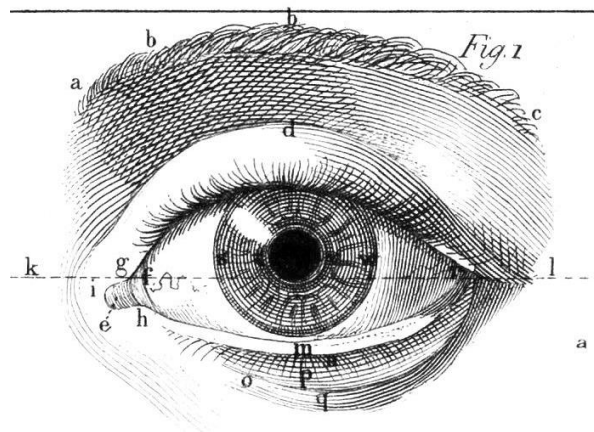


Barlaeus dinner on Trust in decentralized data infrastructures

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Report



Blockchain & Society Policy Research Lab

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Twice a year the University of Amsterdam (UvA) invites the most distinguished members of the Dutch society, scientists, business leaders, high ranking public servants for a dinner to discuss impactful societal, economic, cultural or scientific issues. The Barlaeus dinners – honoring Caspar Barlaeus (1584–1648), the Dutch mathematician, historian, poet, humanist, and theologian – provide a platform for academia, industry and public administration to learn from each other, and coordinate action for the benefit of society. Its latest edition was hosted by the Institute for Information Law's (IViR) Blockchain and Society Policy Research Lab among the classical statutes of the Allard Pierson Museum, on 24 of May 2018. The event was devoted to the controversial yet thrilling topic of trust in decentralized data infrastructures, such as blockchains.

In this document we summarize the discussions that took place among the extraordinary group of guests including, among others, the Rector Magnificus of the UvA, the Chief Scientist of the City of Amsterdam, the CEOs of IBM, and ING, partners from the biggest Dutch law firms, and senior UvA scientists, such as the Dean of the Business School, or the Directors of IViR, and the Institute for Network Cultures.

Highlights

- Contrary to the dominant discourse blockchain technologies are not trustless. In fact trust is a major, unresolved challenge related to the technology.
- Practical applications that are able to prove the worth of decentralized datasets are yet to emerge
- Extensive interdisciplinary education programs are necessary to facilitate the knowledge transfer among different societal domains, and to unlock the full potential of this technological innovation
- Blockchain policies should ensure that the technology does not interfere with justice and democracy, and should actively balance economic interests with fundamental rights
- The development of blockchain governance frameworks is probably the most important challenge in the short to mid-term.
- There is a potential of, and a need for multidisciplinary collaborations inside UvA, and with other partners in the Amsterdam region of these topics.

The evening started with opening speeches by Mirjam Leloux, the Director Information Exchange Amsterdam, and professor Karen Maex, the Rector Magnificus of the UvA. After them, Balazs Bodo, the founder of the Blockchain and Society Lab, gave a keynote on the importance of and uncertainty around the concept of “trust” in the context of blockchain technologies. The subsequent discussion was organized around four round tables, each entrusted with discussing the fate of data in a blockchain-based scenario across four dimensions: markets, government, law, and society. In the following we summarize the keynote and the table discussions.

Trust and Blockchain Technologies

The Blockchain and Society Policy Research Lab which we established at the IViR at the beginning of 2018, with the help of a €1.5M ERC grant, studies the legal and policy implications of blockchain technologies. The goal of the Lab is very similar to the goal of the Barlaeus dinner: we want to create a reliable and trustful source of knowledge, together with a trusted network of partners for the rapidly developing domain of blockchain technologies.

There is a fundamental paradox around blockchain technologies. On the one hand they are being advertised as technologies which can eliminate the need of trust, of trusted intermediaries and trusted institutions from a number of human activities. On the other hand, there is an immense amount of hype around the technology, and the rapid rise in the value of cryptocurrencies invited a flood of fraudulent activities to the blockchain technology domain. While the technology is seen as “trustless”, the social, economic, political, and cryptographic challenges around it are mind-bogglingly complex. While the technology promises full transparency, the groups of stakeholders, the marketplace of the blockchain-based projects, the products and services are increasingly intransparent. Consequently, there is very little verified and trustful information available about the technology, its societal impact, legal compliance, the long-term threats, dangers, as well as opportunities and promises. We believe it is time to produce trustful information on the real societal value of the technology, information that looks beyond and exposes the hype, information which is not biased by some hidden agenda.

We also need to create circles of trust among institutions that have long term responsibilities in society. The speed of change in the technology sector is dizzying. New concepts emerge, become fashionable and die, in the course of a few years. As the science fiction writer Bruce Sterling noted in 2010 at a conference on the university and cyberspace, our digital environment is structured around concepts, products and services which usually have a shorter life-span than a pigeon. Just think of the term “information superhighway”, Napster, or the iPod. On the other hand, the guests of the Barlaeus dinner – in the spirit of Barlaeus himself – represent institutions, human and societal projects that are all inter-generational and connect past generations with future ones. Universities, banks, cities, the state, law firms, newspapers, museums: they all operate in a time scale that involves multiple human generations. They are custodians of human memories across decades and centuries. They all coordinate human activities that span over centuries.

If the main goal of the Lab is to create trusted knowledge, our other goal is to bridge these two time scales: the short scale and the intergenerational; the technological and the institutional; the temporary and the glacial; the revolutionary and the conservative. The coming blockchain revolution set out to retire many of the trusted institutions, by disintermediating the human practices that they coordinate. We want to make sure that before that happens we thoroughly understand the role, relevance, strengths and weaknesses of the disrupting technology and the institutions to be disrupted.

The first step in achieving this goal is to change how we deal with technology and the promised disruption. If we listen to entrepreneurs and blockchain evangelists, we hear grand visions about how and why a decentralized technology will lead to radically new forms of social, economic and political organization. While we cannot rule out the chance of such a revolution, we rather prepare for an evolution: the evolution of institutions, markets, modes of social, political cooperation and coordination, etc. The goal of this Barlaeus dinner is therefore to focus on the evolutionary potential of blockchain technologies, and think about how the institutions we represent can use this novel technology for the benefit of society, for the benefit of our respective institutions, for the benefit of each of us as citizens.

Since the term “Blockchain” covers an already huge, rapidly growing and highly technical field, we propose to do something simple. At its core, blockchains are nothing more than distributed databases. Rather than storing data in one central data silo, this technology enables us to maintain a shared set of facts together. To give you an example from a completely different domain, the British Broadcasting Corporation (BBC) some years ago experimented with decentralizing its very core, its very essence of existence, its audiovisual archive. The idea was to give every BBC license fee payer a media server, linked up via a peer-to-peer network, on which there was a small part of the BBC archive. This would have made every British citizen a custodian of the audiovisual heritage of the UK. Blockchains do something similar: free up data from the sole custodianship of a single institution, and enable a wide group to preserve that data together.

We already have two well-established mechanisms to maintain a shared knowledge about the state of the world around us. Markets are very good decentralized mechanisms to aggregate knowledge in the form of prices. Bureaucracies have developed over the ages to maintain an authoritative source of knowledge in certain domains. With the internet, it has become obvious that under certain conditions decentralization may be a more effective way to pool knowledge, to coordinate the production and use of resources than either markets or bureaucracies. So, the first set of questions flows from this technological opportunity of decentralization. What kind of data is best shared in a decentralized manner? What is the knowledge that we, as a society, want to manage and preserve in a decentralized manner? Can we imagine contexts and situations in which we would feel comfortable sharing the burden and responsibilities of maintaining datasets with others? Can we

imagine ourselves, our institutions, to rely on data shared and maintained by a decentralized network of unknown actors, rather than the processes and institutions we know and trust already?

The second set of questions goes beyond the data itself, and looks at how that data is used. One of the most important uses of data, any data, is that it enables the coordination of groups and activities. This has been true ever since the first tax records were pressed into the soft clay, somewhere in Mesopotamia, and thus the first states were born, several thousands of years ago. As a result, blockchain technologies raise the question of what kind of human activities are best coordinated in this decentralized, distributed manner.

Evangelists try to convince us that any and every human activity can and should be coordinated via shared datasets and impersonal smart contracts. Science is organized skepticism, so we are reluctant to accept this claim without serious scrutiny about the relative costs and merits of the alternatives. As for the coordination of small groups, such as ours, at this dinner, the proper technology of coordination is the room, the chair, the table and some food. Markets and bureaucracies have also proved to be highly efficient in coordinating in huge and complex human endeavors.

Yet, more and more of the things around us are of planetary scale. We are using planetary scale info-communication infrastructures. We use networks and services that operate simultaneously across billions of users. We are embedded in global systems of finance, logistics and labour. We are facing planetary scale challenges of global warming, migration, pollution, etc. All of these require the coordination of human resources, activities, processes on a planetary scale.

In face of these challenges it is imperative for us to know whether a decentralized-data-based coordination infrastructure, which blockchain promises to be, could step in where markets or bureaucratic forms of coordination seem to fail to produce good enough results. We can and should use this technological opportunity to explore whether it is possible to scale up the governance mechanisms to a planetary scale so we can govern such resources in a decentralized manner.

In order to arrive at the answers to such large-scale questions, we need to clarify a plethora of issues in the background. We need ensure that the data which sits in these decentralized databases accurately represents the state of affairs. We need ensure that the off-chain and on-chain states of the world are kept in sync, that there are reliable sources of truth for the shared databases, and that the off-chain consequences of on-chain actions are properly enforced. We need to be sure that there are no perverse incentives hidden in the decentralized systems that lead to the re-concentration of power in what was designed to be a decentralized network of distributed power, distributed trust. We need ensure that the decentralized technological systems and the status quo will not be locked in an endless antagonistic power struggle the way p2p file sharing technologies and copyright law are now.

Is it possible to create such a certainty? We believe so. But for that to occur, cooperation of this group is needed. None of us is in the position to answer these questions alone. We need to invest in discussions, shared projects, interdisciplinary education programs so we can come up with ways to find the answers. We need to develop spaces and instruments, such as regulatory sandboxes, where we can test solutions. This Barlaeus dinner hopefully will be the first step in the process.

Markets

The Markets table was led by Marc Solomon, the Dean of the UvA Business School. The table focused on market forces and was invited to discuss the topic through the lens of the market: investment, risks, profits, and competition. The group focused on two issues. First, assessing the value of blockchain technology in solving market problems. Second, evaluating the quality and necessity of blockchain implementations.

The first question tackled by the group concerned why, today, only few blockchain-based solutions find actual implementation, while most remain mere ideas. It was noticed that a surge of projects appeared on the market, but progressively became inactive after a short life span. Similarly, many proofs of concept have been developed, but have yet to become fully operational.

Notwithstanding efficiencies in value transfer and the ability to lower transaction costs offered by the technology, the group identified several challenges hindering the actual implementation of blockchain-based projects. First, according to the participants, it would be necessary to propose more useful and effective use cases which can attract a larger client base and convince people of the benefits of the technology. On a more technical level, the need to ensure security and privacy to the input data and the lack of digitization of relevant datasets create obstacles for the launch of blockchain implementations. Moreover, the lack of trust in the technology and in the surrounding ecosystem contributes to slow down the emergence of the industry.

Generally speaking, there are both legal and technical barriers hindering the launch and success of blockchain-based projects. As for the future development of the industry, lack of education and specific skills on this technology could represent a further impediment. The lack of transfer of knowledge at an interdisciplinary level constitutes a barrier that must be overcome through coordinated effort and cooperation. Technical knowledge, in fact, is not sufficient for the market success, and interdisciplinary skills will play a crucial role in fostering future blockchain adoption and growth.

When wondering about which use-cases for blockchain could reveal successful in the upcoming years, the participants manifested particular optimism regarding implementations in the education field. More specifically, blockchain could underpin the creation of reputation systems with accreditation points, ensuring the mobility of degrees across universities and educational institutions in general. More generally, the transfer of value without the intervention of a central certifying actor, as enabled by distributed ledger technologies, could be beneficial in several areas of business.

The sharing of data is a fundamental aspect of blockchain technology. The current lack of incentives for organisations to share data within existing data markets could be overcome in the context of future blockchain-based digital infrastructures. Today, the value that can be derived from holding information is the main driver of the so called data economy. The group suggested that new incentives systems could emerge to open the sharing of non-personal or anonymized data, and blockchain applications could be a kick-starter for this change.

To sum up, the markets group welcomed blockchain technology with enthusiasm but not without acknowledging the multiple obstacles that currently hinder its actual implementation. In particular, clear regulatory frameworks and strategies for data management should be provided in order to promote the correct development of this promising industry.

Government

The government table was led by Andre de Kok, System Architect at the Rijksdienst voor Identiteitsgegevens. The government group tackled the question of how public institutions should approach Blockchain and the decentralization of data and services. First, the participants observed that the state, with its multiple functions and apparatus, conveys different sets of interests and objectives into organizational and regulatory frameworks. On one hand, the legislative power is traditionally aimed at providing certainty and continuity to the “social contract”. To protect individuals and safeguard the fundamental values of society, institutions limit market forces and overlook the allocation of sources. On the other hand, the government must organize administrative functions and infrastructures to ensure the most efficient arrangement of social and economic interactions. In this capacity, the state should promote innovation and encourage technological development for the optimization of resources.

The discourse on the relationship between government and blockchains is therefore twofold: on one side, it is relevant to question how the State should react to the development of the technology in order to tackle threats and challenges of decentralization. On the other, it is interesting to investigate how public bodies could benefit from the use of blockchains to increase transparency and efficiency.

As for the first question, the guests discussed if and how the state should regulate blockchain technologies and the applications based on it. Despite the difficulty of identifying an appropriate holistic approach for the regulation of the technology, the participants were convinced that the state should not be neutral. Public institutions should endorse an ethical and normative framework aimed at preventing uses of the technology that interfere with justice and democracy, balancing economic interests with fundamental rights.

The second query regards the possible use of blockchain technology at a governmental level as a means to pursue public interests such as increasing trust in institutions. The seminal use-case discussed was that of digital identity. Two Dutch municipalities are piloting blockchain-based projects seeking to optimize online recognition and authentication processes and, avoiding the multiplication of data collectors, give citizens exclusive control over their personal data. Another field of application mentioned by the participants was the health sector: several national and international studies are exploring the use of blockchain for the management of medical records in a privacy-by-design and security-by-default fashion. Finally, highlighting as a crucial requirement that of technical interoperability, it was noted how the technology could also prove to be cost-saving and time-efficient for taxation accountancy.

All the participants were excited about the organizational shifts these use-cases may produce. However, they also saw the potential downfalls of such systems. Above all, the risk of increased mass-surveillance which the datafication of society entails.

Notwithstanding the spread of enthusiasm about the disruptive power of blockchain, the first-hand experience of some of the guests revealed that the government is not eager to change. An effective design of governmental infrastructures requires the coordinated development of appropriate governance, law and technology, for which a common understanding of tools and objectives is a precondition. A clear policy and standardization strategy are, therefore, the first steps to be undertaken by institutions dealing with blockchain. On one side, the technology could increase citizens’ trust in data and, if properly deployed, award public actors more transparency and efficiency. On the other, decentralization and automation of processes pose challenges to law enforcement and social equality. Hence, it is in the interest of institutions to overlook the

development of blockchain technology and – maintaining a strict dialogue with the stakeholders involved – develop the capacity to capitalize on opportunities, as well as tackle emerging issues.

Law

This table was chaired by Nico van Eijk, Director of the IViR. The discussion at this table centered on the role of law and regulation vis-à-vis blockchain technology, as well as revolutionary vs evolutionary nature of the same. The general view was that law has an important role to play in the development and adoption of blockchain technology. Although this technology may disrupt legal processes, it will probably not replace them. Law should function as an enhancer of trust in the technology, rather than a barrier for its development. In developing regulatory models, policy makers should look at how disruptive technologies of the past (e.g. radio broadcasting or the Internet) were regulated. Ideally, regulation should be triggered only when the use of blockchain technology in a given sector achieves sufficient scale to justify oversight, due its potential risks and harms.

In its simplest expression, this means that the level of regulation should reflect the scale of the person or company it targets. One approach to actualize this vision is through risk regulation, with legislators stepping in where the use of blockchain technology materially impacts core aspects of a market or sector, or poses significant risk of conflict with consumer rights or fundamental rights. One could also tackle the technology via a value chain approach, similar to the way in which Internet service providers are regulated in copyright law. In other words, legal responsibility would be attributed on the basis of the value of the activities performed by a company operating in a specific blockchain sector, in relation to the product or service marketed. Either approach would entail the imposition of stricter regulations on high value actors in certain blockchains, such as miners or cryptocurrency exchanges.

When discussing potential EU-wide regulation of blockchain technology, the question emerged of the application of such regulation to non-EU actors, especially for enforcement purposes. One possible venue to ensure a wide geographical reach of European regulation would be to rely on the extraterritorial application of some sectorial EU law. It was noted that this may already be the case with regard to personal data protection, due to the broad territorial reach of the General Data Protection Regulation (GDPR). In fact, assuming this legal instrument applies to blockchain technology – on the grounds that the data in question are pseudonymous –, then it may apply extraterritorially in certain scenarios to blockchain companies that have no physical contact to the EU. Another possibility brought up by the participants was to deal with jurisdiction and enforcement issues at the level of international trade law, especially in sensitive areas like financial services.

From the privacy standpoint, and beyond the issue of extraterritorial application of the GDPR, doubts were expressed on how to ensure the application of the right to erasure ('right to be forgotten') provided for in Article 17 of the GDPR. In addition, there was a discussion on the benefits and drawbacks of the use of pseudonymous data, which are covered by the GDPR, and anonymous data, which are not. Most participants professed a preference for the blockchain solutions relying on pseudonymous data, as this would in principle allow for the application of the GDPR, thereby providing a measure of legal certainty and oversight to users and companies. From the regulatory perspective, this could mean taking steps to restrict anonymization techniques.

Another cross-cutting topic of discussion related to the question of whether blockchain represents a revolution or an evolution. The answer, it was argued, will to a significant extent depend on the context. In some contexts, the technology appears to be revolutionary, provided it is able to scale. Several examples were mentioned: identity management; land registries in countries where

traditional systems are unreliable; the use of cryptocurrencies where the national currency is unstable (e.g. in Venezuela); the case of remittances, where blockchain allows significant efficiency gains; some processes in the context of the insurance sector; and the tracking of shipped goods across the world.

In examining the current landscape, it was further argued that the most promising use cases for blockchain are found in closed permissioned applications, which are by definition the furthest away from the most disruptive decentralized, open, and permissionless applications. As one participant put it, the most successful blockchains have a trust layer, which paradoxically relies on trusted intermediaries, precisely those middlemen that this technology was supposed to dislodge. If this is true, then blockchain might represent in many cases a new round of automation.

Society

Geert Lovink, the Director of the Institute of Network Cultures, led the discussion at the society table. We envisioned this table to take a look at the opportunities and risks from a critical, societal perspective, and dig deep into the question of how societies, democratic institutions and processes, our smaller or larger communities can remain in control of, and not be subjected to a technology, which, at its extreme, may atomize societies and channel human interactions through impersonal and self-executing smart contracts.

The most important recurring concept in the discussion was that of ‘power’. Sometimes power surfaced in very literal terms, such as the geographic clustering of blockchain miners who enforce the rules on the blockchain around cheap sources of electricity, often in authoritarian countries. The more energy-consuming the upkeep of blockchain infrastructures is, the more likely that an underlying, hidden geography of cheap power will have an impact on the power relations within the blockchain ecosystem. But power has also turned out to be important in its other sense. Decentralized technologies, which have no single legal entity behind them - just a loose, ever changing and anonymous network of developers, who work on open source code - tend to emerge as autonomous or sovereign sources of power, which are able to challenge the law enforcement capacities of states. Privacy enhancing technologies such as the TOR network, or P2P file sharing systems, like bittorrent, are just two examples of dual-use technologies, which have important legitimate uses but also enable large and resilient dark-webs to operate. Recent years have been about an increasingly intensive power struggle between these technology-enabled extralegal domains and practices, and various private and public agents trying to counter them. Certain variants of blockchain technologies also enable dual uses. On the one hand, for some applications, there will be ample incentives to achieve full legal compliance. But we also have to understand the conditions which foster extra-legal applications of the technology.

The second issue that emerged was the system of incentives, and opportunities for institutions and individuals to participate in the governance of blockchain technologies, and applications. How technology is governed by stakeholders, and how technology can be used to govern activities, groups and resources was identified as a key challenge that needs sustained and intense attention. Decentralized technologies have proven to be an effective alternative to market and centralized forms of coordination. But it remains unclear if decentralized forms of governance also prove to be more effective than the status quo. In particular, the discussion identified the drivers and technical possibilities of re-centralization as a key challenge. Though the technology was designed to be decentralized, it is increasingly clear that there are many opportunities and ample economic or political incentives for re-centralization of power in the decentralized network. One interesting

question left unanswered was: given humans' propensity for power and hierarchical relations, why would anyone participate in a system that effectively prevents any concentration of power?

Ultimately, the discussion turned to the concept of trust, and the need to better explore the latter in the context of blockchains. Since it is often unclear who exactly has power over processes, activities and transactions occurring within the network, it is also unclear whom participants need to trust, what is the exact scope of that trust, and how different types of trust (in the math, in individuals, in the right incentives, in numbers, etc.) mix.

Conclusion

The Lab participated in the development of the Dutch Blockchain Research Agenda, which was published in spring 2018. The Agenda sets out a number of research priorities that also address the practical manifestations of the challenges we identified during the dinner discussions. Our hope is that this meeting was only the first in the line of collaborations which systematically invest in finding the answers to most of the questions raised.

About the Lab

The [Blockchain & Society Policy Research Lab](#) was founded in 2018 at the [Institute for Information Law](#), University of Amsterdam. Its goal is to explore the legal and policy implications of blockchain technologies using an interdisciplinary approach. The Lab works on a number of challenges, with an interdisciplinary team.

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