

## **Blockchain and the Promise(s) of Decentralisation: A Sociological Investigation of the Sociotechnical Imaginaries of Blockchain**

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### **Abstract**

The idea of revolutionary social change is common topos within the discussion around decentralised technologies. An example for this is the recently emerged blockchain technology. This article aims to characterise the techno-utopian promises associated with the idea of decentralisation in the context of blockchain technology and to assess their significance within the discourses surrounding the technology. Based on different materials from the community discourse, three promises of decentralisation in the context of blockchain are identified, namely the promise of self-organised social order, automated coordination by technology and disruptive social change. It is found that while these promises characterised the normative foundation surrounding the technology in its early days, other ideals have emerged that now stand next to it. This presumed pluralisation of imaginaries is interpreted as an indication for a diversification of the blockchain community that has occurred since its inception. Thereby, the research hints to two largely neglected factors within the discussion about the promises associated with blockchain technology: Firstly, it shows that decentralisation can mean different things and should rather be understood as a metaphor. Secondly, it demonstrates that the idea of decentralisation is not uncontested within the discourses around blockchain technology. Only if these insights are taken into account, a realistic representation of the techno-utopian ideals behind blockchain can be attained.

Keywords: Blockchain, decentralisation, techno-utopianism, technology, imaginaries

## 1 Introduction

“Technologically, blockchain is enabling us to revive that spirit and build the decentralized digital community that the founding fathers of the internet initially envisioned.”

(Seguin 2018)

“We just want to take the internet to its logical conclusion: total decentralization.”

Stephen Tual, Former CCO Ethereum (Volpicelli 2015)

The idea of disruptive social change by technology is a common topos in the public and academic discourse about emerging information and communication technologies. Since the inception of the internet, network technologies such as the blockchain have often been associated with promises of revolutionary social change that centre around the idea of decentralisation. Due to its unique technological architecture, blockchain technology is often said to bring about a new mode of socio-economic organisation characterised by decentral and non-hierarchical cooperation (Swan 2015). To date, blockchain technology has received enthusiasm by observers that is unrivalled since the early days of the internet and has become a buzzword in community, media, industry and academia alike (Galati 2018). Understanding the promises associated with the technology within the current public discourse seems more important than ever. Against this background, the question emerges: How can the techno-utopian promises of decentralisation be characterised in the case of blockchain?

This article deals with this question from a sociological perspective. It is argued that in the case of blockchain, decentralisation acts as a powerful imaginary that is connected to promises of a self-organised social order, coordination by technology and disruptive social change. Instead of understanding decentralisation solely as a technological principle, it rather appears to have metaphorical capabilities and be associated with different meanings in different contexts.

The significance of decentralisation as a normative ideal in the context of blockchain is, however, not uncontested. Against the background of an increased tendency towards centralisation on the level of blockchain projects as well as a more predominant use of

blockchain-based applications for investment purposes, it is argued that there has been a pluralisation of imaginaries within the discourses surrounding the technology. In this sense, blockchain technology is interpreted as a powerful illustration of how ways of attributing meaning to a technology change over time.

This argument is laid out in three steps. In the first step, the connection between blockchain and decentralisation is dealt with in more general terms (2). This part introduces the case of blockchain by explaining blockchain's twofold existence as a decentralised technological system (2.1.) as well as an ideological community (2.2.), before dealing with the significance of the idea of decentralisation within the normative foundation of blockchain (2.3.). It is found that while there is a high importance of the role of decentralisation, its meaning affords a closer look, which is provided in a second step (3). Based on community documents, three promises of decentralisation are presented (3.1-3.3) and situated within different lines of thinking. In a third step (4), these results are set into perspective by asking whether decentralisation has lost its significance over time, which is discussed against the background of recent developments surrounding blockchain technology (4.1-4.3). The article closes by reflecting about the role of decentralisation in the normative foundation of blockchain (5).

The article aims to add to an emerging strand of sociological literature which critically engages with the ideas, narratives and visions surrounding blockchain technology (e.g. (Golumbia 2018; Kow and Lustig 2018; Swartz 2016)). It complements existing works by providing a framework to describe the promises of decentralisation and exploring their significance against the background of recent developments. Therefore, it serves the objective of providing a better understanding of the normative visions associated with blockchain within the discourses surrounding the technology.

## **2 Blockchain technology and the imaginary of decentralisation**

### **2.1 What is blockchain technology?**

In order to fully understand the role of decentralisation in the case of blockchain, it is first necessary to note that the idea of decentralisation lies at the base of its technological architecture. Blockchain is a data base technology that has been first presented in late 2008 by an individual or collective under the pseudonym of 'Satoshi Nakamoto' (Nakamoto

2008). It is most well-known for its first and most prominent application, the digital currency ('crypto-currency') Bitcoin. In terms of its technological properties, blockchain can best be described as a decentralised database (or: ledger) that is shared between different computers participating in a peer-to-peer network of computers. The technological novelty of blockchain is that complex cryptographic algorithms enable all computers within the network to come to a 'consensus' about what the correct state of the database is (Tschorsch and Scheuermann 2016). Therefore, the technology allows the implementation of decentralised databases that are shared between many different computers within a blockchain network.

Before the invention of blockchain technology, decentralised networks had always needed an intermediary – a third party – to verify that the content written in a decentralised database has not been manipulated. For instance, in the context of digital currencies, there always had to be a central bank or a payment provider to ensure that the money supply (which was registered in the shared database) was correct. With the inception of blockchain, this third party becomes obsolete, as it is guaranteed by technological means that all computers ('node') within the network can access the correct state of the database. Therefore, the technology allows the implementation of decentralised databases that are shared between many different computers within a blockchain network in many contexts that previously required the existence of a centralised instance.

Blockchain's most prominent use case lies in the field of digital currencies, with over 2000 cryptocurrencies and tokens and a market capitalisation of roughly 100 billion Euros (Bundesministerium für Wirtschaft und Energie and Bundesministerium der Finanzen 2018). However, the technology yields many other potential fields for application and is hence often described as an emerging 'general purpose technology' of digitalisation (Kane 2017). Apart from the area of payments, a vast ecosystem of start-ups, companies, communities and individuals developing new applications to blockchain technology has emerged. By now, blockchain projects are experimenting with the technology for applications in many areas of social and economic life, ranging from fields of application such as land registering, identity management, copyright registering or logistics to more exotic fields such as gambling or online gaming. Even new fields might be opened up by the potentials of so-called 'smart-contracts' and decentralised autonomous organisations (DAOs) (Buterin 2014).

## 2.2 Blockchain as an ideological project

The history of blockchain technology can not only be described as a technological project, but also as an ideological project. In the technology's early days, blockchain was only known to a small number of people invested in the topic of cryptography<sup>1</sup>. Bitcoin as well as other cryptocurrencies entered the public discourse to a larger extent starting from 2009 in the form of an 'alternative currency movement' (Vidan and Lehdonvirta 2018: 43). Within the following years, a change became evident: Had blockchain been primarily a technological solution within the field of digital currencies, it soon became a cultural phenomenon closely connected to promises of social change by technology (Golumbia 2016: 66). As Dodd remarks for the case of Bitcoin: "Bitcoin is arguably a social movement as much as it is a currency" (Dodd 2018: 40).

At the heart of these promises made around blockchain technology is the idea of decentralisation. Having been released only shortly after the financial crisis in 2008, particularly Bitcoin seemed to many as the technological remedy to a seemingly corrupt international system of banks and governments, being a technology based on principles such as anonymity, transparency and decentralisation. The ambition behind blockchain (and particularly Bitcoin) seemed appealing to many: To take the power away from these 'intermediaries' and decentralise it to foster the creation of a free and democratic social order. This tenor of anti-authoritarian thinking runs through many blockchain-projects, which are not only limited to the area of digital currencies. As Swartz remarks, many blockchain-projects are working towards the creation of "revolutionary social, economic, and political change." (Swartz 2016: 86).<sup>2</sup>

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1. The document lining out the design principles for Bitcoin ('whitepaper') was first posted to the Cryptography mailing list at metzdowd.com, a list of users invested in the topic of cryptography (Redshaw 2017: 52).
  2. Nowadays, these promises around blockchain technology have exceeded the boundaries of the blockchain community and are well-established within the public discourse. Within the scope of this article, the focus will be rather on the community discourses around blockchain rather than the public image of blockchain.

To date, the promises associated with the technology are kept alive by the large community<sup>1</sup> that has developed around blockchain. The importance of normative values within the community is visible in the inception of an emerging 'cryptoculture', which manifests itself in the community's own magazines (<https://www.cryptoculturemagazine.com/>), slang terms (e.g. hodl), symbolism (as the stylized B for Bitcoin), song (Bitcoin song) and persona cult (Satoshi Nakamoto). Against this background, blockchain appears less as technological infrastructure, but rather as an ideological project that has promoted an idea of blockchain technology that is closely connected to hopes, expectations and visions. Golumbia even argues that the community behind Bitcoin shares more similarities with religious cults rather than technological projects (Golumbia 2018).

From a sociological perspective, this close connection between technology and normative orientations might not seem surprising, considering the large number of technologies that are closely connected with utopian visions.<sup>2</sup> A prominent role within the theoretical discussion around the promises of technology plays the idea of 'imaginaries', which has more recently been popularised by Jasanoff's concept of 'sociotechnical imaginaries' (Jasanoff 2015). Jasanoff argues that visions of the future take a key role within technological projects, as they provide social actors with a sense of orientation and foster legitimacy and motivation within collective projects (Borup et al. 2006; Jasanoff 2015: 10). Imaginaries can therefore be seen as a major factor determining the shape and success of technological projects. Exploring the content and ways of interpreting the imaginaries around the idea of decentralisation within the context of blockchain constitutes a key objective within the scope of this article.

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1. Comparable to the Free and Open Source Software (FOSS)-movement, blockchain can be characterised as an instance of community-driven software development, meaning that developers and users of the technology are often geographically dispersed and organised via digital media and online boards instead of one company or party being responsible for the software's development.
  2. One could e.g. think of the discussion around Big Data and AI within the current public discourse (Elish and boyd 2018). Borup et al. argue that the idea that technology will bring about progress is actually anchored in Western thinking, which dates back to the Enlightenment (Borup et al. 2006: 291).

### 2.3 The normative foundation of blockchain as an imaginary of decentralisation

When attempting to characterise the meaning of the imaginary of decentralisation in the case of blockchain, the documents of the discourses around the technology provide an important starting point for research. Following Jasanoff, a diverse set of material potentially qualifies for this purpose, such as “symbolic and cultural resources, such as images, texts, memories, metaphors and language itself” (Jasanoff 2015: 25). In the case of blockchain, there is no such thing as a key document to the blockchain community outlining the meaning of decentralisation within its normative foundation. Instead, diverse kinds of material such as developer statements, whitepapers, media articles and posts in online boards provide promising resources for research. By analysing a diverse set of materials this article seeks to identify understandings of decentralisation that are common within the discourses surrounding the technology, rather than focusing on one specific case (such as Bitcoin or Ethereum). Within the discourses around blockchain-technology, the high significance of decentralisation within the normative foundation of blockchain technology is immediately visible. As Swartz states, decentralisation constitutes a key “rhetorical pillar” and “one of the most frequently” used words in discourses around the technology (Swartz 2016: 88). Ethereum founder Vitalik Buterin even states that it is “often even viewed as a blockchain’s entire *raison d’être*” (Buterin 2017). Several quotes provide evidence for the view that decentralisation is an ideal that is of high significance within the community, which is shared across different kinds of blockchain projects and users of the technology:

“Entering the Aragon Nest program [...] is about entering a community whose every member is committed to help every other to pursue a common goal: working toward the decentralization of human worlds.” (Sarrouy 2019)

“An exciting alternative has arisen in the form of a movement toward *decentralization*, in which networks of peers self-organize to act collectively without such concentrated power centers.” (Zemel 2018)

“Euphoria stems from the realisation that Bitcoin could be the vehicle that transforms the financial system from centralised to decentralised.” (Kelly 2015: 59)

However, while the normative importance of decentralisation seems immediately evident,<sup>1</sup> it is less clear what the vision of a ‘decentralised digital community’ (Seguin 2018) is actually supposed to look like. In this context, it is important to clarify that the term ‘decentralisation’ – as it is used within the discourses around blockchain technology – exceeds a strictly technological understanding of the term, as e.g. in computer science. According to a technological understanding, ‘decentralisation’ could be understood as a principle of the organisation of computers in a network which can be distinguished from centralised systems and (sometimes) distributed systems (e.g. Baran 1962). ‘Decentralising’ would then refer to implementing decentralised network architectures in specific applications, e.g. by implementing a decentralised land register instead of a system maintained by a centralised authority. While the implementation of (technically) decentralised systems is an important part of the vision of blockchain, reducing it to this aspect would surely fall too short and strip it of the ideological richness connected to the visions behind the technology.<sup>2</sup>

Instead, we follow the idea of Golumbia to understand decentralisation as a *metaphor* that can have different meanings in different contexts (Golumbia 2016: 64-65). According to this view, the meaning of decentralisation cannot be defined *a priori* and needs to be defined on the basis of the actual discourses surrounding the technology. This allows to account for the multiple understandings of decentralisation that are put forward within the community discourse. The different meanings of decentralisation are reflected within the promises that are made around blockchain technology. In the following, three promises of decentralisation will be identified based on materials from the community discourse: the promise of self-organised social order, the promise of automated coordination by technology and the promise of disruptive social change. These promises illustrate the different meanings that are associated with decentralisation within the discourses surrounding the technology.

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1. From a critical normative perspective, this glorification of decentralisation as a mode of horizontal power has been criticised under the label of ‘network fetishism’ (e.g. Baldwin 2018; Garcia 2016).
  2. In fact, blockchain is not the first and only technology that is revolved by promises of decentralisation. Schrape (2019) shows that the promises around decentralisation can be traced back the DIY-scene of the late 1960s, and similar promises can also be found within the computer counterculture of the 1970s and 1980s as well as the early days of the internet.



### 3 The promises of decentralisation

#### 3.1 The promise of self-organisation

In order to understand the promise of self-organisation that is being made in the context of blockchain technology, it is key to understand the role of intermediaries. Blockchain technology is often promised to abolish intermediaries – such as banks, governments or companies – which are often seen as a key problem within present society that is associated with capitalism, oppression and corruption (Swartz 2016: 90). From the early days of blockchain technology, the idea of abolishing these intermediaries was central to the normative foundation of the technology (Garrod 2016). Already the first known document presenting the technological concept of blockchain to the public, the Bitcoin whitepaper carries the idea of disintermediation:

“A purely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another *without going through a financial institution.*”  
(Nakamoto 2008, italics added)

Instead of a system dominated by powerful intermediaries, blockchain is posited to bring about a social order based on self-organisation. The ‘cyber-utopia’ (Baldwin 2018) constructed here is one that upholds individual values such as freedom and equality, and is said to replace vertical relations between individuals and institutions with horizontal relations between individuals. In this sense, the normative foundation of blockchain can be seen as an instance of horizontalist thinking (characterised by distrust in authorities and promoting values such as self-management, autonomy and direct democracy) which can also be observed in social movements such as the Occupy-movement (Sitrin 2012). The horizontalist belief surrounding the technology can be exemplified by two quotes, of blockchain project Bitnation and the ‘Church of Bitcoin’ respectively:

“The Church of bitcoin has a simple and clear mission. We want to free the world from the oppression that is currently enabled by government and central bank control over exchange.” (Church of Bitcoin 2019)

“In BITNATION's world sovereignty shifts decisively from the State to the Citizen. By reducing competition between citizens for services and increasing competition

between Nations for citizens we will improve the quality of governance and reduce incentives for coercion and violence.” (Bitnation Whitepaper 2018: 2)

The idea of self-organisation in the promises of blockchain can be situated in a libertarian line of thinking that upholds individual liberty as a core principle. The techno-utopian vision constructed around blockchain technology strongly reminds of the ‘cyberlibertarianism’<sup>1</sup> (Winner 1997) of internet enthusiasts of the early days of the technology such as Nicolas Negroponte and John Perry Barlow. At the same time, it can be argued that the idea of self-organisation that lies at the base of these promises can be traced back as far as to the political theory of Jean-Jacques Rousseau. In fact, the vision of a self-organised social order in the case of blockchain strongly reminds of Rousseau’s dream of direct democracy: In ‘The Social Contract’, Rousseau put forward a radical vision of society that would be under the direct control of the people, which govern the state based on the general and common interest (*volonté générale*) (Rousseau 2013). This utopian thinking of self-organised democratic beliefs is also prominent within the promise of social order associated to blockchain. Against this background, it can be agreed with author Brett Scott, who argued that Bitcoin can be seen as a Rousseauian approach to finance, contrasted by a Hobbesian world of central banks (Scott 2013).

### **3.2 The promise of coordination through technology**

Connected to the vision of implementing a self-organised social order is a strong idea of automating social relations. At the base of this vision lies the idea that blockchain replaces human-based institutions and experts by automated code that functions all by itself. This idea of automation is reflected in statements claiming that blockchain-based currencies are ‘math-based money’ (Seward 2013) or that blockchain-based money works “over and above social life” (Dodd 2018: 35). According to this vision, human trust is no longer deemed necessary: instead, blockchain acts as a ‘trustless consensus machine’ (Davidson, De Filippi, and Potts 2018: 2) that ‘governs’ social behaviour on the basis of

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1. Winner describes cyber-libertarianism as “collection of ideas that links ecstatic enthusiasm for electronically mediated forms of living with radical, right wing libertarian ideas about the proper definition of freedom, social life, economics, and politics in the years to come.” (Winner 1997, for an alternative definition cp. Malcom 2013). A classic example that is often referred to as an example of cyber-libertarianism is John Perry Barlow’s “Declaration of the freedom of the internet” (Barlow 2016).

technological algorithms and cryptographic mechanisms such as consensus algorithms or smart contracts.<sup>1</sup> Therefore, the vision imagined for the future of blockchain can be described as one of automation, where blockchain coordinates and regulates different kinds of human behaviour:

“Blockchain technology and smart contracts eliminate the need for middlemen to enforce contracts, verify transactions, or perform background checks. This means that BPM [business process management] software can more fully automate business processes and manage new technology embedded in the process.”  
(Saunders 2017)

The epitome of this dream of the automation is a new emerging kind of blockchain projects, the DAO (‘decentralised autonomous organisation’). The DAO refers to the project of creating a decentralised automated organisation on the blockchain that coordinates the behaviour of individuals by the means of smart-contracts and algorithms. While the first implementation of a DAO on the Ethereum blockchain has actually failed in practice – in the sense that the ‘coins’ were stolen by an unknown individual (DuPont 2017) – there is a growing number of blockchain-projects which are seeing a large potential within the technology. According to Josh Zemel of blockchain-project DAO-stack, DAOs are “the future of collaboration” (Zemel 2018). Today, an increasing number of DAO-based blockchain-projects such as Aragon or Democracy Earth indicate that the dream of automated social coordination is very much alive.<sup>2</sup> This idea of automated governance of social relations in the case of blockchain can be seen as related to the idea of steering social processes with technological means that is present within the cybernetic thinking of Stafford Beer (1994). As in the promise of automation around blockchain, cybernetic thinking assumes similarities between biological and physical models and the governability of both. Beer put these cybernetic models into practice by applying them to governance

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1. Against this background, Vidan and Lehtonvirta interpret blockchain as an important shift in the interrelationship of human and technology: “Nakamoto here seems to appreciate Actor-Network Theory’s call for symmetry by equating participants and nodes, votes, and CPUs. His imagined community fully embraces hybridity” (Vidan and Lehtonvirta 2018: 47).
  2. While one might initially think that the vision of an automation of social relations might be at odds with the idea of autonomy, Swartz argues that both automation and autonomy should be rather seen as interlinked, with the former being a prerequisite for the latter (Swartz 2016: 93).

organisations and political change, e.g. in the case of the Chilean Cybersyn project (cp. Espejo 2009). The idea of representing human behaviour in formal models and governing it aided by technological means is one idea that is reflected within cybernetic thinking as well as the discourses surrounding blockchain technology.

### 3.3 The promise of disruptive social change

Promises of disruptive social change have been with blockchain technology from its inception and can be found within discourses in community, media, industry and academia alike. For instance, Tapscott and Tapscott state that blockchain might be “the most important and most revolutionary digital innovation since the inception of the world wide web, with enormous potential for change” (Tapscott and Tapscott 2016: 225). Adopting this line of thinking, academic researchers Van den Hoven et al. believe that “Blockchain technology may be the basis of the next step in human, social and cultural evolution” (Van den Hoven et al. 2018). Andrew Keys of blockchain-start-up ConsenSys even predicts a fourth industrial revolution that will draw on blockchain-based technology:

“This year, the Fourth Industrial Revolution will ignite, as the buzzwords of artificial intelligence, robotics, Internet-of-Things, quantum computing, and biotechnology actuate from proofs-of-concepts into production. All of the aforementioned technologies will be deployed on blockchain substrates.” (Keys 2019)

Therefore, the notion of social change brought forward within such claims of social change by blockchain is clearly one of revolutionary and disruptive change. As opposed to a steady, evolutionary understanding of social change, descriptions of the perceived impact by blockchain are often depicted as historic breaks within history.<sup>1</sup>

A common stylistic device that is used to illustrate the presumed ability of blockchain for social change is the comparison to other technologies, most notably the internet. For instance, founder Mark Metry claims that blockchain can be seen as the “most important invention since the internet and electricity” (Metry 2017). The comparison of blockchain to the internet elucidates the high expectations of bringing about social change that are

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1. This conception of social change can be characterised as an ‘epochalist’ understanding of social change, making a rhetorical distinction between the age ‘before blockchain’ and ‘after blockchain’ in order to make “the new visible through the juxtaposition of the old” (Savage 2009: 218).

connected to the technology. It is this presumed capability of bringing about change that observers calling blockchain the “new internet” (e.g. Sharma 2018) are referring to. At the same time, the internet also acts as negative example, as it is seen as a disappointment by many, being seemingly dominated by centralised platforms and profit-oriented businesses (Swartz 2016: 90).

The idea of encompassing social change by technologies is not a new idea, as it can be traced back to Schumpeter’s notion of ‘creative destruction’. Creative destruction in the Schumpeterian sense describes a form of innovation, that “enables to establish new markets and market principles through new technologies and thereby disrupt existing markets and conventional rule patterns” (Wagener 2018: 387, own translation). Schumpeter illustrates this view using the example of the railroadization of the US-American Middle West, which he sees as a “death sentence for the agriculture of the west” (Schumpeter 1991: 349). The idea of disrupting traditional market structures by technology<sup>1</sup> strongly reminds of the promises around blockchain and its supposed “potential to revolutionise the world economy” (Tapscott and Kirkland 2016). Within the community discourse, this change is – different from Schumpeter’s conception of destructive change – something that is solely connoted in a positive sense.

<b>Dimension of promise</b>	<b>Manifestation</b>	<b>Tradition of thought</b>
Social order	Self-organised	Libertarian (e.g. J.J. Rousseau)
Mode of coordination	Automated	Cybernetics (e.g. S. Beer)
Social change	Disruptive	J. Schumpeter

**Table 1:** Dimensions of promises within the blockchain community discourse

Taken together, the three promises of decentralisation in the context of blockchain presented above clearly show that decentralisation is more than just a mode of technical organisation in the context of blockchain discourse – it can rather be understood as a socially powerful imaginary connected to multiple promises regarding social order, the mode of coordination and social change (see Table 1). In this context, it could be shown

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1. More recently, this idea of ‘disruptive technologies’ has been taken up and popularised by Harvard Professor Clayton Christensen (Christensen et al. 2015).

that these promises draw on different lines of thinking such as libertarianism, cybernetics and Schumpeterian economics. At the same time, this typology of the visions connected to blockchain opens up new questions regarding their interrelationship and how the role of decentralisation has developed over time. As the sociology of expectation has argued, imaginaries should not be thought of as stable entities, but can also change over time, responding and adapting to new conditions (Borup et al. 2006: 286). Since its inception, the blockchain-ecosystem has undergone considerable changes and has developed from a small technological project to a new base technology of digitalisation. In this context, it is questionable how the changes that the blockchain-ecosystem has undergone have also resulted in a change of the *normative* importance of the idea of decentralisation.<sup>1</sup> In the following, this question will be addressed against the background of two recent developments within the blockchain community: Firstly, a tendency towards (technologically) centralised blockchain-systems and, secondly, an increased interest in blockchain as an instrument for financial speculation.

## 4 Setting the promises of decentralisation into perspective

### 4.1 Has decentralisation run out of steam?

An important aspect that should be considered when speaking of a tendency towards more (technologically) centralised blockchain-systems is the fact that many of the ‘radical blockchain dreams’ (Swartz 2016) associated with decentralisation have actually not materialised.

Firstly, instead of moving towards self-organised systems that are characterised by equality and horizontalism, many blockchain systems have rather developed into the direction of (technological) centralisation. Perhaps the most prominent example for this development is the centralisation of mining power within the Bitcoin blockchain system, which factually allows a small number of actors (‘mining-pools’) to be the decisive force in

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1. Following Jasanoff, imagination and the material world are not disconnected, but rather stand in a close interrelationship. This is reflected by her use of the word ‘socio-technical’, which suggests that “these imaginaries are at once products of and instruments of the co-production of science, technology, and society in modernity” (Jasanoff 2015: 28).

decisions about protocol changes (Böhme et al. 2015: 220).<sup>1</sup> As De Filippi remarks: “The governance of many blockchain-based applications is, despite their decentralised infrastructure, often a lot more centralised than it might seem at first glance” (De Filippi 2017: 68-69, own translation). Secondly, the ambitious visions of automation put forward in the case of Decentralised Autonomous Organisations (DAOs) have, to date, remained an idea rather than reality.<sup>2</sup> And, thirdly, while blockchain technology, without doubt, has had a considerable impact in the area of payments, the promises of radical disruptive change of the societal mode of coordination seem, at the present moment, to have been strongly over-exaggerated.

At the same time, one can witness an emerging trend towards more technically centralised blockchain-systems (for example so-called ‘private permissioned blockchains’<sup>3</sup>). In fact, there is an increasing number of cryptocurrencies and blockchain applications that rely on centralisation as a key design feature (Hsieh, Vergne, and Wang 2017: 58), such as the blockchain-projects Tether (combining a decentralised currency with a centrally managed money supply). Particularly business actors have caught a lively interest in the topic of more technically centralised blockchain designs, as these compensate for some of the drawbacks of (technologically) decentralised blockchain-systems. Therefore, a growing number of actors surrounding the technology are actually working towards a future that is characterised by greater centralisation, rather than decentralisation:

“A private blockchain comes with more privacy and a greater degree of control. (...) Private blockchains are perfect for intra-business usage.” (Berlia 2017, IT service provider Indus Net Technologies)

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1. A more recent example could be seen within the Ethereum-blockchain-system, where a recent decision to half the block-rewards was taken “by a single elite of 15 developers” (Tomasicchio 2018).
  2. Zemel states: Up until this point, however, DAOs have remained largely an abstract idea, not yet in practice except in a handful of limited cases. And the decentralization movement has not yet scaled” (Zemel 2018).
  3. In this context it is important to note that – as opposed to the common opinion within the public discourse on blockchain technology – that blockchain-systems can be implemented in ways that are not fully (technologically) decentralised. This could, for instance, be realised by only allowing a limited number of actors to read the content that is stored on a respective blockchain. For a technical overview on different types of blockchains cp. Wüst and Gervais 2018: 2.

“Are we still going to be hung up on “It is not really decentralized”? Do we care?”  
(Krishnakumar 2019, Venture capital investor)

#### **4.2 Blockchain between ideological community and investment opportunity**

A second development that should be considered when asking about the normative role of decentralisation as a community ideal is the increased interest in blockchain as an instrument for financial speculation. Zook and Blankenship (2018) argue that the failure of decentralisation has resulted in a change of direction within blockchain currencies, which are now tending more towards the goal of creating economic investments while having abandoned their initial normative goals and visions:<sup>1</sup>

“The initial vision of blockchain to create a global alternative currency and do away with financial intermediaries has largely failed. Far from the reworking of exchange envisioned by Nakamoto (2008), blockchain currencies have become merely another means of speculative accumulation.” (Zook and Blankenship 2018: 14)

There are several reasons that speak for the validity of this claim. Firstly, many blockchain-based digital currencies have developed a large appeal to financial investors interested in generating monetary gains through speculative investments, facilitated by their monetary instability (Yermack 2015).<sup>2</sup>

Secondly, a growing number of large companies have developed a key interest in generating financial gains by the use of blockchain technology, as can e.g. be seen in the case of the Hyperledger-project, which is supported by large industry players such as IBM, Intel and SAP.<sup>3</sup>

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1. Very fitting within this context is Garrod’s critique of Bitcoin who argues that the notion of freedom brought forward within the context of blockchain only conceives of freedom as freedom from intermediaries such as the state, but does not take into account the ‘tyranny of the market’ (Garrod 2016: 62).
  2. As Yermack points out in the case of Bitcoin: “Bitcoin appears to behave more like a speculative investment than a currency” (Yermack 2015: 42).
  3. Another development that could be mentioned here is that many smaller companies have discovered blockchain technology as an instrument to raise money by investors, as can be seen in the case of ICOs (‘initial coin offerings’), a method of crowd-funding which is based on blockchain-technology (Allen et al. 2018: 20-21).



And thirdly, within the community's discourses one can also observe the view that blockchain technology rather serves as an instrument for investment purposes rather than fostering social change:

“I don't care about decentralization, it gives me profit and that is enough, and centralized coins don't hurt investors.“ (gedor (2017), user of online Board Bitcoin-Talk).

“Decentralisation has become a boom thanks to Bitcoin, but what happens today, is that people are trying to get rich thanks to investors who don't know the difference between 'decentralised' and 'distributed'. [...] So yeah, decentralisation is a very rare thing today.” (AleksandraSandra (2017), user of online Board Bitcointalk)

In the light of these claims, the promises of decentralisation do not seem to constitute ways of imagining the future that are unequivocally shared among community members. Instead of understanding decentralisation as a key value, some users of the technology appear to see blockchain primarily as a way to yield monetary gains by investments rather than being interested in it as an ideological project.

### **4.3 Towards a pluralisation of imaginaries?**

Against the background of the two developments lined out above, it is questionable how the imaginary of blockchain technology can actually be characterised: As one of financial investment, as one of centralisation, or – as initially assumed – one of decentralisation? Considering the recent developments within the blockchain eco-system, it is argued here that it can be either of those options, depending on the context. As more businesses and users with large economic interest have become interested in the technology, new imaginaries have emerged around the technology which are now visible within the community discourse. The diverse promises and visions associated with blockchain technology reflect not only one idea of decentralisation, but rather several ideals that could be described as community goals. Therefore, the developments described above can be interpreted less as an absolute loss in the normative importance of the idea of decentralisation, but rather pointing to a pluralisation of imaginaries.

This pluralisation of imaginaries could be interpreted as reflecting the changes that blockchain technology has undergone since its inception. While the technology has initially started off being an ideological project of technologists (Redshaw 2017) centred around the idea of abolishing powerful intermediaries such as banks within the field of finance, it

has developed into a large and diverse community that now includes actors that exhibit (economic) interests of these very intermediaries, such as companies or investors.<sup>1</sup> Within blockchain's diverse community, the promises of decentralisation might act as normative orientation for some, but not for all members of the community. The existence of multiple imaginaries thus, which are situated between utopian idealist views on the one hand and pragmatic realist views on the other could be seen as illustrating the diversity of the visions and hopes associated with blockchain technology.<sup>2</sup> In the end, navigating between these opposing idealistic and pragmatic visions in order to facilitate further technological progress might open up new challenges for the communities that centre around the technology. While different visions of the future may stand next to one another without interference, they might sometimes also lead to conflicts within social groups, in case imagined futures are not compatible with one another (Pfothenauer and Jasanoff 2017: 804).<sup>3</sup> These conflicts are dealt with on a community level, as the controversial discussions about the idea of decentralisation in the blockchain community illustrate. It is thus in the hands of the community that has developed around the technology to mediate between conflicting views and decide whether an ideal of decentralisation (Xu 2018), centralisation (Kikovic 2018) or a mediating perspective<sup>4</sup> between both (Ahsan 2018) is the right way to go for the future of blockchain-technology.

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1. Against this background, the young history of blockchain could be seen as reminiscent of the history of the internet, which is often described as a decentralised network technology that has eventually come to be dominated by large businesses. Following this line of thinking, it would be questionable whether blockchain is heading into a similar direction of 'economisation' (cp. De Filippi 2017: 77).
  2. This seeming contradiction between idealistic and more pragmatic perspectives within the community reminds of the common narrative associated with the Free and Open Source Software (FOSS) movement, which is often seen to embody the same conflict (e.g. Tozzi 2017).
  3. A recent example for the contestedness of imaginaries from a different area could e.g. be seen in the Brexit-votes, in which visions for Britain to remain in the EU were opposed to one in favour of Brexit (Pfothenauer and Jasanoff 2017: 804).
  4. As Ahsan states: "An ideal future would be one where we can combine the speed, efficiency and focus of centralized systems, with the security, incorruptibility, and inherent creative capacity of decentralized ones" (Ahsan 2018).

## 5 Conclusion: An imaginary of decentralisation?

This article has aimed to characterise the techno-utopian promises of decentralisation surrounding blockchain technology and assessed their significance against the background of recent developments. Therefore, a broad approach has been taken that has dealt with different interpretations of the technology that are brought forward within the current discourses surrounding the technology. Drawing on different documents from the community discourse, the imaginary behind blockchain was characterised as one of decentralisation. In order to make sense of the visions attached to the technology, three promises of decentralisation were identified, based on documents of the community discourse around blockchain. It has been found that the imaginary of decentralisation is connected to specific notions of social order (self-organisation), coordination by technology (automation) and social change (disruption), which have their roots in different traditions of Western social and political thought. This exemplifies the important insight that there is not *one* meaning of decentralisation within the discourses around blockchain technology, but rather *different* meanings that differ depending on the context.

In order to assess the normative significance of these promises of decentralisation within the blockchain community, the article has then discussed the role of decentralisation against two developments around the technology: Firstly, the tendency towards (technologically) centralised blockchain-systems and, secondly, an increased interest in blockchain as an instrument for financial speculation. It has been argued that while decentralisation has been a key ideal within the early days of the technology, it now seems that the idea of decentralisation is rather contested: As more businesses and investors have become interested in the technology, imaginations of the future centred more around the idea of (technical) centralisation as well as blockchain as an opportunity to create economic gain by monetary investments. This pluralisation of imaginaries can be interpreted as indicative of the diversification of the community around blockchain that has occurred since its inception. These results point towards two important points that have been rarely considered within the current sociological discussion on the ideals of decentralisation in the case of blockchain. Firstly, it points towards the insight that decentralisation is not only to be defined as a technological principle but is rather a metaphor that is connected to different meanings and promises in different contexts. Exploring these different meanings is thus an important goal for further sociological

research. Secondly, it shows that research on the normative ideals surrounding blockchain needs to consider the contestedness of imaginaries to a larger extent, instead of resorting to the common narrative of blockchain as a project of decentralisation.

In the end, the example of blockchain has very much demonstrated that thinking about futurity is a key feature of technological projects and that there is a close connection between technological projects and (techno-) utopian thinking (Turner 2006). Blockchain can thus be seen in a long line of technologies that have been associated with claims of revolutionary social change such as the internet. At the same time, the example of blockchain can also be read as a powerful example of how thinking about futurity might change over time. This illustrates the importance of social interpretation for the societal reception of technologies more generally. In this light, while the analysis of the promises of decentralisation has focused on *what* the promises of decentralisation entail, the insights gained open up as many new questions about *why* utopian promises surround technologies in the way they do.

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