

**Special Collection: Report on Blockchain
for Societies.**



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The Amsterdam Law Forum (ALF) has released in this edition a Special Collection titled Report on Blockchain for Societies, which has been edited by Dr Thibault Schrepel who is an Associate Professor at the Vrije Universiteit Amsterdam (VU) and PhD student in blockchain and antitrust Kirill Ryabtsev. This Report is composed of several contributions written by prominent scholars and practitioners in the area of blockchain technology, the Report discusses the application of blockchain governance to various legal fields such as data protection, regulation of luxurious goods industry, real estate, health and vaccines, and laws on nationality.

BLOCKCHAIN AND AI: AN (ALMOST) PERFECT LIAISON

A PRELIMINARY STUDY OF THE CIVIL RESPONSIBILITY REGIME

By: Benedetta Cappiello

INTRODUCTION

The rapid improvement and development of Distributed Ledger Technologies (“DLTs”) and software or hardware of artificial intelligence (AI) are increasingly changing people’s daily lives. Overall, the technological advent is deemed to be “disruptive” towards the old and traditional nation system, as conceived since the Peace of Westphalia; namely, the current spread of new technologies is leading towards a paradigm shift among all in the economic, social and for what it of interest for the present contribute, the legal. It thus requires a coherent change of approach at all levels of society.

Both DLTs and AI have put at stake at least the economic and the legislative sovereignty of the State; also, traditional legal concepts struggle against the (alleged) new ones, developed thanks to the new technologies. Reference is made, for instance, to the contract *vs.* the smart (legal) contract, the companies *vs.* the diffuse autonomous organizations (DAOs).

This entry intends to question what would happen if the two more challenging technologies, blockchains (one among the DLTs representation) and AI, were to be combined. The aim is to understand whether and how the said technologies can work together to improve each other while increasing society’s well-being. In this respect, this entry will tackle both the technology (what blockchain and AI are, and how they work) and the legal consequences derived from their use. In this respect, two use cases will be presented. In detail, the expected regime of non-contractual liability, which shall apply to platforms/systems developed and deployed, combining a mix of blockchain and AI software will be scrutinized. A conclusion will then be attempted. Regarding the geographical area of interest, the entry will focus on the EU while being aware that the phenomenon under scrutiny has a transnational dimension.

TECHNOLOGICAL SIDE

The idea to combine blockchain technologies and artificial intelligence is grounded on

the assumption that, as said, both are leading to a radical shift in society. Given this, it is questionable whether a combination will boost their respective use while overcoming their shortcomings. A brief understanding of both technologies will help.

AI is used to automate tasks that normally require “*human intelligence*”. AI technologies are not new, but today they have become highly sophisticated. As regards the state-of-the-art, two significant branches of AI can be distinguished. In the first one, real-world phenomena or processes are modeled (translated) in a form that computers can read and use. Thus, IT programmers will provide an AI software with rules mirroring the underlying logic and knowledge of the activity the programmers want to model and automate.

The second area is represented by the so-called machine learning software, which detects patterns in large amounts of data. These systems are programmed to understand whether a given data (such as an email) shall be in (desired) or out (spam). The system reaches this conclusion by analyzing given words/patterns it has learned to understand from an enormous amount of data. Accordingly, king/win/ and others lemma, along with an email departure (such as Belarus), might prove that a given email has a higher chance of being spam. Accordingly, the more data an AI system has, the more it learns and elaborates them highly sophisticatedly. However, it does not guarantee their “quality” nor certify their provenance or immutability. The software can thus then get mistaken. Given these shortcomings, an AI machine learning system might be combined with blockchain technologies.

In a nutshell, blockchain is a digital ledger storing an impressive amount of data. The system is decentralized, immutable, and transparent. It has been changing the concept of trust: from third-party trust to technology trust. The data uploaded within the chain are “correct” from the technical side: they have not been duplicated or reused. However, the data are not necessarily true; the garbage in and garbage out paradigm is inherent to blockchain: a data stored in block is in fact immutable but if it mirrors an information which is untrue, the negative consequences will affect all the subsequent transactions.

Some blockchains rely only on endogenous data (party, token); thereby, the transaction occurs within the chain. Some others require an exogenous third party, an oracle, acting as a virtual agent, providing for the data, which triggers the required transaction. For instance, a swap contract (Bitcoin *versus* Euro) written as a smart contract in the blockchain might provide that the exchange will be made once the Euro has reached a given value in the Milan stock exchange. The contract is basic: if – then. However, it

requires data taken from outside the blockchain to be deployed. The contract abides by what the oracle states, and the parties, too, are indirectly bound.

This said, one might wonder whether the proposed integration of AI and blockchain might entrust the data provided by machine learning software: the algorithm developed within it might exploit the blockchain technologies to collect, store and use accurate and certified data.

TWO USE CASES

1. Fetch.ia is a native platform developed on blockchain and provides a series of different services in various fields of daily life (energy, supply chain, hotel agency, parking, energy consumption). For each field, an AI agent written with an algorithm of machine learning is deployed and increases its capabilities thank to the available amount of data at its disposal. In fact, the platform is open to all interested users who can enter in the P2P buying the FET token; once in, each user can share and get information in its field. In practice, once a transaction in a given field is required (say that a party is searching for a hotel room in a given place), providers and consumers *via* their AI agent (the interested party and the hotel owner) will be connected; the AI agent will then elaborate the information at its disposal – available within the blockchain – to get out of the transaction their respective optimum. This means that the two AI agents share the data stored in the platform (say the medium price for a hotel room; the amount of money the person involved wants to spend) and through the algorithm of machine learning they get the maximum output. Then a transaction on the blockchain is made, say the booking of the hotel.
2. Jur.io is a native blockchain platform providing three levels of dispute resolution: the first one implements “a smart arbitration” system based on legally binding procedures. For this level, the deployment of an AI system is under scrutiny, smoothing the task of data 'storing, reading, and elaborating. When a claim, all documents and attachments will be scrutinized and synthesized by AI software before reaching arbitrators 'attention. The other two layers work as ADR on a P2P platform; take for instance the case of a selling contract of minimum value, and having a transboundary nature; in case of breach of contract parties won't have interest to start a claim before a court or an arbitral tribunal; however, justice in the relationship can be ensured by other means. In this respect ODR first, and ADR on blockchain system now can offer a solution. In practice,

they feature a decentralized oracle-like voting system providing decisions in small/micro-claims (similar to contract agreement). This is possible by exploiting game theory and the Schelling focal point. The result will reflect the desirable solution; then, the algorithm of deep learning, linked to the platform, will help corroborate or not the solution. This means that the algorithm will elaborate the data stored in the platform (including for instance old decision) and it will tell whether or not the solution proposed is the “just solution”. Those acting as arbitrators might rely on the oracle, which has a better and deeper understanding of the praxis in a specific field.

LEGAL CONSEQUENCES

All the above raises some legal consequences which need to be tackled with. Reference is made to the accountability and responsibility issue. The question arises because the oracle/AI Agent developed as an algorithm of machine learning might get wrong because of an original bias or a bug subsequently appeared. The negative consequences are borne by the parties (users and bystanders); however, the principle of *neminem ledere* which informs each legal system requires that, in case of damage, there should always be someone to be held liable. The spread of new technologies is putting at stake the regimes of civil liability (fault-based or risk based) currently available; namely, the question has become how to ascertain who is liable for what; the opacity of AI-systems – especially those engaging with machine learning techniques – can make it extremely difficult to identify who is in control and therefore responsible.

The current challenge for the legislator is to determine a clear legal framework able to, firstly, guarantee continued technological development and secondly, to be integrated with already binding sources of law. To reach this result, we assume that there is a human being behind each technological application who shall be held accountable and take responsibility for his/her wrongdoing (in programming or controlling a program). That said, it is of interest to scrutinize the most recent legislative proposal enacted within the EU.

The legislator has started to sketch normative provisions regarding blockchain technology, at least on some aspect of its deployment (crypto assets or cryptocurrencies). As for AI, its ethical, social, and legal aspects have been under deep scrutiny. The EP recently released a draft Regulation on AI enacting provision on civil responsibility of AI-Operators, distinguishing between AI-systems having high or low-risk impact. Given this, one might wonder whether the said EP proposal will apply to platforms developed

through both AI and blockchain once enacted as a Regulation. Mainly, reference is made to the provisions enacted for AI systems having a low-risk impact. For those, the EP draft introduces a fault-based system according to which the AI operators will be held accountable for their wrongdoing (only a few exemptions are provided). In the case of the P2P platform linked to AI (Oracle /agent), the operator allegedly accountable is the individual/company that has developed and is controlling the algorithm; besides, it might be held accountable (joint responsibility) the operator having deployed the P2P platform.

Moreover, the combination of AI and Blockchain technologies might make it easier to apply the EU Regulation on general data protection. The data controller and the data processors might be easily found where there is an AI system developed to store and use the data. Unlike blockchain, AI does not guarantee the anonymity of its users and its developers.

PRELIMINARY CONCLUSION

The entry has shown that new technologies such as blockchain and AI can be integrated exploiting the best each one can offer. As shown, the reliability linked to a blockchain platform (in terms of data storage and data control) can ensure that an AI-system linked to the platform will provide its algorithm of machine learning with data which can be trusted because they are immutable and transparent. The output so reached by the AI algorithm increases the confidence of parties involved; the medical sector is the one which could exploit the best from the said technologies integration (think about data triggered out of clinical trial, then stored in a blockchain platform and re-elaborated by an AI algorithm to provide, among all, a diagnosis).

That said, the entry has also shown that there is legal effect linked to new technologies development and use which need to be tackled with; technologies run faster than legislators at all levels; as seen, currently there have been very few normative attempts to enact provisions defining a regime of responsibility for both blockchain platforms and blockchain operators. Conversely, legislators have drafted provisions on AI ethical and, also and foremost, responsible development and use. Accordingly, the proposal to apply these letters to a platform which combines AI and blockchain technologies will help confer legal certainty upon users; this will cover the normative on civil liability within blockchain operators currently lay. Accordingly, the anthropocentric approach distinguishing AI shall somehow be favored and applied for blockchain platforms. This

will, in turn, positively impact society: it will raise the confidence in the technology while better protecting users, acting as producers or consumers.

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