

Cross-Border Smart Contracts: Boosting International Digital Trade through Trust and Adequate Remedies

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Introduction:

Cross-border digital contracting in recent years has witnessed the development of smart contracts that can be used for a variety of automated electronic transactions.¹ A number of internet platforms such as *Ethereum* have emerged that offer to create smart contracts and expand their application to these different transactions.² This expansion is bound to have an impact over the manner in which trade is currently conducted which raises the importance of regulating these new digital contracts.

As these contracts are based on programmable software their lack of flexibility as opposed to natural language contracts could lead to not fulfilling the parties' expectations, thereby leading to a potential breach of contract. This paper briefly assesses the role that the UN Convention on the Use of Electronic Communications in International Contracts and the UNCITRAL Technical Notes on Online Dispute Resolution can have in such a situation. The paper then emphasises the current gaps in the international legal framework with regards to smart contracts and their breach that requires for further research and legal regulation.

What are Smart Contracts?

Smart contracts were first referred to by Nick Szabo in the 1990s as "a set of promises, specified in digital form, including protocols within which the parties perform on these promises."³ On this basis it can be said that smart contracts are software codes that embed the terms and conditions of a contract and that run on a network leading to a partial or full automated self-execution and self-enforcement of the contract.

The automated performance of the contract is enabled as a result of the transfer of contractual terms and conditions into an algorithm or technology-enabled rules-based operations that signal for actions, such as payment, to be taken once the relevant conditions have been fulfilled.⁴ In this light, it has been suggested in a recent report by the Smart Contracts Alliance that smart contracts can be used for complex transactions to enable for a simpler performance of these and to help with cutting down on costs.⁵ Examples of such uses include using contracts for better visibility in supply chains, for mortgages or for trade finance.

¹ Such transactions include the facilitation of automatically executed derivatives for example. See Hedgy <https://angel.co/hedgy> (last accessed January 2017).

² See Ethereum <https://www.ethereum.org/> (last accessed January 2017).

³ N Szabo, *Smart Contracts: Building Blocks for Digital Markets*, 1996.

⁴ Smart Contracts Alliance in collaboration with Deloitte Report, *Smart Contracts: 12 Use Cases for Business & Beyond: A Technology, Legal & Regulatory Introduction-Foreword by Nick Szabo*, December 2016 <http://digitalchamber.org/assets/Smart-contracts-12-use-cases-for-business-and-beyond.pdf> (last accessed January 2017). See also, P De Filippi and S Hassan, 'Blockchain Technology as a Regulatory Technology: From Code is Law to Law to Law is Code,' *First Monday*, Volume 21, Number 12, 5 December 2016 Section IIA.

⁵ See Smart Contracts Alliance in collaboration with Deloitte Report, *supra* n 4.

Execution Issues and Remedies in Smart Contracts: Current Applicable UNCITRAL Texts

Smart contracts have been designed to ensure that the contract would be performed adequately without any risk for breach. However, the code embedding the contract terms can contain bugs or produce results that are not in accordance with the expectations of the parties.⁶ Therefore, this would mean that the smart contract can be potentially breached in such cases as its performance would not be as expected or intended by the parties. The question that ensues is whether there are current rules or guidance under the UNCITRAL texts for establishing liability and providing adequate remedies for breach in such circumstances.

The UN Convention on the Use of Electronic Communications applies to the use of electronic communications used in the formation or performance of a contract between parties whose places of business are in different places.⁷ According to this Convention, a smart contract⁸ would be considered to be legally valid as these form electronically through computer code. Moreover, Article 12 disposes that contracts formed as a result of automated messages are legally valid and enforceable under the Convention. Nevertheless, there is no legal provision that offers further indication on liability in an automated contract and from whom remedies would have to be given.

Self-enforcement functions as conflict prevention in smart contracts⁹ but issues of enforceability in the context of cross-border smart contracts due to jurisdictional variations can still arise.¹⁰ In order to further solve this dilemma, smart contracts can incorporate an online dispute resolution clause in their code.¹¹ Also, an ODR clause would be useful to avoid any 'wrongful' irreversible performance of the contract without having recourse to an external source. The UNCITRAL Technical Notes on ODR offer guidance on what an ODR procedure would include and would also be compatible to be applied to an ODR provision in smart contracts. Once the ODR process gives a result, it can issue an adequate remedy for the condition or problem.

Current Gaps in the International Legal Framework:

The breach in performance by software driven automated contracts, such as smart contracts, raises important liability questions that currently do not have a direct answer in the available international legal texts. This also has implications over the remedies that the aggrieved party would be entitled to in such a context. As opposed to natural language contracts where it is clear that if the seller for example makes a late delivery due to his own wrongdoing the buyer would be entitled for relevant remedies from the seller. Errors committed as a result of codes make it more difficult to establish which party caused the breach or is liable because of it.

Conclusion

The UNCITRAL texts are equipped in dealing with smart contracts to a certain extent as they recognise automated electronic contracts and offer enforcement solutions to these through ODR. It is however the case that there is a current regulatory gap with regards to establishing liability in

⁶ Smart Contracts Alliance in collaboration with Deloitte Report, supra n 4, p 10.

⁷ Article 1 of the Convention.

⁸ Apart from smart contracts touching on the exceptions in Article 2.

⁹ R Koulou, 'Blockchains and Online Dispute Resolution: Smart Contracts as an Alternative to Enforcement,' SCRIPTed, Volume 13, Issue 1, May 2016, p 65.

¹⁰ See R3 and Norton Rose Fulbright White Paper, 'Can Smart Contracts be Legally Binding Contracts: Key Findings,' p 5 <http://www.nortonrosefulbright.com/files/norton-rose-fulbright--r3-smart-contracts-white-paper-key-findings-nov-2016-144554.pdf> (Last accessed January 2017).

¹¹ Ibid.

cases of breach of smart contracts which raises a need for an international text on these. Consequently, such a text would contribute to the removal of any current obstacles in trading via smart contracts by reinforcing the users' trust in their use which would boost international digital trade.