Blockchain Technology & AI Arbitration: What May the Future Hold?

By Julien Rodsphon, legal intern at Billiet & Co

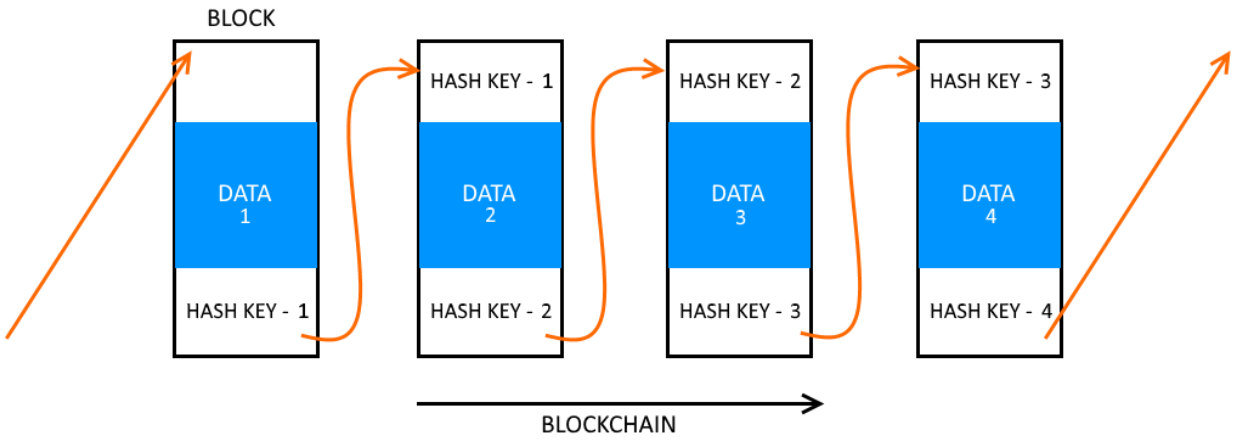
This article attempts to determine the possible future opportunities for arbitration when it comes to blockchain technology and smart contracts. It will be divided into three parts and a conclusion. In the first part the definitions of blockchain technology, smart contracts, and AI arbitration will be addressed and it will be explained how these three notions can be linked together in theory. The second part will present pilot projects on AI that serve the purpose of justice as well as their pitfalls. Eventually, the third part will address the opportunities that arise in the context of AI arbitration and blockchain technology.

I. Defining and Interlinking Blockchain Technology, Smart Contracts, and AI Arbitration [1]

A) Blockchain Technology

A blockchain is a chain of blocks that contains information. It can be pictured as a huge accounting book where the records (the blocks) are interlinked and encrypted to protect the security and privacy of what is in the blocks. It is, in other words, a distributed and secured database, open to anyone (in the case of a public blockchain), and that can contain all types of transaction, not only economical ones.

To make it simple, each block contains three elements: **the data**, which depends on the type of block (for a transfer of bitcoins for instance it will be the sender, the receiver, and the number of bitcoins), **the hash**, which is a unique fingerprint-like that identifies the block and its content, and **the hash of the previous block** in order to create the chain.



Source: techpiration.com

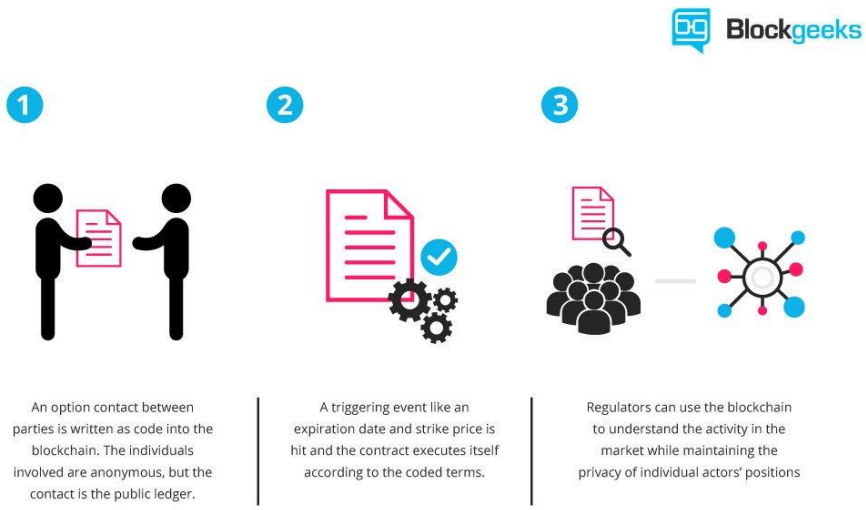
The interest of a blockchain is twofold. First, the content of each block is validated by the users of the blockchain. To sabotage a blockchain, one would need to have control over 51% of the users of that blockchain, which is not possible. Second, once the content of a block (a transaction for instance) has been validated by the community of users, it cannot be changed anymore and will be forever part of the blockchain as long as the chain exists. This makes a blockchain not only an indestructible ledger of information of all kind but also a very useful tool of traceability as anyone can access all the blocks in the chain.

B) Smart Contracts and AI Arbitration

A smart contract is a self-executing set of electronic instructions written into lines of code. This permits a computer to read the contract and to execute it if the conditions for the execution are met. It is based on an *"if – then"* logic. For instance, a smart contract concerning the lease of an apartment could be divided into two phases. First, the lessee would have to pay the first month of rent through the smart contract. That would be the *"if"*. Then, once the payment has been made, the smart contract would give to the lessee the code of the locker situated next to the door of the rented apartment that contains the keys. That would be the *"then"*.

Smart contracts have already been used for decades **[2]**, but the concept reached a whole new level with the blockchain technology. As explained before, a blockchain constitutes a secured and accurate platform of exchange of data, indestructible and always traceable. Such context is optimal to exploit smart contracts in their full potential. Indeed, when for instance two persons sign a smart contract, they can then insert it inside a block of a blockchain. The smart contract will then be validated by the users of the blockchains and once it is, it won't be possible to modify it anymore. This process presents advantages of transparency, efficiency and rapidity, amongst others. It also prevents attempts from one of the parties to rewrite the contract afterwards.

This is an illustration of how a smart contract may function within a blockchain (Source: blockchainglobal.be).



The interest of the present article is to discuss the utilization of an AI as an arbitrator, in order to settle a dispute that would arise out of a smart contract inserted in a blockchain. AI stands for artificial intelligence and in the case of arbitration, it could be constituted of an algorithm within the smart contract that would resolve disputes by founding its reasoning on similar situations that happened before in other blockchains, for instance, since all information in a public blockchain is available for the users. The object of the second part of this article is to analyze pilot projects of AI intervening in the course of rendering justice in order to see how such AIs could be used for arbitration in smart contracts contained within a blockchain **[3]**.

II. Overview of Pilot Projects and Detected Pitfalls

In this part, the author will focus on AIs that already exist and that could be used in the course of arbitration. The first AI worth-mentioning is called Kira. As described by its creators, *"Kira is a powerful machine learning software that identifies, extracts, and analyzes text in your contracts and other documents"* **[4]**. In other words, Kira is an AI that can read a contract and underline the important terms, therefore enhancing one's visibility into his/her contract. Kira can operate the due diligence process in minutes and aims in the end to reduce the time lawyers spend on reading a contract **[5]**. Thus, Kira is not a tool that can give a decision over a dispute. However, it fulfills the first step of rendering a decision: reading and understanding the contract.

The second AI this article will address is the ROSS Intelligence **[6]**. As described by its creators, *"ROSS has been built from the ground up to deliver the most complete collections of relevant law in response to your natural language research queries"*. ROSS is in other words a research platform for laws and jurisprudences like Westlaw or LexisNexis but its creators revendicate that ROSS is way easier to use and way more intuitive. Where Kira is a tool that allows a quicker reading of contracts, ROSS allows a quicker finding of relevant laws, cases, and responses for a given issue. ROSS is indeed able to answer legal questions within a day and it provides with its answer a few paragraphs explaining it **[7]**. Again, as Kira, ROSS is not a tool that can settle a dispute. However, it presents the advantage of explaining its reasoning when giving an answer.

To a similar extent as ROSS, an AI has been created to predict future decisions of the Supreme Court of the United States in given cases **[8]**. Founding its reasoning on the analysis of previous cases, the creators of this AI argue in their conclusion that their model *"achieves 70,2% accuracy at the case outcome level and 71,9% at the justice vote level"*. Although there is no doctrine of precedent in arbitration like there is in the Common Law Tradition, such an AI could be used for the purpose of arbitration. For instance, after hearing the parties and before starting to draft the awards, arbitrators could use this AI to analyze previous arbitral and judicial decisions and see how the AI predicts the outcome of the current arbitration. Arbitrators would then have an idea as to the direction their award should take, as long as they trust the AI and the jurisprudences/previous awards relied on.

All these AIs present a major disadvantage: they cannot recreate the human perspective that exists in every case. For instance, even though Kira can read the clauses of a contract, it cannot determine the subjective intent of the parties behind the clauses. To a similar extent, ROSS cannot take into account the human factor when drafting the answer to a legal issue. Concerning the third AI mentioned, as it cannot consider the sensibility of each judge of the Supreme Court, it cannot determine with certainty an outcome.

III. Identification of opportunities

There actually exists an AI arbitration: the Arbitration Engine, or *"[the] first online collective decision-making application based on the Influents Algorithm [which] is a proof-of-concept pilot, designed for a two-party conflict with an arbitrator/mediator"* **[9]**. However, this tool is actually more than seven years old and is therefore not really relevant for the purpose of the present article. Yet, it can give us insight as to how AI arbitration could be in the future. In the Arbitration Engine, visitors have two possibilities, the first one being to experiment with a pre-made scenario that is a simulation of a compulsory management-union mediation, as contemplated by section 55 of the British Columbia Labor Relations Code. The second possibility is to set up a whole new conflict scenario. In both cases, the visitor will explore the algorithm by taking on the role of the three parties (the union, the employer, and the mediator/arbitrator). **A more modern AI arbitration could have a similar structure where each party would enter their data into the system and then the AI would analyze these data little by little by asking questions to the parties to determine an outcome in the end.**

As to the 3 AIs previously mentioned, one possibility would be to merge them into one with first, Kira analyzing the contract and the potential issues raised by the parties when a dispute starts. Then ROSS could rely on previous jurisprudences/arbitral awards, but also on future decisions that would be predicted by the last AI, to draw a developed answer as to the legal issues detected by Kira. This answer could take the form of an award binding the parties as long as they agree to it. This whole process of AI arbitration could be included into a smart contract contained in a blockchain. All the users, but particularly the parties to the smart contract would have access to the conduct of the arbitration and could intervene by bringing details or by answering questions spontaneously asked by the AI. Such solution would facilitate the access to an arbitral justice as there won't be anymore need to constitute an arbitral tribunal for instance. Amongst other things, this would save time and costs. **An alternative solution, in order to limit the absolute objectivity of AIs, would be to subject the *"award"* rendered by the AI to a final check done by a human arbitrator. This could still be dematerialized as the smart contract inserted in the blockchain could already contain the name of the human arbitrator that will have to do the final check of the *"award"* given by the AI.**

However, as of today and to the knowledge of the author, there is no AI system fully used as an arbitrator and that can render binding decision to settle a dispute. It is therefore relevant, after the future possibilities previously mentioned, to discuss what are the current opportunities of AIs in arbitration and how it could be compatible with a smart contract within a blockchain.

First of all, AIs could make for good experts. According to the WIPO, *"[e]xpert determination is a procedure in which a dispute or a difference between the parties is submitted, by agreement of the parties, to one or more experts who decide on the matter referred to them. The determination is binding, unless the parties agreed otherwise"*. In that scenario, AIs could be used as experts to answer technical questions that, although they do not need human subjectivity to be answered, might require the analysis of numerous data (for instance determining the market value of the shares of a company at a given time). Using AIs as experts in arbitration could improve the speed of the proceedings, the preciseness of the results and prevent any discussion post expert determination as to the partiality of the expert, since it will be a robot.

Secondly, just like Kira which is an AI that analyses contracts, AIs could also be used to assess evidence, which consist in arbitration of determining the relevance and materiality of documents. AIs could present a summary of the pieces of evidence produced by the parties and in the context of e-discovery or the analysis of important quantity of documents, AIs could be more efficient than humans and less prone to mistakes. This would allow arbitrators and lawyers to spend their time on other issues, rather than looking for something into a pile of documents, thus saving time and costs in the overall arbitration process. However, where AIs could assess the relevance and materiality of evidence, determining the admissibility of evidence should be left over to the arbitrators. Indeed, the

issue of the admissibility of evidence involves subjective consideration, especially in the context of illegally obtained evidence. In that case, human arbitrators should be the ones that decide whether or not document is admissible having regards to the particular circumstances of the case.

As explained in another article about AI and arbitration **[10]**, AIs could ensure the equality of the parties in the arbitral proceedings by keeping a precise count of how much each party speaks, how many pages parties use in their submission and so on. In that context, AIs would be used to help arbitrators making sure the proceedings are equal between the parties and the role of the arbitrator would be to bring some subjectivity and flexibility into all that, as flexibility is also a feature of arbitration that is important for the parties.

In other words, AIs currently present the main opportunity to reduce costs and improve speed by assisting arbitrators and lawyers. On the other hand, their main asset also constitutes their main flaw: their lack of subjectivity that implies necessarily a better objectivity. All these possible utilizations of AI in arbitration could be inserted within a smart contract contained in a blockchain in order to always reduce the human intervention in something already dematerialized.

Conclusion

AIs today present opportunities not to settle disputes on their own already but to restore somehow what were the reasons parties used to choose arbitration: speed and minor costs if compared to litigation. AIs could thus be used as assistant for arbitrators and lawyers for the tedious tasks that tend to make proceedings last longer, such as the ones aforementioned. Smart contracts and blockchain technology make already an efficient and promising association aiming to dematerialize legal relationships and ease their creation. Adding an AI arbitration mechanism to a smart contract would follow the philosophy of smart contracts and blockchain technology as it would dematerialize and ease the settlement of disputes. Such a solution should be viable in the future but right now, AIs are not efficient enough to act as arbitrators and there are not enough rules to legally deal with them.

A solution could be to propose an international convention like the New York Convention but for AI arbitration. In such an AI arbitration convention, there would be rules and frames as to which situations can be arbitrable by a machine. Arbitral institutions could propose adapted rules for AI arbitration, from how to put it into place to the enforcement of an AI award. The author of this article is of the view that the use of AI is inevitable in the future and it will change how lawyers and arbitrators think, work, and apprehend a case. The international arbitration community should embrace such considerations in order to participate efficiently in the creation of always better AIs that will help arbitrators and lawyers and maybe one day completely settle disputes.

ICT pioneers who wish to develop or use AI arbitration should make sure that their technical evolution meet all existing legal requirements related to valid arbitration processes and outcomes. **With a view on ensuring legal compliance with AI arbitration, feel free to contact the Billiet & Co legal team of experts for assistance at www.billiet-co.be.**

REFERENCE

[1] To write this part, the author of this article relied on different sources without specifically quoting them such as http://blockchain-technology.cf, https://blockchainfrance.net, https://www.blockchainexpert.uk, or the YouTube Channel "Simply Explained – Savjee".

[2] See *Smart Contracts Were Around Long Before Cryptocurrency*, Allan I. Mendelowitz and Willi Brammertz, americanbanker.com, 17 November 2016.

[3] AI arbitration has to be distinguished from ODR (online dispute resolution) as AI could happen online but not every arbitration that happens online is AI arbitration. For an insight on ODR projects, see *The Governance of Blockchain Dispute Resolution*, Darcy W. E. Allen, Aaron M. Lane and Marta Poblet, pp. 8-13.

[4] https://kirasystems.com

[5] To a similar extent, see https://ebrevia.com/#overview, which is an AI specialized for due diligence in M&A.

[6] https://rossintelligence.com

[7] *A New Beginning – Artificial Intelligence and Arbitration*, Philippe Billiet and Filip Nordlund, Korean Arbitration Review.

[8] *A General Approach for Predicting the Behavior of the Supreme Court of the United States*, Daniel Martin Katz, Michael J. Bommarito, and Josh Blackman.

[9] http://www.arbitrationengine.com/index.html

[10] *Will Artificial Intelligence Take Over Arbitration?*, Christine Sim, Asian Journal of International Arbitration, p. 8, 2018.