



UvA-DARE (Digital Academic Repository)

Life in Blocks: How Blockchain Technology Narrates the World

Leiter, Andrea

Publication date
2022

Published in
Research Handbook on Law and Literature

[Link to publication](#)

Citation for published version (APA):

Leiter, A. (2022). Life in Blocks: How Blockchain Technology Narrates the World. In P. Goodrich, D. Gandorfer, & C. Gebruers (Eds.), *Research Handbook on Law and Literature* Routledge.

General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

20. Blocks

Andrea Leiter

INTRODUCTION

The claim that blockchain will disrupt life as we know it has been voiced in almost every corner of the world, with few topics left untouched. But how can we engage with such a claim? How can we try to understand the kinds of changes that are being fostered by this technology? The idea behind this chapter is to try and sketch out ways of reading blockchain technology as narrative technology. Rather than inquiring into the stories about blockchain technology, I focus on the narrative capacity of the technology itself, treating the technology as a mode for mediating how we interact in and understand our social, economic and institutional engagements. I conceptualize the architecture of the technology as a site of politics, where normativity is constituted through the demands of representation as the narrative form of the technology. Rather than providing a final judgement on the potential and threats of the technology, the contribution aims at developing a vocabulary that foregrounds the ordering capacity of blockchain technology and inquires into the ways in which it mediates lives.

NARRATION AS WORLD-MAKING

Declaring a new beginning is like putting down a marker and demanding that the interpretation of everything revolves around this marker. One field that has put down such a marker is blockchain technology. Its advent was accompanied by a claim to disruption of the status quo in almost all areas of life: nothing less than the disruption of the economic structure, the disruption of the monetary structure and the disruption of established structures of governance. The notion of disruption demands a cut – a breaking of tissue and a reconfiguration of the past toward the current moment with a view to the future. One way of engaging with such a claim would be to trace its history and reassemble the genealogy of its pieces in order to locate and situate its claims.¹

Yet, rather than historicising the claim to disruption, I work with the concept of narrative and its relationship to ordering the world.² It is especially the agency of the narrative, its ability to enact a world, and its capacity to take up ‘the risks and joys of composing a [...] cosmopolitics’³ that I explore. I rely on Said’s characterisation of the Western novel as the particular genre that narrates with an intention for creation, an intention for changing, for making, ‘for

¹ Adrian Daub offers a comprehensive account of the notion of disruption in the tech space, tracing it through economic history and drawing out its libertarian flavour. See: Adrian Daub, *What Tech Calls Thinking: An Inquiry into the Intellectual Bedrock of Silicon Valley* (FSG Originals x Logic 2020).

² Donna J Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Duke University Press 2016).

³ Ibid 15.

a kind of appetite that writers develop for modifying reality'.⁴ Such modification relies on the invocation of something new, something with the ability to alter the status quo. Newness in this sense is then understood to stand neither in contradistinction to everything else, nor as a placeholder for something not yet recognised. Much rather, newness here is to be understood as the inauguration of a world-making process through narration. World-making takes place through assembling various modes of representation (not representations) that cut the concepts with which we live in the world and through which we know it.⁵ In such an account, narration points me to the close relationship between author(ship), author(ity) and world-making.⁶

With a view on authorship, I try to situate the stories about the blockchain space in the context of their emergence. Who is claiming what and from where? These questions have a firm place in the repertoire of critical inquiries, as they enable us to draw out implicit assumptions, biases and interests of the authors that are not made explicit or visible in a narrative. With a view on authority, I engage with the enactment of the narrative, with its ability to implement modes of engagement that mediate life. Finally, with a view on world-making, I try to follow the politics of exclusion. Narrating the world means authoring it by including certain things in the story and leaving others out, highlighting some aspects and backgrounding others. Or, to speak again with Haraway, it is about 'both absence and presence, killing and nurturing, living and dying – and remembering who lives and who dies and how in the string figures of naturalcultural history'.⁷ Thus, it is by means of narrative and storytelling that I want to approach the claim to disruption in the blockchain space. But rather than only assembling stories about the technology, I will inquire into blockchain's own narrative technique, its own mode of storytelling. By focusing on blockchain as an overarching technology of narration, I try to grasp how our social, economic and institutional interactions are and will be mediated by this technology.⁸

The first part of the contribution relates the question of authorship to the White Papers of the two most prominent blockchains, the Bitcoin and the Ethereum blockchain. The White Papers are the closest we can get to actual authorship that expresses the visions, ambitions and ideologies of the projects. Through the distributed nature of the network, authorship in the operation of the network is decentralised and supposedly lies with all participants who engage in the network. The second part draws out the limitations of the non-authored network phantasies by tying them to the mechanical architecture of the blockchain. Authority is exerted by the enactment of the forms of engagement that are enabled on the blockchain in the form of smart contracts. As a Turing-complete system, the Ethereum blockchain claims to enable

⁴ Edward W Said, *Beginnings: Intention and Method* (Granta Books 1997) 81.

⁵ Donna J Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Duke University Press 2016). The notion of 'cut' is inspired by a 'matterphorical' understanding. See: Daniela Gandorfer, *Matterphorics: Of the Laws of Theory* (Duke University Press 2022).

⁶ Shaunnagh Dorsett and Shaun McVeigh, *Jurisdiction* (Routledge 2012) 32.

⁷ Donna J Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Duke University Press 2016) 28.

⁸ Others have taken up a similar idea of thinking of blockchain through narrative; see: Wessel Reijers and Mark Coeckelbergh, 'The Blockchain as a Narrative Technology: Investigating the Social Ontology and Normative Configurations of Cryptocurrencies' (2018) 31 *Philosophy & Technology* 103–30; Lyazid Sabri and Abdelhak Boubetra, 'Narrative Knowledge Representation and Blockchain: A Symbiotic Relationship' (2020) Scinapse paper; Deborah Maxwell, Chris Speed and Larissa Pschetz, 'Story Blocks: Reimagining Narrative through the Blockchain' (2017) 23 *Convergence* 79–97.

universal representation and the replacement of authority with consensus. Yet, as the final section of the chapter shows, the forms that are consensually executed have already made their representational cuts and thus constitute an important site of the politics of blockchain.⁹ Any worldly interaction has to pass through the filter of the smart contract, through the demands of representation of the technology. It is here that I can identify exclusion and ordering. The possible worlds that can emerge through blockchain technology, I hope to show, are shaped and bounded by its particular narrative capacity.

BLOCK 1: AUTHORSHIP – WHITE PAPERS FOR ASSEMBLING THE STORIES

A White Paper has come to be the foundational document in the space of technological innovation and almost every blockchain project is accompanied by one. The release of the Bitcoin blockchain was not through a mechanical first transaction, but through the posting of the White Paper in a mailing list.¹⁰ The second famous blockchain project, the Ethereum blockchain, was also first described in a White Paper authored by Vitalik Buterin in 2013.¹¹ Since then, the White Paper has usually been the most important document in attracting funding for a new project. Studying White Papers allows me to ground and situate the projects with an eye on who authored them and in which context. There is a rich history tying the contemporary blockchain iterations to the political movements of cypherpunks and anti-authoritarian activists in the 1980s and 1990s.¹² Yet, for this contribution, the focus is not on developing a genealogical lineage of travelling concepts and people. The ambition is much more modest. A small glimpse at the genre of the White Paper and a recounting of the commonly told origin stories of the technology will provide the anecdotal context for the projects.

That blockchain projects are released in the form of a White Paper, in and of itself, gives some indication of their governance and world-making aspirations. However, despite the ubiquitous appearance of White Papers in the past decade, not much has been written on the genre of White Papers.¹³ They are often said to have emerged in the British parliament and are traced to the so-called Churchill White Paper of June 1922, officially the ‘Palestine-Correspondence with the Palestine Arab Delegation and the Zionist Organisation’, confirming Britain’s commitment to the Balfour Declaration.¹⁴ Until today documents that include the draft text of a bill or other not yet formalised proposals in British parliament are called White Papers. In the 1980s the term White Paper transitioned into the corporate world, where it is a promotional

⁹ Sheila Jasanoff, ‘Technology as a Site and Object of Politics’ in Robert E. Goodin and Charles Tilly (eds), *The Oxford Handbook of Contextual Political Analysis* (Oxford University Press 2006).

¹⁰ Satoshi Nakamoto, Jaya Klara Brekke and Bridle James, *The White Paper* (Ignota Books 2019) 66.

¹¹ Vitalik Buterin, *Ethereum White Paper* (2013) <https://ethereum.org/en/whitepaper> accessed 27 February 2021.

¹² Jaya Klara Brekke, ‘Disassembling the Trust Machine: Three Cuts on the Political Matter of Blockchain’, Dissertation Durham University, chapter 5.

¹³ Edward A. Malone and David Wright, ‘“To Promote That Demand”: Toward a History of the Marketing White Paper as a Genre’ (2017) 32 *Journal of Business and Technical Communication* 113–47; Michael A Stelzner, *Writing White Papers: How to Capture Readers and Keep Them Engaged* (WhitePaperSource Publishing 2007).

¹⁴ Winston Churchill, British White Paper of June 1922 on Palestine (UK June 1922).

document released to create interest in and increase sales of a new product.¹⁵ The few publications available on the study of White Papers as a genre lament that there is no answer to the question of the purpose of the White Paper and no basis for proper classification.¹⁶ Without delving into genre theory, it appears telling that a governmental document has found its way into business marketing and now lives on as a creature of both worlds. From the perspective of increased managerialism in administration, this double heritage appears familiar.¹⁷ In the case of the most important White Papers in the Blockchain space, this twofold quality is telling with regard to the scope of the projects. As mentioned above, the areas that will supposedly be disrupted by the technology are no less than the fundamental sites of governance of society: money, the economy and social institutions.

The Bitcoin blockchain is often said to have its origin in the release of the document ‘Bitcoin: A Peer-to-Peer Electronic Cash System’ to the Cryptography Mailing List, the so-called Bitcoin Whitepaper.¹⁸ The release of the White Paper was accompanied by a number of symbolically laden gestures that foregrounded its vision. First, the paper was released on 31 October 2008, the first Halloween after the financial crisis. It proclaimed the substitution of established financial institutions with a system of decentralised trust that resides in the design of the system and not in the people operating it.¹⁹ The suggestion of erasing the human from the transactional sphere is central to the whole blockchain undertaking. The necessity of such a system is presented as a reaction to the failures in the financial sector, especially those of big banks and investment firms, which is tied to the unreliability, messiness and irrationality of human actions. In this account, the problem is located in the inconsistencies of human behaviour, especially in governance structures and institutions more broadly. It also carries a tone of an ongoing abuse of power of the powerful elites inhabiting these institutions against the upstanding good citizens who become victims to this abuse. The human-less-ness of the proposed system is further aided by yet another symbolic gesture. The paper was released under the name of Satoshi Nakamoto, an unknown individual or collective, the subject of numerous theories and legends.²⁰ Taken at face value, the White Paper was released by no one and from nowhere.²¹ The additional difficulty this creates for historically and sociologically locating the author(s) anticipates many of the qualities of the blockchain world.

The absence of known authorship is reflected in the proposed architecture and closely linked to a concern over privacy in electronic transactions. The Bitcoin Whitepaper states: ‘What is needed is an electronic payment system based on cryptographic proof instead of

¹⁵ Malone and Wright, ‘“To Promote That Demand”: Toward a History of the Marketing White Paper as a Genre’ (2017) 32 *Journal of Business and Technical Communication* 113–47, 114.

¹⁶ Jeffrey Naidoo and Kim Campbell, ‘A Genre Analysis of High-Tech Marketing White Papers: A Report of Research-in-Progress’ (2015) 2015 IEEE International Professional Communication Conference 1.

¹⁷ Fleur Johns, ‘From Planning to Prototypes: New Ways of Seeing Like a State’ (2019) 82 *The Modern Law Review* 833–63.

¹⁸ Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2008) bitcoin.org accessed 27 February 2021.

¹⁹ Kevin Werbach, *The Blockchain and the New Architecture of Trust* (MIT Press 2018).

²⁰ Satoshi Nakamoto also holds the private key to a wallet that contains approximately 5 per cent of all Bitcoins, currently being estimated to amount to a value of 30 billion USD (as of 27 Feb 2021).

²¹ This resembles the ‘disembodied scientific objectivity’ discussed by Donna Haraway, ‘Situated Knowledge: The Scientific Question in Feminism and the Privilege of Partial Perspective’ (1988) 14 *Information & Communications Technology Law* 3, 575–99, 576.

trust, allowing any two willing parties to transact directly with each other without the need for a trusted third-party.²² Thus the mechanism of ‘peer-to-peer’ electronic cash without the involvement of a third party is the centrepiece of the technology. First, no third party controls the transaction; no one except for the sender and the recipient is involved. Second, the envisioned transaction is digital, so that no physical medium of exchange, such as a paper bill or a coin, is being exchanged. The problems that arise in this peer-to-peer digital context are the following: How can both the sender and the recipient know that the value was actually transmitted; that the sender had paid and that the recipient had received the payment; and that the sender had not sent this same transaction to multiple other recipients? This has come to be known as the double-spending problem. This problem has previously been solved by a central registry keeping a ledger of transactions, typically a bank. This central registry, however, is precisely the unreliable human institution to be eliminated from the design of this new electronic cash in order to protect privacy.

Anonymity as a value of the system and factual in-transparency about current financial beneficiaries are key characteristics of the technology. This anonymity is coupled with a claim to absolute transparency, which holds with the rejection of human interaction in favour of code. It seeks an absolute flawless formalism that becomes equated with a claim to objectivity and, following that logic, truth. At a blockchain conference in 2018, I picked up a small piece of paper from a coffee table. In black typeface on white paper, it read:

PW: More Truth

The self-ascribed radical proposition of developers in the blockchain space is to create a future of more truth through formalised processes that are ‘codified’ into the public ledger and thus transparently accessible to everyone.²³ The envisioned architecture of the technology is well expressed in the Ethereum White Paper, where the Ethereum blockchain is described as:

a blockchain with a built-in fully fledged Turing-complete programming language that can be used to create ‘contracts’ that can encode arbitrary state transition functions, allowing users to create any of the systems described above, as well as many others that we have not yet imagined, simply by writing up the logic in a few lines of code.²⁴

In addition to replacing authorship with a distributed network, the vision of blockchain technology expressed by Buterin is characterised by (i) Turing-complete programming language; (ii) ‘contracts’ to encode state transition functions; (iii) that can create any system yet to be imagined; (iv) as a logic to be expressed in written code. The references to universality, markets and the perfect logical formalism are all features that come to legitimise the authority of the material implementation of blockchains.

²² Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2008) bitcoin.org accessed 27 February 2021.

²³ Michael J Casey and Paul Vigna, *The Truth Machine: The Blockchain and the Future of Everything* (St. Martin’s Press 2018).

²⁴ Vitalik Buterin, *Ethereum White Paper* (2013) <https://ethereum.org/en/whitepaper> accessed 27 February 2021.

BLOCK 2: AUTHORITY – EXECUTING THE LEDGER

Authority in the blockchain is mainly understood to stem from the functioning of the smart contracts, the pieces of code that run on the distributed network and are permanently synchronised into a state. The smart contract is a technique of decentralised, automated computing. Anyone can engage in a transaction in the network, and it will be executed on all nodes that comprise it. There is no single institution that enforces transactions, but rather an architecture of computing and cryptography that enacts them. Authorship and authority are then considered to be distributed and decentralised and legitimised through the permanent synchronisation of the ledger, also called consensus building. To understand this relationship between authorship, consensus and authority in blockchain technology, I will lay out the mode of assembling the chain.

The blockchain is a ledger kept by everyone, meaning each computer or network of computers constituting a node, participating in the system that keeps a record of all transactions. A number of transactions are gathered into a block and the block is then added to the previous block, creating a chain of blocks, a blockchain, or, as one author put it, ‘simply a list of things that happened’.²⁵ This ledger is publicly accessible to anyone and keeps a record of all transactions ever executed on the blockchain. The computers in the network commit their computing power, or share of tokens,²⁶ to upholding and permanently synchronising this ledger. For this ‘work’ they are rewarded through shares of the transaction fees as well as by a so-called block reward, issued automatically when a new block is created. The block reward is rendered through a token pertaining to the blockchain. On the Bitcoin blockchain the native tokens are Bitcoins; in Ethereum they are called Ether.

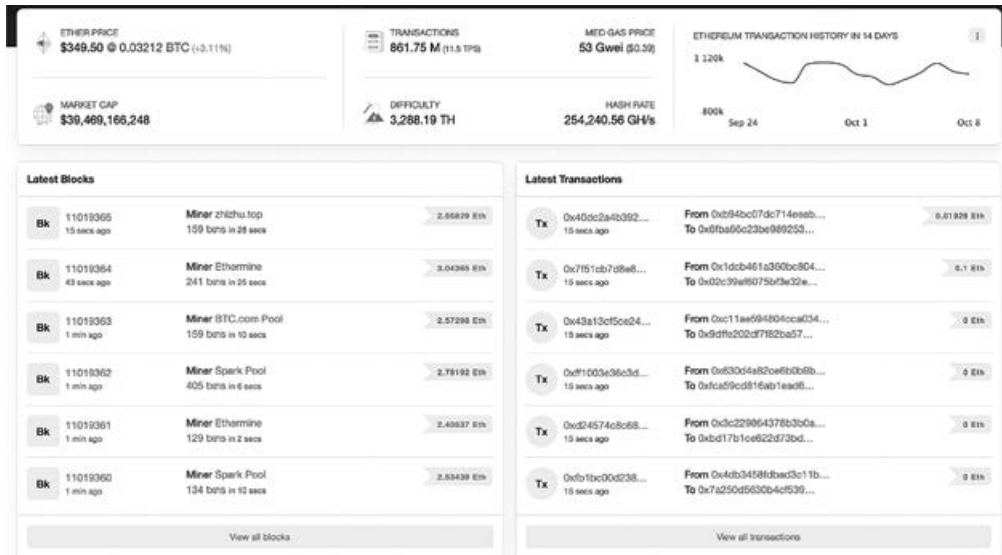
Bitcoin and Ethereum are only two particular blockchains, but many of their features are characteristic of the technology at large. Successor projects have changed mechanism and functionalities, but most have not departed from the idea of a distributed ledger incentivised by monetary rewards in the form of native tokens issued in the process of compiling the blocks for the blockchain. The Bitcoin blockchain is concerned with transaction of funds, or, as the White Paper says, with an Electronic Cash System. Thus, it specifically targets the digital transfer of funds. The Ethereum blockchain expands this focus by including digital assets to represent ownership rights and non-fungible assets, and most importantly by enabling so-called smart contracts, pieces of code that themselves control digital assets.²⁷ Smart contracts in Ethereum capture anything that is represented in a form legible by a computer.

²⁵ James Bridle, ‘Introduction’ in Jaya Klara Brekke (ed), *The White Paper by Satoshi Nakamoto with a Guide by Jaya Klara Brekke* (Ignota 2019) xiii.

²⁶ The Bitcoin blockchain operates with a so-called proof of work mechanism that is dependent on the commitment of large amounts of computing power, bringing the electricity consumption of the Bitcoin blockchain to overtake that of a country like Argentina. Cristina Criddle, ‘Bitcoin Consumes “More Electricity Than Argentina”’ BBC News Technology www.bbc.com/news/technology-56012952 accessed 27 February 2021. Newer blockchains are working with a ‘proof of stake’ mechanism that relies on the staking of funds for securing the network. Henning Diedrich, *Ethereum* (Wildfire Publishing 2016) 152.

²⁷ Vitalik Buterin, *Ethereum White Paper* (2013) <https://ethereum.org/en/whitepaper> accessed 27 February 2021.

The ordering characteristics of blockchains become easier to grasp when we look at a snapshot of a state of a blockchain, in this case the Ethereum blockchain. It is publicly accessible on the website etherscan.io.²⁸ What you see below is a screenshot of Etherscan on 8 October 2020.



The top part indicates the current price of one Ether, the total market capitalisation of the cryptocurrency, the medium transaction fee (here called gas) and the so-called hash rate, indicating the computer power dedicated to the network and thereby serving as an indirect indicator for the security of the chain. In the lower part you see the indications for the latest blocks and latest transactions. Regarding the blocks, the first number in the first column identifies the block in a sequence of blocks with its unique number; the second column identifies the miner, the number of transactions included into the block and the time it took to compose and inscribe it. The last number indicates the amount for the block reward. In the adjacent column, called transactions, the first column indicates the transaction hash, uniquely identifying the transaction, and the second column shows the sender and recipient of the transaction by identification of the wallet address. The amount of Ether transacted is shown in the last column.

This image shows part of the representation of the ledger, called the distributed ledger, because it is simultaneously held on all nodes in the network. You could expand this view by clicking ‘view all blocks’ or ‘view all transactions’ and thereby go back to the first block in the chain, the so-called genesis block. This record would then show you every transaction ever executed on the particular blockchain you are viewing. To maintain this record of transactions the ledger is permanently synchronised along all nodes of the network.

The synchronisation is also called consensus building, in the sense that it is a consensus of all participating nodes on the state of all the enacted transactions. It is here, in the consensus mechanism, that we find the nexus between authorship and authority. Contentious questions

²⁸ Such a scan exists for any of the major blockchain projects.

that require decision-making are placed outside the workings of blockchain into the realm of the peer-to-peer negotiation prior to the execution of the smart contracts. The smart contracts are then considered to be a representation of the true intentions of the participants and their execution turns into an execution of truth.²⁹ The problem is not located in the realm of representation, but in the realm of the accuracy of the execution. The transactions build the bridge between one valid state in the world of Ethereum and the new valid state that now includes the change enacted through the transaction.³⁰ This is where the consensus mechanism becomes the most important tool. The phantasy is that a ‘decentralised network would replace authority in which a consensus algorithm resolves any incompatible disputes and ensures consensus in the network; code would replace law and execute immediately and exactly as written’.³¹ Authority is legitimised based on the assumption of a computational execution of mathematical logic.

BLOCK 3: WORLD-MAKING AND REPRESENTATION

The question that remains unanswered is: The execution of *what* is actually enabled in this system? This is where push finally comes to shove and we can see that the system is built with a gigantic blind spot on the question of representation. It starts its operation from the premise that representation has been solved elsewhere, or that it is not a problem in the first place. Yet it is precisely here, in the distinctions made through the representation of reality, that we find the politics of blockchain.³²

This final section of the text outlines two questions that emerge from representation as world-making³³ along ordering modalities that enable the consensus building and thus the making of the distributed ledger. The consensus making through synchronisation is, as the name indicates, mainly dependent on temporal ordering. To enable this, two things are necessary. First is a digital representation of any event to be recorded. Since a general consideration of digital representation would by far exceed the scope of this text, I will limit myself to a very particular problem of representation, focusing on subjecthood and what it means as a precondition to be active on a blockchain. The second precondition for the consensus mechanism is the indexing of the events on a linear axis of time. Again, rather than an exhaustive discussion of the infinite aspects of this modality of linear temporality, I will lay out the ordering technique and point to some consequences. Yet, I am certain that both of these elements are essential for grasping the kinds of worlds that blockchains enable and, more importantly, the kinds of lives that can and cannot enter the world of blockchains.

²⁹ On the ‘uncertainty that smart contracts produce’, see: Robert Herian, ‘Smart Contracts: A Remedial Analysis’ (2021) 30 *Information & Communications Technology Law* 17–34.

³⁰ Gavin Wood, *Ethereum: A Secure Decentralised Generalised Transaction Ledger* (2014) Ethereum Project Yellow Paper 1–32, 2 <https://ethereum.github.io/yellowpaper/paper.pdf> accessed 27 February 2021.

³¹ Jaya Klara Brekke, ‘Disassembling the Trust Machine: Three Cuts on the Political Matter of Blockchain’, Dissertation Durham University, 13.

³² *Ibid.* 18. For an insightful account of the connection between the physical and the digital realm in blockchains from the perspective of control see: Jannice Käll, ‘Blockchain Control’ (2018) 29 *Law and Critique* 133–40.

³³ Nelson Goodman, *Ways of Worldmaking* (Hackett Publishing 1978) 7, 132.

Viewed from the perspective of representation, the blockchain is a record of all the interactions that are enabled in this network. It is thus a record of the permissible engagements in the realm of the technology.³⁴ The writing of code in the form of smart contracts on a blockchain can then be viewed as a similar practice as the writing of laws. As such, the Ethereum blockchain is often understood to be the most important iteration of crypto law, a law in which the object to be regulated by law inhabits the legal rule itself.³⁵ As in law, the form determines possible conduct on the blockchain. To become recognisable to the world of law any phenomenon must be made legible to law's forms. Inquiring into law's forms then becomes an exercise that by necessity relies on these very forms and follows 'cuts' that have discursively consolidated.³⁶ Legal personhood and subjectivity are pertinent examples to show how form precedes the event in law.³⁷ The representation of events through the form of legal subjecthood cuts both in the sense of enabling access to the world of law and in foreclosing paths toward accountability.

In most cases legal subjectivity is so deeply embedded in our everyday lives that we might forget that the legal subjects are the result of a creative process, and not pre-determined.³⁸ Legal subjects are constituted in a particular configuration with enabling and constraining aspects.³⁹ Take the legal subjectivity of the corporate form as an example. Corporations, both public and private – such as companies, the state, the church, and so on – come into existence in the world of law through the granting of legal personhood.⁴⁰ As with any re-presentation, their outlines and characteristics are not re-presented, but created in law. In order to grasp the political stakes involved in creating legal subjects, we can look into an area in which these forms are currently contested.

The long struggle by social movements and indigenous peoples to hold corporations liable for human rights violations keeps running up against the positivist argument that corporations are not subjects of international law and thus, cannot be the bearers of responsibility of legal obligations rooted in international law.⁴¹ The technical discussion about the subjecthood of corporations forecloses the possibility for the affected populations to rely on international legal instruments to seek redress for the harm caused by corporate conduct.⁴² On the flipside,

³⁴ Jake Goldenfein and Andrea Leiter, 'Legal Engineering on the Blockchain: Smart Contracts as Legal Conduct' (2018) 29 *Law and Critique* 141–9, 145.

³⁵ Primavera De Filippi and Aaron Wright, *Blockchain and the Law: The Rule of Code* (Harvard University Press 2018) 192.

³⁶ I rely here on the notion of 'cuts' with regards to legal forms as invoked by Sundhya Pahuja, *Decolonising International Law: Development, Economic Growth and the Politics of Universality* (Cambridge University Press 2011).

³⁷ Outi Korhonen, *International Law Situated: An Analysis of the Lawyer's Stance Towards Culture, History and Community* (Brill 2000) 6.

³⁸ Annelise Riles, 'Is the Law Hopeful?' in Hirokazu Miyazaki and Richard Swedberg (eds), *The Economy of Hope* (University of Pennsylvania Press 2016) 100.

³⁹ Antoinette Rouvroy, 'Governing without Norms: Algorithmic Governmentality' in Bogdan Wolf (ed), *Special Issue on Lacanian Politics and the Impasses of Democracy Today*, (2018) *Psychoanalytical Notebooks* 99–102.

⁴⁰ Natasha Wheatley, 'Spectral Legal Personality in Interwar International Law: On New Ways of Not Being a State' (2017) 35 *Law and History Review* 753–87; Fleur Johns, 'Theorizing the Corporation in International Law' in Anne Orford, Florian Hoffmann and Martin Clark (eds), *The Oxford Handbook of the Theory of International Law* (Oxford University Press 2016).

⁴¹ Antoine Martin, 'Corporate Liability for Violations of International Human Rights: Law, International Custom or Politics?' (2011) 21 *Minnesota Journal of International Law Online* 95–218.

⁴² Olivier de Schutter (ed), *Transnational Corporations and Human Rights* (Hart 2006).

subjecthood for the corporation is accepted in a different field of international law, namely international investment law, where it enables companies to protect their property rights beyond the bounds of domestic legal systems.⁴³ Both of these areas are currently controversially discussed, but while in the debate about human rights obligations of companies, subjecthood of the company is rejected to the disadvantage of those who want to hold them accountable, in the discussion of property protection on the international level, subjecthood – and thus the ability to shield company assets from public attempts at redistribution – is being secured through ever more international investment agreements.⁴⁴ The forms of legal subjecthood and their particular configurations are the key site of political contestation in both of these debates and bring to the fore how malleable and yet powerful these forms are.

In a similar vein, the subjects that can interact with a blockchain have their own process of constitution. Currently they are constituted as so-called wallets. Only an entity that appears in the form of a wallet with a pair of a public and a private key can interact with blockchain technology.⁴⁵ The notion of a wallet invites a monetary understanding, as if it refers to having money, or rather crypto tokens, to spend in the blockchain system. But the wallet is much closer to the basic entity that creates subjectivity for interacting with the blockchain world. There are many non-monetary applications that rely on tokens for interaction, rather than payments.⁴⁶ The wallet is also often compared to an address, like an email address, and consists of a number of digits (varying on different blockchains) that uniquely identify it. An example of an Ethereum wallet looks like this:

0x89205A3A3b2A69De6Dbf7f01ED13B2108B2c43e7

Thus, the wallet is the basic form for subjectivity on the blockchain. Access to such a wallet is restricted by technical ability and material feasibility. With a device such as a smartphone, tablet or laptop and an internet connection, a wallet can be drawn up within minutes. More important for the discussion here, there are no constraints regarding the entities that can have a wallet and thus much experimentation is ongoing, regarding, for example, trees,⁴⁷ animals,⁴⁸ pieces of art⁴⁹ and so on having a wallet, and what that would mean. These propositions trigger a whole avalanche of questions: Where is the agency in a wallet for a tree? How is nature objectified in these proposals? Is this the first step to an even greater commodification of nature? How is the relationship between nature, humans and technology conceptualised in these propositions? Are these profit-driven entities? Yet, this flexibility is one of the reasons why many social activists see potential for social and environmental justice through blockchain applications.

⁴³ Andrea Leiter, *Making the World Safe for Investment: The Protection of Foreign Property 1922–1959* (Cambridge University Press forthcoming 2022).

⁴⁴ There are currently 3284 bilateral investment agreements in force that inscribe legal subjectivity for the corporation with regards to the protection of assets of foreign investors. UNCTAD, *World Investment Report 2020: International Production Beyond the Pandemic* (2020) xii.

⁴⁵ Henning Diederich, *Ethereum* (Wildfire Publishing 2016) 104.

⁴⁶ In a project on crowd-sourced arbitration, ‘Kleros’, the tokens serve for expressing the commitment to the resolution of a contentious case. <https://kleros.io/> accessed 27 February 2021.

⁴⁷ <https://terra0.org/> accessed 27 February 2021.

⁴⁸ <https://sovereignnature.com/> accessed 27 February 2021.

⁴⁹ <http://plantoid.org/> accessed 27 February 2021.

The other angle to be considered in this context is the role of anonymity in blockchain and how it precludes the allocation of responsibility. Tracing the subject/entity/owner of a wallet address is difficult and, in some cases, impossible. Zero-knowledge proof encryption, a method that allows to verify that one has the answer to a particular mathematical puzzle without actually revealing it, is heavily relied upon for security and privacy reasons.⁵⁰ Without going into the detail of the many implications of this ambition, for the purposes of subjectivity on the blockchain, it means that accountability becomes difficult, if not impossible. The debates on subjectivity are shaped and often framed in the language of rights in parallel to the debates in law.⁵¹ The commonality is that, again, the form precedes the event. For an entity to enter the world of blockchain it has to appear in the form of a wallet, that is, representation in 42 digits, and any interaction has to be coded in a smart contract. Digital representation is the precondition for the coming into being of subjects in the realm of blockchain. I return to the initial concern of this section by pointing out that these questions are systematically excluded from the conception of blockchains while being the most important sites of the politics of blockchain.⁵²

In a similar vein, linear temporality is a crucial mode of representation in the blockchain space. The marker for a new era is the genesis block, the first block in the chain. All the events that follow are clearly defined into before and after by way of their position on the chain. The feature is related to the double-spending problem in the Bitcoin White Paper and introduced as the timestamp server. In order to be able to keep a distributed ledger without a third trusted party, the blockchain establishes ‘a system for participants to agree on a single history of the order in which they [transactions] were received’.⁵³ The mechanism to achieve this is digital timestamping. The basis of this idea is that any submitted data will be carrying the time and date of its certification regardless of the medium on which it is inscribed. This was usually achieved through a centralised timestamping authority, which indeed exists as the TSA – the Time Stamp Authority.⁵⁴ Anyone interested in securing their data with a time stamp can submit and receive a timestamp certificate. The accuracy of the claimed time of a digital document can now be verified by anyone through the certificate issued by the time stamping authority. For privacy purposes, the sender does not send the actual document, but a hash of the document. A hash is a string of letters and numbers that identifies a digital file without revealing its content. This mechanism, though securing privacy, fully relies on the ‘trust-worthiness’ of the Time Stamp Authority. Or, to put it in the words of the blockchain community, it would require trust in the third-party intermediary.⁵⁵ Now, in the case of blockchain technology, this would subvert the whole project, since the idea is precisely to move away from a centralised authority and instead develop a decentralised, peer-to-peer network. Instead, in blockchain

⁵⁰ Z-Cash is a cryptocurrency that promises complete anonymity. <https://z.cash/> accessed 27 February 2021.

⁵¹ Primavera De Filippi and Aaron Wright, *Blockchain and the Law: The Rule of Code* (Harvard University Press 2018).

⁵² Sheila Jasanoff, ‘Technology as a Site and Object of Politics’ in Robert E. Goodin and Charles Tilly (eds), *The Oxford Handbook of Contextual Political Analysis* (2006).

⁵³ Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2008) 2 bitcoin.org accessed 27 February 2021.

⁵⁴ <https://freetsa.org> accessed 27 February 2021.

⁵⁵ Bart Van Rompay, Bart Preneel and Joos Vandewalle, *The Digital Timestamping Problem* (Werkgemeenschap voor Informatie-en Communicatietheorie 1999) 3.

technology this problem is solved through a so-called time server. The time server works ‘by taking a hash of a block of items to be timestamped and widely publishing the hash, such as in a newspaper’.⁵⁶ Furthermore, each block contains a hash of the previous block evidencing that it comes later on the timeline. It is thus crucial for the blockchain that all transactions are placed into one linear record along the temporal vector. They reach what is called ‘finality’, meaning confirmation, when they can no longer be reversed or changed, usually after the implementation of a number of successive blocks.

Expressing the potential dangers and exclusions of linear temporal ordering and its desire for finality is not easy. Yet, when we turn to the fundamental level of the relationship between experience and time, we start seeing what is at stake in a world that is built on the notion of ‘finality’. In a sense, it is an augmentation, or extreme manifestation of the cuts made in digital representations in the first place, because it renders them unchangeable and more importantly, invisible. Returning to Haraway’s conception that storytelling ‘is about both absence and presence, killing and nurturing, living and dying – and remembering who lives and who dies and how in the string figures of naturalcultural history’,⁵⁷ it is the functional erasure of remembering the exclusions and the violences committed in representation that renders the finality of a state on the blockchain the ultimate force. Memory in blockchain is completely detached from experience; it is not only halfway between the material reality and idealism as mediation, but the full-blown idealist representation detached from material reality that constitutes life on the blockchain.

CONCLUSIONS

The aim of this contribution was to explore blockchain as a narrative technology to produce a glimpse of what life in blocks might look and feel like. In treating blockchain as a narrative technology rather than only assembling stories about blockchain, I tried to move away from the hype around money and cryptocurrencies and get closer to the technology’s capacity for mediating lives. Tracing the narrative capacity along the entangled axis of author(ship), author(ity) and world-making, I tried to develop an account of the site of politics in this technology. In focusing on author(ship) through a study of the Ethereum and Bitcoin White Papers, I tried to provide a sense of the historical and social context of the emergence of the projects, as well as of the ideological directions manifest in their writing. The White Paper as a genre points to the governance ambitions of the projects, morphing government regulations with corporate selling points. The picture that emerges from the White Papers is one that chases objectivity as mathematical truth, universality in formal representation, a transactional society without traditional institutions and the distribution of authorship over a decentralised network. The authority of the network, too, hinges on the decentralised nature. By locating the contestation of interests outside the realm of the technology and treating smart contracts as a reflection of consensus between all entities involved, the problem to be solved by the technology has come to be the mathematical execution of the formal consensus. As such, authority as decisive institution has

⁵⁶ Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2008) 2 bitcoin.org accessed 27 February 2021.

⁵⁷ Donna J Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Duke University Press 2016) 28.

been ‘solved’ into a mathematical constitution of consensus. Thus, authorship and authority are distributed over the network and evade the question of force and contestation by placing it outside the system. This setup brings to the fore the most important question that lurks behind the discussion of authorship and authority, namely the problem of representation. The question of what can enter and be active in the realm of blockchain remains unanswered by the structure of the network. It becomes a question that is at best sidelined and at worst not considered a valid question in the first place. In the final section of the contribution, I tried to highlight some implications of this setup along two features of blockchain’s mode of representation: first, I showed how the creation of representative forms such as subjectivity shapes the way different entities can gain or lose power for advancing their interest by comparing the creation of subjectivity in the realm of international law to that of the blockchain space; second, I drew out that the demands of linear temporal ordering dictated by the technology and the way they advance a form of representation are completely detached from lived experiences.

Indeed, when looking at blockchains through the lens of ordering, we encounter a hyper-formalist narrative structure. It is not only the abstraction of a rule that meets the excess of the world and is then negotiated, but also an attempt at marginalising the excess of the world by only enabling formalised engagement. It is an exercise of world-making through the constitution of a ledger of all events that can represent one universal truth. It is a mechanism that reduces all there is to its forms. Everything else ceases to exist. As I hope to have demonstrated in this contribution, the narrating capacity of blockchain might go further than the narrating capacity of law as we know it. As in any system of representation, form precedes the event, so that only what is legible in the recognisable forms can become part of that normative system. What might be particular about blockchain’s ordering system is the way it cuts through life and the limited possibility for reframing or reinterpreting these cuts – both in the sense that what is not recognisable disappears to a degree of complete inexistence, and in the sense that its forms are even narrower than the forms of law with which we are familiar. When life is mediated through the narrative of blockchain, experience, simultaneity, duration and pluralism have to make way for a world of proclaimed universal objectivity and finality.