfied. Cryptography is the mechanism responsible for the non-alterations in the record of these transactions. Courts are also limited in their ability to command a programmer on changing the code established.

Therefore, alternative resolution mechanisms are the only possible recourse for smart contract disputes. Courts have no jurisdiction over smart contract disputes. Courts have not yet acknowledged blockchain technology or focused on the legal repercussions of blockchain transaction due to unsatisfactory governing bodies and uncertainty over jurisdiction leading to little to no court decisions in this regard.

On another hand, two major legal obstacles face the implementation of blockchain within such a context.

Firstly, using blockchain transactions as evidence obeys a fairly precise set of rules and laws. We cannot admit the blockchain transactions as an authentic instrument, however an electronic contract with an electronic signature can be considered so. We are awaiting legal reform to solve this debate.

Secondly, these transactions give rise to disputes with regard to personal data. In Europe, stringent laws exist to protect persona data, mainly, the GDPR. People have total rights over their data while minors, for example, are subject to restrictive regulations. Blockchain is incompatible with certain rules like the virtue of the right to oblivion or the right to erasure.

## **Possible Solutions**

To solve for the issue of the anonymity of the parties in a blockchain-based transaction, many solutions can seem handy. For example, specific personnel to the blockchain service with

utmost secrecy and confidentiality obligation can be handling the identification of the parties in a way that lies upon them a legal obligation to identify the parties to the contract. This is not too dissimilar to the codes of Banking Secrecy known worldwide.

Additionally, the courts could hire an expert to decipher the code of the smart contracts when such a need arises. The court can mandate when possible that a new transaction be implemented to reverse the effects of the disputed transaction. Amidst the prevailing existent traditional legal infrastructure, these solutions could seem like a plausible alternative.

However, for smart contracting to be fully realized there must be a governing blockchain-based dispute resolution body. This governing body can be AI-operated. Two main branches of artificial intelligence (AI) exist: Knowledge-based systems and Machine Learning. Further AI technologies valuable for the legal industry include sentiment analysis and natural language processing (NLP). Smart contracts being self-executed, can find themselves a solution for dispute arising from them that imitates their core value: a self-dispute-resolution system. Finally, there exists some online dispute resolution mechanisms for smart contract dispute resolution like Juris or Kleros Arbitration.<sup>10</sup>

## Conclusion

Traditional institutions for modern dispute resolution are only hindering the development and implementation of new technology. However, the scientific merits of cryptographically secured and distributed-database technology can be questionable. The technology behind blockchain is undeniably a genius one, creating a major disruption in the business field (think NFTs for example), also allowing data management as a transparent register. It has a traceability

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<sup>10</sup> (Kleros.io, n.d.).



function in terms of being able to deal with everything from products to energy to diamonds and to know where it comes from and how it was produced, etc. It is important to preserve it, and to develop it. We still have a long way to go, countries are reforming their laws to attract what seems like the technology of the future. It can appear as a way to do without the usual judges and the traditional way of conflict settlement, however reforming the laws and adapting them to this technology can be of a great help in its development.

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*This bibliography is in accordance with the Lebanon Law Review's "Berytus™" referencing style.*

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