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Are smart contracts smart enough? COVID-19, force majeure, blockchain and oracles

The COVID-19 pandemic has created a unique confluence of technology and law. Domestic and international market turmoil, economic instability and restrictions on commerce and travel have all required that businesses rely heavily on technology solutions in order to minimize person-to-person contact in contract formation and performance. Blockchain technology and its smart contracts have emerged as important tools in this trend. At the same time, however, the COVID-19 crisis is cited as an event of *force majeure* that excuses parties from performing under their contracts. While the technological mechanisms of commercial contracts have evolved during the pandemic, it has been a challenge for legal concepts to keep pace.

In light of the multiple legal issues and disruptions caused by the pandemic, business professionals searching for new solutions need to know what smart contracts are and how they would function under the legal doctrine of *force majeure* in light of COVID-19.

What is *force majeure*?

The legal doctrine of *force majeure* ("superior force" in French) frees parties from liability or obligation when extraordinary circumstances beyond the control of the parties prevent one or both parties from fulfilling their obligations under an agreement.

What are smart contracts?

Smart contracts are blockchain-based and distributed-ledger mechanisms that automatically execute, manage or record legally relevant actions according to the terms of an agreement. If implemented fully, smart contracts would exclude centralized third parties from a transaction. For example, the computer-based protocol could eliminate third-party escrow services by allowing the parties to directly escrow the cash into a "smart" agreement (i.e., code or chain) as a block of data. The smart contract would then automatically process and validate the contractual requirements based on specified inputs, deliver the consideration and close the transaction. In other words, the contract is automated, reducing human involvement (and the potential for human error). The smart contract is designed as a simple "if this happens, then that happens" formula. So, in the case of the escrow, "***if*** the deed is signed and submitted, ***then*** funds are released."

How would smart contacts function under *force majeure*?

Smart contracts are currently not well suited to address excuses for non-performance. For a smart contract to execute completely, all terms must be programmable, foreseeable and identifiable. However, comprehensively coding for causes of non-performance–including multiple causes and attributing causes–is far more complex than is achievable at present by straightforward coding.[1] Some causes (e.g., those that are part of the contract environment) are easier to foresee and program into a smart contract (e.g., an insufficient cryptocurrency balance).[2] However, external causes are more complex than is achievable in the current coding environment. Also, not all disasters can be anticipated–like COVID-19–at the time of coding a smart contract. Returning to the escrow example, the parties might wish to cancel the sale and terminate the escrow entirely in light of the pandemic, but the existing smart contract will only release the funds from escrow *if* the deed is deposited, per the original set of smart contract programming requirements.

The smarter contract: Hybrid smart contracts

Though smart contract technology is developing rapidly, it has clear limitations. The most current and feasible practice seems to be the hybrid smart contract construct, which implements both smart and traditional systems. The hybrid construct references the execution of certain of its terms through a smart contract (e.g., escrow functions) while separately addressing issues that cannot be easily addressed or coded (e.g., defining "reasonable time" or determining the occurrence of events "beyond the reasonable control" of a party). As to the escrow

example, if the deed is not deposited by a certain date, for example, the funds would be released back to the depositing party (and not to the counter party). This creates a more flexible or variable set of "*if, then*" properties.

Oracles

Blockchains (smart contracts) generally cannot receive data from sources outside of their network. However, oracles allow blockchains to receive information from outside of the chain by providing an authoritative source of external data.[3] Oracles are layers of data transmitters that serve as bridges between the outside world and blockchains. The data transmitted by oracles may come in different forms (e.g., stock price information from the New York Stock Exchange, a decision made by an expert mediator). Smart contracts could bypass the need of coding all possible outcomes at the onset of transactions by linking contractual ambiguities (e.g., defining "reasonable time") with external data (e.g., mutually consented timeframe) for later discussion.

Solving for *force majeure* events

Because oracles are providing information that may be required to resolve disputes, they can be utilized in connection with third-party Alternative Dispute Resolution (ADR) or Online Dispute Resolution (ODR). As smart contracts hit issues that require outside verifications (i.e., unforeseen at the time of coding), they will use oracles to receive external data to resolve the situation. Naturally, such dispute-based oracles would input the causes of non-performance from outside the chain (or originally programmed events), resolving the *force majeure* issue. For example as to COVID-19 and the termination of the hypothetical escrow, a dispute resolution oracle would allow external experts or mediators to affirm the existence of a pandemic and the parties inability to perform by an outside date or inability to perform at all, and therefore automatically resolving the return of the funds and relief of performance of the underlying contract.

Blockchain technology provides vast potential to address urgent and emerging needs in commercial contracting in what may be a new normal for the business community. Hybrid smart contracts and oracles are just some of the tools that the blockchain offers. As a technology, blockchain is still in the early stages of its development and adoption. However, it is poised to radically change the landscape of transactions by enabling a new generation of contract development and performance.

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[1] Eric Tjong Tjin Tai, "Force Majeure and Excuses in Smart Contracts" 12-13 (Tilberg Inst. Private L., Working Paper No. 10, 2018).

[2] Id.

[3] Mikhail Goryunov, What are Oracles?, 3COMMAS (May 28, 2020), https://3commas.io/blog/what-are-oracles.

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