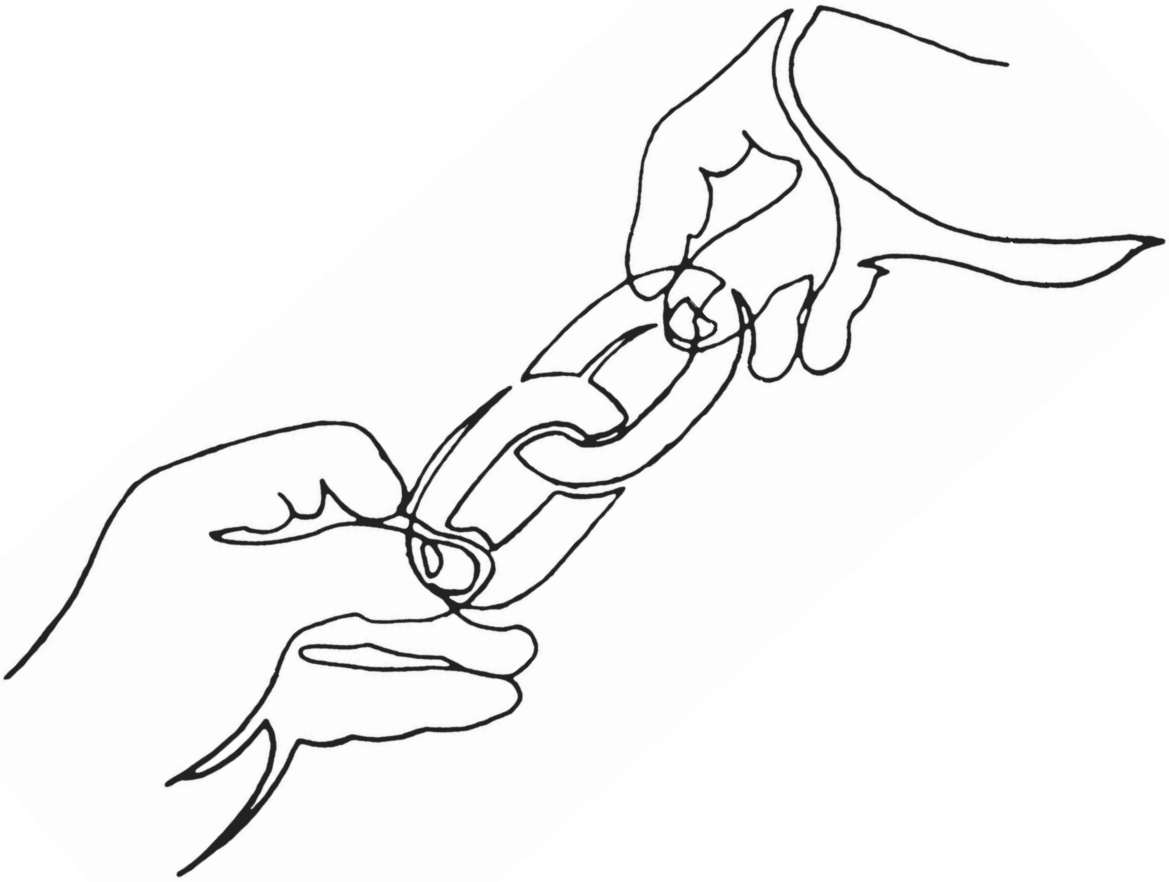
(De)coding a technopolity

Tethering the civic blockchain to political transformation



Syed Omer Husain

Propositions

1. Decentralizing technologies can depoliticize a citizen just as much as centralizing governments. (this thesis)
2. For government to cede power, it needs someone credible to cede power to. (this thesis)
3. If the scientific method is inadequate for science, there's no way it is adequate for society.
4. By understanding our semantic associations, we can begin to understand our biases.
5. "Progress is the realization of utopias" (Oscar Wilde), while academia is often used as a dustbin of failed utopias.
6. Art is the expression of unity within diversities.
7. If you consciously choose your constrictions, they liberate you.

Propositions belonging to the thesis entitled

(De)coding a technopolity: tethering the civic blockchain to political transformation

Syed Omer Husain
Wageningen, 14 May 2020

(De)coding a technopolity

Tethering the civic blockchain to political transformation

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This thesis was conducted under the auspices of the Wageningen Graduate School of Social Sciences (WASS).

(De)coding a technopolity

Tethering the civic blockchain to political transformation

Syed Omer Husain

Thesis

submitted in fulfilment of the requirements for the degree of doctor
at Wageningen University
by the authority of the Rector Magnificus,
Prof. Dr A.P.J. Mol,
in the presence of the
Thesis Committee appointed by the Academic Board
to be defended in public
on Thursday 14 May 2020
at 11.00 a.m. in the Aula

Syed Omer Husain
(De)coding a technopolity: Tethering the civic blockchain to political transformation
238 pages

PhD Thesis Wageningen University, Wageningen, The Netherlands (2020).
With references, with summary in English.

ISBN: 978-94-6395-309-2
DOI: 10.18174/514268

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Chapter 1

Introduction: technopolitical responses to interregnum

The interregnum

This project was developed within the ongoing scientific and socio-political debate on the relationship between technology and political transformation i.e. technopolitics. In the past decade, internet access has grown to three billion people: from 20% of the world population to over 50% contributing to the easy access and sharing of information, increased literacy and instantaneous global communication. Concurrently, we witness a spike in political movements organized through translocal social networks like Occupy and the Arab Spring; emerging technologies like blockchain creating parallel systems of finance, political action and governance; e-government and digital tools for collaborative democracy initiated by state actors to increase political participation; and the free-culture and open-source software movements attempting to democratize technological development, sharing and use. Somewhat paradoxically, this is also referred to as the epoch of post-politics where the genuinely 'political' has been repressed, disavowed or foreclosed leading to a loss of political agency and a surge in political apathy (Rancière 1999; Žižek 1999; Mouffe 2005). It seems as though the collision of hyper-globalizing social worlds, technological evolution and political deficits today is beyond comparison to any point in time earlier. As Gramsci put it, "the crisis consists precisely in the fact that the old is dying and the new cannot be born. In this interregnum a great variety of morbid symptoms appear" (Gramsci et al. 2011, p. 276).

We can see how global society today is fraught with recuperating from political deficits and seemingly a long way from achieving any sort of coordinated action on global problems such as regressive political policies, the realities of ecological crises and climate change, the failure of economic infrastructures and the disenfranchisement and relegation large portions of the world population (Bauman and Bordoni 2014). This watershed moment – where technologies for political transformation already exist, or can easily be developed for political transformation – brings the prospect of catastrophic consequences or a powerful upgrade to global politics in a relatively small amount of time. It is precisely in the nexus of this exigent societal 'interregnum' that the core aim of this thesis is situated: to guide technopolitical transformation in the path of creating a more equitable arrangement of politics and political action.

The internet, and the technologies built upon it, have always been heralded as catalysts for pollical transformation. But thirty years after its inception, "the internet has only proved to be a mirror of society and politics" (Kurban et al. 2017,

p. 500). While we have observed a range of attempts in enhancing deliberation, organization, communication and even transaction, technopolitical innovations have thus far failed in ushering in a democratic-political transformation that satisfies anyone across the political spectrum. It is as if the armies of technopolitical activists are somehow handicapped in their fight to realize their utopias. Furthermore, while there is a surge of innovations and projects in every field from law to economics, there is a severe lack of rigorous praxis-based approaches that analyze how emerging technologies play a role in political transformation.

A blockchain revolution?

There is an enormous body of research investigating the transformative and disruptive potential of blockchain technology (Golumbia 2015; Davidson et al. 2016; Tapscott and Tapscott 2016; Yli-Huumo et al. 2016). In 2008, when Satoshi Nakamoto, whose identity is still a mystery, released a white paper titled Bitcoin: A Peer to Peer Electronic Cash System, the first ever blockchain made its public debut. Shortly after, the open-source community started to develop the first pilot of a purely peer-to-peer transaction system known as Bitcoin. Bitcoin's allure was in the fact that it is a completely decentralized electronic currency that can function without any central bank or single governing authority acting as an intermediary.

The bitcoin protocol established a set of rules – "in the form of distributed computations – that ensure the integrity of the data exchanged among billions of devices without going through a trusted third party" (Tapscott and Tapscott 2016, p. 5). To elaborate, the payments through bitcoin use a "decentralized virtual currency [and] are recorded in a public ledger that is stored on many – potentially all – Bitcoin users' computers, and continuously viewable on the internet" (Nathan and Scobell 2012, p. ix). Bitcoin is the first and largest cryptocurrency, though there are hundreds of other currencies currently up and running that work through different mechanisms. The common feature they all share is the underlying technology: blockchain, a cryptographically secure distributed ledger.

Until 2013, the spotlight was on Bitcoin. Ever since, the attention shifted to the underlying cryptographic register, blockchain. There is a burgeoning number of academic studies, popular and news articles, documentaries, blogs, conferences, courses and project proposals that surround the concept. Unsurprisingly, there are vastly deferring opinions on the transformative capacities of the emerging

technology. While some would say it has the "potential for reconfiguring all human activity" (Nathan and Scobell 2012, p. viii), others call it a scam and completely useless (Aslam 2018). Furthermore, the excitement around blockchain is driven by a diversity of actors including, but not limited to governments, anarchists, banks, entrepreneurs, coders and ecologists. Blockchain is being innovated by both institutional actors like governments and banks, as well as libertarian and anarchist actors. It is often cited as a panacea for many global societal issues including, for example, poverty (Kshetri 2017a), identity management (Jacobovitz 2016), development practices (Institute of Development Studies 2017), community currency (Birch 2015), commons-based peer-production (De Filippi 2015) and even government itself (Ojo and Adebayo 2017; Carter and Ubacht 2018).

Put simply, blockchain allows people to trust each other and transact peer-to-peer where trust is not established by a third party, but through collaboration, cryptography and codes. More specifically, it is an algorithm which is able to determine consensus across a globally dispersed decentralized network without resorting to any external authority for decision, regulation or enforcement. Therefore, it is poised as an algorithmic solution to the politico-administrative problems of trust, authority and consensus. It is clear through such claims, along with the surge of experimentation from all parts of the political and institutional spectrum that blockchain comes with high political passions of transformation. It is not only being used to create alternative, parallel worlds with their own socio-economic and political infrastructures (crypto-anarchists), but also enhance the existing institutional infrastructures (crypto-institutionalists). However, these two approaches signal two very different types of technopolitical transformation with regards to the distribution of power and system of politics. The prior is attempting to use blockchain to replace institutions of power i.e. blockchain as a decentralized institution, while the latter is using it to upgrade the current system i.e. blockchain in, for and with institutions.

Even with the obviously inherent political nature of blockchain, most scholarly research has eluded to identify, analyze or address the broad socio-political implications that the different political approaches could have for society, political processes and governance (Atzori 2015, 2018; Golumbia 2016). Computer science has focused on technical experimentation concerning the infrastructure, incentive systems and features (Herbert and Litchfield 2015; Huckle et al. 2016; Zheng et al. 2017; Liang et al. 2017; Wang et al. 2017). Legal studies has largely focused on finding strategies and formal laws to regulate cryptocurrencies and blockchains, while overlooking the larger governance implications (Middlebrook

and Hughes 2013; Farmer 2014; De Filippi and Hassan 2016; Fridgen et al. 2018). Economists have evaluated and analyzed cryptocurrencies, Initial Coin Offerings (ICOs), financial systems, and other economic contingencies (O'Dwyer 2015; Böhme et al. 2015; Catalini and Gans 2016; Scott 2016; Conley 2017). Omitting a few studies (Atzori 2015; De Filippi and Loveluck 2016; Campbell-Verduyn 2017; Herian 2018), any in-depth analyses of the political implications of blockchain are yet to published. Moreover, there is an absence of a rigorous framework to identify political ambitions of blockchain experiments, let alone the political imaginaries or societal visions that underpin them.

Civic tech: digital tools to update democracy?

Over the past few decades, there has concomitantly been a boom in civic tech: digital tools specifically made for civic engagement and participation. These technologies are part of a response to phenomena such as the democratic deficit (Bekkers et al. 2007; Bauman and Bordoni 2014), the loss of hope and trust in national government (Curtin and Egeberg 2008; Friedman 2016) and civic disengagement (Wike et al. 2016). Civic tech has seized a lot of scholarly attention and been referred to with many different terms including e-democracy (Chadwick 2003), e-government (Layne and Lee 2001), open government (Attard et al. 2015), crowdsourcing democracy (Bani 2012), Govtech (Adler et al. 2017), smart government and smart specialization (Capello and Kroll 2016).

Government is initiating the use of these digital tools in an attempt to create more efficiency, transparency and accountability within the political system. Furthermore, these systems are meant to enhance democracy by increasing citizen participation in the political process. This is also often encapsulated under the banner of a place-based strategy for regional development where local actors are incentivized to take part in the political process (Bentley and Pugalis 2014; Harrison 2014; Remesar and Borja 2014). Participatory and place-based politics are highly contestable fields of academic study (Powell and Colin 2009; Alonso et al. 2011; Bani 2012; Baiocchi and Ganuza 2014; McDonald 2014; Lee et al. 2015), yet the digital transformation of government has yet to achieve a satisfactory result in this regard (Kassen 2017; Kurban et al. 2017; Simon et al. 2017).

Furthermore, while there is a large amount of scholarly attention thus far afforded to civic tech that is being developed and propagated by large institutions for

participatory and place-based politics, research on civic tech that is co-created as a part of a grassroots movement or social movement has been inadequate or superficial (Donohue; Knight Foundation 2013; May and Ross 2017; Skarzauskiene and Maciuliene 2017). This open-source and free civic tech which is co-designed by civil society, local council and global volunteers can be referred to as place-based civic tech (see below). It is argued that this form of civic tech opens up a digital space for self-organization and management and enables a place-based or translocal geography of political participation and action.

Approaches to innovation: up, down and the middle

While there are many similarities in terms of aims, approaches and practices in blockchain and civic tech, they introduce a different set of political practices and enable a different type of political reality. If we want to tether emerging civic technologies to a political transformation that creates a more equitable political system, we must first decode how and why they are being created. In an effort to detect, analyze and address the political implications of these technopolitical experiments i.e. (de)code a technopolity, this thesis identifies three different approaches to – and associated patterns of – innovation that apply to both blockchain technologies and civic tech.

First, there is a centralized approach, where technopolitical practices are designed and implemented top-down, through institutions that are dominant nodes of power, such as the state or transnational organizations. The technology, and practices it will enable, are designed behind closed doors by decision-makers and provided as services to the citizen or user. For instance, this refers to state regulation of the internet or e-government initiatives where the government sets the "affordances and constraints" of the system (Benkler 2011, p. 711).

Second, there is the decentralized bottom-up approach, where the technology is not only co-produced by individuals in networks, but also creates an alternative, parallel socio-political world. These technologies – built as translocal startups – are often created and managed by open-source communities who actively take part in the redesign and amendments to the affordances and constraints. This approach would include most cryptocurrencies, crypto-anarchist projects as well as open-source software built on collaboration platforms like GitHub.

Third, there is an emerging approach in which technology is co-designed and co-managed by local government, civil society and a set of globally dispersed volunteers. This thesis terms this approach as a 'collaborativist approach'. It coins the phrase 'place-based civic tech' to describe how the technopolitical solution is simultaneously local and global, in that, different place-based movements are united in the diverse ways to practice collaborative democracy. This includes the Radical Municipalist movement which began in Spain. It aims to create an ecosystem of municipalities which collaborate to create civic technologies as instruments to practice direct democracy.

Problem definition and puzzlement table

This thesis takes the perspective that technologies that are created through any of the above listed three approaches personify "prefigurative politics" by design, in that they embody the politics and power structures they want to enable in society (Scott 2015; Myers 2017; Husain et al. 2019a). Following Kranzberg's first law of technology, "technology is neither good nor bad; nor is it neutral" (Kranzberg 1986, p. 545), this thesis shows how both blockchain and civic tech contain in-built features of access, decision-making and value, which influence the distribution of power and socio-economic and political realities. Technologies set certain "affordances and constraints" (Benkler 2011, p. 711) on their users, which can be thought of as the possible courses of action available to an actor. More simply, the prefigurative design of a technopolitical system partially determines the political agency and power actors have within a given system.

The thesis claims that the embodied prefigurative politics and political contingencies, are inspired, determined and guided by particular political imaginaries which underpin the innovation. However, "technological opportunities do not only enter into economic and social life without deliberate choices and efforts" (Archibugi 2017, p. 541). Therefore, this thesis opposes Marxian-Deweyan techno-determinism which attributes social relations, political cultures, behaviors and power relations solely to the technopolitical infrastructure (Smith and Marx 1994; Kline 2015; Dafoe 2015). Since the desirable technopolitical scenarios only perpetuate the mainstream through design choices and deliberate use, it is a research imperative to rigorously unpack the political imaginaries underlying civic tech and blockchain projects. It is these imaginaries that establish the conditions of possibility for political transformation. Kranzberg's final law reads "technology is a very human activity

– and so is the history of technology" (Kranzberg 1986, p. 557). This PhD makes a step in articulating a frame with which to influence the future of technopolitical transformation and research.

Table 1 – Puzzlement table

Chapter	Triggers	Further questions and perspectives chosen
4	Why do so many blockchain grassroots projects and startups have weak political conceptualization when they are specifically aiming for socio-political change?	• How could these projects better conceptualize their political underpinnings? • What are some of the major misconceptions within the blockchain space, and why? • Looking past the hype, what really is the transformative capacity of blockchain and how can it be harnessed and mainstreamed? • Is there a way of clustering blockchain projects according to their political underpinnings and motivations?
5	Why are there so many government-led blockchain projects when the technology itself emerged from an anarchist-revolutionary space aiming to create a parallel world outside of the dominant institutional paradigm?	• Where and how can we situate these projects in contemporary politics as well blockchain spaces? • How do they use principles such as decentralization and disintermediation differently from non-institutional projects? • Do these projects allow for a change in power relations and decision-making structures?
6	Why have civic engagement technologies primarily been picked up by cities and why have they not made it to the mainstream as of yet?	• What are the historical and political antecedents to this movement that allow it to flourish in particular places? • How are these places so well connected trans-locally? • How was this field tied to other growing fields around the internet, law, politics and economic systems? • What was this unique form of collaboration sparked by, and moreover, what was it maintained and spread through? • Why is it not experimenting with blockchain?

Table 1 highlights the three empirical triggers i.e. basic questions that emerged from a period of immersion in the social worlds of blockchain and civic tech, and how they developed into further questions. Each of the triggers had a particular empirical focus which evolved into the three empirical chapters of this thesis (4, 5, & 6). Table 1 thus illustrates the beginning of the iterative research journey that culminated thread together this thesis. While the different approaches to innovation – mentioned in the previous section – expose some of the imaginaries at play,

technopolitical transformation is an empirical puzzle and is treated as such in this thesis. Several projects which fall into one of the approaches have been empirically researched through digital ethnography, immersion in technopolitical spaces (both online and offline), participating in hackathons and innovation relays, carrying out workshops, attending events and conferences, as well as secondary forms of research. This data has then been analyzed and corroborated by a theoretical framework developed specifically for the project.

Aims and research questions

The overall aim of this PhD is produce a rigorous empirical study into analyze, and in turn, guide technopolitical transformation in the direction of a more equitable arrangement of politics and political action. It intends to do so by not only creating frameworks to analyze the three different approaches, but also showing how some of the most innovative technopolitical approaches can be exported to different domains of political activism.

The overarching research questions for the project are thus:

> How can and is emerging digital technology being used for transforming politics and political action? More specifically, how does the design, implementation and use of technopolitical innovations influence the practices of politics?

These questions inspired three sub-questions which were addressed in the three published chapters that together make up the main body of this thesis:

1. How can we identify, cluster and analyze the underlying political imaginaries of blockchain projects that shed light on the potential technopolitical transformation? (Chapter 4)
2. Are all government-led technopolitical (blockchain) projects set up to re-centralize power in the hands of the institutions? (Chapter 5)
3. Does creating a digital space for autonomous self-organization (i.e. place-based civic tech) allow the emergence of a parallel, self-determining and more place-based geography of politics and political action? (Chapter 6)

Thesis structure

The thesis consists of seven chapters. The introduction above introduces the topics of research i.e. technologies for technopolitical transformation, namely, blockchain and civic tech. It highlights the societal and scholarly urgency to investigate these topics by situating them in the contemporary socio-political situation.

Chapter 2 outlines the theoretical background of the thesis. It builds a conceptual lens using theories from different disciplines to study technopolitical innovation empirically. The disciplines it consults include: Science and Technology Studies (STS), algorithmic governance, post-politics, libertarian municipalism, social ecology, critical geography and the place-based approach. It lays the foundations of a new analytical frame by using the concept of prefigurative politics as a conceptual bridge builder.

Chapter 3 introduces the methodology employed during the course of the research. It presents digital ethnography as the main methodological approach used to gather data from both online and offline social worlds. It details the principles of a digital ethnography and how they are threaded through the main components of the data collection and analysis. This includes: the concept of social worlds, cyber-immersion and routines, localities and their contextual differences and events. It also lists the types of events, workshops, experts, hackathons and working groups that contributed to the empirical research, along with a critical overview of data collection. Finally, it contains several textboxes to explain events and concepts that might be unfamiliar to some readers.

Chapter 4 begins the empirical part of the thesis. It begins to address the first sub-question by conceptualizing the transformative potential of blockchain-based projects. It shows how blockchain projects personify prefigurative politics by design: they embody certain politics and power structures. After exposing the many misconceptions and debates that surround blockchain for political innovation, the chapter ends by proposing a frame to question, cluster and analyze the political imaginaries that are intrinsic to the design, implementation and use of blockchain projects.

Chapter 5 uses the cases of government-led blockchain projects to answer the second sub-question. It critically engages with the literature on post-politics and algorithmic governance to understand the nature of technopolitical transformation possible through government-led interventions. Furthermore, it also addresses

one of the existing debates on the post-political itself: whether it is a condition that structures innovation or a contingent political strategy that aims to delimit a citizen's political agency. It urges researchers and practitioners to not only question the algorithmic design of blockchain projects, but also the metapolitical narrative underpinning them.

Chapter 6 introduces the concept of 'place-based civic tech': citizen engagement technology co-designed by local government, civic society and global volunteers. To address the third sub-question, the chapter uses an in-depth case of the radical municipalist movement in Spain to show how there is a compelling narrative of creating a more place-based geography of politics and political action using civic tech. Furthermore, it contributes to the study of technopolitical innovation in general by discussing it in terms of a municipal strategy aiming to implement collaborative democracy.

Chapter 7 synthesizes and discusses the main findings of the entire project. This involves not only reflecting on the theoretical and methodological connectivity of the three empirical chapters (4, 5 and 6), but also using meta-inference to gain new insights and reveal future research agendas. After providing a set of general methodological and theoretical reflections, it reflects on the insights gained during the study according to three themes: the geography of politics and political action, political theory and practice and the future of technopolitical transformation research. It ends by providing some concluding remarks.

Chapter 2

Theoretical background: prefiguring a technopolity

Introduction

This chapter presents the theoretical grounding and background of the thesis. The main aim of the chapter is to show that it was necessary to build a conceptual lens using theories from different disciplines to study technopolitical innovation empirically. It highlights the inadequacy of contemporary interdisciplinary work on the topic, and lays the foundations for a new analytical frame. Furthermore, together with the next chapter on methodology, it elucidates how both the analytical and methodological design of the study were molded through an open, transdisciplinary and original approach. While the background and key principles of the different theories are presented, this chapter also creates a series of linkages that illustrate how different theories can be connected. It begins by foregrounding the idea of "prefigurative politics" as the binding thread for the different chapters in this thesis. The subsequent sections expand this base by cross-fertilizing it with concepts from Science and Technology Studies (STS), algorithmic governance, post-politics, libertarian municipalism, social ecology, critical geography and the place-based approach.

Figure 1 shows how the empirical and theoretical puzzles – derived from the triggers in the previous chapter (Table 1) – broadly informed the theoretical body of literature that was consulted for this project. The theoretical base of the study can broadly be divided into two parts: the design and implementation of technology, and the practice of politics and political transformation. Both these broad headings encapsulated research from several disciplines. The main research consulted is listed below the first three headings, while it is looked at from the lens of prefigurative politics, as will be explained in the following. Throughout this chapter, I will work through the connections that can be made with different parts of these theories. This will help outline the analytical frame to investigate the 'critical visions and approaches for technopolitical transformation' and investigate the empirical puzzles as shown in Figure 1.

A higher order aim of the theoretical work undertaken for this thesis is to develop and explore critical visions and approaches for sustainable and place-based technopolitical transformation. Each of the sections will also show how different concepts can be operationalized to align innovation practices to this end. This chapter as a whole provides us with a base to better understand the main empirical chapters (Chapters 4, 5 and 6), as well as the thematic insights in the discussion

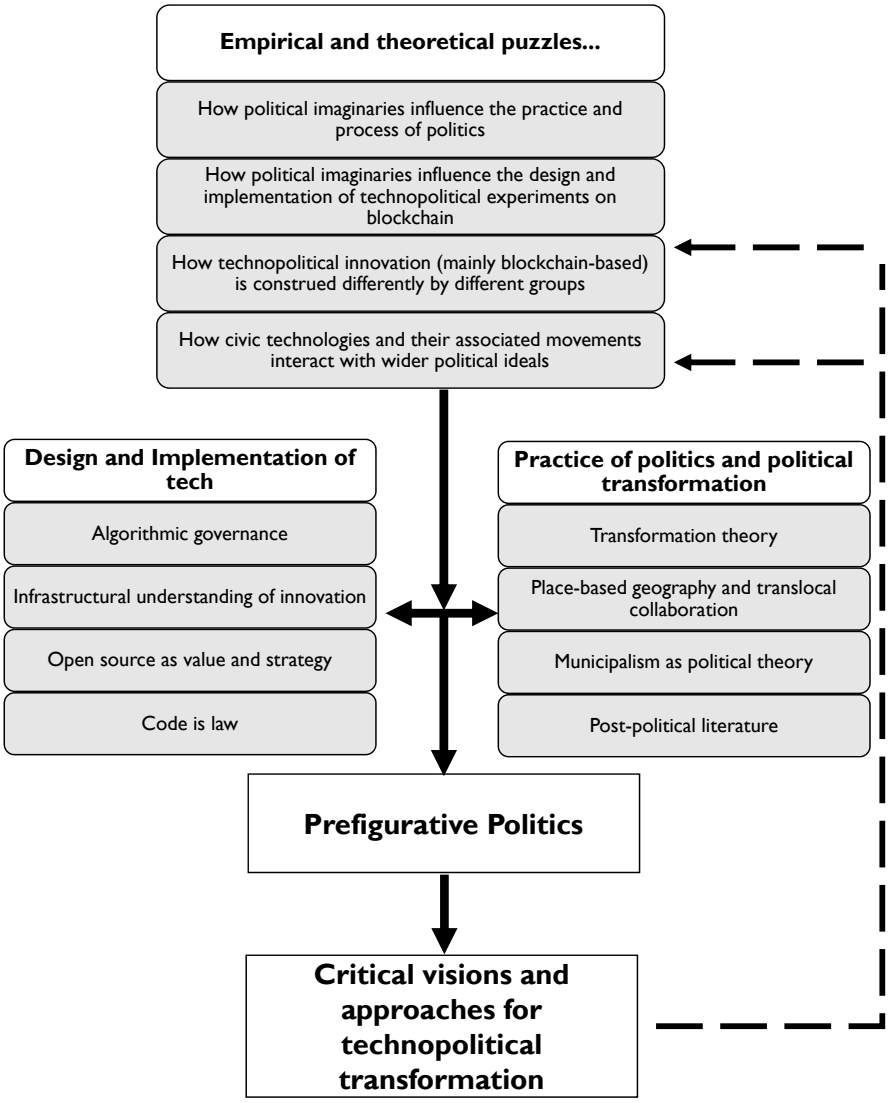


Figure 1 – Division of theoretical base

chapter. A simple sketch of the sub-sections of this current chapter are illustrated below in Figure 2. These are the main features of the analytical frame for this study which is outlined in the last section of this chapter.

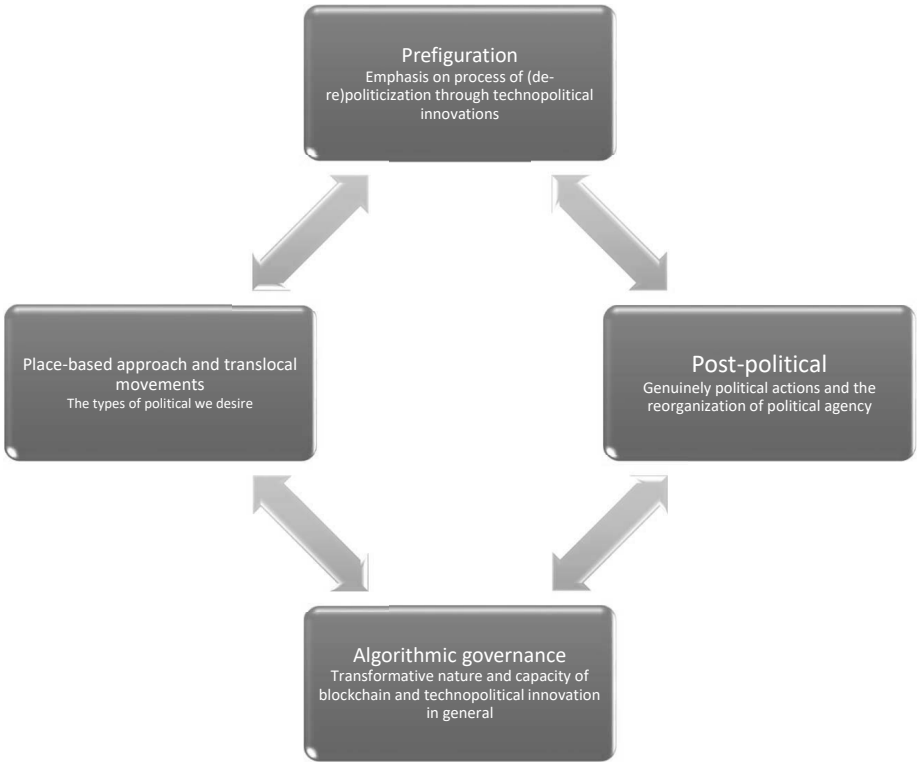


Figure 2 – Sketching the concepts

Prefigurative politics as a conceptual bridge builder

Prefigurative politics (along with a number of associated terms like prefiguration, direct action and micro-politics) has become a significant feature in discourse of political protest and transformation. Recently, it has been invoked in support of many contemporary movement activities, including direct environmental action (Mason 2014), the alter-globalization movement (Maeckelbergh 2011, 2012), the global justice movement (Mason 2014; Sancho 2014), reclamation of public space (Razsa and Kurnik 2012), and various movements that concern alternative modes of governance (Portwood-Stacer 2012; van de Sande 2015) and free spaces (Futrell and Simi 2004). The term was coined by Carl Boggs (Boggs 1977) as a political logic in contrast to 'statist Marxism' and was later adopted by the New Left (Breines 1989; Epstein 1991) to initiate debates on more participatory forms of democracy.

Prefiguration, in the context of contemporary scholarship can be split into two groups: following Boggs and Graeber, it is a way of enacting mobilization where 'means are deeply reflected in the ends' i.e. the major focus is on the 'process'. Contrastingly, following Epstein and Breines (the New Left), prefiguration creates parallel channels, or alternative projects, to bring about structural changes. Whereas for the first group, prefigurative politics is the "embodiment within the ongoing political practice of a movement" (Boggs 1977, p. 100), for the New Left, it is similar to doing additional activities parallel to the main protest. As Yates confirms, for Breines and Epstein, "prefiguration is doing extra activities or projects alongside adversarial protest, rather than the dynamic underpinning it" (Yates 2015, p. 5). The overlap between them is "linked by the notion of prolepsis evoked by the word itself: to prefigure is to anticipate or enact some feature of an alternative world in the present, as though it has already been achieved" (Yates 2015, p. 4). Both conceptualizations consider "politics as an instrument of social change… yet it is often not clear if it is a tactic, orientation or way of doing protest, an alternative type of movement activity or a combination of these, and it is rarely apparent where distinctions with other types of political activity ought to be made" (Yates 2015, p. 2). Throughout the thesis, I take these ideas of prefiguration and apply them to technopolitical innovation where both the design and implementation of a given system are considered to have prefigurative elements i.e. they embody the politics and power structures they want to enable in society.

The Occupy Movement was one of the recent popularizers of prefiguration (Graeber 2013). Occupy is a movement to implement a radical form of democracy: "rather than petitioning politicians to bring about democratizing reforms or a building a party that would hopefully instate democracy after revolution…they sought to prefigure a democracy-to-come, by actualizing radical democracy in the movement itself" (Murray 2014, p. 2). They took over public spaces where experimental forms of democracy could be tested and developed. Analogously, in this thesis, I argue that civic technologies or blockchain projects embody creative spaces for political experimentation in the same way i.e. for different sociotechnical systems to be tested out. The following paragraphs are dedicated to further unpacking this idea. We will see how the different fields of study, such as post-politics, political imaginaries and place-based geography, help deepen an understanding of prefiguration. Furthermore, it is also pertinent to note that technopolitics provides a unique case through which to understand how prefiguration takes place in a digitally-mediated political world.

If we consider prefigurative politics as building alternative worlds, inclusive of the way these worlds are built, as well as the processes they implement, it becomes essential to understand the political ideals and imaginaries underpinning them. When we start to imagine that each technopolitical experiment is, or can be, a social movement with different prefigurative elements, it sheds light on the meaning of 'technopolitical innovation' in general. Before mainstream use, each system or project functions very similarly to a social or political movement by embodying certain political imaginaries, as well as creating an alternative structure of decision-making, procedures, and power relations. In fact, following Yates, we can begin to identify how each innovation would take place through a series of "interrelated social processes", whose identification allows for an understanding of the "political logic at play in the processes of [technopolitical] prefiguration" (Yates 2015, p. 14).

First, "prefiguration involves experimentation" (Yates 2015, p. 13). Within a technopolitical system such as a participatory democracy platform, the way consensus is achieved, who participates and how projects are planned and carried out, is always open to change and improvement. As we will see in Chapter 6, the form of collaboration through which the system is built makes a big difference to how the culture of experimentation is prefiguratively enacted. Second, "prefiguration involves establishing new collective norms" (Yates 2015, p. 14), codes of conduct and strategies for social change. In the methodology chapter (3), we will already see how the social worlds that technopolitical systems created influenced where users (or in this case, respondents) co-designed the software and strategies for implementation and use. In Chapters 4 and 5, as well as later in this current chapter, we will see how debates in the field of blockchain and algorithmic governance talk about how code and design of a system can regulate behavior, norms and the culture of participation. Third, the "demonstration and diffusion of practices, orders, devices and perspectives allows prefigured 'alternatives'" (Yates 2015, p. 14). In all three of the published chapters we will see how technopolitical innovation creates alternative social worlds to interact within. For instance, by creating an alternative financial system, cryptocurrencies enable a 'political exit' from the existing political regime. In sum, identification and analysis of technopolitical prefiguration already begins to shed light on the nature of the potential political transformation.

One of the most debated concepts within the field of prefiguration is 'process'. It is claimed that the "term 'process' saturates movement discussions, spaces and practices" and how, "for many people, this movement is precisely and primarily about process" (Maeckelbergh 2011, pp. 2, 7). Since prefigurative politics wants

to develop more inclusive political practices, the 'process' is in itself an experiment to understand what would be the best way of organizing for enacting the values of the democracy. Historically, prefigurative politics (as far back as the Russian Soviets, or even the Paris Commune of 1871) referred to building a horizontal community within a movement, as a "necessary precondition for broader structural transformation" (Murray 2014, p. 3). Breines explains how the New Left wanted to achieve these dual goals concurrently, but the tensions that arose between the two elements eventually dissembled any organizations that attempted to focus on both process and broader structural change (Breines 1989). This tension is reflected in the critique of prefigurative politics where it is accused of being incapable of achieving any large structural changes in political infrastructure. The critiques explain how an excessive focus on the 'process', referring to the internal relationships, is "ineffective at both outward-facing movement-building and executing a broader strategy to transform existing institutions" (Murray 2014, p. 4). These two expressions – broad structural transformation and focus on process – help us distinguish between early forms of prefigurative politics and contemporary ones.

Graeber explains how this kind of direct participation and focus on internal process is particularly transformative for participants and serves as a sort of pedagogical function for self-organization and poltiical participation (Graeber 2013). However, we can see how this perspective "over-valorizes the experience of political participation, independent of its effects on material concerns" (Murray 2014, p. 5). If we contextualize this to technopolitical innovation, the analysis becomes much more complex. If a given technical system prefiguratively decides the allowances and constraints in a hardcoded way, then the design (almost) wholly determines what kinds of 'processes' it will allow. In this way, it is to a large extent the case that the 'process' will enable certain types of political behavior, while ruling out others. Perhaps, in a context where 'process' is coded in a technical system, it is not over-valorized, but it is nevertheless quintessial in deciding the trajectory of the potential political transformation. As we will see in in Chapters 4, 5 and 6, this sheds light on the necessity to focus on the designing and designers of these processes.

To summarise then, prefiguration in a technopolitical system directly impacts the transformation of the basic institutions of society by creating alternative ways for politics to be practiced. In the case of blockchain and civic tech experiments, any alternative system – for instance, finance, politics, budgeting or city planning – is attempting to create a "counter-institution" (Murray 2014, p. 8). These projects are attempting to either transform existing institutions, by changing power relations

and internal organizational mechanisms, or create alternative institutions that could potentially replace the existing ones. Thus, prefiguration, in the context of technopolitics, does not necessarily seek to "conquer the world" (Maeckelbergh 2011, p. 2). Rather, it attempts to simultaneously create the narrative and theory of alternative ways of carrying out politico-economic processes and the political structures and practices necessary to govern them. Most technopolitical innovations noted in this thesis are experimental, in that, they are still in the iterative process of resolving many internal and external contradictions. With prefigurative technopolitics, "theory can be developed from a distance, but practice can only be developed through doing" (Maeckelbergh 2011, p. 3). This is why both the designing and implementation of the technopolitical experiment need to be rigorously investigated.

It is also through this idea of 'learning through doing' that the strategic element of prefiguration becomes clear. Many civic tech and blockchain technopolitical projects practice agile methodologies where the system is developed iteratively and incrementally, instead of all at once (Denning 2016). This involves trying out new features of a system at different scales, through small iterative steps, to learn what works and what does not. Through this methodology, political strucutues, decision-making processes and consensus mechanisms are being tested out with the aim of learning how to "govern the world in a manner that fundamentally redesigns the way power operates" (Maeckelbergh 2011, p. 15). However, in cases where these iterative steps are not taken, there is also a chance the same power structures are retierated or transformed into less equitable ones. For instance, Chapter 5 will show how some prefigurative political technologies, namely government-led blockchain projects are designed, and subsequently, imposed by governments, without any iterative steps or co-design with citizens. In this way, these technologies prefiguratively impose certain restrictions on the users, in this case, the citizens. In this chapter, we see how they attempt to recentralize power under the guise of a radically decentralizing system, thereby not reconfiguring power structures at all.

If strategy can be understood as an approach to organization aiming to achieve strucutural socio-economic and political changes, then it is clear that each technopolitical experiment uses prefiguration as a strategy. In other words, each technopolitical system imposes certain prefigured power structures, which are strategically chosen by the designers. In the next section, as well as in Chapters 4 and 5, we will see how crypto-institutionalists use a prefigurative post-political strategy to delimit the political agency of citizens through code.

Post-political, post-democratic and post-technopolitical

Terms such as 'post-democratic' (Crouch 2004), 'post-politics' (Mouffe 2005), and the 'post-political' (Rancière and Corcoran 2010) refer to the current state of democracy, where genuinely political behavior, such as contestation and deliberation, are not apparent. The post-political condition, in general, is one in which the political realm has been gouged out or completely vanished (Žižek 1999; Mouffe 2005; Berglez and Olausson 2014). According to such post-foundational theories "contemporary forms of depoliticization are characterized by the erosion of democracy and the weakening of the public sphere, as consensual mode of governance has colonized, if not sutured, political space" (Wilson and Swyngedouw 2014a, p. 5). Swyngedouw, through an understanding of post-foundational thought which draws on Badiou, Mouffe, Ranicière and Žižek, states that the post-political:

> "refer to a situation in which the political – understood as a space of contestation and antagonistic engagement – is increasingly colonized by politics – understood as technocratic mechanisms and consensual procedures that operate within an unquestioned framework of representative democracy, free market economics, and cosmopolitan liberalism" (Wilson and Swyngedouw 2014a, p. 6).

Within post-political theory, there are some key theoretical nuances which strengthen the conceptualization of technopolitical innovations for transformation. While these are discussed more thoroughly with regards to blockchain projects in Chapter 5, here, I will elaborate on their general contribution to the analytical frame and how they are related to the other concepts.

Mouffe, Ranicière and Žižek each express a slightly differing opinion on what exactly has happened to the genuinely political and what today comprises politics. Only after identifying these differences can we contextualize technopolitical prefiguration to post-politics. Mouffe believes that the political has not disappeared systemically, but rather, the dominant economic practices have "repressed" it (Mouffe 2005, p. 18). For her, there are not enough alternative channels and flexible modes of participation which can challenge the hegemonic model of economic order building. In this context, if a technopolitical innovation prefiguratively creates an alternative channel of participation (for instance, a remittance service that uses a cryptocurrency), it would count as a genuinely political act by creating a system that lies completely outside of the dominant institutional setting. Any agent using this

would, in turn, be carrying out a genuinely political act. However, considering that a prefigurative technopolitical system creates the conditions of possibility for certain types of political action, this 'alternative' too, could be designing the political out of the equation. For instance, this crypto remittance system, could eventually be regulated and taxed by the same agencies, thereby denying an alternative channel to emerge. Thus, could prefigurative technopolitical projects which seem liberating still nevertheless be subjugated through a post-political condition?

Ranicière does not think the political is repressed, but instead, 'disavowed'. For him, three further concepts explain the post-political: archi-politics – closed communitarian groups such as nationalists; para-politics – where political conflict is reformulated to fit in the representative democratic system; and meta-politics – where politics is reduced to systemic governing of things rather than people (Rancière 1999). For him, most technopolitical innovations would somehow loosely fit within one of these types of politics, and hence, the genuinely political could not arise so easily. Similarly, Žižek takes this one step further by explaining that the political has not just been repressed or disavowed, it has been "foreclosed" (Žižek 1999, p. 187). In this context, for the latter two, the genuinely political can only be accessed through the niches of society, where they wholly circumvent the dominant political regime and create alternative modes of governance. Even then, none of the above mentioned scholars would agree on which of the 'heroic' alternative systems creates a more equitable system of politics. They only agree that today's global economic system prefiguratively embodies values of the post-political: global consensus, economic order building and depoliticization of the citizen. In that, technopolitical innovation could either create an alternative path that is genuinely political, or reiterate depoliticization by designing it within the system. However, it is still to be decided which types of depoliticization are desirable. Hence, we can note how the degree and nature of the 'political' is partially pre-determined in the design of the system. In Chapter 4, this is precisely why I discuss how underlying political imaginaries determine how the political is formulated, and moreover, what kind of political action and agency the system permits.

A critique of the abovementioned post-political perspective is that it does not "deny the continuing contingencies, and contestations of power relations, but rather casts political agency solely as a revolutionary act" (Beveridge and Koch 2017, p. 36). Hence, it construes the genuinely political, as well as political agency, only in opposition to the dominant institutional order. In other words "true political agency does not engage with political systems, the existing police order. Rather,

like some of the Occupy movements, it confronts them by denying them, by ignoring their conventions" (Beveridge and Koch 2017, p. 36). Mouffe would contest this statement, explaining that the genuinely political must engage with the "visible nodes of power"; otherwise, radical political experiments like civic tech and blockchain can be seen to "reproduce the very post-political condition it wants to attack" (Mouffe in Beveridge and Koch 2017, p. 37). As discussed earlier, in a technopolitical system, certain affordances and constraints (Benkler 2011) prefiguratively determine the way in which political agency can be exercised. Hence, it is pre-determined in the system which ways a political agent can engage with visible nodes of power. In Chapter 4, we will see how blockchain projects are polarized on whether they engage with institutions, or operate in total isolation from them. This, in turn, explains which types of political agency are allowed (by the designers) to be exercised within the systems.

With regards to the overall analytical frame of this thesis, we can note that some of the key features of the post-political perspective help us better understand how to rigorously investigate technopolitical innovations for their transformative capacity. Following Beveridge and Koch, this thesis notes that prefigurative depoliticization is a contingent strategy that "reshapes the political", rather than a condition (see Chapter 5 for a more detailed debate on strategy vs. condition). Furthermore, it attests that depoliticization and re-politicization should be analyzed from the same frame as being dynamically interlinked (Featherstone and Korf 2012; Chatterton et al. 2013; Jessop 2014; Penny et al. 2019). This nuance allows us to see the unboundedness of politicization and depoliticization within technopolitical projects, where the "distinction between the political and apolitical realm becomes a matter of empirical investigation and not definition" (Beveridge and Koch 2017, p. 40). Hence, in all three of the main chapters (4, 5 & 6), I have set out to empirically investigate and substantiate practices of politicization and depoliticization in technopolitical innovations.

Blockchain, algorithmic governance & theories of transformation

As described in Chapter 1, blockchain is one of the emerging technologies that is poised to transform the way politics is carried out. It is one of the most hyped technopolitical innovations of this epoch. The surge of excitement around

blockchain-based innovation is now commonplace in both research and practice (Tapscott and Tapscott 2016; Busby 2018). At the same time, however, the claims around blockchain range from it having the "potential for reconfiguring all human activity" (Nathan and Scobell 2012, p. viii) to it being a completely "useless" technology and a scam (Aslam 2018). While blockchain has been conceptualized more thoroughly in the introduction, as well as Chapters 4 and 5, this section will highlight some of the contemporary approaches to blockchain research and how they are relevant for the thesis.

Despite the recent boom in blockchain researchers referring to its transformative or disruptive potential (Radziwill 2018; Saberi et al. 2018; Casino et al. 2019), very limited attention has thus far been given to what this actually implies from a political point of view. The few studies that discuss the politics of blockchain projects (Atzori 2015; Golumbia 2015; De Filippi and Loveluck 2016; Velasco 2017; Tasner 2018; Calzada 2018; Herian 2018) are, as of yet, insufficient to guide further research or practical experiments that could operationalize the alleged 'transformative potential' of the technopolitical innovations. In addressing this gap, this thesis cross-fertilizes the blockchain research space with conceptual frames from the social and political sciences.

We begin with Brett Scotts' concept of the 'technoleviathan' (Scott 2015). As highlighted earlier, most technopolitical projects embody some form of political process: "a normative vision of an imagined future reality rather than a description of an actual reality" (Scott 2015). According to Scott, these prefigurative technopolitical innovations "do not offer an escape from government, they just offer another, competing governance system with its own dynamics" (Scott 2015). In fact, to prefiguratively implement an imagined reality, as Scott puts it, is premised on certain assumptions on how technology impacts society in general (for further discussion of these assumptions, including as a basis for imaginaries, see Chapter 4). In that, this thesis attempts to politicize the technical nature of blockchain projects and other emerging innovations. It does so by providing typologies, analytical frames and concepts which help navigate between prevalent techno-utopianism and techno-cynicism perspectives on these topics. Chapter 4, for instance, develops a typology that clusters different types of blockchain projects according to their political imaginaries (Table 6) and a frame to understand the expression of these imaginaries (Table 7). Chapter 5 furthers this analysis by conceptualizing government-led blockchain projects and their political implications.

To understand the utopian and cynical perspectives regarding these technopolitical experiments, we need to look at one of the central issues in any form of prefigurative technology: the question of agency. In terms of technopolitical innovations, to what extent do we have control over these technologies, and hence, also the institutional systems of production and socio-political relations? To what extent do these technologies regulate what is, and is not, allowed by the creators of the system and path dependent technological logic? (Dafoe 2015, p. 1048) Before the 1980s, many theorists would claim that technological evolution is an "autonomous" history-shaping process (Carpenter and Winner 1978). According to this body of thought, technology followed an internal logic, had a life of its own and profoundly molded societal structures without any human intention guiding them (Kelly 2010). This view, derogatorily labelled 'technological determinism' has recently been dismissed and replaced with more constructivist approaches to the study of the history of technological development. Through empirical investigation of design, interpretation and implementation of technologies (Hackett et al. 2008), "constructivist scholarship has convincingly shown the important role in the evolution of technology of different social groups, historical context, and varying perceptions of the meaning and purpose of a technology" (Dafoe 2015, p. 1048). The discipline of science and technology studies (STS) has falsified many other conjectures of the determinists. Technological determinism has primarily become a "critic's term" (Kline 2015), "reduced to the status of a straw position in technological studies" (Lynch 2008). However, while most STS scholars ascribe to the idea that technology is shaped by 'interrelated social processes' (as it involves prefiguration), and that technology influences social relations (Mackenzie and Wajcman 1999), interrogations of the "effects and autonomy of technology are neglected" (Dafoe 2015, p. 1049).

This neglection shows up in the lack of studies on how political imaginaries in the design of technologies influence the socio-political and economic relations that emerge from them (Chapter 4). I discuss this in depth in Chapter 4, showing how imaginaries (ideal-types of technopolitical infrastructures) impel certain design features. However, the neglect can also be identified within the widely prevalent polarized perspectives in the blockchain space in general: namely, techno-utopianism (Tapscott and Tapscott 2016; Kshetri 2017; Radziwill 2018; Brody 2019) and techno-cynicism (De Filippi and Loveluck 2016; Golumbia 2016; Ian Bogost 2017; Volmar 2017; Roubini 2018), where blockchain and other emerging technologies are construed as 'all or nothing'. The crucial debate within these

polarized perspectives is whether blockchain has a disruptive or transformative capacity, and whether it can lead to a more equitable socio-economic and political system.

Swartz (2016) claims that there are two types of blockchain projects: radical and incorporative. Simply put, radical projects are concerned with creating 'alternative systems', as the heroic anti-system that the post-political theorists talk about being genuinely political. These systems enable users to wholly circumvent the dominant institutional paradigm and take part in a parallel socio-economic system. Contrastingly, incorporative projects are those that innovate within the current institutional paradigm. According to some of the post-political thinkers, these innovations would probably only manage to speed up depoliticization and shrink political agency (Burnham 2014; Dean 2014; Blühdorn 2015; Buller et al. 2018). While there are many different perspectives on the types of transformation blockchain could usher in, the growing literature on crypto-economics (Vlasov et al.; Allen 2016; Rabah 2016; Batsaikhan 2017; Iyer et al. 2018; Verbin and Esmail 2018; Berg et al. 2019), algorithmic governance (Mager 2012; Just and Latzer 2017; Campbell-Verduyn et al. 2017; Danaher et al. 2017; Rachel 2018) and cross-disciplinary legal studies (Lessig 2008; De Filippi and Hassan 2016; Dwyer 2017; Walch 2017), shows us that there is a widespread belief that blockchain and associated technopolitical innovations could transform the practice of politics. It is the type, nature and power of the transformation, that is yet to be determined. This thesis contributes to this knowledge gap by not only providing a frame for analyzing the sorts of transformation that are currently being proposed, but also, the types of transformation that would lead to a more equitable system of politics.

Despite the acknowledged advantages of deploying blockchain in many different fields, the adoption of these systems remains slow and lacks a critical mass of users. According to Atzori, "this is surely caused by many hurdles and trade-offs still existing at the technical, regulatory and governance level, but it is also due to the way the implementation of the blockchain technology is often devised" (Atzori 2018, p. 56). Furthermore, until now, blockchain practitioners and scholars have "insisted on the concept of individual centricity and decentralization of digital services through peer-to-peer interactions with the aim to disrupt and re-conceptualize the traditional top-down structure of financial, political, legal and even social powers" (Atzori 2018, p. 56). There are two points to be made in response here. First, Atzori is referring to who, in this thesis, are referred to as crypto-anarchists, whose imaginaries are in stark contrast to crypto-governmentalists. The latter, who,

as we will see in Chapter 5, seek to re-centralize power and reiterate the current politico-economic structures. Second, as I discuss in Chapter 4, decentralization and disintermediation, which are frequently seen as seamless and predictable theoretical processes, discount the complex incorporation mechanisms necessary for implementation (Allenby 2012). As many studies (along with the section on misconceptions around blockchains transformative capacity in Chapter 4) have shown, considering there are place-based norms, cultures, political structures and institutional practices at play, disintermediation does not unfold in a homogenous way (Allenby 2012; Janssen et al. 2012; Pugalis and Bentley 2014; Atzori 2015). We can, however, ascertain, that technopolitical innovations do in some way influence behavior. We learn that the design of technical infrastructures themselves can "reframe, redefine and reconstitute the mundane activities of social actors and social processes underpinning global governance" (Campbell-Verduyn 2017, p. 8).

We can consider these prefigurative arrangements as "arrangements of power" (DeNardis 2012, p. 721) which create the conditions of possibilities for exercising political agency. Filippi and Hassan elaborate on how code has increasingly been established as a way to regulate internet behavior and, thus, online agency (2018). Accordingly, with the advent of blockchain and smart contracts, there is an observable shift from 'code is law' (code has the effect of law) to 'law is code' (law is actively being defined as code) (De Filippi and Hassan 2016). As we will see in Chapter 4 and 5, this leads to a profound shift in political 'process' that is prefiguratively implemented. Currently, law is enforced "ex-post" i.e. after the event through state intervention. Contrastingly, in new technopolitical systems, law with be enforced "ex-ante" i.e. before the event, through unchangeable code (De Filippi and Hassan 2016). In other words, the code will prefiguratively design the potential exercise of political agency, as well as any form of transformation in 'process'. If we accept that technopolitical infrastructures, in many ways, will delimit an individuals' capacity to exercise political agency, recreate networks and geographies of political actions, mold political processes and change state-citizen relations, it becomes imperative to urgently and critically interrogate how these systems are designed and implemented. In that, this thesis focusses on how interrogating technopolitical projects can open these innovations up to alternative imaginations. In all three of the three published chapters, I question: whether and how political imaginaries underlying these experiments are open and flexible enough to be changed? Also, are the power relations in these dynamic spaces (online and offline) even open to enabling transformation? While there are a series of such nuanced theoretical

questions that this thesis seeks to answer, it also makes a humble contribution towards identifying which alternative imaginations are bringing about a more equitable system of politics by decentralizing the geography of political action.

Place-based geography, municipalism and translocalism

With insights from human geography and political theory are threaded throughout the thesis, this section will elaborate on how and why these disciplines play a key role in the imagining, design and implementation of technopolitical innovations for political transformation. This, in particular, refers to the concepts of place, municipalism, and translocalism.

As some critical geographers claim, technology has been intrinsically linked to the way geography is conceptualized (Harvey; Jones 2009; Graham et al. 2015). David Harvey coined the concept of time-space compression to refer to the destruction of spatial barriers and distances that resulted from updates in the infrastructure of technology (see Figure 3). He explains how certain technological advancements have so dramatically revolutionized "the objective qualities of space and time that we are forced to alter, sometimes in quite radical ways, how we represent the world to ourselves" (Harvey 1990, p. 241). Harvey refers, by way of illustration, to how the passenger aircrafts in the 60s and the proliferation of telecommunication networks in the 80s already changed both our objective everyday experiences and perceptions of space and time; subsequent studies on the internet globalization, cyber-geographies, and so, on have highlighted how this process has continued to change geographical understandings and networks.

It is now a commonly held belief that geographies are fluid, unbounded and everchanging (Janelle 1969; Massey 2005; Sheppard 2009; Jones 2009; Ash et al. 2016). In accordance with this conceptualization, the theoretical basis of this project is further supported by a relational notion of place, which assumes that places are not simply geographical locations, but the ever-changing outcomes of practices, socio-political practices and economic interactions (Massey 2004, 2005, 2008; Woods 2011; Heley and Jones 2012). Such a framing explains how they exist as dynamic nodes in a network which form a geography of political action (Escobar 2001; Castells and Elgar 2004). Place-based approaches have become increasingly popular in sustainability transformations (Horlings et al. 2019), practice of politics (Pierce et al.; Baker 2016), policymaking (Dabrowski 2014) and

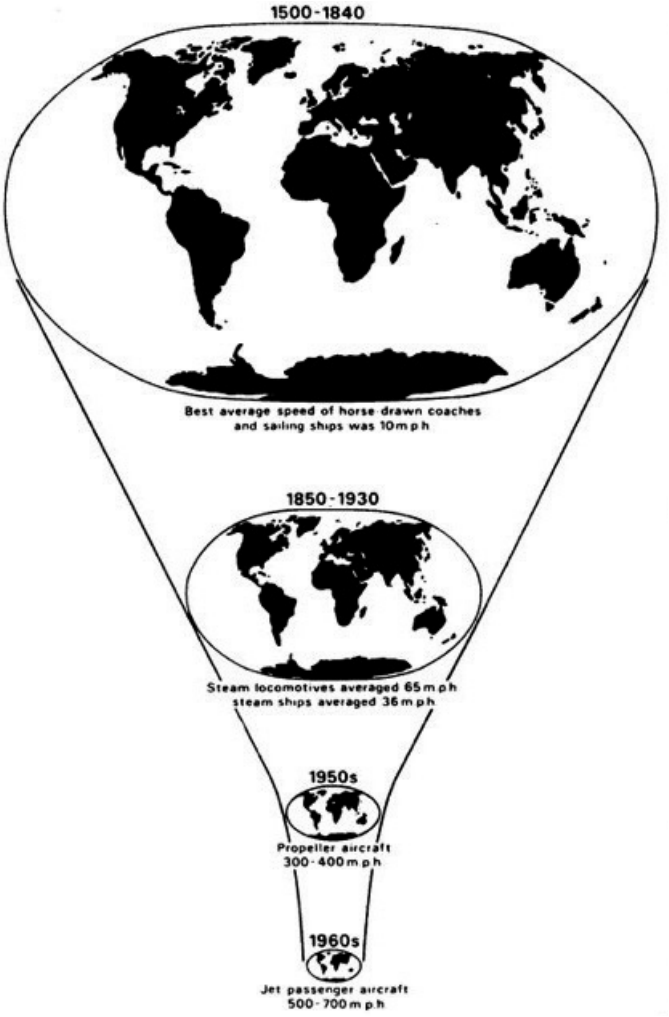


Figure 3 – The shrinking map of the world through innovations in transport which 'annihilate space through time' (Harvey 1990, p. 241)

development studies (Bentley and Pugalis 2014; SUSPLACE 2016). Yet, despite the affinity of a place-based approach to political transformation, it has yet to be used as a premise to technopolitical transformation (Husain et al. 2019b). In Chapter 6, the concept of 'place-based civic tech' is coined to illustrate how the development of technopolitical tools themselves can be a process of place-based or 'translocal' innovation. In this scheme, technology for political transformation is co-created, co-managed and co-owned by its users, who are themselves place-based political

actors. Here, co-creation itself is a product of an unbounded geography, where local activists, organizations, city councils, and citizens collaborate with the global open-source community and other local communities. Thus, this movement is simultaneously global and local, whereby different place-based movements are united in the diverse ways of practicing collaborative democracy. Moreover, these forms of translocal collaboration help operationalize what this thesis terms as a 'place-based geography of politics and political action'. In that, each one of the published chapters (Chapters 4-6) takes a different empirical situation and attempts to understand how technopolitical transformations could lead to the activation of place-sensitive political processes: the policies and processes that are responsive to place-specific needs (Franklin and Marsden 2014).

This dynamic of translocal collaboration is one of the core themes that this thesis highlights with respect to political theory and practice. In the three main chapters, I look at how a place-based approach is (and could possibly be) shaping the design and implementation of blockchain and civic tech projects. Municipalism is one of the political concepts that will be analyzed both theoretically and empirically. It has become a sort of container term for a range of identity struggles and politico-economic struggles. While I look in depth at the Radical Municipalism movement as an empirical case in Chapter 6, here, it is useful to briefly touch upon the history of the concept. Our historical starting point is the concept of libertarian municipalism that was coined by Murray Bookchin. It is described as " a social thought that is based on anarchist collectivism" (Miliszewski 2017, p. 15). Although most (or all) municipalist experiments in some way make reference to Bookchin's ideas, thus far it has never been used as a frame to investigate the geography of technopolitical transformation.

In brief, libertarian municipalism describes a "directly democratic self-government, a political system that is based on radical decentralization and confederalism and supported by ecological philosophy" (Miliszewski 2017, p. 15). The base ideas of self-organization, collaborative governance and place-based political action are apparent throughout Bookchin's political philosophy (Bookchin 1995; Murray Bookchin 1999; Janet Beihl 2015). Under his model, each commune or city would govern itself through a radical form of direct, face-to-face democracy, which would function without any delegated form of authority. We learn that Bookchin advocates for the idea of decentralized democracy consisting of "self-reliance and local democratic institutions" (Hern 2016, p. 178).

As Fowler aptly discerns, Bookchin's vision is both "utopian and practical, short and longer term", where the larger political project would culminate into a "global commune of communes" (Fowler 2017, p. 24). In that, we could connect Bookchin's philosophy to both prefiguration and post-politics. As described earlier, one of the critiques of prefiguration – much of which aims to embody directly democratic practices – is that it does not have a long term goal to change political structures. Libertarian municipalism can be considered as one of the guiding philosophies of how to simultaneously prefigure and achieve structural change through technopolitical experimentation: to "stop the centralization of economic power" (Editors of Kick It Over Magazine 1986) while engaging with visible nodes of power (Mouffe 2005) i.e. cities and communes. Furthermore, we see that Bookchin's ideas also avoid the 'post-political trap' of the historic and New Left which disembeds politics from the everyday (Husain et al. 2019b), depoliticizes the citizen (Chapter 5) and confines it to a "negative, anti- oppositional position" (Fowler 2017, p. 25). In Chapter 6, I will investigate how these ideas are and can be operationalized with regards to technopolitical experiments. We can, however, already note how the premises of place-based geographies and municipalism have found their way into various imaginaries that guide technopolitical experiments, both with blockchain and civic tech.

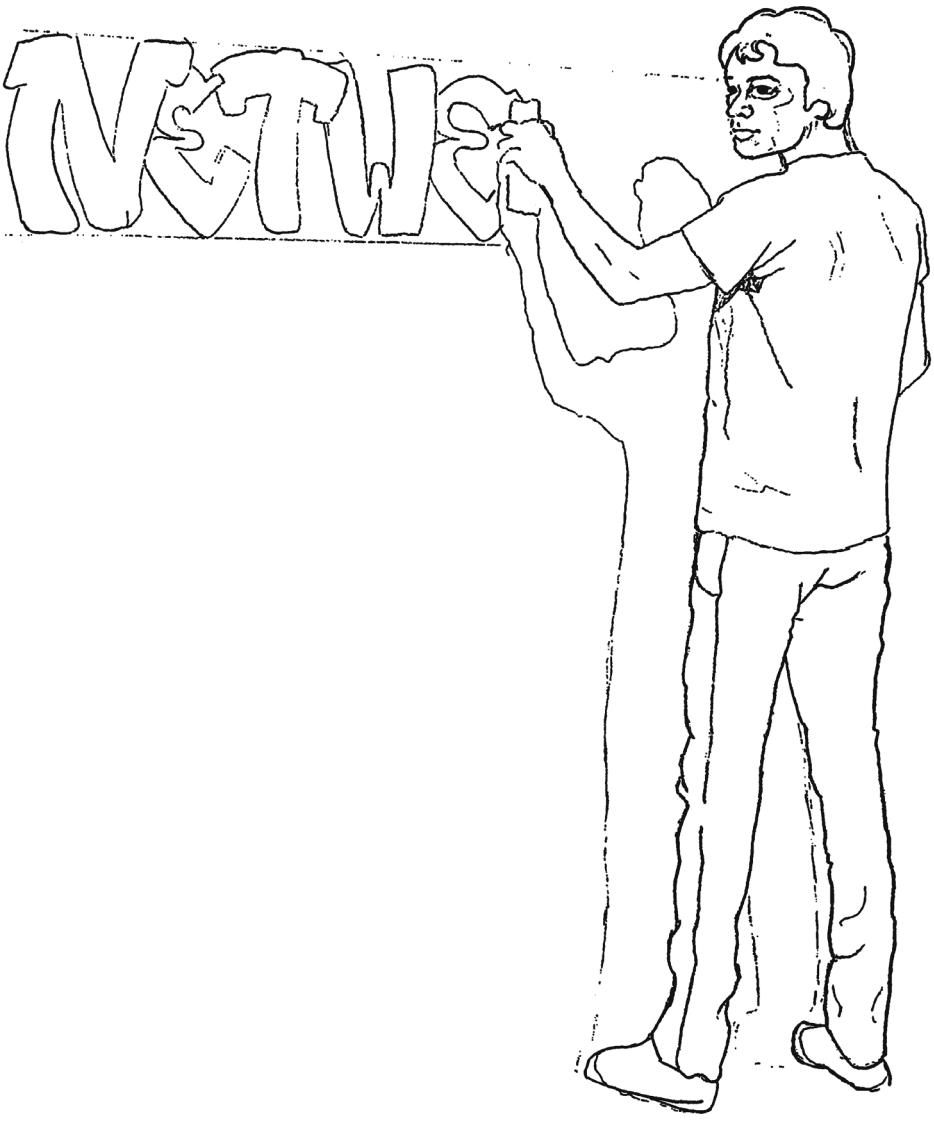
An analytical frame to (de)code a technopolity

A polity is commonly known to be a form or process of civil government. Hence, a technopolity could be considered a polity that utilizes technologies like those discussed in the remainder of this thesis. The subtitle of this thesis reads "tethering the civic blockchain to political transformation". As such, the predominant aim of this thesis is to guide emerging civic technologies to create a transformation that enables a more inclusive and equitable system of politics. In light of this goal, I have drawn on concepts that help understand how to prefigure processes that engage visible nodes of power together with civil society to create a more equitable polity.

While technopolitical innovations are already heralding one version of a polity, their transformative effect on the post-political issues of agency, democratic deficits and centralization of power are inadequate. To (de)code the polity, we must acknowledge that technology is both shaped by interrelated social processes and also autonomously influences political power relations, socio-economic interactions and cultural processes. This chapter gives us the analytical depth to:

1. Identify how the imaginaries of technopolitical projects influence their design and implementation. Through this analysis, we can open up technopolitical projects to other alternative imaginations (Chapter 4).
2. Understand whether the post-political characteristics of depoliticization, apathy, absence of agency and democratic deficit are a condition or a politically contingent strategy imposed through government-run technopolitical infrastructures (Chapter 5)
3. Ascertain how the creation of technopolitical tools to enhance collaboration between citizens and local government can occur through a translocal political movement. This sheds light on how a translocal geography of politics and political action can be actualized by creating and using technopolitical tools in a place-based way (Chapter 6).

Before moving onto the three chapters which address the abovementioned research prompts empirically, I will expound on the methodological approaches that shaped this study.



"ethnography is about telling stories…but the way they were told has changed" (Murthy 2008, p. 838)

Chapter 3

Methodology: digital ethnography, collective intelligence and finding patterns

Introduction

The research conducted for this PhD was completed in the three years (2016 – 2019) spanning the Marie Curie Action ITN funded project SUSPLACE. The main aim of the project was to gain an understanding of how the design and implementation of emerging technologies could potentially transform the way politics is practiced today. Building on the scant scholarly work done in the field, the study endeavored to operationalize a reflexive methodology which investigated both academically conventional and unconventional sources of data. Furthermore, since much of the innovation being carried out in the field was conducted online, a mixed methodology that had the capacity to analyze both the online and offline social worlds together was necessary for a rigorous study.

The empirical work conducted for this thesis was predominantly guided by the iterative principles of 'digital ethnography' (Pink et al. 2016). However, the general methodological approach included a diverse set of participatory action and qualitative methods used in social sciences (Bergold and Thomas 2012), as well as inspiration from agile methods and design sprints usually used in software creation (Denning 2016; Knapp et al. 2016; Linchpinseo 2019). This chapter is structured to explain these elements with details on the specific methodological approaches taken to collect and analyze the data. It begins by contextualizing the principles of digital ethnography outlined by Pink et al. with regards to this research before elaborating on the different components of the study. These components delve into the data collection and analysis during the 3.5 years of immersion in the social worlds, localities, various types of events, hackathons and workshops, while also detailing the methods for analyzing specific types of secondary data. The main data types collected were non-verbatim field notes (Textbox 2), virtual archives and maps (Textbox 3), process diaries (Textbox 8 and subsection on Hackathon) and expert interviews (Table 3). Data was primarily analyzed through the analytical frame developed in Chapter 2, using an amalgamation of different types of content analysis. Throughout this chapter, there are textboxes describing and clarifying details on the events that were attended for this thesis, as well as the data collection and analytical processes associated with them. The last section of this chapter is dedicated to reflecting on the strengths and weaknesses of the data collected and triangulation of the different methods for analysis.

Introducing digital ethnography

The starting point of a digital ethnography is that "digital media and technologies are part of the everyday and more spectacular worlds that people inhabit" (Pink 2016, p. 162). As such, several researchers have begun to develop methods that allow us to understand how the "digital has become a part of the material, sensory and social worlds that we inhabit, and what implications there are for ethnographic research" (Pink et al. 2016, p. 7). Digital ethnography is often an obvious, and moreover, necessary choice when conducting research in technopolitics (conceptualized here as the relationship of technology and political transformation). Within the emerging blockchain, civic tech and open-source spaces that were explored for this research, actors took part in both online and offline (or digital and material) social and innovation worlds.

While the concept of social worlds will be expounded on in the next section, it is important to note that a social world is where symbols, activities and organizations exist in a spatially unbounded way. This also means that any developments in the field, whether narrative building, political actions, decision making, or planning, took place both online and offline. In fact, the emerging spaces of technopolitics are, in part, so fast-paced because of their hybrid nature: geographical, temporal and practical obstacles are less of a hinderance because of the features and possibilities of the digital. Since the field is constantly advancing in different time-zones and spaces (both online and offline), a hybrid and iterative methodology was essential to keeping up to date with and collecting data regarding the latest projects, events, debates, stories and research. As Pink explains, digital ethnography is not a "tool box method…[or] a set of predetermined techniques that are subsequently applied, but are always evolved as a part of a specific research project, question design and practice" (Pink 2016, pp. 162–163). In this way, methods created for this study were responsive to their respective contexts, while still directed by some of the core principles of ethnographic and participatory practices.

Principles of digital ethnography

Pink et al. (2016) outline five key principles for digital ethnography that are derived from and grounded in research experiences. This section helps understand how and why they came into practice during the empirical work done for this thesis. While specific instances of how they were used are mentioned throughout the

chapter, the principles also show how this is not a "model that is aspired to, but be bounced off, played with and adapted according to the contexts and aspirations of each new research project and process" (Pink et al. 2016, p. 66).

The first principle presented by Pink et al. is *multiplicity*. In sum, it conveys that "there is more than one way to engage with the digital" (Pink et al. 2016, p. 67). As the authors remind us, "digital technologies and media (and the things people can do with them) are interdependent with the infrastructures of everyday life" (Pink et al. 2016, p. 68). This interdependency necessitates to now consider the digital as another site of research which is intrinsically related to more conventionally researched spaces (Daniels et al. 2017; Anderson and Ranie 2018). For instance, civic technologies could only be used in places where there is already a modern infrastructure for internet and computer networks to function properly. The topic and the research site itself help determine which of the multiple ways that the field could be engaged with through a digital ethnography. Additionally, the flexibility of "linking digital objects within a database environment has made possible a (near) synchrony among a multiplicity of research activities including organizing, sharing, annotating, analyzing, and interpreting field content" (Hsu 2017, p. 44). The hybridity of the research process is also reflected in the different formats of information in the digital environment, and how we can organize and analyze them.

As touched upon earlier, the everyday developments in the field of blockchain, civic tech and the associated political movements are global, hybrid and ever-changing. During the study, it was necessary to alternate between using many of the conventional techniques of data collection (e.g. interviews) and monitoring debates via the diverse range of mediums through which they were taking place. For instance, many of the debates, and decisions concerning the preliminary vision and planning documents of a blockchain project, the White Paper, were debated on team communication platforms such as Slack. For many projects, these platforms entirely replaced face-to-face meetings because the team was geographically spread across the world. In basic, multiplicity prompted the identification of the richest sites of data, no matter how unconventional they were. Furthermore, in follow on a hybrid form of data analysis, which this thesis terms as 'debate analysis' (explained in a later section and Textbox 1), needed to be developed to deal with these new forms of data.

The second principle, *non-digital-centric-ness*, prompts the researcher "not to be prefaced with the idea of needing to use digital methods" (Pink et al. 2016, p. 71)

but rather, understanding all of the wider aspects of socio-political research. Thus, the digital becomes "relational to other elements and domains of the research topic, site and methods" (Pink et al. 2016, p. 76). This can be thought of as a derivation of the 'non-media-centric approach' in media studies, where media is regarded as inseparable from the wider technopolitical, social, material and emotive worlds (Morley 2009; Krajina et al. 2014; Moores 2016). Throughout the research, the digital was seen only as another aspect of the wider socio-political and economic structures that shape everyday processes. This also meant the digital technology (civic tech or blockchain) was decentered as a focus. The study was about the relationship of these digital technologies with the wider process of technopolitical change. In practice, this meant that while there are many purely online data sources that have been used, it did not replace in-person interviews, attendance at conferences, hackathons, meetups and workshops. The data, findings and insights were always a concert of both online and offline worlds.

The third principle, *openness*, has a burgeoning currency in academia and practice fields today. While geographers like Massey have used it to speak of the unboundedness of 'place' and Ingold about design being an open-ended imagination of the future (Massey 2005; Ingold 2012) , in this study, openness refers to allowing influences from related fields of study. Furthermore, a lot of so-called 'open-source' principles such as collaboration and sharing were employed for the research. For instance, for a lot of the workshops and hackathons conducted with innovators, techies and activists, agile methodologies (Linchpinseo 2019), scrum (Scrum.org 2019) and patterns of decentralized planning (Bartlett 2019) were utilized. In contrast, more conventional techniques like semi-structured interviews, virtual meetings and questionnaires were used for governmental actors. The openness of the method to collaborate with the stakeholders involved in the various spaces signals how this digital ethnography was an inherently collaborative activity, where co-creation and co-deciding were an integral element of the approach. This collaborative tendency can be attributed to the ethnographic approach itself which is open "to its object" and "whose strength is learning by doing" (Beaulieu 2017).

The fourth principle is *reflexivity*: where the methods themselves evolve in response to the specific research project. Reflexivity is now a foundational principle encouraged across the social sciences (Finlay; Maxey 1999; Darawsheh 2014), as well as specifically in digital ethnography methods (Hine 2017). This was one of the most invoked principle in the research. Data was not always easily to locate or attain; for instance, when attempting to conduct expert interviews, a lot of actors

would refuse to be part of academic research in any way (mostly crypto-anarchists) while all of their opinions and vision statements could be find in blogs and forums. Several actors would only engage in debates in semi-closed team communication groups and take a very diplomatic approach during interviews and at conferences. Thus, I not only needed to collect data where it was best available, but also needed to adapt my portrayed identity and image to the context. For instance, at conferences I could primarily be a researcher, while at hackathons I was more of a participant (albeit always also remaining transparent about my status as a doctoral researcher). This, not only allowed me to be reflexive about my role as a researcher, but also be reflexive in the way I worked with different forms of data. For blockchain projects, White Papers, which are the most seminal document (and often times the only written document) concerning the design and implementation of a project, were often incomplete, vague or unavailable. They are considered the most important as they are often the only official form of documentation, yet, do not adequately reflect the amount of work done in the project itself. In such cases, where projects were already being carried out, a lot of data was found in blogs, websites and conferences. It followed the guideline which was introduced by one of the respondents in an interview: "go listen where people actually speak".

The last principle put forward by Pink et al. is unorthodox. The empirical data collected for this study confirms how taking

> "a digital approach enables us to acknowledge and seek out ways of knowing (about) other people's worlds that might be otherwise invisible and that might be unanticipated by more formally constituted, and thus less exploratory and collaborative research approaches" (Pink et al. 2016, p. 88).

Pink et al. explain how digital ethnography sheds light on invisible sites of research and data that has been disseminated in unorthodox ways (Airoldi 2018; Pia 2019). For instance, during the Collective Intelligence for Democracy hackathon (127), the process diaries of the project, along with the design of the platform created were published online. Using diary reflections, field notes (refer to textbox 2) and process diaries during activities such as hackathons, online relays and workshops allowed me to be part of ongoing projects, while also researching them (Boellstorff 2012; Darawsheh 2014). During the course of the entire project, we could note "new forms of continuity" (Pink et al. 2016, p. 92) between online ethnography, ongoing collaboration efforts at events, and discovering unorthodox secondary

data was key to defining research in the technopolitical sphere. This shows how the digital ethnography one of the methodological approaches "enables us to go beyond academia, beyond disciplines and beyond the standard written production of academic scholarship" by engaging with the digital as an intrinsic part of contemporary innovation practices (Pink et al. 2016, p. 92).

Pink et al.'s five principles acted as a guiding schema for both the data collection and analysis, and substantiated the more particular approaches that are discussed below. The next sections delve deeper into both this methodological approach and particular methods used for the overall research project. While the specific methods used for data collection and analysis of the findings reported on in the individual empirical chapters can be found within them, it is worth noting that there is also a lot of overlap in the data sources and methods of analysis between them. Here, I expound on the general methodology used for the entire study while alluding to the principles outline above. Additionally, there are textboxes throughout the remaining sections of this chapter which unpack the more 'unorthodox' phenomena and methods used for this study.

Socio-political worlds

A digital ethnography approach impels us to consider how the digital is increasing, reducing and transforming our socio-political life and agency. The concept of a 'social world' is not commonplace is the social sciences; hence, it merits an explanation. In the 1980s, Unruh expounded that the concept of the social world refers to "a form of social organization which cannot be accurately delineated by spatial, territorial, formal or membership boundaries" (Unruh 1980, p. 271). Instead, the borders of social worlds are demarcated along the lines of "interaction and communication which transcend or cross over the more formal and traditional delineators of organization"(Unruh 1980, p. 271). Applied to the hybrid space of online and offline interactions socio-political worlds are construed as "relatively unbounded… domains of social life", where ethnographers immerse themselves with research participants for long periods of time (Pink et al. 2016, p. 434). Since each social-political world comes with its own variety of communication norms, rules, networks, behaviors, activity infrastructures and operational structures – its own affordances and constraints – an ethnographer has to learn the language and energy of the world to begin understanding it. As Pink et al. confirm, "immersion, participant observation and 'the everyday' are three ideas bound up with how we study social worlds" (Pink et

al. 2016, p. 436). Furthermore, the socio-political worlds researched for this project were not purely online or offline. The internet, in this regard, functioned as a "form of syntopia an extension of, but still heavily integrated with, other face-to-face and mediated channels and processes" (Katz and Rice 2002, p. 202). This makes these hybrid social worlds fluid, where they are: never sealed off from other social worlds, demarcate no clear boundaries, and members enter and exit according to their own whims. For instance, online activists were easily seen moving between and changing projects owing to a realignment of their political imaginaries, interest and priorities.

The socio-political worlds of blockchain, civic tech and radical municipalism were located on team collaboration platforms such as Slack (refer to Textbox 1), online forums such as Reddit, blogs, social media platforms, conferences, Meetups,

Team collaboration platforms (TCPs) & debate analysis

What are team collaboration platforms?
Team collaboration platforms or team communication platforms (TCPs) are an "are an emergent class of social collaboration technology that combine features of multiple enterprise social media including social networking platforms and instant messaging" (Anders 2016, p. 224). According to literature, they create affordances for advanced forms of media technology integrations and are highly adaptable and reflexive to the needs of global teams. Some of the most used platforms include Slack, Microsoft Teams and Cisco Webex teams. Some teams have also created their own platforms with their own integrations. Along with messaging, meetings, calls, channels and themes, these platforms also allow for third-party integration with other services like online drives and collaborative documentation all in one interface. (Lanubile et al. 2010; Cardon and Marshall 2015; Carter 2019).

Debate data and analysis
For the projects that were researched for this project, a lot of the teams were geographically spread across the world, hence these interfaces formed their own social worlds. To stay properly immersed in these worlds, I had an almost daily routine of going through the different channels for different information that was being disseminated and debates that were being carried out. Each day, I would open up the channels which were I had subscribed to, for example: governance, strategy, research, community, meetings. Sometimes threads (debates) were linked to other threads, or to links to blogs and articles, or formed their own channel when they became important or large enough. I joined new channels every time the keywords matched my research interests. Screenshots are not included owing to privacy and anonymity of participants.

Daily collection routine (6 months for 2 projects, 1 year for 2 projects): checking and updating on already joined threads (also involved instantaneously responding) → archiving important notes → taking notes of opinions → creating linkage diagrams → checking new links → finding new channels.

Recording and analysis routine (every month for 1 year, every 2-3 months for 2.5 years): Scanning linkage diagrams → finding validating resources → responding to thread or asking permission to use opinion (always anonymized) → cross-validating and creating linkages using theoretical framework.

Textbox 1 – TCPs and debate analysis

Github projects and hackathons. Their depth, interrelationships, networks and infrastructure were vastly diverse. Hence, since their "boundedness, access, openness and porosity…cannot be assumed", it has to be "established through empirical research" (Pink et al. 2016, p. 438). My research journey began by entering into a number of socio-political worlds in the blockchain space through the internet to begin to understand the technology and its potentialities for politico-economic change. This lead me to subscribe to blogs by thought leaders such as Vitalik Buterin, Vinay Gupta, Primavera de Fillipi, Pia Mancini and so on. This quickly lead to joining various team collaboration platforms which were open to the public. For instance, I joined the Slack team of Feedback, and ICO setup, to apply stigmergic principles to organizations where the initial debates on everything from algorithmic governance to political imaginaries were being carried out on an almost daily basis. In the beginning, I was simply observing and learning, but 3-4 months later, the immersion and everydayness of the activities led to participation through posing questions, actively taking part in debates, working on open-source projects on Github (e.g. reviewing vision statements, testing code, providing feedback) and other such activities (Nørskov and Rask 2011; Alleyne 2018). These will be followed up on with further detail in the empirical chapters (4-6). In Science and Technology Studies (STS), "digital ethnography methods – particularly participant observation – have been used to understand knowledge production" (Beaulieu 2017, p. 34). This form of participant observation in the everyday often turns into participant action, where contribution to the field is actively sought, showing the changing dynamics of a digital ethnography (Ardévol and Lanzeni 2017; Lange 2017). The data that was collected during this immersion in social worlds of blockchain and civic tech (for instance, non-verbatim field notes – Textbox 2) was subject to an amalgamation of different types of content analysis.

'Debate analysis' (Textbox 1) is a term this thesis uses to denote an amalgamation of the different types of content analysis that were applied to the non-verbatim field notes and virtual maps during the immersion process. This is primarily owing to the various types of content that emerged during the immersion. For conversations between participants themselves, a conceptual pattern analysis (Gibson 2006; Huberman and Miles 2012; Maggetti et al. 2015) was carried out using the analytical frame developed in the previous chapter. Here, the themes and ideas are clustered together to discern patterns and distinguish different (prefigurative) political imaginaries. These are then subject to theory and data triangulation (Breitmayer et al. 1993; Carter et al. 2014) where a number of types

Non-verbatim field notes

Non-verbatim field notes and process diaries were a constant feature as a mode of data collection in this project. They were considered as the most appropriate medium to be used for a hybrid ethnography as it was possible to use the same method both online and offline. Simply, a non-verbatim field note, is a sort of "intelligent" transcription, which, instead of capturing words as they are spoken, captures the essential meaning behind them. The note itself can be in the form of a mind map, quotations, graphic recording or simple text. In this study, most of the non-verbatim field notes were handwritten or typed texts.

Main functions
Field notes, in general, fulfill many functions within qualitative research (Phillippi and Lauderdale 2018, p. 382), including:

- Prompt researcher(s) to closely observe environment and interactions
- Supplement language focused data
- Document sights, smells, sounds of physical environment
- Encourage researcher reflection and identification of bias
- Facilitate preliminary coding iterative study design
- Increase rigor and trustworthiness
- Provide essential context to inform data analytics

They construct a very elaborate description of different events, comprised of interviews and encounters, while still maintaining a certain type of fluidity and openness in the recording. They also ascribe to the ethos of the project and its main participants: horizontality, collaboration, informality and fluidity.

Why were they chosen?
Non-verbatim field notes were considered the most appropriate for immersion activities associated with data collection. They were chosen not only because in many cases, the place, informality and noise made it inappropriate for audio-recording. Moreover, they were chosen because the word-for-word data was not required for the hybrid forms of content analysis. Gathering essential meanings and discerning patterns from conversations with participants was considered the key goal. These field notes kept the fluidity of conversations, did not intervene in the event itself, and allowed me to maintain participant status in several events that are discussed below.

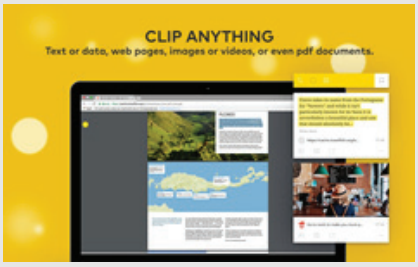
Textbox 2 – Non-verbatim field notes

of data sources (outlined throughout this chapter) and a multi-faceted analytical frame (Chapter 2) are used to corroborate, analyze and interpret data. This is very similar to relationships analysis, where certain words and ideas are seen in proximity to other ideas and words (Scherl and Smithson 1987). If there were links to white papers, blogs or documents (see following sections), this would qualify as document analysis which would then be used to triangulate data gathered from the debates. However, in each of the cases, the aim of the analysis was to create empirical linkages using the analytical framework. The specific analysis routine with regards to TCPs is described in Textbox 1, while the virtual archiving process is documented below (also refer to Textbox 3).

Virtual archiving and mapping

What are team collaboration platforms?
A type of social media platform which allows you to store links, books, highlighted parts of webpages in the form of a map, storyboard or magazine. Each of the archiving platforms has its own interface, functionalities and integrations. One of the unique selling points of using such platforms is that you can 'organize information like you organize playlists' (Lumio, discontinued). For instance, you could highlight different parts of a blog article and choose the order to make a story board, inserting links, images and other references within the board. This provides a quick and powerful way to reflect on what you just read without taking breaks to take notes and make diagrams. These can be thought of as a very advanced version of visual mind-maps.

Screenshot (Lumio, pearltrees)



Lumio was discontinued without prior notice. Hence, the story boards and information stored there are no longer accessible. Pearltrees has changed its interface, however, the information is still online and open for collaboration.

Routine and collection
My routine involved reading through the different blogs and media sources was visiting the different websites I followed and clustering them according to topics. Topics, for instance, included governance, government-led projects, direct-democracy, cyber-anarchy, currency and so on. These were then later or instantly added to different story boards and maps to be analyzed. Though this technique was mostly used as a data collection technique, it also often led to a basic level of analysis because keywords could be linked to the sources of information. For example, most of the crypto-institutional information was present in governmental reports and blogs of national governments rather than crypto-enthusiast news sites and blogs.

Textbox 3 – Virtual archiving and mapping

In a TCP, a question such as "is decentralization always desirable"[1] on a channel often had a thread of 200 posts a day with attached resources like diagrams, articles or graphs. These posts would often contain external links to physical meetups, conferences, discussion papers, blogs and different routes to continue the discussion. These posts were archived via a number of methods. The data (mainly in the form of linked pages) formed visual mind-maps (Wheeldon and Ahlberg 2019) with descriptions and storyboards on online archiving platforms such as Lumio (discontinued), Pearltrees, Pocket and Raindrop. Some examples of these virtual archiving and mapping platforms are given in Textbox 3 (next page). Though this was a very efficient and visually stimulating way of organizing data, in this case, it was not always the most reliable. Lumio was discontinued and the data stored on it has not been accessible ever since. Pearltrees had an update and the thought 'tree' turned into a simple bookmark. Regardless, the easiness and clarity of making mind-maps using links of any data type located online was an empowering tool which enabled an embodied experiential 'wayfinding' while exploring the web (Symonds et al. 2017). The use of more "creative techniques" like storyboards and online archiving mind maps supported the creation of "additional in-depth data as well as increased participation" from the respondents (Cross and Warwick-Booth 2016). During the research process, this was considered analogous to how an ethnographer would explore a place without needing to constantly take elaborate field notes. Albeit, the experience of being able to traverse the web, a limitless space, is arguably far more intimidating and complex than exploring a village.

Alongside this online immersion which began in October 2016, by the start of 2017, I began attending blockchain and civic tech meetups in Amsterdam. This involved searching for MeetUps and events by popular tech-society research institutes and organizations like Waag Society and Pakhuis de Zwijger, and attending as many as possible (1-2 every month) to familiarize myself with the social world of the space. Notably, a monthly meetup called Bitcoin Wednesday was the entry point into the offline world, introducing a host of new socio-political worlds which were globally dispersed. It was one of the first free Meetups for anyone interested in blockchain and cryptocurrencies. While the informal conversations led to developing a diverse personal network of blockchain enthusiasts, the event allowed me to interview a host of practitioners in the field (refer to Table 3 for details). Considering the limited number of events (i.e. one per month), it was possible to attend a variety

[1] No specific screenshots are provided for privacy and anonymity.

of them, both in Amsterdam and beyond (refer to Table 2). This supported the formation of an inclusive personal network which allowed me to get familiar with the social world. Castell's theory of networked society was invoked in some of the methodological approaches that followed (Castells and Elgar 2004). He claims that transnational and fluid relationships have transformed our notions of associations and communities. With a change in the nature of community, it becomes pertinent to mention "networked individualism" (Raine et al.; Wellman 2002). According to this perspective, social relations are now formed by a person's individualistic and personal networks, rather than, collective forms that governed before, such as a person's village, neighborhood or association. This allowed me to understand how my individual network was once again beginning to transmute into new forms of collectives or communities. In other words, even the interactions in physical meetups or groups led back to a diverse number of online communities.

As Kozinet explores through the 'netnography' approach, these new forms of communities can be both found and studied online. His core idea is that an 'online community' entails both a digital (online) and material (in-person) component (Kozinets 2010, pp. 14–15). Hence, to be part of these new communities, I had to show continuity in my participation through active membership, "repeat contact, familiarity, shared knowledge of some rituals and customs, some sense of obligation and participation" (Kozinets 2010, p. 10). This meant that being part of the 'local blockchain scene' entailed more than just attending the meetups. In terms of credibility with the research participants, it also helped that I was somehow involved with other projects around the world through which I could draw comparisons and insights.

Late 2016 and early 2017 ushered in a surge of hype, research and media attention to blockchain's use beyond Bitcoin and cryptocurrency. By the end of 2017, it was even considered "this year's buzzword" (Busby 2018). This meant the birth of hundreds of new socio-political worlds, each with its own political imaginaries, aims, potentialities and norms. These worlds were located both online and offline, and at least, at first, easily accessible. Actors in the field were eager to explore the potentialities of the technology in all directions. My research ambitions were split in two: one that focused on the crypto-anarchists, who were claiming to build parallel systems of finance, politics and social organization; and one that focused on the crypto-institutionalists such as national governments, and transnational organizations such as the EU, who were innovating within the dominant institutional paradigm. As noted earlier, each space had its particularities. Crypto-anarchists

projects were usually global, translocal, or local projects, which involved a lot of online collaboration. Contrastingly, crypto-institutionalists were almost always national, regional or local projects which required many traditional techniques such as interviews and workshops. While I immersed myself in both spaces using the techniques described, it was curious that there no spaces in which the two groups were collaborating. Textbox 4 (below) briefly describes the contrasting features of the social worlds of crypto-anarchists and institutionalists.

Crypto-anarchists

Crypto-anarchists are bound by the philosophy of creating parallel systems of economics, political activism, identity, currency etc. to create the conditions of possibility for politico-economic freedom and exit.

Social Worlds
Crypto-anarchist social worlds existed in several online and offline spaces such as Reddit forums, blogs, slack teams and local meetups and events. A lot of these projects also take place in the Dark Web which was not used as a source of data for this project. However, documentation about the dark web was used. At times, the actors of these worlds also took part in blockchain events and conferences.

Semi-structured and informal interviews, online immersion, blog analysis, workshops, white paper analysis were the main sources of data collection.

Crypto-institutionalists

Crypto-anarchists are bound by the philosophy of creating parallel systems of economics, political activism, identity, currency etc. to create the conditions of possibility for politico-economic freedom and exit.

Social Worlds
The social worlds of this group existed online in some of the same spaces such as blogs and slack teams, but much more behind closed doors at institutional meetings with some events at EU institutions and national level government meetings.

These worlds were accessed by getting in touch with institutional actors directly at the open events, through email, interview requests, offering workshops and commenting on reports and national-level strategies.

Textbox 4 – Social worlds of crypto-anarchists and crypto-institutionalists

Searching for such a place-based, more collaborative approach to technologically-mediated political change, I came across the work of ParticipaLab in Medialab Prado in Madrid and the open source citizen-engagement software Consul. Consul is an open-source software that is being used by hundreds of municipalities to enable participative politics.[2] It falls under the banner of civic tech (citizen engagement technologies). Through a series of informal meetings with Consul at

[2] Refer to (Consul 2019)

ConsulCon[3] and different municipal actors using the software, and attending the hackathon Collective Intelligence for Democracy (refer to Textbox 8), I became deeply immersed in the social world of civic tech enthusiasts: those who were seeking to find new and tech-mediated ways of transforming the relationship of local government and citizens. The civic tech and associated radical municipalist movement allowed me to conceptualize this space as creating a translocal geography of politics and political action. Owing to the online translocality and close-knit network, I was able to:

- Follow the technologies (Spitulnik 2002) as they entered different social contexts. Most of the times, for instance, the Consul codebase was forked (copied) from Github, and amended for context-specific needs; it was reposted as a derivative project. This allowed me to examine and understand how, for instance, place-based political needs and norms influenced the redesign and implementation of the software.
- Follow the "freedom technologists": those actors which "combine technological and political skills to pursue greater Internet and democratic freedoms" (Postill 2014, p. 401). In my research this led me to follow these new types of 'political agents' (hackers, blockchain enthusiasts, practitioners, open-source coders, online journalists, civic activists and tech bloggers) through the different channels they used (Refer to the textbox 5 on the 15-M and radical municipalist social world).

We can note how the social worlds investigated for this thesis are relatively open and inclusive. Moreover, as we will see in the following chapters, there are numerous ways technological mediations and interventions reconstruct (other) social worlds. In the case of the 15M in Spain (details in Textbox 5), we see how a micro-movement metamorphosed into a mass movement using mainstream media and SMS messaging. In that, owing to immersing and actively participating in the various socio-political worlds, I was able to 'follow' the protestors, technologists, politicians, researchers across the ever-changing technopolitical landscape. This involved an everyday routine for two years as an ethnographer in catching up, sharing, exploring, critically analyzing and archiving (Postill and Pink 2012, pp. 128–129).

[3] ConsulCon is a hackathon that took place in 2017 and 2018 which aimed to develop the software further and aid municipalities and cities adapt the technology for its own purposes.

15-M, Civic tech & Radical Municipalism

Overview
The 15-M, the Indignados Movement or 'take the square' was an anti-austerity movement in Spain which originated in social networks. It began with demonstrations on 15 May 2011. It can be seen as a historical antecedent of Radical Municipalism Movement which ushered in a new generation of civic engagement technologies or civic tech i.e. digital tools that redefine how consensus is reached in cities and municipalities. It is a movement that pushes to redefine democracy in the digital age by creating tools for participation and bottom-up direct democracy. It has been realized through hackathons to design 'place-based civic tech' (Chapter 6), prefiguration through citizen assemblies, participation platforms, participatory budgets and horizontal political processes. For more information on the movement, refer to Chapter 6 and (Castañeda 2012; Postill 2014; Rubio-Pueyo 2017).

Data Collection
- Immersion at events: Democratic cities, ConsulCon, Collective Intelligence for Democracy (2 week hackathon)
- Active participation in telegram, slack and other team forums
- Collaboration with participants on other projects
- Cross-linking initiatives and supporting
- Consulting on Civic tech projects with governmental, EU research projects, national and local projects
- Interviews with analysts, figureheads, politicians

Data Analysis
As Pink et al. note, the 15M social world can be conceptualized as a "field" (Postill, 2015), which is a highly dynamic political arena which contains diverse agencies (like those of hackers, journalists, activists, politicians and technologists) so much so that it "resembles the 'affinity space' of a massively multiplayer online games" (Pink et al., 2016). For data analysis, I conducted pattern analysis from the process diaries, notes on collaboration with linkages to my theoretical frame, collaborative writing of proposals with using a 'value-driven approach' (Chapter 6).

Textbox 5 – 15M, civic tech and Radical Municipalism

Localities

The 'local' context has always been a very important site for ethnographic research. In the digital age, as many have claimed, we need to reconceptualize the relationship of the local and global (Brenner 1998; Wellman 2004; Govers and Go 2016). Within the context of the theoretical and empirical setting of blockchain and civic tech, the local or digital implies its relationality with the scale and place of the internet. It becomes necessary to "find, distinguish research online localities and/or how localities spill over between the online/offline in ways that acknowledge their partial merging" (Pink et al. 2016, p. 561). The concepts of locality and place have been sustained fields of study in human geography, anthropology and sociology. Doreen Massey provides one of the most influential conceptualizations of 'place' where it is seen as an 'event' or 'constellation of processes' which is 'relational' (in that it is only

recognized in relation to other places) (Massey 2005). Place, is then characterized as open, dynamic and constantly performed. A locality, in contrast, is a place which is physically inhabited. Postill explains what implications the digital has for localities (Postill 2011), by observing how "researchers undertake a research and intervention process to identify the technological needs of a specific 'local community' and seek to address them in collaborative, participatory ways that involve local people" (Pink et al. 2016, p. 575). This was the case during the 15-M, but also during the hackahtons, workshops and social worlds of the municipalist movement.

These various localities, thus form, a translocal network of collaboration united by a similar political imaginary. Translocality necessitates us to take into account that the digital and material are intrinsically bound together within the same world, and the "online-offline are part of the same processes through which localities are produced, experienced and defined" (Pink et al. 2016, pp. 577–578). However, these localities may have different features. Pink et al. give the example of last.fm which makes 'neighborhoods' of people that listen to the same music, but are all over the world geographically (p.578). Such new neighborhoods were ever present in my research. As explained earlier, the blockchain space was split into the two higher order categories of crypto-anarchists and crypto-institutionalists. However, in practice, there could be many other divisions within the field. As Chapter 4 will explain, crypto-anarchists could be libertarian or commons-oriented, while the crypto-institutionalists could be collaborativists or governmentalists. Every group created and distinguished its own social worlds, but also its own neighborhoods as a "set of [physical] locations" (Boellstorff 2008) where "political action" (Michal Osterweil; Milan and Hintz 2013) can be planned for and enacted. For instance, in the Radical Municipalist movement, municipalities with mayors who were in favor of participative democracy formed the set of localities. While these localities were made and experienced both online and offline, it is important to note that this dynamic has many implications for place-making.

To begin to understand the place-making component, I began to discern how these translocal networks of localities collaborated, maintained their political ties and implemented new ways of working. For instance, the translocal network of Consul allowed me to meet and ask questions about how different municipalities forked and amended the code to fit their place-specific needs. This was done by not only interviewing the Consul team and several of the municipal actors using it, but also via participant observation of the process of installing the software during the hackathon (ConsulCon 2017 and 2018). I took field notes of nature, character and practicalities of

the interaction. The field notes included, for instance, whether the Consul aids were pushing an agenda, which political ambitions were highlighted, the learning curve of actual implementation, whether it was responding to the need of the civil society or initiated by the municipalities, which design features were amendable and what political implications this could potentially have. Furthermore, I also questioned the Consul aids on why they were providing such tools. In the absence of a foundation or hierarchy, I found that there was a group of individuals (often the co-founders) who offered their expertise on how to initiate the use of the software. However, it is striking that it was never just consultancy or advice about the software itself – it was a deeply political act of how to transform the way a municipality would be governed. In that, it also played a role in how the civil servants and citizens would perceive their roles and play a part in a political transformation. Slogan's such as 'take the city back' or 'right to the city' resonated with all of the cities part of the movement. As an ethnographer, it was only possible to identify and analyze this mode of place-making by looking at both the online and offline dynamics of the translocal collaboration.

As explained earlier, we could see how there were different ways of representing and expressing local issues, depending on the interface. For instance, opinions discussed and statements made on the collaboration platforms and forums – which are closed to some degree – were certainly not articulated at neighborhood assemblies. However, within the translocal activist spheres, it was clear that people could easily form their identity and pick their causes, no longer limited by geographical proximity. Significantly, this entire process of data collection is evidence of this online-offline dynamic, whereby I was deeply immersed in the blockchain and civic tech social worlds, while not always being present or recognized within the network of every locality. As a digital ethnographer I was, thus, interested in the ways that localities are both online and offline, while at the same time attempting to conceptualize how translocal networks influence place-making practices (an explanation of how this takes place is in Textbox 8).

Events

The notion of a ritual event[4] is appropriated from anthropology by media studies as a "media event" (Pink et al. 2016, p. 612). Within this research, the 'event' took

[4] For an explanation of a ritual event in media ethnography, please refer to: Coman and Rothenbuhler (2005)

place simultaneously online and offline. Not only does this have spatial implications of being geographically fluid with diverse means of participation, but also, temporal implications, in the sense that the event could go on for months. An apt illustration of this case was my participation in the Social Innovation Relay #2 (Social Innovation Community (SIC) and DRIFT 2018a). Learning Relays are a "new way of learning through small communities of practice" which are organized around a uniquely "experimental setup in which we combine a face-to-face thematic workshop, with an online learning relay in which participants will activate each other's knowledge and networks to crowdsource input for each other's challenges" (Social Innovation Community (SIC) and DRIFT 2018b). The relay kicked-off with a one-day face-to-face (offline) thematic workshop around socio-political experimentation. During this period, all participants meet each other and deepen the learning question they bring with them to the relay before beginning the two month period of 'relaying' online. The Relay consists of weekly web meetings and feedback sessions in which all the group members are invited to provide input, carry out debates and reflect on each other's learning questions.

The written conversation part of the relay was conducted on LinkedIn Groups, while virtual meetings and webinars were carried out on Zoom. My learning question (specifically used for this event) was centered on 'how digital socio-political innovations maintain their place-based characteristics when they come in contact with non-local institutional actors like national governments or the EU?' I initiated the discussion with the following description:

> "Digital social innovations are becoming quite popular these days. It's become really common for people to work on digital commons, crowdsourcing public policy and sharing energy etc. But they encounter a basic problem - sometimes they are so generic that they impose a 'way of doing things' on communities, and perhaps this is why they don't gain traction. If you consider the work that you are doing, what steps would you take to ensure that the communities specific needs are met and not subsumed by a more dominant narrative propagated by governments and transnational institutions? In other words, how can we make these innovations matter to the larger political system while still conserving place-based features. For instance, how could design thinking facilitate the development of more place-based social innovations?" (LinkedIn Group SI Learning Relay #2)

This sparked a conversation that was approached from many different perspectives owing to the diversity of the groups: civil servants, technologists, founders of makerspaces, alternative urban planners, activists and other types of practitioners. Input came from members of the group (whenever they found time during the week), while members of the other groups were free to contribute on issues they found interesting. This event created a new online social world, which is not always in operation, but can be reactivated at any point. Moreover, the individuals that took part in this event are active in several other social worlds that overlap in terms of topic. As highlighted earlier, this allowed the broadening of my individual network, through which it was possible to develop new translocal connections.

In general, the conversation during the relay conceptualized how digital forms of collaboration transform the playing ground for institutional actors, where an initiative could seek out institutional support translocally. For instance, an initiative belonging in Zagreb, Croatia could seek support from a foundation based in Barcelona, thereby by-passing, the national political sphere. As such, this initiative would escape the dominant narratives and create a new option for place-making for the citizen. The hybrid space, or the online-offline dynamic, was the baseline start of any argument. Whilst local place-making was very important, most of the participants simultaneously expressed a desire and commitment to taking part in translocal networks of innovation and knowledge building. These reflections and conversations were recorded and analyzed mainly using the conceptual frames of political imaginaries and place-based geography.

It is evident how these sorts of 'events' have changed in: (i) the ways they are constituted and experienced, (ii) play out spatially and temporally, (iii) enable a translocal geography of political action and thus, (iv) intervene in the process of place-making. As Pink et al. explain, a digital ethnography approach observes "people, things and processes as they engage in activity traversing the online/offline" (Pink et al. 2016, p. 632). This enables the ethnographer to better examine the technopolitical, material, experiential and social elements of the events. All of the events attended for this research (refer to Table 2 – Table of events) contained this online-offline dynamic to different extents, making the task of ethnography very complex. The worlds of civic tech, blockchain and technopolitical activism composed of an "audiovisual landscape that is constituted through multiple agencies and processes" (Pink et al. 2016, p. 667). Additionally, we can also note that the ethnographer, as well as the changemaker, is increasingly 'mobile', making 'digital ethnographic places' that form 'virtual field sites' (Postill and Pink 2012).

The events attended could roughly be categorized along a spectrum. First, the free-culture events, which were highly hybrid in their form: in-person, audiovisual, digital, material and textual. OuiShare Fest was one such event, where a workshop was given around Peer-to-peer governance using a horizontal workshop and fishbowl method (refer to Textbox 6 – Free culture events). The data collected in these events was usually in the form of non-verbatim field notes (Textbox 2), team journals (of which field notes were taken instantly), harvest sheets and photographs of mind maps. Field notes were usually also taken to explain other forms of data at the event, and later analyzed in combination with the original source. Second, there were the more conventional conferences, meetings, workshops and seminars, where data was collected in the form of semi-structured interviews, non-verbatim field notes. In sum, each event, owing to its differing degree of hybridization and complexity, required a different mix of methods that were appropriate in systematically catching relevant data. The events towards the more hybrid side of the spectrum required more hybrid forms of data collection as information was

Free-Culture Events

Free-culture comprises of a social movement which endorses the freedom to create, alter and reproduce the creative of works of others in the form of free content. It is commonly associated with the Creative Commons, free and open-source software movement, remix culture, hacker and maker movements, as well as the public domain movement. These movements and spaces create alternative spaces for political engagement and citizen activity. Most of the actors who take part in one movement also promote or are involved in the ecosystem of free-culture. For this project, there many free culture events that I actively participated in by giving workshops, consulting, writing proposals and fulfilling facilitator roles.

Types of events attending during the research

- Open source software
  ConsulCon, IOPD
- Digital innovation hackathons (local and online)
  Digital Social Innovation Fair Rome
- Wemakethecity (Amsterdam)
  Social Innovation conferences
- OuiShare Festival Paris 2017
  P2P Application Workshop
- Border Sessions
  Commons register workshop

Data collection methods and analysis

For most of the free culture events, I used participatory action methods which were unique to the event itself. They involved process diaries, collaborative-team journaling, group harvesting, recording of mind-maps from workshops for pattern analysis, and end-product analysis when it came to software creation.

Textbox 6 – Free-culture events

being created and disseminated both online and offline. For the events on the conventional side, it was easier to use more conventional forms of data collection, as the event was usually a one-off set of meetings and talks.

The different forms of data collected at events were then subject to the same conceptual analysis using the analytical frame developed in Chapter 2. To reiterate, the aim was to thematically cluster and triangulate the various ideas emerging in the content analyzed, using different theories to understand technopolitical transformation. The field notes taken during both online and offline events were used to carry out this analysis, along with corroboration from expert interviews. Table 2 below outlines the main events that comprised the immersion activities. It gives details of the time, type of event, methods used, data collected and the types of actors I interacted with during the event.

Hackathon – Collective Intelligence for Democracy

While there were several mini-online hackathons that I attended, the most significant one was a two week long hackathon in Madrid called Inteligencia Colectiva para la Democracia or Collective Intelligence for Democracy in 2018. This was centered around two-weeks of prototyping workshops; organized by the ParticipaLab, it has been held annually for the past three years. Through this event multidisciplinary teams gathered, from across the world, to create projects around citizen participation and technology that enables responsive democracy (Medialab-Prado Madrid 2017). These projects were proposed by local civic activists, supported by institutional actors, after which a team of global volunteers came together to co-create them at the hackathon (they were presented at the Ciudades Democráticas (Democratic Cities) conference in Madrid). There were many unique features of organization within the conference. Each team comprised of approximately ten team members, who were selected from a pool of applicants. Each of the projects was very different in terms of focus, nature and scope (Textbox 7). This experience was foundational to my understanding of the dynamics within, and products of hackathons, and hence, merits discussion in detail. In this case, it was formative to the conceptualizing of a 'place-based geography of political action' in Chapter 6.

On the first day, teams got to know each other, decided upon a methodology, and also had the chance to switch teams or commit to contributing to other teams.

Table 2 – Table of events

Name and date	Type and duration	Methods and data collected	Actor groups
European Week of Regions and Cities Discussion groups Brussels (x2) **September 2016 + 2017**	European Commission (EC) Conference **4 days**	Non-verbatim field notes for 25+ conversations, 4 recorded semi-structured interviews	Institutional, researchers, policymakers, politicians
European Week of Regions and Cities Masterclass Brussels **October 2016**	Masterclass **7 days**	Non-verbatim field notes for 10+ conversations, 2 non-verbatim interviews	Academics, activists, Institutional, researchers, policymakers, politicians
EU Digital policy roundtables **October 2016**	Meetings **3 round tables**	Non-verbatim notes for each round table	Policymakers, digital innovators
Blockchain events Amsterdam (Bitcoin Wednesday, Blockchain talkz and misc. Meetups) **December 2016 to present**	Workshops, open meetings, networking events **40 events**	Non-verbatim field notes for 100+ conversations and interactions, 10 recorded interviews with non-verbatim notes	Academics, researchers, coders, blockchain developers, civic tech practitioners, policymakers and digital innovators in general
Spotlight on Blockchain (Brussels) **May 2017**	EC conference **1 day**	Non-verbatim field notes for entire conference of 7 different speakers and 5 conversations, 1 recorded interview	Blockchain thought leaders, policymakers, digital policy heads, hacker activists, cypherpunks
OuiShare Festival Paris **July 2017**	Free-culture (please refer to (Husain 2018)), collaborative planning, experimentation **3 days**	Photographs of graphic recordings, scans of notes of moderators, and non-verbatim field notes of 15+ conversations	Civic tech practitioners, policymakers, activists, social and political innovators, academics, blockchain thought-leaders
Social Innovation Relay (DRIFT and SIC) Zagreb **April -June 2018**	Collaborative social innovation workshop **1 day workshop in person, 2 months online relay (weekly meetings)**	Photographs of graphic recordings, archived group discussions, verbatim and non-verbatim field notes	Civic tech practitioners, social innovators, hackers and makers, ecologists, de-growth professionals
Digital Social Innovation Fair Rome **June 2018**	Social Innovation and free culture **2 days**	Non-verbatim field notes of 4 conversations and 2 interviews (see table 3)	Participative democracy practitioners, local government, social innovators, blockchain projects
We make the city Amsterdam **June 2018**	Social and political innovation workshops **7 days**	Non-verbatim field notes of 4 events, photographs of graphic recordings and notes from moderators of 2 round tables	Local government, citizen groups, citizen experts, academics, digital policy, participative democracy experts

European Social Innovation Competition semi-finalists meeting Cluj **July 2018**	Social innovation competition **3 days**	Copies of business and social innovation modeling exercises (7), non-verbatim field notes (1 for each day)	Social and political innovators, accelerator organizations, EU practitioners
Blockchain Live London **September 2018**	Blockchain conference **1 day**	Verbatim and non-verbatim field notes of 10 conversations, recorded interviews (1) and dissemination documents like working papers (3)	Blockchain thought leaders, policymakers, national directors, digital policy heads, hacker activists, cypherpunks
Collective Intelligence for Democracy Madrid (x2) **November 2017+ 2018**	Free-culture, hackathon, participative democracy **14 days intensive**	2 weeks of daily process diaries with 8 team members (see section on Hackathons), non-verbatim field notes of 20+ interactions and recordings of talks and meetings	Civic tech practitioners, social innovators, hackers and makers, ecologists, collaborative democracy activists
ConsulCon Madrid (x2) **November 2017 + 2018**	Open-source software hackathon **2 days**	Archives of discussion groups (3), non-verbatim field notes of 10+ conversations and 2 recorded semi-structured interviews	Civic tech practitioners, local government, coders, hackers, researchers
International Conference on direct democracy and citizen initiative Barcelona **November 2018**	Direct democracy conference **3 days**	Video recording archives of talks and meetings, non-verbatim field notes of 10+ conversations	Civic tech practitioners, local government, coders, hackers, researchers, social innovators
Gofod Cardiff **March 2018**	Third-sector organization conference **1 day**	Non-verbatim field notes of group meetings (4) and talks (2)	Local government, NGO-charity, participative democracy practitioners, social and political innovators, national government, policymakers
Welsh Council for Voluntary Action (WCVA) Cardiff **March 2018**	Workshop **1 day**	Graphic recordings and questionnaires along with follow up interviews of 2 members	Local government, researchers, policymakers
Border Sessions The Hague **June 2019**	Technopolitical conference **3 days**	Non-verbatim field notes of 3 round tables and 2 presentations	Civic tech practitioners, policymakers, activists, social and political innovators, academics, blockchain thought-leaders

Selected Projects: ICD 2018

1. Legislative advancements to improve participation in Spain (with new forms of political participation)
2. Expanding the operability of CONSUL for participatory budgets
3. Quality indicators of democracy (framework for analyzing digital democracy projects)
4. Levanta la Mano (Raise your hand): Methodology of citizen participation for children and adolescents
5. Minga Lab (Brazil) (toolbox and metaplatorm for participation in rural areas)
6. GANA + (Participatory budgeting project by Open Government of Nariño)
7. Holopolis*: prototyping future democracy (with artificial intelligence and virtual reality)
8. Citoyen 2.0 (citizen participation platform based on CONSUL for Burkina Faso)
9. Better news for a better democracy (a collaborative software platform to share news)
10. **Planning centre for citizen participation – CocoPlanner (text-box in detail)**

Textbox 7 – Selected projects ICD hackathon

Our group, CocoPlanner (Project 10 in Textbox 7), choose an altered version of the Google Design Sprint approach (Knapp et al. 2016), combined with agile methods (Linchpinseo 2019) as a hybrid approach for the hackathon. In essence, we began with the idea of quick prototyping by figuring out what was really needed for the project and eliminating the features that were not. The CocoPlanner was meant to be a 'planner' that would aid the local government of Gothenburg, along with its citizens, to choose appropriate tools for their collaborative processes. While most planners begin by 'defining problems' and 'framing issues' we wanted Coco to begin by asking 'which values an actor wanted playing out in the projects'. Using an amended version we began mapping and contacting civil servants of Gothenburg and those citizen groups that would be most interested in the development. The co-founder of Digidem Lab in the city was leading the project, hence, had contact with all the appropriate parties.

Our team comprised of civic tech experts, researchers, filmmakers and political scientists, who were all entrenched in different socio-political worlds. We were eight in total. We lacked a designer, so had put that up on the bulletin wall. We were together usually from the morning till evening with many participants continuing on for dinner and drinks. This led to a very close relationship, not just with the team, but with all the participants of the hackathon. For my research, I asked the team to allow me to keep a process diary where we would spend the last 15 mins of each day to reflect on team dynamics, whether and how our opinions on civic tech were changing, and an open space for discussion. Each of the team members was given a chance to share. The main thematic trends that were discerned through the

conceptual debate analysis were: the role of tech, place-making, multi-linguistic-global teams, long-term follow-up of the project, role of governmental actors and role of research. These diaries were then shared with the rest of the team at the end of each day for any reflections and additions, making it an ongoing reflection. Some of the trends identified and insights gained (through the debate analysis) were shared on the final day of the presentations of all of the projects.

Since all of the project teams were located in the same physical space, there was a lot of collaboration between teams. In fact, two of the teams even merged together to work jointly on some aspects of the projects, and set up a desk to consult on developing software prototypes for other projects. This highlights both the reflexivity and openness in energy and organization that a hackathon creates. Since we did not have a developer in our team, we approached them to create a basic website for us, which they did by the last day of the hackathon. There were also all of the mind-maps, sticky note walls and plans up on all the walls of the space. Individuals would pass by, begin a discussion, or leave a note on topics that they wanted to discuss or could help with.

The hackathon was located in a place: Medialab Prado. However, it created hybrid social worlds on Slack and telegram and constituted an 'event' that was place-shaping in a translocal sense. This necessitated a non-digital-centric methodological approach which looked at the multiple sites for data gathering. As an ethnographer, the hackathon turned out to be one of the richest sites for data collection because it enabled so many different worlds to converge, creating a close-knit community around citizen engagement and technology. Not only were participants from different technical and professional backgrounds, but they also came with varied understandings about different socio-economic and cultural contexts. This brought a complex, yet, fresh look at how technologies create affordances and constraints for their users. All the theoretical and praxis-based reflections were recorded in the form of non-verbatim field notes (refer to Textbox 2).

The hackathon also resulted in further immersion within the translocal network of technopolitical activists who were directly and indirectly connected to the different projects and Medialab Prado (the host of the hackathon). Other participants of the hackathon and I decided to continue on to Barcelona with some of the organizers to the International Observatory for Participative Democracy, (International Observatory for Participative Democracy 2018), entering yet another socio-political world which housed a lot more institutional actors. Not only does this highlight

how my individual network expanded through the hackathon to other realms of technopolitical activism, but also gave me a chance to later interview a number of technopolitical activists who were working for municipal governments in Spain (refer to Table 3 – interviews). While 'Collective intelligence for democracy' is one type of hackathon, there are many ways hackathons are conducted as is highlighted in Textbox 8.

Hackathons

Recently, hackathons have become increasingly popular innovation activities that bring people together to envision new possibilities for technological evolution. Even though they mainly emerged in open-source technology communities, there are a broad range of organizations that are adopting the format, including local and national government, environmental activists, political and social innovators, museums, charities and translocal social movements. Topics covered range from fashion to climate change (Taylor and Clarke 2018). In basic, they bring a range of participants in a single location for a brief time to 'hack' a concept. The common format of a hackathon involves intensive activity for a few days comprising of the presentation of challenges, formation of teams, and presentations of demos and solutions at the end of the team. It is a process that begins with a challenge and ends with a pilot-worthy solution.

Techniques and resources
Hackathons have gained some attention because of their inherently horizontal and participatory nature allowing participants to interact and create on a theoretically even playing field. While the format does not entail complete absence of power relations and harmful behavioral patterns, it provides the conditions for a different way of innovating. There are many tool-kits, guides and blogs that highlight the different ways hackathons are carried out. Some seminal resources to consult include: (Briscoe and Mulligan; Calco and Veeck 2015; Trainer et al. 2016; Hulet 2018; Taylor and Clarke 2018; Bartlett 2019).

Data collection
- Participatory action methods: including collaborative process diaries, field notes
- Visual harvesting techniques: creating mind-maps, storyboards etc.
- Design sprint techniques: agile prototyping and reviewing methods include various data collection methods

Textbox 8 – Hackathons

Workshops

There were two workshops on technopolitics that I co-organized for this project at free culture events (Textbox 6): Applying P2P principles in service design for the housing, mobility and energy sector at Ouishare Festival 2017 in Paris (OuiShare 2017); and, Networking Knowledge for the Commons (creating a commons-register) at the Border Sessions festival in the Hague (Border Sessions 2019). Both workshops were carried out by a multidisciplinary team with mixed methods for harvesting ideas from the participants.

The first workshop was arranged around four different topics, each having a dedicated discussion group, with moderators who were experts in the field. The moderators were selected by the coordinator of the workshop, Sharable (people-powered solutions organization), on the basis of research interest and expertise. There were experts on housing, mobility and energy as group leaders and P2P application experts working to help participants understand how these services could be transformed. The moderator would set the scene of the discussion, whilst participants would bring to it their specific contexts and inquire as to how different peer-to-peer principles could be applied to their social innovations. This led to a lot of data being collected on the main conflations and misunderstandings of how P2P system function. For instance, most participants believed that no hierarchy also meant no leadership positions. All this data was recorded by the moderators in the form of mind-maps and field notes and shared with the rest of the organizers. Pictures of the table maps and plans were also taken for later analysis. After the workshop was over, the organizing team sat together and discussed which patterns, trends and difficulties we could see in the application of P2P principles. This data was then analyzed and applied to the context of P2P initiatives on blockchain and how they shared similar deficiencies and obstacles.

The second workshop focused on "how can we develop a register for the commons that helps strengthen their mutual bonds and their visibility to the outside world?" For the purposes of my project, it was to contribute to insights on the way civic tech works in general. My co-organizers and I used three design tracks to carry out discussions with the participants (refer to Textbox 9). Each of the panels summarized their findings and the moderators carried out a discussion on how to unite the

Track 1: Technical design
How to achieve distributed trust through a decentralised system of registration and collaboration? This track focuses on a technical design. What can the register practically be, in a technical sense? What are some key user stories?

Track 2: Commons taxonomy
What sort of categories is useful for the register? Can we make a 'taxonomy' for the commons? From his experience with mapping commons in Turkey, Selçuk will guide us through these questions.

Track 3: Open sourcing the commons
Sergei is developing a serious game about commons and open source. He is researching how knowledge about commoning practices flow through communities and how they are influenced by each other's ideas. How can we identify the components of (urban/land based) commons designs that we can share?

Textbox 9 – Three design tracks for workshop

different learnings from the workshop. Having the liberty to go to the different tracks, I took field notes and asked questions before moving on to the next table. Each of the discussions was in some way relevant to how a transparent online 'register' of any initiatives (in this case, commons-based) would aid in building and strengthening a network. This pointed to questions of the nature of civic tech in general: who is it for, how/by whom is it governed, how consensus is formed, how criteria is formed and what implications do the affordances and constraints set. The workshop provided considerable insights that led, in turn, to clarification of the data previously gathered at conferences. This helped add depth to the analysis answering the research questions.

The initial idea during the doctoral project was to carry out similar workshops in Wales with the Welsh government in collaboration with the Sustainable Places Institute at Cardiff University (during the two three-month secondments undertaken in accordance with the requirements of the Susplace ITN). While two meetings with the Welsh government's technology office were organized (refer to Table 3 – interviews), they did not culminate into a workshop because of the premature state of the government's technical infrastructure. Rather, interviews were carried out with two high-ranking officials of the Welsh government, who explained that the national government was in no position to transform the relationship of citizens and government using digital mediation. In addition, at the Gofod Conference in Cardiff, I was introduced to third-sector organizations working towards citizen participation. This also led to meetings and interviews with the Electoral Reform Society (working towards better politics in Wales) and Satori Labs (designing technology for public services). These interviews were open-ended conversations about the relationship of technology (blockchain and civic tech) and political transformation and were used as data for Chapters 4 and 5. Another product of entering this social world was a one-day workshop organized with the Welsh Council of Voluntary Action (WCVA) to discuss the potential of blockchain and other digital infrastructures to improve the collaboration of various third-sector organizations in Wales and beyond (see Table 2 – events). While some clarifications were provided on the institutional setting and operational interfaces dominating both the governmental and voluntary (third-sector) spaces in Wales, none of them culminated in particularly relevant data for addressing the research question of this PhD. The main insight from these activities was that the degree of readiness of institutional actors to experiment and innovate around citizen engagement varied extremely. For instance, the conferences and workshops attended at the

European Week of Regions, European Parliament and European Commission had a very different tone of optimism and tech-readiness (refer to Table 2 – events). Not only did these events clarify the direction and aims of the crypto-institutionalists, they allowed me to enter their social worlds with the identity of an EU researcher.

Workshop data i.e. non-verbatim field notes of participant reflections, mind maps, and graphic recordings were subject to conceptual analysis and cross-referencing with other data sources. Since the data gathered was mainly in the same forms as gathered during other immersion activities, such as events and hackathons, the analytical framework helped to triangulate the trends and ideas brought up in the workshops.

Interviews

Most interviews carried out during participatory research are semi-structured (Kallio et al. 2016). In the case of this project, however, there were several other types of interview also carried out (see Table 3 below). The interview questions directly addressed three main themes contained within the research questions of the thesis: the political imaginaries of blockchain and how they are implemented; how they can transform power relations and decision-making mechanisms within the dominant institutional setting; and, how the digital can transform the relationship of citizens and government. Owing to the variety of research settings, interviewee preferences and temporality, most of the interviews had a unique structure and flow. The details and examples of the methods employed are listed in the table below (Table 3). Most interviewees preferred to stay anonymous, but all allowed me to name their organizational affiliation.

While 12 of the interviews were recorded, there were 75 that were written as non-verbatim field notes shortly after the conversation was over (refer to Table 3 – interviews). This was owing to the shortness and inappropriateness (considering the noise, place and informality) of audio recording. Furthermore, there were many more conversations that would not merit the status of 'interview' (owing to their brevity and informality), but they were nonetheless recorded in the form of non-verbatim field notes during, or shortly after the conversation (refer to Textbox 2). In each instance, the individual was asked whether their responses could be anonymously considered for this research. At conferences where several short interviews were taken in the span of a few hours, respondents were numbered rather

Table 3 – Table of interviews

Date	Organization	Sector(s)	Method	# of interviews
September 2016	European Commission and European Parliament	Digital Innovation	Semi-structured (non-verbatim field notes)	4
2016-2019	Blockchain project leads and experts at events (most were carried out at Bitcoin Wednesday or related events)	Blockchain	Informal, non-verbatim (5 recorded)	40
January 2017	Blockchain Pilots (Dutch government)	Crypto-institutionalists	Semi-structured (recorded)	1
May 2017	EU blockchain experts and practitioners	Crypto-institutionalists	Semi-structured (non-verbatim field notes)	3
June 2017	Decode	EC blockchain project	Semi-structured (recorded)	1
June 2017	Dutch Blockchain Coalition	National blockchain association	Semi-structured (non-verbatim field notes)	1
July 2017	Civic tech and blockchain activists (events + skype)	Civic tech and blockchain	Semi-structured (non-verbatim field notes)	15
August 2017	P2P Models	European Research Council (ERC) project (blockchain)	Semi-structured (recorded)	1
March 2018	Welsh council for voluntary action	Third-sector organization	Semi-structured (recorded)	1
April 2018	Satori Labs	Social Innovation organization and civic tech + blockchain experts	Semi-structured (recorded)	1
April 2018	Ex-civil servants welsh government	Digital office national government	Semi-structured (non-verbatim field notes)	1
April 2018	Welsh Chief technology office	National government	Semi-structured (recorded)	1
June 2018	Blockchain experts (institutional and project leads)	Mixed	Semi-structured (non-verbatim field notes)	7
November 2018	Civic tech experts and hackers at Collective Intelligence for Democracy	Mixed	Semi-structured (non-verbatim field notes)	10
November 2018	Local government at Collective Intelligence for Democracy	Local government – participative democracy	Semi-structured (1 recorded, 2 non-verbatim field notes)	3
July 2019	Blockchain Pilots (Dutch government)	Crypto-institutionalist	Semi-structured (recorded)	1

than named (with permission, sometimes their role and position was also recorded). As indicated earlier, a conventional semi-structured recorded interview was usually chosen with institutional actors, while some instead preferred to answer a series of questions via email. With a few projects, such as Blockchain Pilots, interviews were taken both at the beginning of the research period in 2016, and then again towards the end in 2019, to learn about the developments and insights gained.

The recorded interviews (audio) were transcribed non-verbatim to tease out the main concepts that each interviewee was referring to. The questions asked during the semi-structured interview were referring specifically to corroborate, explain or justify trends and concepts from analyzed from other data sources. As mentioned above, the majority of interviews were recorded as non-verbatim field notes in the first place. Hence, both the types of interviews were subject to a conceptual analysis using the analytical framework developed in Chapter 2.

Blogs

Recently, blogs have become a more recognized site for academic research. Walker explains how the public nature of blogs is responsible for how academics generally engage with the "blogosphere" for qualitative research (Walker 2006, p. 131). She explains that there are three categories of blogs: those of public intellectuals (e.g. figureheads in the blockchain space, twitter philosophers), researchers (e.g. academics sharing data on a blog) and anonymous-pseudonymous users (e.g. activists, hackers). In the civic tech and blockchain worlds, all three kinds of blogs can be found with heated debates and long threads in the comments sections. Moreover, they could "function to make social researchers more accountable', where they can be conceptualized as a "Habermasian 'public sphere' in which communication has the potential to be more egalitarian and foster a system of checks and balances" (Murthy 2008, p. 847). This "mutual accountability" could contribute to the expansion of the dialogue by creating more and faster responses between the diverse communities (Bohman 2004, p. 136).

Reading blogs was part of the daily routine and social worlds that I was a part of for the project. It would be hard to follow the important and trending debates without reading the recent blogs, especially, famous blogs like Hackernoon or Vinay Gupta. Finding methods to search for and follow blogs, as well as collect the data was very complex. The numerous risks and technical options were carefully

considered using some of the seminal work in the field (Hookway 2008; Boellstorff 2012; Harricharan and Bhopal 2014; Kurtz et al. 2017). Some blogs were regularly read because of their importance within a social world. The data collection of the blogs followed from the work of Kurtz et al. on Blogs as elusive ethnographic texts:

Table 4 – Stages of blog analysis, source Kurtz et al., 2017

Stage	Methodologies	Sampling Strategy
Stage 1: Scoping	General search terms, based on existing literature	Nonsystematic, random sample
Stage 2: Seeding	Blogs from stage 1 were analyzed for frequent words or phrases and these words and phrases were used as key words to generate a new sample	Systematic, random sample
Stage 3: Expanding	Purposive sampling was used to increase diversity of blogs	Purposive sampling
Stage 4: Verifying	The final sample was verified and enlarged by using Stage 2 and Stage 3 keywords in a search engine that does not optimize users' results	Systematic random sample

This process was repeated on approximately a monthly basis 1.5+ years, while some new stories or trajectories in the fields led to a more regular run-through of all the stages. The specific blogs used for the research are cited and referred to directly in the published chapters. Blogs and white papers (see below) were predominantly used as sources to validate and triangulate the analysis that was conducted through other data sources. The analytical frame developed in Chapter 2 was used to conduct the conceptual analysis.

White Papers

White Papers are commonplace in the blockchain world as the preliminary document and vision statement of an ICO or project. They usually include an outline of a problem that the project is looking to solve, the solution to that problem, as well as a detailed description of a product, its architecture and its interaction with users (CoinTelegraph 2018). There were around 100 white papers analyzed for this PhD to begin to identify, group and sort out the political imaginaries and their implementation plans. They differed vastly in quality, information and understanding of the dominant institutional setting and politico-economic

infrastructures. The initial idea for data analysis was to do a keyword search and analysis to determine trends and political imaginaries. However, owing to the fast-paced and fluid nature of the field, what I discovered during the process was how the same words were used very differently by different projects. For instance, as stated in the first two chapters, words like decentralization, disintermediation, access, inclusion, transparency and so on, were oft-cited, but contained entirely different meanings. This led to a deeper analysis of understanding what these words meant to different types of projects. The different and often misconceived meanings is a topic that will be elaborated on in Chapter 4. However, it is relevant to mention here that during the scans of the white papers, notes were made to distinguish between the differing meanings of these terms and how they corresponded to different political imaginaries. These were later used to delineate the typologies of blockchain projects in Chapter 4 (see Table 6). These notes were used in corroboration with interviews and empirical analysis from immersion activities to address the research questions.

Both, in the case of blockchain projects and civic tech initiatives, a rough cartography of political imaginaries could be charted to begin to understand trends within the space (refer to Figure 4). This cartography led to one of the core findings of the paper: how political imaginaries behind projects, rather than their technical features, determine the potential for political transformation. Much like blogs, white papers of blockchain projects have not been given enough attention in academic research owing to how they are not the most updated and formalized versions of statements about a project. However, in the case of determining political imaginaries, I argue that they form and articulate the principles, values and political ambitions that guide the entire project. Hence, they were used to further validate and triangulate the data analyzed from the other data sources mentioned above.

Ethics

There were no major ethical challenges or risks during the course of the research. The main concern of many respondents was whether their anonymity would be kept, since opinions and development trajectories were changing so fast.

Most hackers preferred complete anonymity, including for their groups and which platform they were quoted from. Similarly, data from team collaboration platform debates were not cited directly before the individual was personally asked for

permission to do so. Where the respondents agreed to give their group or company's name, it has been cited both in the table of interviews (3) and in the published chapters.

Institutional actors were also reluctant to be quoted with their names, depending on the topic at hand. Many allowed the institution to be named, but not the individual. Furthermore, I always double-checked with them before citing them directly. In both online and offline settings, consent was always given for the data to be used.

Critical overview of data collection and analysis

As can be seen from the above sub-sections, a considerable range of methods were employed to collect and analyze data. As mentioned earlier, the field of techno-politics is uniquely fast-paced, hybrid (online-offline) and translocal. Considering the nature of the field, some of the data for this study needed to be collected from sources which are unconventional in academic research. For instance, the use of data (captured in the form of process diaries and agile software development) from hackathons is not commonplace in social science research as of yet. Though there are several risks and potential weaknesses of such data, this thesis has argued for the urgent and necessary requirement to incorporate such data in scholarly research. Throughout the empirical study, it was necessary to acknowledge the relationality of this unconventional 'digital' data with other sources. Presented in Table 5 below, are the strengths and weaknesses of the varieties of data collected and the steps were taken to overcome the latter. This is followed by a reflection on how the data from these different sources came together and was analyzed.

Table 5 describes the strengths and weaknesses of the data collection and partially the process of analysis (i.e. cross-referencing and corroboration). While there were specific steps taken to enhance rigor for each individual method and data type, the overall research was made more rigorous by the observation of the research issue from different perspectives. In qualitative social science research, this process is commonly referred to as triangulation (Flick 2004, p. 178). To reiterate, the data collected from all of the sources mentioned in this chapter was subject to a conceptual (content) analysis using the analytical framework developed in Chapter 2. This involved two types of triangulation as a 'validation strategy' (Breitmayer et al. 1993): triangulation of data (which involves data gathered from different sources, in different places, at different times, from different types of actors and

Table 5 – Data collection and analysis: strengths and weaknesses

Data type	Strengths	Weaknesses	Steps taken to reduce bias and enhance rigor
Peer-reviewed research	Rigorous academic work provides reliable empirical and theoretical ideas	Within the concerned fields, scholarly studies were scant and often technical and contained discipline-bias	Literature on the relevant topics was reviewed regardless of disciplinary and technical background and cross-checked with other data and experts
Expert interviews (semi-structured)	Direct method of inquiry It was easy to contact and get interviews Interviewees were eager and open because of the newness of the fields Reliable, significant and new source of data Unexplored perspectives, opinions and strategies are highlighted	Very few established experts in the field Opinions change in fast-paced fields Not always easy to discern ulterior motives, hidden goals and biases It was not always appropriate to record interviews	Cross-checking interviews with each other Cross-checking bias of interviewee's participation in forums, team groups and blogs Repeating interviews with key individuals over time
Process diaries	Efficient and informative method for events like hackathons, workshops and other events organized under P2P principles Less recall-error and more reliance on short-term memory i.e. it creates a mechanism of reliability It allows the possibility to communicate the preliminary analysis to the informants and use them as dialogue partners in the analysis. This can be thought of as a democratization process in research. Provide a space for participants to reflect on their own by taking part and cross checking process diaries. It also creates an interactive research process. Longitudinal analysis is more insightful due to an informants ability to see how her own perspectives on the process evolved	Data analysis can be arduous and unsystematic Linguistic bias, language and misunderstanding between different participants reflections Yields an enormous amount of data External cross-checking is hindered by the depth with which they read the entries Reading the content of the diaries by the participants could affect the way in which documentation took place e.g. the degree of critique	I usually wrote the diary entry myself asking questions to give clarity to the reflection of the research participant Participants were asked to reflect in three phases: first, by reflecting directly after each session; second, after reading their previous reflection; third, by reflecting after reading their group members reflections Giving all the participants a live copy (google doc) at the end of the process to see and amend any of the reflections to avoid author-bias For non-native English speakers, there was always a team member who spoke both languages to help the process

Table 5 continues on next page

Table 5 – *Continued*

Data type	Strengths	Weaknesses	Steps taken to reduce bias and enhance rigor
Field notes and reflections	Always appropriate to take field notes and reflections Wide variety of formats to keep field notes (mind-maps, audio recording, drawings, spider diagrams, non-verbatim notes etc.) Combined with informal interviews, these notes proved a powerful tool in contexts where recording was not appropriate or permitted (such as conferences and meetups)	Diversity of formats can cause difficulty in analysis Need to be thoroughly checked over time for author bias	Using my conceptual framework in combination with grounded theory to find patterns within the diversity of notes Re-checking with respondent on notes taken Re-reflecting on same events at different stages in the research
Workshops	Stimulating for starting debates with experts and having time to understand insights P2P principles (like fishbowls and decentralized organizing)[a] allow for non-hierarchal thinking and planning Both the product and process of the workshop benefits the research	Harvesting is always confusing for participants Each participant comes for different reasons One workshop was coopted for 'business' purposes	Workshop findings were always analyzed in concert with the associated field notes and process diaries Participants were always consulted before the harvest was finalized
Popular media and blog analysis (non-peer reviewed sources of data)	Majority of the thought-leaders, ICO-heads, innovators and practitioners were publishing in popular media and blogs Rigorous research in the blockchain and civic tech world was sometimes published in the form of a repository or blog post Any study on these topics would be incomplete without information available on these channels	At times, unreliable It is often difficult to objectively read opinionated bloggers Misconceptions and misinformation was rife Difficult to ascribe credibility to different bloggers and news outlets	Cross-checked with academic and other sources of data Expert reflections on blog posts were considered Scholarly methodologies for blog analysis were utilized For popular media and news outlets, more reliable and popular sources were used

Table 5 – *Continued*

Data type	Strengths	Weaknesses	Steps taken to reduce bias and enhance rigor
Digital Archiving	Easy, fast, visual and efficient means of archiving web-page type data Visual representation aided in conceptualization and linkages Social archiving features allowed others to recommend research sites	One of the digital archives was discontinued without prior notice leading to loss of data and mind-maps	After the disconnection incident, archives were kept in several different sites Used more as a method of data organizing, rather than collection
Debates on 'Team Collaboration Platforms' TCPs and forums	Following debates on platforms allowed for up-to-date information about development of projects Leading figures in projects would post on their project boards Could be accessed anywhere and at any time Allowed for an easy entry into the social world of both blockchain and civic tech	Debates were long and in the form of 'chats', hence, recording always had to be in form of field notes or 'cut and paste' of sections Anonymity had to be preserved as some of the groups were private and I was invited under many conditions Forums could be trolled by many different parties which increased the likelihood of unreliability	Any quotations or inquiries which were ambiguous were checked with the author of the comment ICO forums and TCPs were cross-checked with their White Papers and official documents (and then reintroduced as debates)

[a] For workshop techniques used during this study, please refer to Patterns for Decentralized Organizing – Richard Bartlett

different contexts); and, triangulation of theories ("approaching data with multiple perspectives and hypotheses in mind … . various theoretical points of view could be placed side by side to assess their utility and power" (Denzin 1978, p. 297)).

As explained elsewhere, "the importance of triangulation cannot be underestimated to ensure reliability and validity of the data and results" (Fusch et al. 2018, p. 23). During the research process for this thesis, data and theoretical triangulation were practiced not only "within-method", but also "between-method" (Fusch et al. 2018, pp. 22–24). Within-method means that data collected from the range of collection methods (see above) was triangulated through cross-referencing and conceptual analysis. Between-method, in this case, comprised of triangulating (comparing and contrasting) data from the different methodological approaches e.g. debate analysis from triangulated contrasted with non-verbatim field notes from events and other immersion activities. Triangulation has been sometimes criticized as "extreme eclecticism" (Fielding et al. 1986, p. 33) to gain some sort of objective understanding of social phenomena. However, when it comes, to combining theories and methods, to gain breadth of understanding and gain knowledge about phenomena which is still very emergent – such as technopolitical transformation – triangulation can (and did) play an important role. As Flick states, "triangulation is now seen less as a validation strategy within qualitative research and more as a strategy for justifying and underpinning knowledge by gaining additional knowledge" (Flick 2004, p. 179).

To summarize, the analytical frame developed in Chapter 2 comprised of theories not only from different disciplinary perspectives (e.g. critical geography and political theory), but also with very different (socio-political) ambitions. Hence, theoretical triangulation was prefigured in the approach, since technopolitical transformation was being observed from these different standpoints. Data was gathered from both online and offline sources, some of which are uncommon sites of research (e.g. TCPs and online forums). The range of both theoretical and analytical perspectives and methods used for this study contributed to a rigorous empirical study – not to the end of objective truth, but to the expansion of the knowledge-base of technopolitical transformation.


EQUITABLE DESIGN
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EQUITABLE POLITICS

Chapter 4

The political imaginaries of blockchain projects: discerning the expressions of an emerging ecosystem

Abstract

There is a wealth of information, hype around and research into blockchain's 'disruptive' and 'transformative' potential concerning every industry. However, there is an absence of scholarly attention given to identifying and analyzing the political premises and consequences of blockchain projects. Through digital ethnography and participatory action research, this article shows how blockchain experiments personify 'prefigurative politics' by design: they embody the politics and power structures they want to enable in society. By showing how these prefigurative embodiments are informed and determined by the underlying political imaginaries, the article proposes a basic typology of blockchain projects. Furthermore, it outlines a frame to question, cluster and analyze the expressions of political imaginaries intrinsic to the design and operationalization of blockchain projects on three analytic levels: users, intermediaries and institutions.

Keywords: blockchain; political imaginaries; prefigurative politics; decentralization; technopolitics

This chapter is published in the journal of Sustainability Science for the Special Feature of SUSPLACE: Exploring the transformative capacity of place-shaping as: Husain S.O., Franklin A., Roep D. The political imaginaries of blockchain projects: discerning the expressions of an emerging ecosystem https://link.springer.com/article/10.1007/s11625-020-00786-x

Introduction – Why question the political imaginaries underpinning technical infrastructures?

Until 2013, much excitement revolved around Bitcoin, the Cryptocurrency (CC) which introduced online distributed ledgers to the world; from then on, attention shifted to the vast potential applications of the ledger itself, popularly referred to as blockchain[5]. Academic studies, popular and social media, slack and GitHub forums, MeetUps, Ted Talks, blogs, conference keynotes, and white papers surrounding blockchain variously show the vast diversity of opinions, visions, and prescriptions surrounding the technology. Everything within a spectrum from blockchain as having "the potential for reconfiguring all human activity" (Nathan and Scobell 2012, p. viii) to it being a "useless" technology and a scam (Aslam 2018) can be found effortlessly. To add to this, the hype surrounding blockchain's transformative or disruptive potential is fueled by a diversity of actors; including technologists, governments, businesses, banks, start-up entrepreneurs, coders, hackers, anarchists, ecologists and international organizations – all of whom are experimenting with the technology for different purposes. Hence, the starting point of this article is the scholarly and pragmatic need for navigating the widely prevalent techno-utopianism and techno-cynicism on the topic.

Put simply, blockchain is a shared cryptographic register. It records transactions between two parties in a permanent and verifiable manner without the need for any intermediary or central authority. Though blockchains themselves can be seen as a development that drew from and combined many existing technologies (Campbell-Verduyn 2017), in this article, we situate them as the meeting point of two historical trajectories: the ledger (Peters and Panayi 2016) and the internet. We mention this to elucidate a simple point: the historical evolution of any general purpose technology like the ledger, or the internet, comes with diverse sets of political underpinnings, or political imaginaries (McBride 2006; Nowotny 2014, p. 17), that play out in many different ways – some more dominant than others. For instance, amongst other developments, the ledger enabled the formation of a credit system to speed up the exchange of goods and services, which defined the expansion of power and wealth in societies (Gleeson-White 2011). The internet decentralized communication and knowledge by creating networks of computers that would enable people to send information directly to each other (Gupta 2017;

[5] Blockchain is often conflated with Distributed Ledger Technology (DLT). In brief, blockchain is only a 'type' of DLT. For clarifications, refer to: (Banco Bilbao Vizcaya Argentaria 2019)

Tabora 2018). While the internet has been used for raising awareness about and organizing around global issues like climate change and poverty, it has also been used by the behemoths of transnational banking to create debt and associated financial crises. Groups with different political imaginaries make and use technology in different ways.

In this article, a political imaginary is conceptualized as a "a collective structure that organizes the imagination and the symbolism of the political, and therefore organizes the instituting process of the political as well" (Browne and Diehl 2019, p. 394). This definition follows from Taylor's work on social imaginaries, expounding how our shared political, economic and social practices are framed by an exercise in collective imagining regarding their purpose and relevance. This exercise creates a "common understanding that makes possible common practices and a widely shared sense of legitimacy" (Taylor 2004, p. 23). According to some, the political is changing shape, and being determined by hybrid combinations of old ideologies (Grant 2014; Nowotny 2014; Wilson and Swyngedouw 2015) and leading to a loss of political agency and repression of the political (Mouffe 2005; Beveridge and Koch 2017). Furthermore, there are emerging technologies like blockchain enabling new forms of political experiences – both online and offline – influencing the collective imagination of the political. Considering the dramatic changes to the nature of the political itself, traditional concepts from political science, sociology and related disciplines "have difficulty in explaining how the political is constituted" (Browne and Diehl 2019, p. 393), let alone incorporating an analysis of technopolitical innovations like blockchain.

To that end, we show how blockchain projects personify 'prefigurative politics'[6] by design – the idea that their technical and organizational forms, to a large extent, embody the political imaginaries and power structures they want to enable in society. Generally, the themes of decentralization of power, disintermediation from longstanding intermediaries like government and banks, and cryptographically-enhanced transparency, dominate the blockchain discourse (Tapscott and Tapscott 2016). In spite of the inherently political nature of these technologies, most of the early studies largely evaded discussing the broader, longer-term socio-political implications that various projects would have on society, governance and politics

[6] According to Graeber, "the idea that the organizational form that an activist group takes should embody the kind of society we wish to create" Explanation has been adapted from: (Graeber 2013, p. 23) For more information of prefigurative politics/prefiguration, please refer to (Murray 2014; Scott 2015; Yates 2015; Baker 2016; Gordon 2018)

(Atzori 2015). Legal scholarship "detailed the varied manners in which Bitcoin, CCs, and blockchains fit within existing formal laws and regulations often loses sight of the wider governance implications" (Campbell-Verduyn 2017, p. 4)[7]. Computer science studies focused on experimenting with different technical infrastructures and features (Herbert and Litchfield 2015; Huckle et al. 2016; Liang et al. 2017). Economists fixated their analyses on cryptocurrencies, cost efficiencies, Initial Coin Offerings (ICOs) and their progress (O'Dwyer 2015; Böhme et al. 2015; Catalini and Gans 2016; Conley 2017). While there are a number of recently published overviews highlighting various research directions required in the field (Risius and Spohrer 2017; White 2017; Ferreira et al. 2019; Casino et al. 2019; Mackey et al. 2019; Treiblmaier 2019; Tang et al. 2019; Lu 2019), excluding a handful of studies[8], in-depth research about the political consequences of blockchain projects is absent to date.

In response to this state-of-play in the blockchain research space, this paper aims to advance a clear agenda for further research politicizing the imaginaries underlying a range of blockchain projects. We assert that analyzing the political imaginaries of so-called 'game-changing' general-purpose technologies are vital, since it determines the types of socio-economic and political actions that can emerge from, within, or on these interfaces. Exercises and debates in political imagination of emerging technopolitical systems will thus, not only help us identify and cluster the political trends of current projects, but also develop normative arguments for and against design features of future projects. In other words, it is only this sort of rigorous political analysis that could potentially open up blockchain projects, as well as other technopolitical innovations to other, alternative imaginations. Furthermore, we follow many others in taking the stance that technology is neither neutral nor apolitical in its technical design or socio-economic implementation (Strate 2012; Scott 2015). On the contrary, we attempt to show how blockchain projects contain different in-built features of access, decision-making and value – all of which influence power relations between individuals and communities. The main intention of this paper is to provide a starting point to identify, cluster and analyze the underlying political imaginaries of blockchain projects and set up a

[7] The citation comprises of the following additional references: (Middlebrook and Hughes 2013; Farmer 2014; Bollen 2016)

[8] Indeed, this is not an exhaustive list of citations – but scholarly literature in development and social impact studies take another stance mostly conceptualizing how a particular project could (often hypothetically) enable a fairer society (Atzori 2015; De Filippi and Loveluck 2016; Campbell-Verduyn 2017; Herian 2018)

corresponding research agenda to stimulate further inquiry. It does so by creating a basic typology of blockchain projects (Table 6), as well as a frame (Table 7) through which the expressions of project-specific political imaginaries can be analyzed. We advocate a more collaborative approach to designing and conceptualizing these technologies, where academics, technologists, policymakers and lawyers work together. Considering the wealth, diversity and speed at which blockchain initiatives are being created, we emphasize the urgency of articulating a broader, more multidisciplinary approach that rigorously questions the possible political implications.

The article proceeds as follows. Having foregrounded the idea of imaginaries and their prefigurative embodiments, we supplement the analytical frame by drawing on concepts from transition theory and critical geography. After proposing a basic typology of four basic clusters of projects based on their political imaginaries, we reflect on the tensions, myths and pathologies surrounding blockchain's oft-cited design principles and how to approach them from a political imaginary perspective. We then advance a preliminary frame which identifies expressions and implications of political imaginaries on three analytic levels; users, intermediaries and institutions.

Framing the issue – transformation, creative destruction & prefigurative politics

To understand how to open up blockchain projects to other political imaginations, we must also conceptualize our agency and control over technological evolution. Framed differently, to what extent do the technologies themselves shape their evolution through path dependent technological logic? (Dafoe 2015, p. 1048) Until the 1980s, a widely accepted stance was that technological evolutions is an autonomous history-shaping process (Carpenter and Winner 1978). It followed an internal logic and progression, had a life of its own and premised societal structures without human intentionality (Kelly 2010). Even though this sort of technological determinism was dismissed by subsequent constructivist claims which highlighted the role of social groups, contexts, and other perceptions of meaning (Hackett et al. 2008; Lynch 2008; Kline 2015), the corresponding "effects and autonomy of technology are neglected" (Dafoe 2015, p. 1049). This neglection, in turn, shows up in the widely prevalent polarized perspectives in the blockchain space

in general: techno-utopianism (Tapscott and Tapscott 2016; Kshetri 2017; Radziwill 2018; Brody 2019) and techno-cynicism (De Filippi and Loveluck 2016; Golumbia 2016; Ian Bogost 2017; Volmar 2017; Roubini 2018). It also shows up in the lack of frames understand the potential socio-politically transformative effects technology (in this case, blockchain projects) has on society.

Though most books and studies on blockchain often refer to its transformative or disruptive potential (Tapscott and Tapscott 2016; Radziwill 2018; Saberi et al. 2018), there is little understanding of what that actually implies from a political point of view (Atzori 2018). Without identifying and conceptualizing this potential with regards to our agency, it is impossible to open up technopolitical evolution to achieving any transformation that leads to a more equitable political system. This involves asking questions such as: are the imaginaries informing blockchain open or flexible enough to be changed?; How 'active' was the construction of these imaginaries in the initial instance?; do blockchain practitioners consciously realize the political imaginaries their tech embodies? In the following, these questions help open up and guide the research agenda about political imaginaries and their embodiment in blockchain projects. However, we acknowledge that choosing concepts to frame the discussion is in itself a normative exercise and leads to some implicit prioritization of types of transformation. The concepts and frameworks below were chosen on the basis of their ability to help critically explain the construction and practice of technopolitical transformation to create a more equitable system of politics.

Swartz (2016) identifies two types of blockchain projects: radical and incorporative. Simply put, radical projects are oriented towards revolutionary social, economic and political change through imagining a new techno-political order. These systems enable users to circumvent the dominant institutional setting – central governments, banks and corporations – by creating new ones. Contrastingly, incorporative projects innovate within the existing techno-political system not (necessarily) aiming for a reconstruction of the underlying political and social premises, but instead providing, for instance, more transparency and autonomy (Swartz 2016, pp. 86–87). As she clarifies, "the distinction…is not clearly defined and, in practice, there is a continuum between the two ideological modes" (Swartz 2016, p. 87). Often we see how many radical startups which begin with "utopian visions might 'pivot' (to use industry parlance) towards business models different from or even in opposition to their original goals" (Swartz 2016, p. 88).

The point Swartz raises should not be understated; being from the radical camp does not ineludibly imply being radically more egalitarian or just. Calls for 'transition' and 'transformation' through blockchain resonate with both camps, where projects often advertise themselves as addressing problems in areas including energy (Sivaram 2018), land-registry (Kshetri 2017), identity (Jacobovitz 2016) and governance services (Drucker 2017). Though often there is an apt articulation of the complex internal governance of a project, we will see that the conceptualizations of the political aims and power dynamics within a broader geopolitical context are severely lacking (Markey-Towler 2018). As Hölscher et al. (2018) explain, both concepts, transition and transformation, "refer to change in complex adaptive systems [but are] often employed to different system foci. This has implications on what elements of change are analysed" (Hölscher et al. 2018, p. 2).

Conceptually, the term 'transition' is predominantly employed to analyze changes in society subsystems like energy and mobility, focusing on "social, technological and institutional interactions" (Loorbach et al. 2017). In contrast, 'transformation' is more commonly used to reflect on "large-scale changes in whole societies, which can be global national or local" (Hölscher et al. 2018, p. 2). In this regard, radical blockchain projects could simply be transitional, where no large scale societal change is construed, but rather a subsystem with different political premises is imagined and hoped to replace its mainstream counterpart. Similarly, an incorporative project could be thought of as more transformational because it changes a broader societal process. Both concepts help us to delineate the various system foci, which in turn will enable us to understand the political imaginations behind them.

While many blockchain projects may look transformative or transitional at first, they could also be 'creatively destructive', to use David Harvey's (1990) vocabulary. To understand this phrase, it is necessary to highlight his concept of "time-space compression" (Harvey 1990, p. 240). In sum, time-space compression refers to the way the acceleration of economic activities and global interconnectedness leads to the destruction of spatial barriers and distances. For Harvey, "creative destruction is embedded within the circulation of capital itself" (Harvey 1990, pp. 105–6), and thus, refers to industries and jobs that are made redundant as a result of increasing global connectedness. As an illustration, we can look at how the internet made hundreds of activities associated with publishing, retail, music and travel completely redundant (Karr 2015). Both radical and incorporative

blockchain projects could be thought of as a new vehicle expediting time-space compression, where 'anything of value' or any form of capital, can be transferred globally much faster, more efficiently, and in a more decentralized manner than previously imagined. Hence, theoretically speaking, both incorporative and radical projects could be simply updating the infrastructure of global trade, finance, business, and government. In that, rather than resolving the inherent contradictions and inequalities of our politico-economic system, as they are often poised to, could both types of blockchain projects rather just be "moving them around geographically"? (Harvey 2010).

Regardless of how transformative blockchain projects may be, most of them articulate, if not embody, some form of prefigurative politics – "a normative vision of an imagined future reality rather than a description of an actual reality" (Scott 2015). That is, they prefiguratively embody the politics and power structures they are aiming for. Scott's (2015) concept of the "Techno-Leviathan" adequately expresses a starting point to understanding this approach: "technological infrastructures do not offer an escape from government, they just offer another, competing, governance system with its own power dynamics". We can choose to view rule by code or algorithms as positive or negative, but we must perceive the power in-built into the usage of a system (Scott 2015). With regards to governance within and through blockchain, projects often feature the technology's "design principles" (Tapscott and Tapscott 2016) such as access, disintermediation, decentralization, empowerment and equality. Our interest here is in how these principles embody socio-political structures differently in different projects, depending on their underlying political imaginaries. For instance, 'if a financial system is no longer governed and regulated by the state (i.e. it is disintermediated), how does the replacement governance system distribute power and create value?' (Table 7, p. 96).

Through the analysis of patterns through active participation in the blockchain space, journal reflections at events and literature review (which is expounded upon in the next section), we construct a basic typology of blockchain projects (Table 6) into four clusters based on their imaginaries: (i) crypto-libertarians, (ii) crypto-commonists,[9] (iii) crypto-governmentalists and (iv) crypto collaborativists.

We can distinguish the first two from the latter two quite easily because of one simple reason: the first two are parallel projects attempting to create very

[9] Neologism first proposed by Peyrouzet García-Siñeriz (2018)

Table 6 – Typology of political imaginaries

	Crypto-anarchists		**Crypto-institutionalists**	
	Crypto-libertarians	Crypto-commonists	Crypto-governmentalists	Crypto-collaborativists
Basic political imaginary	Free-market libertarian political economy	Commons-based political economy	Free-market, government regulated political economy	Commons-oriented, municipalist political economy (hybrid), transnational movements
Mode of governance	Decentralized mass-driven, individualistic	Decentralized collectivist, commons-driven	Centralized, state-run	Partially decentralized, municipal and civil society, transnational institution and global civic society
Value and incentives	Speed, efficiency, risk, growth	Equality, social justice, ecological (commons goals)	Efficiency, transparency, accountability, growth	Collaborativism, translocalism
Political scale	Global/translocal	Local/ translocal	National	Local/municipal/ translocal
Implementation process	Start-up/ crowdfunded	Start-up/ crowdfunded	Government-led	Municipal/citizen-led, institution-led
Dominant node of power	Market, mass consensus	Collective	National government	Municipality/city
Examples	Most cryptocurrencies (Bitcoin, Litecoin EoS etc.), SunExchange, DAOStack, Bitnation, Project Graceland	FairCoin, Democracy Earth, WePower, RightMesh, P2P Models	E-estonia, GrantSolutions, China's social credit system, Smart Dubai	Colony, FairBnb, ACT community mobilization, Decode, Berkeley Blockchain Initiative

different worlds i.e. blockchain *as* government. Even then, each one of the clusters conceptualize their imaginaries differently and hence, enable a different types of socio-political processes and transformations. The first two both fall under the larger umbrella of crypto-anarchists (Peyrouzet García-Siñeriz 2018, p. 7), while the latter two fall under the banner of crypto-institutionalists. While both the crypto-anarchists

aim for detachment from the state, the former, crypto-libertarians, is unique for its individualistic market-oriented approach to both economic organization and mode of governance (Golumbia 2016). The latter, crypto-commonists, takes the collectivist approach as advocated by commons activists, and hence, a collaborative approach to governance (Bauwens 2018; Adams 2019). Amongst the crypto-institutionalists, crypto-governmentalists are usually governmental agencies (national or city) who aim to improve government's efficiency, transparency, accountability and security by using blockchain (Hancock and Vaizey 2015; Ølnes et al. 2017). Such projects take the approach of using blockchain *in* government. Crypto-collaborativists are those public-private partnerships or coalitions that aim to collaboratively experiment with blockchain experiment with existing political infrastructure as well as create new ones. This is the group that either designs projects *for* government or in collaboration *with* government. While these clusters are not fixed, they begin to shed light on the prefigurative element of the political imaginaries of these projects.

To highlight the importance of identifying and analyzing these imaginaries, we assert that "technological opportunities do not enter into economic and social life without deliberate efforts and choices" (Archibugi 2017, p. 541). We oppose our frame to Marxian and Deweyan techno-determinism (Smith and Marx 1994), which considers social relations, organizational structures and cultural practices predominantly a product of a society's techno-economic infrastructure. Since possible socio-political scenarios will perpetuate the mainstream only with deliberate use, identification of the imaginaries becomes even more important because our efforts and choices of designing and using particular systems will enable particular socio-political realities.

After outlining our methodology, we critically analyze the most cited and popularly misconceived design principles of blockchain projects, and follow with a discussion and research agenda.[10]

[10] In this article, we make a distinction between blockchain platforms like Ethereum or EOS and projects like Status or Augur. However, we also acknowledge that this is not a strict distinction, since 'projects' like Colu or Bancor, allow currencies and projects to emerge from within them. Platforms, projects, and hybrids, indeed have political imaginaries at play, but we confine ourselves to discussing projects in this article for conceptual clarity.

Methods: digital ethnography & immersion in social worlds

This article is principally an outcome of the first author being immersed in the blockchain space for the past three years in Europe – primarily in the Netherlands and the UK. The methodological approach was predominantly inspired by the iterative principles of digital ethnography (Pink et al. 2016; Hjorth 2017; Hsu 2017) and supplemented with participatory action and qualitative methods used in social sciences (Bergold and Thomas 2012). Digital ethnography begins with the idea that the "digital has become a part of the material, sensory and social worlds that we inhabit" (Pink et al. 2016, p. 7) and hence, must be an integral feature in most forms of ethnographic research. Furthermore, this approach helps takes notice of how the digital is increasing, reducing and transforming our socio-political life and agency in our social worlds. The social world[11] that blockchain innovation takes place is neither solely online or offline, and hence, needs to be treated as such during empirical research. Since each social-political world comes with its own variety of communication norms, rules, networks, behaviors, activity infrastructures and operational structures, an ethnographer has to learn the language and energy of the world to begin understanding it. As Pink et al. confirm, "immersion, participant observation and 'the everyday' are three ideas bound up with how we study social worlds" (Pink et al. 2016, p. 436). This form of ethnography is a reflexive methodology that allows researchers to develop individualized approaches for each environment and is the most appropriate tool for understanding online environments (Ward 1999).

To do research within the social worlds of blockchain projects, activities included participant observation to analyze the issues raised and debates carried out at monthly blockchain MeetUps for a year in Amsterdam (12); online and offline hackathons annually (2 hackathons); weekly presence in Slack teams and other team collaboration platforms[12] (6 teams); and other online forums like Reddit (4 forums regularly); attendance at blockchain conferences (4 European conferences),

[11] Understood as "a form of social organization which cannot be accurately delineated by spatial, territorial, formal or membership boundaries" (Unruh 1980, p. 271). Applied to the hybrid space of online and offline interactions socio-political worlds are construed as "relatively unbounded… domains of social life", where ethnographers immerse themselves with research participants for long periods of time (Pink et al. 2016, p. 434).

[12] Team collaboration platforms or team communication platforms (TCPs) have are an "are an emergent class of social collaboration technology that combine features of multiple enterprise social media including social networking platforms and instant messaging" (Anders 2016, p. 224).

online seminars (3 seminars) and after-parties; and conference calls with project leads and entrepreneurs; analysis of data from , wikis and blogs produced by respondents, as well as online focus groups. The offline involvement at events allowed many opportunities for discussions and informal interviews with ICO heads, expert practitioners, blockchain figureheads, government officials, coders, researchers, experts and activists (25). However, considering the briefness and casual setting unsuitable for audio recording, most conversations were recounted as non-verbatim journal reflections. The online data collection comprised of a daily and weekly routine of: reading already joined threads and channels, contributing to debates, virtually archiving notes, taking field notes, and placing them in hand-made cross-reference diagrams. Furthermore, the choice of which blockchain projects to analyze was driven by the research process itself, where projects were recommended or discussed during the immersion activities. However, it should be noted that projects were deliberately chosen across the political spectrum after the basic typologies were observed– from crypto-anarchists to crypto-institutionalists (which had very different social worlds[13]) – in search for outliers and differentiating data.

The evidence and insight acquired through the above method of immersion is used in concert with several other sources of secondary data, including academic studies, White Papers[14], cryptocurrency and technology blogs, news websites and popular media. Considering the nature of the study – to identify and analyze the political premises of blockchain projects – these sources have been used as primary data, since they are often the only articulation of the political imaginaries. We used these documents to tease out the political imaginations in the author bias, ethics disclaimers, vision statements and place them in linkage diagrams. Many of the non-academic sources which were consulted remain in the basement of the internet, which is not only hard to find, but dominated by groups which prefer to remain detached from popular media. Conversely, in our scholarly literature review, we noted that many articles concerning blockchain cite the popular news websites like CoinDesk and CoinTelegraph, as well as blogs and forums like Hacker Noon and subreddits like r/Blockchain/. Indeed, as the Misfit Economy points out, activities

[13] Crypto-anarchists projects were usually global, translocal, or local projects, which involved a lot of online collaboration. Contrastingly, crypto-institutionalists were almost always national, regional or local projects which required many traditional techniques such as interviews and workshops.

[14] "A white paper is a document which includes an outline of a problem that the project is looking to solve, the solution to that problem as well as a detailed description of their product, its architecture and its interaction with users". For more info, refer to: (CoinTelegraph 2018). Examples of the white papers of projects include all projects listed in Table 1.

in the grey area between 'deviance' and the 'normal' are often the cradles of innovation (Clay and Phillips 2015). Furthermore, they offer us a way to 'reinvent the wheel' — create new alternative systems that at least initially, operate outside the dominant institutional setting. Homero Gil de Zúñiga et al. (2010) reiterate these points that we need to take into account "a new type of political advocate" (p. 36) who are "increasingly relevant to political discourse…[who] evidence of the emergence of a hybrid participation that combines the virtual and real world realms of political engagement and action" (Gil de Zúñiga et al. 2010, p. 45).

Both online and offline sources of information were cross-validated though an iterative form of pattern analysis. This analysis comprised of identifying patterns that emerged in how the themes (highlighted in the next section) were conceptualized in different blockchain projects. Hence, the pattern markers were found in the various data sources outlined above and subsequently clustered as shown in Table 6. As noted, there was no fixed criteria with which to cluster the projects. Instead, it evolved over the course of the research. This criteria is reflected in the first column of Table 6. It is this evolution through the analysis of patterns and cross-validation with experts and academic analyses that led to the outlining the questions and prefigurative political expressions of blockchain projects in Table 7.

Results: rethinking blockchain's design principles – equitable design ≠ equitable politics

Blockchain is often cited as a panacea for many sectors of the digitally-enabled economy (Kshetri 2017), and as infrastructure for a variety of public services (Killmeyer et al. 2017), including land registry (Oprunenco and Akmeemana 2018), healthcare, recycling (Saberi et al. 2018) and many more (Vigna and Casey 2016). However, the political motivations behind these projects are seldom questioned.[15] Cryptocurrencies, one particular set of use-cases of blockchains, have been closely associated to a libertarian ideology, but these are underdeveloped conceptualizations at best (Faife 2016). For instance, libertarians could be statists, advocating a limited government; or anarcho-capitalists and cyberlibertarians, who would like to hand over all power to the markets. In CoinDesk's Q2 2018 survey of 1200 crypto-community respondents, concluded that 52 percent was distinctively

[15] There are some more developments particularly in the field of cryptocurrencies such as: (Golumbia 2016)

right-wing, while 45 percent was leaning towards the left (CoinDesk 2018, pp. 105–106). While these statistics are enlightening for a superficial understanding of the cryptocurrency field, they reflect the political inclinations of those who are active users of cryptocurrencies, rather than those individuals creating blockchain-based projects. In contrast, our aim is to understand the political premises that inform the design of the projects themselves, rather than their users. More specifically, through asking a series of questions, we seek to be able identify the clusters of projects and better predict the associated socio-political implications.

In the following section, we use published scholarly research and insight from non-academic sources in concert with reflections, cross-validating interviews with experts and patterns identified during the ethnography. The analysis will be used to formulate fundamental questions about the political imaginaries and their prefigurative political expressions. The themes listed below were the most popular, yet, often repetitively misconceived features of blockchain projects identified during the course of the first author's empirical research. The questions formulated are considered fundamental owing to: the fact that each project researched has cited the misconceived terms; they determine the basic functioning and design of the project; expert interviewees considered them as fundamental in defining the expressions of political imaginaries of blockchain projects. The themes lay the groundwork, in terms of conceptualization, to ask specific questions regarding the four clusters of expressions outlined in Table 7: political imaginaries, nature of transformative potential, prefigurative political design and incentives and values.

Decentralization & Disintermediation

Perhaps the most glorified characteristics of blockchain are its capacity to decentralize and disintermediate. These closely related concepts, and often conflated features are appealed to by all initiatives. With blockchain, every node in a network retains a copy of all transactions that are carried out on a system, effectively eliminating the need for a third-party intermediary like payment processors, banks and even governments. The decentralization of the nodes allows for disintermediation, but does not necessitate it. For instance, disintermediating from centralized institutions could be carried out through a peer-to-peer (P2P) protocol which allows two parties to transact without an intermediary. A cryptocurrency – such as Bitcoin – would be one such example: an electronic cash system which allows peers to transact tokens without any middleman writing the

terms of transaction. Bitcoin, can decentralize transaction data, make it transparent in a public ledger, and replace traditional financial intermediaries. Each transaction is instead validated by miners (a group of volunteers) who compete to solve a mathematical puzzle to gain a small reward. However, it has nonetheless created an alternative governance system which has recentralizing tendencies in the form of "colossal mining operations…with risks of collusion or cartelization" (Atzori 2015, p. 16). As Dodd explains, Bitcoin's "social life" is characterized by asymmetries of wealth and power that are not dissimilar from the mainstream financial system" (Dodd 2018, p. 35). This raised several questions for our empirical research, such as: once we remove traditional central authorities, who does our blockchain-based system give power to? Which actors are most likely to become more powerful as a consequence of decentralizing a particular system? Are there, or could we create cryptocurrencies with non-libertarian imaginaries? Such questions, as well as the problematic understanding of decentralization influences the various expressions of blockchain projects identified in Table 7. For instance, if traditional authorities are replaced, who then sets the affordances and constraints for the user?

While the power relations and politics of Bitcoin have been addressed elsewhere (Golumbia 2015), we can ask similar questions about all blockchain projects. Blockchain projects in different sectors have different sets of actors, each of whom have different aims and scope. For instance, take the case of e-Estonia, a series of projects launched by the national government of Estonia to digitize the interactions of citizens with the state. Through our empirical work, we asked what does creating a "virtual, borderless, blockchained, and secure" (Heller 2018) government entail in terms of a cyber-governmentalist imaginary? Does the transparency and efficiency brought about by virtualizing governance services change arrangements of power and decision making, or simply increase accountability and reduce chances of coercion? Does the decentralization of data ownership entail any disintermediation from the government itself, or rather deepen institutional control? If we are able to conceptualize cases like this, we will be in a better position to understand the nature of the project. This includes, for example, whether it is incorporative or radical, the potential for time-space compression and/or creative destruction, the aims, scope and features of transformation or transition. The aim of this article is provide a frame to systematically and thoroughly investigate such issues as is delineated in Table 7.

With regards to disintermediation in general, arguably one of the most important questions that emerged during the course of our research we need to ask in this context is which types of intermediaries might we want to get rid of, and why?

While there are many projects that decentralize for the sake of decentralization, Schneider (2017) notes that there needs to be more nuance in understanding whether or not decentralizing everything is either feasible or makes systems more accountable. His point is that since many decentralized systems eventually show different forms of centralization, projects must be very specific about "the particular features of a system a given design seeks to decentralize". Furthermore, he explains how recentralization often occurs because of "imbalances of power that operate outside the given network". For instance, wealth in the cryptocurrency world is usually correlated to wealth in the external economy, as well as early adoption and education (Schneider 2017). To counteract these concentrations of power, projects can use a diversity of modes of decentralization, or checks and balances – each informed by their own political imagination. Mechanisms and software that decentralize complex systems can bring liberating possibilities; yet they also risk creating radically unaccountable and coercive concentrations of power (Atzori 2015; Reijers and Coeckelbergh 2016). In that, Table 7 makes an effort to expose the various modes and expressions of decentralization and disintermediation implicit in blockchain projects.

As an illustration of the above point, take the case of the so-called sharing economy initiatives such as Airbnb and Uber, which rely on the "contributions of users as a means to generate value within their own platforms" (De Filippi 2018, p. 2). These companies have been called tightly controlled, profit-driven corporate platforms which exploit their users, leading to global protests (Largave 2017; Lownsbroug 2017). As a response, some crypto-commonist initiatives are built as "platform cooperatives", which are "collectively owned and governed by the people who depend on and participate [in them]" (Sutton et al. 2016) deriving from a long history of cooperative economics. For instance, in the FairCoin Coop, all decision and strategies are made in monthly assemblies (König and Duran 2016). As such, the power relations are of a collaborative nature, with the politico-economic imagination behind these initiatives being commons-based rather than market based. Of course, equality in design of a platform does not necessarily imply the same qualities will exist practice. A commons-based system cannot just be a simple bolt-on set of principles to an existing project or business. It has to be conceived as a political choice and involves an entirely different starting point than a regular startup. Hence, it becomes very important to consider political premises underlying the variations of decentralization, both at the design level (political imaginaries and prefigurative political design in Table 7) and at the implementation level (nature of

Table 7 – Political imaginaries and their expressions

Level of Analysis	Expressions			
	Political imaginaries	**Nature of transformative potential**	**Prefigurative political design**	**Incentives and values**
Basic	• Which cluster(s) does the project roughly fall under?	• What does the project explicitly aim to transform and why?	• What sort of socio-political interactions do the design and features enable?	• Who has the biggest incentive to participate in the system, and why?
Users	• What affordances and constraints are created for the user directly by a cluster of imaginary? • How is the perception of the project by (potential) users influenced by how explicit and different the imaginaries are? • What is the relationship between initiator of the project and the user's confidence in the system?	• Does the project aim to be radical, incorporative or a mix in terms of its innovation for the users? • Will the users have an active role in how the implementation/ experimentation of the project will play out?	• How does the design and features of the project affect the interaction between users and technology adoption? • How do different design and features constrain or create opportunities for different political processes/actions? • Which role do the users play in determining changes in the project with regards to consensus, updates, community building etc.?	• What exactly is the user's incentive to take party in the project? • Will the project employ individual or collective incentivization? Does the project value collaboration? • Did/do the potential users have a possible role in defining the values and incentive structures of the project?

Intermediaries	• How do the different clusters perceive the status quo of intermediaries in the relevant industry? • Does the project intend/ attempt to disengage from an intermediary, replace it or disintermediate absolutely? • How will the change in the role or functions of intermediaries change socio-political processes and/or interactions?	• Considering the natural tendency to recentralize, where will the project naturally accumulate power? What will the nature of transformation be as a consequence? • Who will be disempowered through this project? Does this comply with the goals of the project?	• How will the prefigurative design and features of the project change arrangements of power and decision making for the traditional intermediaries? • Which intermediaries would benefit from these features? • Which role do the intermediaries have in designing the consensus and other mechanisms?	• Whether the role of the intermediary is being changed or removed (to cut costs, increase accountability, increase efficiency, automate, create transparency etc.), who has the largest incentive to do so and why? • What incentives do new intermediaries have for participating in the project? What do they value?
Institutions	• Is the project's political premise in sync or against established institutional setting? How and why? • How does the dominant political imaginary of the relevant institution/industry influence the formulation of the project's own imaginary?	• How will the scale and nature of the project affect the institutional setup and respective industry? • Who will be made redundant through the process of change? What are the risks of establishing this system?	• How can/will traditional institutions use the project their own processes? • Who could potentially be excluded from using the system? Does that interfere with the apt functioning of the system? • How will the design affect the degree of creative destruction and disruption in the respective institutional setup?	• Does the project provide added value for institutional actors to conduct transactions within their firm or with other stakeholders i.e. customers, government, companies etc. • Which institutions, businesses and industries will be affected by the project and how?

transformative potential and incentives and values in Table 7). The more precisely we can delineate features of the technical system, the more aptly we can determine the types of socio-economic and political interactions the system can enable.

Access, Inclusion & Empowerment

Blockchain, it is claimed, has the capacity to "bank the unbanked" (Thellmann 2018), create a "financially inclusive future" (Fork 2018), "break the poverty chain in the global south" (Kshetri 2017, p. 1710) and "empower the poor" (Thomason et al. 2018, p. 138). These are some of the commonly made claims about blockchain. Searching similar keywords leads to a series of academic studies, opinion pieces and actual blockchain projects which commonly cite these phrases. While the intent of these projects is seemingly to create a more inclusive financial, economic and political system, their diverse actualizations come with some deeply problematic politics and imaginaries. Firstly, there is the issue of access. For the moment, only 55% of the world has access to the internet, and this is unevenly distributed geographically (Graham 2014; Poushter 2016; World Population Stats 2018). Since most blockchain projects require access to at least a smartphone and the internet, it seems unlikely the technology will be a panacea for poverty in the entire region of the global south (Kshetri 2017). Furthermore, there is an entirely different set of power and information asymmetries and cultures in the developing world which all need to be reckoned with in the design of alternative systems (Castor 2018; Kshetri and Voas 2018).

The social aspects of both the digital divide and democratic divide become increasingly relevant when different aspects of socio-political life are put online. As Min (2010) explains, the digital divide could cause "additional disadvantages for the already marginalized groups in society" (Min 2010, p. 22). The democratic divide, which concerns people's different usage of the internet for political purposes, can be expanded to the blockchain space, by imagining people's differential attitudes and skills to understand what the system allows and disallows them from doing (Norris 2001). As Lubin et al. (2018) assert, expecting these diverse populations to embrace new technological systems created by startups in the blockchain world that restructure daily life transactions "wholesale oversimplifies the social process of technological system" (Lubin et al. 2018, p. 13).

During our empirical research, we found a host of innovative solutions, like cheaper remittance systems (Lashkov 2018), that will make headway in solving

particular issues in particular places. For instance, project Bifröst works with a consortium of non-profit companies to help develop "cash transfer programs" which will use blockchain and cryptocurrencies to enable a new world of micro-finance and cheaper remittances (Bifröst 2018). However, it is hard to miss that the overall crypto-anarchist approach darkly resembles a variation on "authoritarian paternalism", wherein the blockchain innovation community – mostly situated in North America and Europe – decides the best solution for the disenfranchised populations continents away (Scott 2015). As Scott puts it, "there is something obnoxious about the way that university-educated tech optimists constantly invoke the mythical land of "Africa", with the imagined African person in the imagined African village, using Bitcoin to escape corruption in their country" (Scott 2015). Take for instance Zipcoin, which digitalizing the African market through a payment and remittance system (Zipcoin 2018; Cocking 2019). Such vision statements in global development rhetoric and the blockchain startup community carry with them a political ambition of imposing tech-centric solutions for an often non-tech adept community. Their political premises may be radical or incorporative in theory, but our interviews and experts explained how applying libertarian or commonist ideals in the technical design to systems where the cultural and political context is not libertarian nor commonist, is deeply problematic. Furthermore, it may actually worsen socio-economic inequalities in many situations.

As Lubin et al. explain, with regards to financial inclusion, many projects also assume "that under-resourced localities define "value" in the same way as westernized communities do – via fiat currency – rather than by other quality of life measures" (Lubin et al. 2018, p. 13). The latter includes, for example, access to food and basic resources, community solidarity, social capital or direct exchange of services. Hence, the "value as incentive" (Radziwill 2018, p. 35) that is commonly cited in the white papers of crypto-anarchist blockchain projects may not hold, owing to differing political ambitions – both in under-resourced and developed contexts. In general, an incentive in any design element of a system influences the behaviors of anyone participating in the system (Barrera 2018). More simply, they encourage communities of participants to collaboratively create value, which, in turn, will ensure the success of their platform. According to this scheme, working for your self-interests will benefit the whole (antifragile 2017).

Most blockchain-based systems use tokenized pay-for-performance incentive schemes in which participants are rewarded according to the performance of the token's value. However, as Barrera (2017) aptly points out, there are many problems

that could arise from poorly choose performance metrics. For example, innocuous or malicious gaming[16] could exacerbate the inequalities in communities where there is already inequality in terms of capital investment, education, expertise and power. Furthermore, if the politico-economic aim is the empowerment of disadvantaged people, we must then question whether such systems are referring to individual empowerment or collective empowerment – and whether one necessarily translates into the other. It is expressions of such embodied values that the "incentives and values" column in Table 7 attempts to expose. BitPesa, which is the first African digital money transfer company, succeeded in removing correspondent banks from the transaction chain. However, by disintermediating cash transfers, does it necessarily mean that it will be used for collective empowerment or reiterate local inequalities? (Yen 2017; Flore 2018). For instance, those who climb the steep learning curve of exploiting the emerging systems on the blockchain may benefit far more quickly than others, creating a series of issues regarding accountability and the modes of decentralization most suited for the job.

Also, worth reflecting upon here, are the many innovative blockchain projects whose political imaginations regarding inclusion, access and empowerment are not yet realized; rather, they are currently in the process of being developed. For instance, RightMesh "is on a mission to connect the next billion users without infrastructure" (instead of laying new fiber optic cables for internet connectivity, it can transform smartphones into nodes that form a network, and connectivity between them is achieved through Bluetooth and Wi-Fi (which is inherent to the device)) (RightMesh 2018). While there are many initiatives "banking the unbanked", this one "retrofits existing mobile applications and builds new, P2P mesh applications" (RightMesh 2018). When implementing solutions beyond simple connectivity, RightMesh will have to be careful not to replicate, reiterate, or create, new forms of inequalities through power imbalances in a system. Nonetheless, creating such mesh networks for context specific solutions and working with local actors could create new forms of techno-political innovation. Another such example is Colu, a "decentralized payment system for local communities" (Colu Technologies DLT limited 2018, p. 2) upon which communities can create their own currencies and implement mechanisms of consensus and power depending on their place-based definitions

[16] Barrera outlines three other problems: free-riding, multi-tasking and risk misalignment. "Innocuous Gaming: Users may take actions that increase token value but do not have a positive impact on the value of the platform."
"Malicious Gaming: Users may take actions that increase token value to the detriment of platform value." (Barrera, 2017)

of value and culture. Such umbrella systems using blockchain enable a new way of working, where place-based actors can access an open-source software and adapt it to their context-sensitive needs using a global pool of volunteers for support.

Code is Law & Modes of Coercion

"Code is law", another way of referring to "governance by technologies", is the idea that software coding can be understood as a form of law. Campbell-Verduyn (2017) explains that certain design features of technologies themselves can "reframe, redefine, and reconstitute the mundane activities of the social actors and social process under-pinning global governance" (Campbell-Verduyn 2017, p. 8). Specific architectures of general purpose technologies, as described earlier, can be understood as "arrangements of power" (DeNardis 2012, p. 721) which weigh heavily on the conditions of possibility for socio-economic interactions. As Benkler states, the internet has been coded to allow certain "affordances and constraints" (Benkler 2011, p. 722) around values which we may not be able to identify at first. Building on this idea, Filippi and Hassan (2018) assert that "code has progressively established itself as the predominant way to regulate the behavior of Internet users". Accordingly, with the advent of blockchain and associated smart contracts, code is assuming such a strong role, that it is possible to identify a shift from 'code is law' (code has the effect of law) to 'law is code' (law is actively being defined as code) (De Filippi and Hassan 2016).

Contextualizing this shift in terms of political imagination, there is a stark difference in the way socio-economic interactions will be regulated. The current legal system is enforced "*ex-post*" (after the event) through state intervention, while in technological systems, it is in-built in the system, and hence is enforced "*ex ante*" (before the event) through code (De Filippi and Hassan 2016). This implies that the designers, owners and controllers of the system can *choose* to structurally enable and disable certain types of socio-economic interactions, political action and processes on their technical systems. Through empirically scanning blockchain projects, decentralization evangelists and techno-utopians from both the radical and incorporative camps, we identified their shared claim of the possibility to reduce the role of coercive institutions, such as the state and other regulatory bodies, by pre-defining what is and is not allowed (Atzori 2015). Correspondingly, the burgeoning reliance on technology in this regard, signals the urgency of questioning and analyzing the in-built ethical-legal and political

features of projects. If we understand that blockchain projects are reducing certain traditionally coercive institutions, we must ask which new forms of coercion emerge within blockchain governance systems – both internally and externally. According to Myers, "reproducing the coercive role of the state in a decentralized yet less constrained manner does not create a more just society" (p. 246); rather, the same political ideals of libertarian democracy will be implemented in a new and debatably more coercive form.

We are already witnessing government-led pilots experimenting with political rule by algorithm (Calzada 2018). China's social credit system is a national reputation system which aims to standardize the assessment of citizens' and businesses' reputations and grant rewards. Popularly referenced to TV show Black Mirror (Jeferson 2018), it is being described in the media as a politically dystopic shift and another form of surveillance capitalism (Cinnamon 2017; Chorzempa et al. 2018). Similarly, through our research, we ascertained that many blockchain projects prefiguratively implement politicized ideas of incentives to instill certain types of behavior. For instance, the aforementioned example of Colu (Joey 2018) and community cryptocurrencies encourage and incentivizes people to take part in the local economy (Birch 2015; Tarasiewicz and Newman 2015). The imaginaries of such a system shares some similarities with the crypto-commonists, circular economy and politics of local consumption (Mougayar 2016; Circle Economy 2018). There are other exploratory ideas of creating a Co-op Coin which would embody principles of the collaborative economy and use organizational models of cooperatives (Sylvester-Bradley 2018). Design features are highly politicized and have profound implications on the types of activity that can be carried out by civil society. With each project, we must question which values are encoded in the system, who controls it, which organizational structure is present to form consensus, and what are the political visions of the code.

Discussion: screening blockchain projects – an exercise in political imagination

Our central claim in this paper is that blockchain experiments embody the politics i.e. affordances and constraints (Benkler 2011, p. 722), which they aim to enable in society. This, in turn, depends on the political imaginaries on which the projects are built. In this section, in the spirit of setting a future transdisciplinary research

agenda, we propose a frame to question, cluster and analyze the imaginaries and their consequences. We do so in response to the current knowledge gap. That is, in the blockchain space, there are many analysts and practitioners who have attempted to compare the types of blockchains (Grakov and Chiara 2018), design features of blockchain platforms (not projects) (edChain 2018), cryptocurrencies (Desjardins 2018), and even create decision-trees of when to use a blockchain (World Economic Forum 2018; Zitter 2018). Though such tables elucidate the many differences between the technical features, they are far from a graspable comparison of the political premises behind them. Furthermore, it can also be noted that majority of the academic analysis and consultancy reports that were reviewed for this article regurgitate the imaginaries of blockchain projects without any critical reflection. Contrastingly, our aim in Table 7 is to create a broader frame which functions less as a table of comparisons, and more as an iterative framework which opens up new avenues of research and experimentation which can be collaboratively worked on by academics, practitioners, technologists and politicians. It can also be used as a tool by practitioners to understand the political implications of their design, while also elucidating how implementation may pose certain difficulties.

Relevant here is the work of Risius and Spohrer, who delineated a "blockchain research framework" which is "conceptualized as an intersection of activities that blockchain developers and users can undertake and the levels of analysis on which these activities wield influence" (p. 389). They have adapted an established framework from the social media research agenda of Aral et al. to identify topics and find connections that have not been considered by other blockchain research. Deriving inspiration from their work, we have recreated the table below which identifies topics and finds connections specifically with regards to expressions of political imaginaries, transformative potential, prefigurative political designs and incentives.

We use the vocabulary and analysis from the previous sections in concert with our wider empirical journal reflections to construct the questions within the frame. In Table 7, the left-most column separates the levels of analysis: users, intermediaries and institutions. At each of these levels, a series of (research) questions are articulated with respect to each "expression". The row titled "basic" describes the question of the expression itself. For instance, a project's "nature of transformative potential" analyzed at the level of the user will ask how and what exactly will change for the user. In other words, will it simply be an incorporative

project, where the user's role, power and influence will remain the same, or will they change in the proposed system?

This frame can be used reflexively for different purposes. For example: (i) A project can be analyzed from the perspective of just the user, intermediary or institution, with regards to each one of the expressions in the columns. (ii) A project can be analyzed from all levels of analysis with regards to only one expression. (iii) The relationship between two or more expressions can be analyzed through a study or pilot. Though the frame is open to interpretation and use, we must clarify that the questions were written with the intention of being project-specific.

Concluding remarks – the political agency of research on innovation

This article has attempted to articulate a critical frame through which to analyze the socio-political underpinnings of blockchain projects. Yet, our intention in this article is not to promote either blockchain utopianism or cynicism; nor is it to advocate for a crypto-anarchist or crypto-institutionalist approach. Rather, it is to articulate a call and research frame to delve deeper into how the political imaginaries behind both the technical design and implementation of projects prefiguratively create the infrastructure of politics. Furthermore, in contrast to many of the articles that were reviewed during this research, we do not make claims that blockchain is suited for socialist or libertarian systems. Rather, we simply encourage practitioners to critically and reflexively analyze the often underdeveloped political underpinnings of their projects. Indeed, it is relevant to mention how little scholars trained in political and social sciences have addressed the imaginaries and corresponding implications mentioned in this paper. Technology is not neutral. However, it is only with considerable, deliberate efforts, and both individual and collective choices, that technology restructures and reorients our socio-economic lives.

Concerning various design features that most contemporary projects cite, we advocate a more thorough form of prototyping that could elucidate how they will play out. For instance, instead of decentralizing for the sake of decentralizing, we suggest it is more appropriate to first ask which aspects of particular systems would function better in a decentralized way? And for who? Would they enable a new form of political reality? Why would that be desirable? When reconfigured in this way, the "measure of a technology should be its capacity to engender more accountable forms of trust" (Schneider 2017).

To conclude, by envisaging new forms of organization, politics, business and trade associated with emerging technology, we will also, to an extent, be able to guide them. In other words, we become better equipped to paint a picture of the future we desire, considering blockchains' capacity to alter the socio-technical landscape through expediting time-space compression. In the words of Vinay Gupta, we must "make a clear image of the future we want, otherwise we are going to get the kind of future that happens by accident" (Gupta 2018).

Chapter 5

Prefigurative post-politics as strategy: the case of government-led blockchain projects

Abstract

Critically engaging with literature on post-politics, blockchain and algorithmic governance, and drawing also on knowledge gained from undertaking a three year empirical study, the purpose of this article is to better understand the transformative capacity of government-led blockchain projects. Analysis of a diversity of empirical material, which was guided by a digital ethnography approach, is used to support the furthering of the existing debate on the nature of the post-political as a condition and/or strategy. Through these theoretical and empirical explorations, the article concludes that while the post-political represents a contingent political strategy by governmental actors, it could potentially impose an algorithmically-enforced post-political 'condition' for the citizen. It is argued that the design, features and mechanisms of government-led projects are deliberately and strategically used to delimit a citizens' political agency. In order to address this scenario, we argue that there is a need not only to analyze and contribute to the algorithmic design of blockchain projects (i.e. the affordances and constraints they set), but also to the metapolitical narrative underpinning them (i.e. the political imaginaries underlying the various government-led projects).

Keywords: blockchain, post-political, governance, decentralization, government, techno-politics

This chapter is published in the Journal of British Blockchain Association (JBBA) as Husain SO, Roep D, Franklin A (2019) Prefigurative Post-Politics as Strategy: The Case of Government-Led Blockchain Projects. DOI: 10.31585/jbba-3-1-(2)2020

Introduction

A growing body of thought has begun to theoretically and empirically investigate the dynamics of contemporary depoliticization and the alleged 'disappearance of the political'. Uniting a diverse set of opinions is the idea that "contemporary forms of depoliticization are characterized by the erosion of democracy and the weakening of the public sphere, as consensual mode of governance has colonized, if not sutured, political space" (Wilson and Swyngedouw 2014a, p. 5). This emerging literature across the social sciences conceptualizes the processes as 'post-politics', 'post-political' and 'post-democratic' (Crouch 2004; Mouffe 2005; Swyngedouw 2010; O'Callaghan 2019). An important debate within this highly contested sphere concerns the nature of the post-political itself: whether it is a "condition" of contemporary society or a "contingent political strategy" imposed upon it to shrink political agency (Beveridge and Koch 2017, p. 39). Using blockchain as a civic or political technology, that could potentially transform political agency, as well as, political processes, has become an oft-cited claim (Davidson et al. 2016; Tapscott and Tapscott 2016; Markey-Towler 2018). While there are many empirical studies that use the lens of the post-political to explore, for instance, governmentality (Blühdorn 2015), social enterprise (Larner 2014) or radical politics (Swyngedouw 2014), we think government-led blockchain projects provide an apt case for addressing some of the crucial questions surrounding the post-political.

It is argued that blockchain projects personify "prefigurative politics" (Scott 2015) by design: they embody the politics and power structures they want to enable in society. These technopolitical systems achieve this by setting certain "affordances and constraints" i.e. the possible courses of action available to an actor. Through this, such systems can "influence the behaviour, outcomes, and so forth" of any individual taking part in a political process or action within or through it. In other words, the design of these systems prefiguratively determines the agency actors have while using the system. As explained elsewhere, these contingences are deeply political, where they are specifically set up by the designers to delimit an actor's political agency (anon, forthcoming) (Husain et al. 2019a). Moreover, particular political imaginaries guide and inform how and why these contingencies will be set up within the system. If governments are beginning to experiment with blockchain as a technopolitical infrastructure to restructure governance, and allegedly, alter the political agency of citizens, it becomes fruitful to investigate

why and how from a post-political perspective. In that, the aim of this discussion paper is two-fold: first, to reflect upon whether and how government-led blockchain projects are politically transformative; and second, in follow on, to contribute to existing debate on the nature of the post-political as a condition and/or strategy.

The fundamental question this paper aims to explore is whether all government-led technopolitical projects (blockchain or otherwise) are inevitably confined within or structured by the 'post-political condition'? Alternatively, is the post-political a strategy that is being actively implemented to curtail and delimit a citizen's political agency, and, by effect, recentralize power under the guise of a decentralized technopolitical system?

We begin the article by contextualizing blockchain projects in the language of the post-political literature. After a note on methods, we analyze and discuss our empirical findings. In drawing the discussion to a conclusion, we return to the research questions, reflecting also on whether and how blockchain projects can avoid the "post-political trap" (Beveridge and Koch 2017).

The prefigurative post-politics of crypto-anarchists and crypto-institutionalists

Within the blockchain space, one way of understanding the different types of projects is by clustering them. Two higher level clusters of blockchain projects have previously been categorized as: crypto-anarchists and crypto-institutionalists (anon, forthcoming) (Husain et al. 2019a). The prior cluster denotes initiatives that use blockchain as government, while the latter use it in, for and with government. In this article, we will focus on the latter, crypto-institutionalists, which comprise predominantly of government-led blockchain projects. There are estimated to be more than 100 of such projects currently attempting to transform governmental systems in more than 40 countries (Jun 2018, p. 1). Moreover, IBM's executive report claims that 9 in 10 governmental organizations will invest in blockchain in 2018 and that "a group of government organizations are embracing blockchain technology to reduce frictions to innovation and information and facilitate more extensive collaboration", which will stimulate trust between citizens and government (IBM Institute for Business Value 2018, p. 1). Blockchain as, in, for and with government is, however, a highly contestable field of study – including, for example, in academic literature (Hawlitschek et al. 2018), online spaces (Slack teams

of various projects[17]), popular media (ConsenSys 2019), governmental reports (European Union Blockchain Observatory & Forum 2018) and even European Commission launched forums (European Commission 2019). This contestation, much of it surrounding blockchain's transformative potential, can be understood historically. Bitcoin (whose underlying technology is blockchain), for example, was launched in the midst of the 2008 economic crash and accompanying democratic crisis, as a response to the features of what is now commonly referred to as the "post-political condition". Bitcoin was to enable individuals to politically exit from the dominant financial system, while blockchain became the prospective 'liberator' from all other state and corporate run institutions (Atzori 2015).

While the precise nuances of the post-political condition are contestable, the general consensus is on the fact that the genuinely political has vanished (Mouffe 2005; Žižek 2008; Rancière and Corcoran 2010) and "the parameters of political discussion and political action have narrowed to preclude alternatives to neoliberalism" (Beveridge and Koch 2017, p. 33). Swyngedouw, following the post-foundational theorists like Badiou, Mouffe, Ranicière and Žižek, explains that the post-political:

> "refer to a situation in which the political – understood as a space of contestation and antagonistic engagement – is increasingly colonised by politics – understood as technocratic mechanisms and consensual procedures that operate within an unquestioned framework of representative democracy, free market economics, and cosmopolitan liberalism" (Wilson and Swyngedouw 2014a, p. 6)

While this widely shared belief is useful in grasping the idea, it is the subtleties of post-political conceptualizations which arguably provide a more fertile ground to investigate blockchain projects. Mouffe believes that the hegemonic economic regime has not completely obliterated the political, but rather "repressed" it (Mouffe 2005, p. 18). She believes that there is an absence or lack of political channels that can challenge the "hegemony of the neoliberal model of globalisation" (Mouffe in Wilson and Swyngedouw 2014, p. 12). For Rancière, it is not repression, but rather, three types of "disavowal" that explain the post-political: archi-politics (closed communitarian groups such as nationalists), para-politics (where political conflict is reformulated to fit in the representative democratic system), and meta-

[17] Slack teams of Democracy Earth, Ashoka, Consul, Decidim and several others which requested for anonymity

politics (where politics is reduced to systemic governing of things rather than people) (Rancière 1999, pp. 60–95). Žižek adds another layer, by explaining that politics is not merely repressed or disavowed in post-politics, but "foreclosed"; it asks us to "leave old ideological divisions behind and confront new issues". In other words, for Žižek, the contemporary political system effectively places the genuinely political outside of the realm of possibilities.

In sum, we can see most of the post-foundational theorists believe that exercise of genuine political agency can only be from outside of the dominant institutional setting. Similar to the conceptualization of blockchain projects, the global socio-economic system seems to prefiguratively embody values and features of the post-political condition: global consensus, economic logic and depoliticization. In the language of blockchain studies, this could be rephrased as 'depoliticization by design'. In any techno-social system that is depoliticised by design, the "potentialities and plurality of agencies are reduced to the heroic, anti-heroic and demagogic" (Beveridge and Koch 2017, p. 36). For instance, in the blockchain space, crypto-anarchists consider Bitcoin as a technological 'hero', which (debatably) operates outside of dominant institutional systems of finance and economics (Golumbia 2015).

In fact, blockchain projects are polarized between those creating parallel systems outside the dominant setting (crypto-anarchists) and those providing efficiency gains within it (crypto-institutionalists) (Allen 2016, p. 4). Though very different political imaginaries guide these projects, both groups seem to depoliticise in some way. They share an appeal to, and utilization of, blockchain's oft-cited design principles: access, disintermediation, decentralization, empowerment and equality (Tapscott and Tapscott 2016). For instance, Bitcoin, as global cryptocurrency, is disintermediated from traditional intermediaries of the financial system such as central banks and stock exchanges. However, its so-called technological hero is an algorithm, which effectively depoliticizes its economy by automating it. There is no agent (governmental or otherwise) politically responsible for its fair functioning (at least, not yet).[18] Similarly, government-led blockchain projects that decentralize services, or disintermediate processes, by effect, also depoliticize them in that they 'foreclose' any possibility of an exercise of (political) agency. Hypothetically, by automating a governance service like a petition system using blockchain, it

[18] In blockchain studies, there is a growing body of literature around algorithmic governance. This is also one of the reasons why there is urgent call for regulation within the blockchain space, particularly with regard to cryptocurrencies.

could be argued that the political responsibility of the service is handed over to the algorithm. However, the political power could and would remain with the government in two ways: first, the government chooses the "affordances and constraints" and therefore, delimits an individual's agency by design; second, it leaves itself an affordance to choose or veto certain decisions.

This leads us back to our main question: with regards to government-led blockchain projects, is the post-political a societal condition or a politically contingent strategy to recentralize power?

Methods: digital ethnography and experts

The empirical data used in this article is predominantly the outcome of a three-year period of immersion in the spaces and practices of blockchain initiatives of the first author. Following a digital ethnography approach, we acknowledged that the "digital has become a part of the material, sensory and social worlds that we inhabit, and the implications there are for ethnographic research" (Pink et al. 2016, p. 7). The socio-political and innovation worlds of blockchain are, in part, so fast-paced because of their hybrid nature: geographical, temporal and practical obstacles are less of a hinderance because of the features and possibilities of the digital. Any developments within the field, whether narrative building, political actions, decision making, or planning, take place both online and offline. Hence, only a methodological approach that is responsive to this online-offline dynamic is appropriate and adequate for research in this space.

For this research, we began to search for the social worlds where blockchain innovation for political change was taking place. Unruh expounded that the concept of the "social world" refers to "a form of social organization which cannot be accurately delineated by spatial, territorial, formal or membership boundaries" but instead, by lines and channels of communication and interaction (Unruh 1980, p. 271). Hence, as digital ethnographers, we entered the hybrid (online and offline) social world of blockchain innovation to understand the communication norms, rules, networks, behaviors, activity infrastructures and operational structures. The socio-political worlds of blockchain and civic tech were located on team collaboration platforms such as Slack, online forums such as Reddit, blogs, social media platforms, conferences, Meetups, Github projects and hackathons. Their depth, interrelationships, networks and infrastructure were vastly diverse. While

there are many purely online data sources used, this did not replace gathering data from institutional actors and experts that were only accessible in-person. Different methods were used to collect data across the different sites, but were guided by: (i) 'everyday immersion routines' and participant observation (following debates daily); and (ii) participatory action (starting and contributing to online debates, conducting workshops, participating in hackathons and other long-term events). Data used for reflection was mainly in the form of:

1. Field notes and diary reflections: theoretical and praxis-based reflections engaging in many spontaneous conversations at blockchain events with practitioners, figureheads, government officials, coders, researchers and activists.

2. Online immersion routine (participant observation): daily and weekly involvement in forums and working groups; mapping and following the debates.
    - 6 team collaboration platforms (unnamed) and 4 Reddit Forums

3. Digital social archiving: data (mainly in the form of linked pages) formed visual mind-maps with descriptions and storyboards on software such as Pearltrees and Raindrop which are open for the public collaboration and recommendations.

4. Experts: reflexive and tailored interview methods (from semi-structured to informal) for consulting experts; recorded in audio and/or non-verbatim notes. Twenty-five semi-structured and informal expert interviews were used for reflection in this article. They were conducted at numerous events, meetings and forums occurring between September 2016 to August 2019. While the names of the experts are kept anonymous at their request, the geographical location of the events are included:
    - EU Parliament 'spotlight on blockchain' and relevant European Commission working groups at the Week of Regions and Cities (Brussels)
    - EU Blockchain Observatory discussion groups (Brussels)
    - Blockchain Pilots Netherlands (meetings) (The Hague, Amsterdam)
    - Dutch Blockchain Coalition (meetings)(Amsterdam)
    - Blockchain events in Amsterdam (Bitcoin Wednesday and misc. MeetUps)
    - Blockchain Live London – GovTech stream
    - Welsh Council for Voluntary Action (meetings and workshop) (Cardiff)
    - Satori Labs, (Cardiff)

- Ex civil servants in Welsh Government (Cardiff)
- Welsh Government Chief Technology Office (Cardiff)
- Decode (EU project – Amsterdam)
- D-Cent (EU project – Amsterdam)
- P2P Models (ERC Project – Spain/Online)

All this data was used in concert with an analytical frame comprising of three core themes: blockchain and government, post-political theory and algorithmic governance. For field notes, interviews and diary reflections: open coding according to grounded theory comprised of 'conceptual labelling' which later developed into the two clusters of blockchain innovation (crypto-institutionalists and crypto-anarchists). These higher-level categories were used to find relationships within and between projects leading to an abstract variation of axial coding, on paper. Furthermore, the most interesting data to analyze was nuances and divisions between the different social worlds of innovators which would rarely interact with each other. The use of the same terms and language (such as decentralization, disintermediation, access etc.) with completely different meanings added a layer of complexity which prohibited us from using traditional forms of coding. Interviewees and forum/team participants were asked to reflect on patterns and categories to validate and cross-check the inferences.

Discussion: the empirical puzzle of post-political blockchains

In their critical commentary of post-political thought, Beveridge and Koch explain how "there is a problematic understanding of the relation between the 'political', process of depoliticization and the empirical effects of depoliticization" (p. 34). As asserted earlier, the 'truly political' supposedly lies outside of the dominant institutional setting, and thus, only projects that subvert the established system merit this status. Accordingly, the 'political' is seen as an ontological category that constitutes, defines and structures 'politics', the everyday conflicts and struggles of contemporary society. 'Politics', is then, the ontic appearance of the 'political'. Accordingly, if these two concepts "do not belong to the same analytic register", it becomes very hard to empirically assess "the radical or emancipatory quality of actually existing politics by comparing it to philosophical arguments about a distinct definition of the political as an ontological category" (Beveridge and

Koch 2017, p. 35). Instead, they argue that "post-politics or depoliticization is an empirical puzzle and should be treated accordingly" (Beveridge and Koch 2017, p. 36). The following discussion uses government-led blockchain projects as the point of entry to help decrypt the empirical puzzle of the post-political.

Shrinking political agency by algorithm

There is a growing body of literature that refers to algorithmic governance as a technological mode of governance that leads to the formulation of political practices (Introna et al.; Rouvroy and Stiegler 2016; Introna 2016; Bellanova 2017). These scholars engage with the strategies that lead to new forms of decision-making and governance through algorithms. They identify how code, data and technical infrastructure (software) are core features underlying the new modes of governance (Boyd and Crawford 2012; Kitchin 2017; Coletta and Kitchin 2017). These studies claim and explain how algorithms form new affordances and constraints, new modulations of command and control, and new processes for political engagement and subjectivation. Ontic politics, in this domain, is the study of how a citizen's political agency is produced within an algorithmic institutional setting. Critical theorists in this field align themselves with post-foundational theorists, claiming that algorithmic governance essentially entails the depoliticization or subjectivation of the political sphere. For instance, Rouvroy claims that algorithmic governmentality constitutes the disappearance of the political subject (Rouvroy and Stiegler 2016), where individual agency is subjugated by data metrics such as norm, consensus drivers and protocols.

As Lessig asserts, algorithmic governance signals the ascendance of technopolitical infrastructure over normative and judicial infrastructure (Lessig 2008). Accordingly, "code has progressively established itself as the predominant way to regulate the behaviour" (De Filippi and Hassan 2016). With blockchain and smart contracts, some scholars see a shift from 'code is law' (code has the effect of law) to 'law is code' (law is actively being defined as code). While the judicial system is enforced "ex-post" (after the event) through state intervention, algorithmic systems enforce it "ex ante" (before the event) through code (De Filippi and Hassan 2016). This sort of "power through the algorithm" (Lash 2007) prefiguratively determines what is and is not allowed, where the government could remove the possibility of disobedience altogether (Beer 2009). For instance, several governments[19] are

[19] India, Sweden, U.K., Ghana among others are launching pilots and experiments. For instance, refer to (Green 2019).

experimenting with a land registry system on the blockchain, which would use smart contracts to "increase transparency, speed and trust in property transactions" (Mari 2019). Taking the case of Georgia, the National Agency of Public Registry (NAPR) regulates all property transactions in that the blockchain is "private with regards to who can validate the transactions"(Allessie et al. 2019, p. 19). Though the transparency of this system leads to security and reliability of land titles, it also implicitly means that the only actors with an affordance to commit fraud is NAPR itself. A case study by the JRC shows that the project "does not provide any disintermediation of organizations nor replaces any existing system" (Allessie et al. 2019, p. 20). Thus, it is safe to assume that while political disobedience is prefiguratively constrained by the algorithm, political power remains with the same actors. Political power is effectively recentralised under the pretence of a decentralized governance system.

Data arising from our own empirical research further supports the claim that most crypto-institutional projects have similar aims. One interviewer explained that blockchain from their government's perspective is not experimented with to alter power relations or decision-making procedures, but rather "automate" processes that no longer require "politicians to be responsible". Another respondent reiterated "efficiency gains and cost-cutting" are the primary reasons for experimenting with blockchain, rather than "altering political agency of citizens". Similarly, our interactions and immersion in the world of 'GovTech' (tech for government) at conferences and online spaces, highlighted analogous themes of 'handing over responsibility', 'algorithm-ing', simplifying and enhancing political processes. These intentions and themes, albeit not always explicitly, nor with bad intentions, pointed in the direction of depoliticization as an active strategy employed by governmental actors.

Meta-political reduction to economic order building

Earlier, we mentioned how the dominant economic regime has repressed, disavowed or foreclosed the political from being actualized in the post-political condition (Rancière 1999; Žižek 1999; Mouffe 2005). Similarly, we can note that post-politics in "institutional terms is defined by the reduction of the political to the economic – the creation of 'welcoming business environment', which inspires 'investor confidence'" (Wilson and Swyngedouw 2014a, p. 8). A prime example of this logic is Estonia's e-residency program (Sullivan and Burger 2017; Heller

2018). Estonia is regarded as the pioneer in e-government leveraging blockchain and other emerging technologies for managing public affairs. Within their multiple programs, e-residency is "essentially a commercial initiative" that functions as an "international passport" to the virtual business world for anyone to carry out commercial activities (Sullivan and Burger 2017). "Like citizens and residents of Estonia, e-residents receive a government-issued digital ID and full access to Estonia's public e-services. This enables them to establish a trusted EU business with all the tools needed to conduct business globally" (Republic of Estonia 2019). In this scheme Estonian authorities hold and control data, and arguably use e-residency as a "tool for exerting power as knowledge" (Björklund 2016). We gathered data to understand the affordances and constraints that the e-residency would impose and how it would regulate the behaviour of an individual. This data was tabulated and fit into the patterns identified within the crypto-institutional space. Furthermore, it also offered cross-validation for the categories assigned to identify differing political imaginaries (anon, forthcoming).

Our expert interviews and conversations with crypto-institutionalists, as well as document analysis of vision statements and white papers, show how the Estonian digital project allows for an efficient acceleration of global economic order building. Interviewees were presented prompts about e-Estonia (and other crypto-institutional systems) and were asked to reflect and debate these statements. These corroborated patterns identified from the immersion and digital ethnography of the crypto-institutional space. We found that the Estonian experiments fit neatly within the category of crypto-institutional projects where there is a recentralization of power through data management. Moreover, decision making power and political processes are relatively unchanged, albeit more efficient and easier. The project may claim to transform political agency of the citizen, yet, our findings failed to demonstrate any systematic way this was taking place. With regards to the changing role of the citizen or resident and enable more participation, our findings resonated with others claiming that citizens are depoliticized and transformed into passive "consumers" of governance services (Karakaya Polat and Pratchett 2014). We learnt that majority of the 'benefits' for e-residents are economic, and, as such, allow an easy, reliable and geographically neutral entry into the EU economy through Estonia.

The Estonian example shows us how a national government can use a post-political blockchain strategy to simplify bureaucratic procedures, open up new markets, and create global consensus. Furthermore, it opens up its borders for business,

thereby depoliticizing many local economies where place-specific norms, cultures and political structures would have inhibited particular businesses from forming. While interviewing officials from two national governments (Wales and The Netherlands), we found that the intention of both their offices to use blockchain was indeed to create efficiency and speed up bureaucratic processes. Similarly, the delivery of a workshop at a national third-sector institution (anonymous, in Wales) on collaboration through the blockchain resulted in a Q&A session on the potential efficiency gains for internal management via the blockchain. During another workshop, an expert running several blockchain pilots explained how it takes a lot of cross-departmental collaboration and "traditional project work" to actually implement solutions which would change "anything political". Emblematically, the JRC even states that "contrary to how it is often portrayed, blockchain, so far, is neither transformative nor even disruptive for the public sector" (Allessie et al. 2019, p. 7).

Crypto-institutionalists show us how it is possible to utilize the hype around blockchain's transformative potential to reinforce and enhance economic order building and representative democracy. As Atzori points out, democratic transformation cannot simply be "consensus ex post, typical of decentralized networks" since this would require "adequate quality and extension of participation, consensus ex ante and legitimacy of procedures, protection of minority rights, freedom of participants, and again equal opportunities of access to decision-making" (Atzori 2018, p. 58). Furthermore, she argues that even governments that "cluster around specific interests and temporarily agree on a common set of (algorithmic) rules", depoliticize the space for transformative change. Most of the crypto-institutional strategies and rhetoric researched for this article are used to not only reinforce the processes of depoliticization of the socio-economic apparatus, but also, to structurally bound citizens from disobeying or opting for a political exit (Allen 2016; Markey-Towler 2018).

The absence of collaboration in the 'political'

The research underpinning this article began by examining the different citizen-led movements that were working to create and experiment with technologies that transformed the democratic political process. Their efforts were perceived as being rooted in Europe's democratic deficit (Sánchez-Cuenca 2017), lack of participation and collaboration in governance (Parvin 2018), and more generally in political

apathy towards government. The radical municipalist movement (Weareplanc 2017) launched city-platforms for collaborative democracy, participatory budgeting, open consultation and direct democracy projects. In an earlier article, we called this phenomenon 'place-based civic tech': citizen engagement technology co-designed by local government, civil society and global volunteers (Husain et al. 2019b). We noted that "combining online tools with offline collaborative practices presents a unique opportunity for decentralization of power and decision-making" (Husain et al. 2019b). These initiatives attempt to transform the apparatus of the dominant system by working with it. In the blockchain space, we see some of the same rhetoric of the civic tech movement, but a completely different typology of projects. None of the projects in Jun's extensive survey of government-led blockchain projects, for example, explicitly leads to a change in democratic processes or participation (Jun 2018, pp. 3–6). Conversely, as another study asserts, blockchain experiments can even enable a sort of "technological populism" by exploiting "the rhetoric of empowering the disenfranchised through decentralized decision-making process, enabling anonymous of transactions, dehumanizing trust (trust in computation rather than trust in humans and institutions)" (Gikay and Stanescu 2019).

While carrying out our digital ethnography, by being involved in the online and offline social worlds, carrying out interviews, and attending various digitally mediated events, one of the predominant themes we noted was the complete separation of the crypto-anarchist projects (i.e. blockchain as government) from the crypto-institutional projects (i.e. blockchain in, for and with government). The paradox of projects operating in parallel planes sheds light on the power of the post-political condition. As asserted earlier, the post-political casts true political agency only on those acts that operate outside and beyond the dominant institutional setting. From this perspective, all crypto-anarchist projects would be genuinely political as they attempt to create new worlds as opposed to work within the established system. Mouffe would, we anticipate, disagree with this approach explaining that strategies to overcome hegemonic forces must engage with "visible nodes of power, which ultimately are apparent in existing institutions of politics" (Mouffe in Beveridge and Koch 2017, p. 37). If any blockchain approach fails in doing so, it denies the political potential and "reproduces the very post political condition it wants to attack – by not directly engaging with the institutions of power through which it operates" (Beveridge and Koch 2017, p. 37).

Two of our interviewees voiced the opinion that blockchain practitioners have several lessons to learn from the ethos and functioning of civic technologists.

Another one of our interviewees, who piloted several crypto-institutional projects, lamented about how actors from both sides of the spectrum wholly refuse any form of collaboration or cross-learning. Furthermore, this interviewee stated how some of the most fascinating and feasible political technologies will not make it to the mainstream precisely because of this absence in collaboration. Whereas we see the radical municipalist movement creating a "translocal geography of political action" (Husain et al. 2019b) in collaboration with local government, crypto-anarchists such as BitNation or Democracy Earth, seemingly rather create one without any established nodes of power (Sullivan and Burger 2017; Democracy Earth 2018). With regards to collaboration with these nodes, some scholars agree that conceptualizing the post-political as a 'condition' is politically disempowering, since it "denies the political status of less explosive forms of contestation" (Wilson and Swyngedouw 2014a, p. 18). It is through such experimentation that "new political formations will emerge" (Larner 2014).

The strategy of structures over agency

If the post-political is a condition that contemporary society endures, who are the agents that create and maintain it? According to most post-political thinkers, it would be the hegemonic forces of capital or the structures of representative democracy. This approach proposes that:

> Any transition initiative and governance arrangement are inevitably confined within – or dictated by – neoliberal and financialization market logics, which themselves resist their own transition. Institutional structures and socially innovative groups which do not – or insufficiently – challenge the larger political economy that frames social services […] will constantly find themselves interacting in post-political, consensus-oriented governance arenas' (Moulaert et al. 2018)

In the context of blockchain, it would be the algorithm that creates the institutional structures which would, or would not, challenge the larger political economy. Furthermore, this shows how governmental agents actively design and implement the algorithm, which then creates and enforces contingencies upon its users. Accordingly, we would agree with the critics who consider that post-politics as a field of study "is dominated by description of meta-level discourses and ultimately relies on the analysis of structures rather than agencies" (Beveridge and Koch 2017, p. 37). From our research, we learnt that there is a lot of misinformation about

the mysterious closed-door decision making and unchanging political agendas of both crypto-anarchists and crypto-institutionalist blockchain initiatives. In fact, any ontological claim about the 'political' when it comes to the blockchain space negates the plurality and reflexivity of the agencies that operate in the field. Given that business lobbies, banks, national governments and other institutional agents heavily influence the development of the field, we learnt through our interviews that a lot of the projects are unaware of what could be called their 'post-political' strategies.

When it comes to a using blockchain in, for and with government, the two different layers of agency are easier to identify than in the judicial-democratic system. There are those who create the technical design of the system i.e. governmental actors that set the affordances and constraints, and those that participate within this system of contingencies i.e. the citizen or user. While it could be argued that the affordances and constraints are structured by the post-political condition, in this early stage of blockchain experimentation, it is clear that it is being used as a strategy to recentralize power. As one of our interviewees put it, "there's no way government is going to let this be disruptive…ceding power requires someone to cede power to, and it's not going to be an algorithm". Our data analysis pointed in the direction that though the post-political may be a strategy for the governmental actors, it is an unchangeable, and indeed ex ante set of rules for the citizens i.e. a condition.

Concluding remarks: can blockchain avoid the "post-political trap"?

Our main research question for this discussion paper was whether all crypto-institutionalist projects are structured by the so-called 'post-political condition' or whether the post-political is it used a contingent political strategy to delimit citizens' political agency. Drawing on the above discussion of findings, our conclusion, in response to this question is that the post-political is a contingent strategy employed by crypto-institutionalists to depoliticize various politico-economic processes. However, perhaps a more troubling finding is that it a government-imposed blockchain architecture has the potential to create an algorithmically enforced post-political condition for the citizen. In this scenario, there will not even be the symbolic room we have in contemporary representative democracy for the 'political

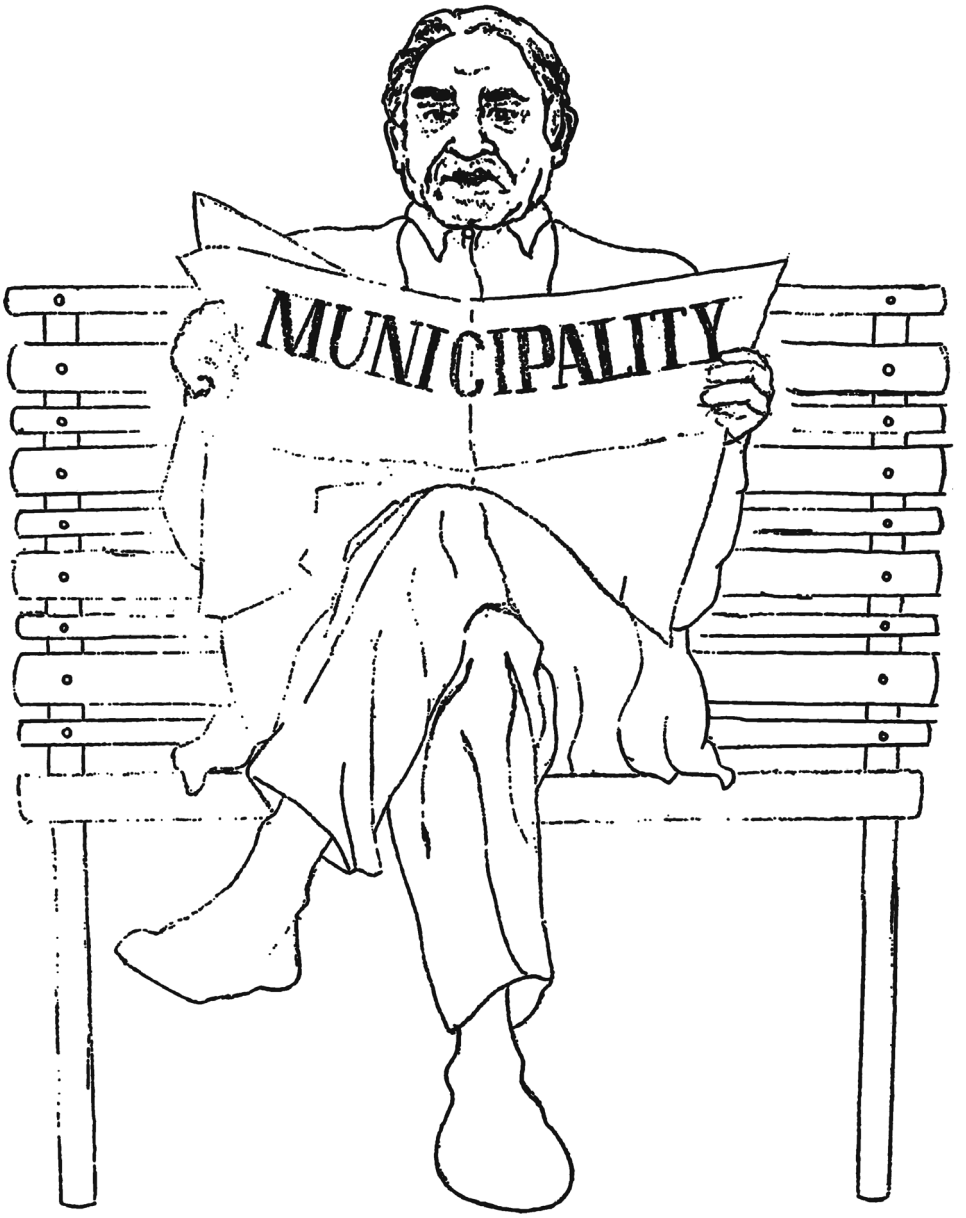
moment'. Our analysis suggests that this strategy of post-political is underpinned by an almost path-dependent idea of the recentralization of power. The above cited interviewee's comment "ceding power requires someone to cede power to" helps us, however, to outline some modest suggestions of how blockchain projects can avoid the post-political trap.

The Radical Municipalist and civic tech movement give us one example of how a translocal political network and local government can be operationalized to re-politicize some aspects and features of the socio-political system. In Madrid, for example, there was a self-organized and self-managing group of citizens, along with local government officials that eagerly accept the responsibility of processes such as participatory budgets, citizen assemblies, random election (Abati 2017; Garcia 2017) and founding the "Madrid Citizens' Council" (newDemocracy Foundation 2019). The political, in this space, is constantly being reconfigured and redefined to incorporate new affordances for the citizen; in the case of Madrid, for self-government. If the political imaginary underlying crypto-institutional projects continues to feature depoliticization, individualism, order building and global consensus, it becomes hard to imagine any technopolitical infrastructure enabling any sort of radical political transformation, at least with regards to a citizens' political agency. The fact, though, that we are still far from mainstream implementation of blockchain in government creates a space of hope by providing the opportunity to influence the design and implementation of the different solutions.

If we accept that blockchain, as a general-purpose technology, does have the capacity to be politically transformative, to redraw boundaries of access, empower the citizenry, create new forms of organization and re-politicise the economy, it becomes imperative for researchers, activists and governmental practitioners to collaborate in order to code new values into the architecture of these systems. Our interviewees all express the difficulty of fostering and scaling collaboration between different parties, explaining that it is necessary to be realistic about moving forward. Reflecting on our individual responsibilities and agency, it is necessary that we, as researchers and practitioners, not only analyze and contribute to the design of the crypto-institutional algorithms (i.e. the affordances and constraints they set), but also the meta-political narrative underpinning them (i.e. the political imaginaries underlying the various projects). Without investigating and influencing both, we fall into the post-political trap which focusses on structures and not agencies. One of the strategies that we explored during our research that ontologically reconfigured 'the political' was the collaborative effort through

the implementation of new 'politics' in the Radical Municipalist Movement (where citizens collaborated with the local governments and global group of volunteers to enable a translocal geography of political action). As Swyngedouw and Wilson exert in ending their book, the post-political conclusion is not an "invitation to ditch forms of institutional and political organization…it calls for a new beginning in terms of thinking through what institutional forms are required at what scale and what forms of political organization are adequate to achieve this" (Wilson and Swyngedouw 2014b, p. 309).

It is widely held that the politics and political imaginaries of blockchain require urgent cross-disciplinary attention to guide both conceptualization and experimentation (Dutch Blockchain Coalition; Atzori 2015, 2018; De Filippi and Loveluck 2016; Shermin 2017; Alketbi et al. 2018; Davidson et al. 2018). This discussion paper is a product of our interest in analysing blockchain in, with and for government through a post-political lens, tying together literature in blockchain studies and algorithmic governance spaces to post-political and post-foundational theory. Continuing to pursue the connections between these bodies of literature and practice together opens up an extensive research agenda regarding both the future of blockchain and study of the post-political.


MUNICIPALITY

Chapter 6

Decentralizing geographies of political action: civic tech and place-based municipalism

Abstract

This article introduces the concept of 'place-based civic tech' — citizen engagement technology co-designed by local government, civil society and global volunteers. It investigates to what extent creating such a digital space for autonomous self-organization allows for the emergence of a parallel, self-determining and more place-based geography of politics and political action. It finds that combining online tools with offline collaborative practices presents a unique opportunity for decentralization of power and decision-making in a manner which both politically motivates civil society and begins to update the infrastructure of democracy. The discussion is supported by a combination of primary and secondary data, with research methods including ethnographic and participatory observation techniques. Research data is drawn from a range of empirical sources, including an in-depth case study of the radical municipalist movement in Spain. The article concludes that there is a clear and compelling narrative of cities taking power back, in the form of a plural and globally networked movement. As such, this study contributes to both the theory and practice of civic tech, municipalism, collaborative democracy and place-based politics while emphasizing the need for further research on experiments and movements currently existing below the academic radar.

Keywords: Civic Tech, Decentralization, Open Source, place-based, democracy, political action, municipalism, radical, collaboration

This chapter is published in the Journal of Peer Production (JOPP) as Husain S.O., Franklin A., Roep D. (2019) Decentralizing geographies of political action: civic tech and place-based municipalism. https://link.springer.com/article/10.1007/s11625-020-00786-x

Introduction

Over the past few decades, governments have initiated hundreds of digital democracy experiments under the umbrella of what is called civic tech: digital tools for civic engagement and participation. These experiments are in part a response to claims of democratic deficit (Bekkers et al. 2007), collapsing trust in national governments (Friedman 2016) and civic disengagement (Wike et al. 2016). Technology that enables citizen engagement and participation has captured a lot of attention and is referred to with many different terms. E-democracy (Chadwick 2003), e-government (Layne and Lee 2001), open government (Attard et al. 2015), crowdsourcing democracy (Bani 2012), Govtech (Adler et al. 2017), smart government and smart specialization are some of the commonly cited phrases, to name but a few (Capello and Kroll 2016). This set of digital tools for democracy are primarily initiated by governments in an attempt to increase efficiency, transparency, accountability, and participation in political processes. Such ways of modernizing government and developing new applications has been the subject of intense study in academic research surrounding participatory and collaborative politics (Mellouli et al. 2014). To date, however, analysis suggests that the "hopes and expectations" of government and other government-sponsored initiators of digital democracy, have yet to be realized (Simon et al. 2017, p. 4). One of the major challenges is the fact that these digital tools regularly fail to achieve a critical mass of participants.[20]

In contrast to the relatively high level of attention afforded to civic tech developed by big companies and governments, to date open-source civic tech co-created or developed as part of a grassroots innovation or social movement has thus far garnered much less attention. Despite the existence of copious amount of such bottom-up activity within the open-source community, an academic understanding of how and why this tech is made and used, and its potential to bring about change, is lacking. By focusing specifically on this locus of activity, we seek to address this knowledge gap. In doing so, we distinguish civic tech that has been co-created and co-designed from the bottom-up by civil society, local councils and global volunteers by referring to it as 'place-based civic tech'. The core question this article aims to address is whether creating a digital space for autonomous self-organization (i.e. place-based civic tech) allows the emergence of a parallel,

[20] Information from a series of field notes at Open Government Workshops and semi-structured interviews with expert practitioners. For information on achieving critical mass as an integral part of the success of civic tech, refer to (Network Impact 2017)

self-determining and more place-based geography of politics and political action.

Though most studies exploring 'place-based civic tech remain outside the scope of academia, peer-reviewed research on other forms of decentralized approaches to policymaking is well established both from a grassroots and institutional perspective (Newig and Koontz 2014; Legard 2015). Moreover, any current deficit in the coverage of place-based civic tech from within academia, stands in marked contrast to the attention it receives from other sources. Popular media and non-academic articles, for example, widely and regularly report on the developments in this arena (Sahuguet 2015a; Troncoso 2018a). By situating this article at the intersection of these studies, we review the significance and implications of this grassroots approach for place-based politics and political action. Serving as a primary evidence base for informing our discussion is the case of a social movement in Spain which is integrally engaged with civic tech. The movement is collectively self-defined by its followers as 'radical municipalism'. By combining the use of place-based civic tech (online) and place-based organizational models for engagement (offline) the radical municipalism movement is seemingly successfully progressing its agenda; that is, to create 'radically democratic' (Weareplanc 2017) grassroots political processes which are fundamentally distinct from those of government. As such, we question whether radical municipalists are establishing a new place-based geography of politics and political action, but notably one which is simultaneously multi-scalar in impact and reach.

Critical analysis of the radical municipalist case supports a review of the extent and ways in which creating a digital space that feeds into and feeds off 'offline' activities, is capable of creating a unique mode of governance in practice as well as theory. In applying the above stated core research question to this case study, we are also able to address a series of supplementary questions. Firstly, in what way(s) do the distinctive characteristics of the radical municipalist approach – namely, co-design, co-ownership, trans-local collaboration, open-source and combination of online and offline activities – decentralize politics differently or more effectively than a government-led approach? Secondly, to what extent does this approach, in both creating and using digital tools, facilitate a parallel regime of place-based politics and political transformation? And thirdly, when and to what extent might decentralization lead to a more 'equitable' or 'inclusive' system of politics?

The remainder of the article is structured as follows: having first provided a note on method, we then proceed to reviewing the emergence and spread of place-based

civic tech. We are guided in doing so by drawing on scholarship which engages with municipalism. In particular, this includes the work of Murray Bookchin on libertarian municipalism and communalism. Having compared and contrasted this body of work with existing typologies of civic tech, we then focus in on the case of radical municipalism. We consider whether and how this place-based civic tech movement is proving effective in decentralizing, yet simultaneously also expanding the global geography of grassroots politics and political action. We conclude by directly addressing the questions outlined above and end by highlighting areas for future research.

Methodology – Beyond the Peer-Reviewed

Though there have been a surge of studies around the use of digital technology, an analysis of the geography of politics confirms that place-based civic tech is largely missing from academic literature. While some articles refer to municipalism and grassroots civic tech, the majority of reports are found in non-academic sources such as blogs, informal case studies, conference proceedings, hackathons, magazine articles, talks, MeetUps and documentaries. Most civic and emerging tech are such fast-paced fields that experiments precede in-depth study and writing. Therefore, it becomes essential to consult and draw from various sources which are not peer-reviewed or scholarly. Most of the non-scholarly textual sources cited in this article are from blogs and articles endorsed or written by reputable organizations and individuals in the field, classifiable in a methodological sense as expert informants.[21] For our research, we used ethnographic and participatory observation techniques to explore online environments. Researching online environments has become popular amongst social science researches owing to their "increasing importance in everyday life" (Kurtz et al. 2017, p. 1), and accordingly, their importance as sources of research material (Boellstorff 2012; Dumova and Fiordo 2012). Furthermore, from the earliest days of the internet, this has been used for community building, collective action and social movement organization (Harlow 2012; Soon and Kluver 2014). In accordance, however, with the need to remain mindful of the risks associated with the incorporation of non-scholarly texts, these sources have each been individually cross-checked with others for descriptive facts and for author bias (Boellstorff 2012; Harricharan and Bhopal 2014).

[21] For instance blogs posted by the P2P foundation or Nesta, reports from local councils and activists of the radical municipalist movement in Spain.

Alongside observing the use of online environments by others, the insights and reflections presented later in this paper are also a product of an amalgam of various other types of secondary, as well as primary data. Most notably this has included active participation in online discussion forums and slack team channels; and, participant observation at stakeholder events such as conferences, hackathons, MeetUps and workshops. The latter generated multiple opportunities for discussion and informal interviews with expert practitioners, government officials, open-source techies, grassroots innovators and researchers. However, owing to their briefness and often inappropriate context for audio recording, conversations are recounted non-verbatim from field notes. The insight and evidence obtained from these activities is used in concert with the other sources of data, to critically interpret the scholarly conceptualization of 'municipalism' and civic tech, as well as to develop a more nuanced understanding of the Radical Municipalist Movement.

Place-based Civic Tech & Conceptions of Municipalism

Civic tech has been used as an umbrella term to describe the range of digital tools that seek to transform the processes of democracy and initiate responsive and inclusive governance mechanisms (Gilman 2017, p. 744). As Gilman suggests, "some definitions of civic technology include for-profit entities while excluding publically funded projects or the role of government as an incubator and technology innovator" (Gilman 2017, p. 745). Though Gilman takes a deliberately 'narrow' definition of civic tech as "technology that is explicitly leveraged to increase and deepen democratic participation", all of the examples she cites can be seen as a response by the government to the public appealing against the problems of 'bad government' (Microsoft Corporate Blogs). By contrast, advocates and practitioners of place-based civic tech claim that it is amongst the responses by civil society to address problems of bad government, that far more significant developments in civic tech are to be found.

One of the distinguishing features of place-based civic tech – tech co-created and co-owned by its users – is that it is commonly engaged with by a larger and more diverse population.[22] Implicit within the movement of place-based civic tech is the notion that how, and by whom the tech is created, determines how it will be

[22] "The city council hosted several organizing events to decide on a strategic plan, and nearly 40,000 people and 1,500 organizations contributed 10,000 suggestions". (Stark 2017)

used. If platforms are created and owned by the government, the features of a platform will reflect those questions deemed most important for consultation on by the government. Contrastingly, if tech is created and 'owned' by citizens as part of the global open-source commons, it will reflect issues that are important to the residents of a place and global community. Furthermore, the trust afforded to a platform by the public and the way in which it is perceived, in terms of 'transparency, bias, privacy and accountability,'[23] may be very different in both scenarios. Public perception and usage is also seemingly influenced by the relationship between offline and online practices. To our understanding, online discussions and complex forms of participation are meant to feed into, and feed off of, the offline processes. For instance, a debate at a neighborhood assembly is informed by, and in turn informs, a decision taken on a corresponding digital platform. The extent to which this online-offline dynamic serves as a core stimulus for fueling the take-up and impact of place-based civic tech is something which we will return to later in this article, in connection with the case study of radical municipalism.

Accounting for the significance of both how the tech is made and how participation is enacted within a place necessitates that due attention is also paid to the dynamic of what we call 'translocal' collaboration. In this article, place-based civic tech is conceptualized in an unbounded way, whereby local activists, organizations, councils and citizens collaborate with the global open-source community and other local communities to create and use civic tech. The movement of place-based civic tech is thus simultaneously global and local, where different place-based movements are united in their diverse ways of practicing participatory and collaborative democracy. Adhering to principles of open-source, they are able to share ways of working and core values, all-the-while adapting the tech and political processes to their place-specific situations. Hence, it is not enough to simply conceptualize civic tech as constituting apolitical tools (Donohue; Knight Foundation 2013), which only embody a political imaginary through their use. Rather, we must acknowledge that the nature of its creation is a political exercise in itself, with this in turn to some extent determining what it will be used for, why, how and by whom.[24] Of direct relevance here is the work of Clément Mabi (Mabi 2017).

[23] These are some of the reiterated concerns and topics of discussion brought up in the online discussion forums and blogs.

[24] Along with the above studies which refer in particular to civic tech – the understanding of morality, agency and intentionality in tech has been a longstanding debate in the philosophy of technology. Refer to:(Stanford University. and Center for the Study of Language and Information (U.S.) 2009; Kelly 2010)

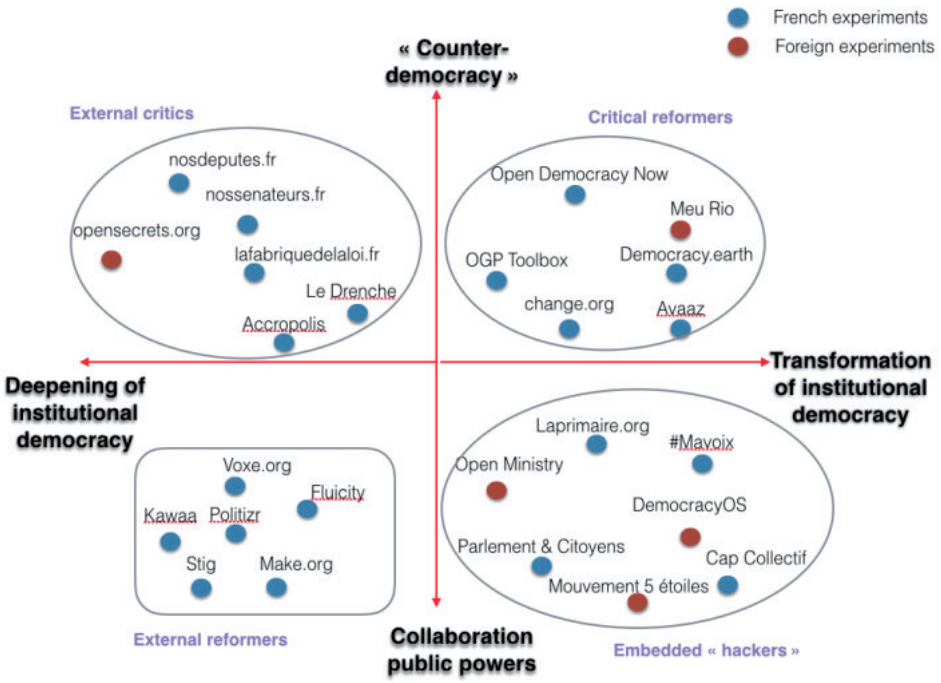


Figure 4 – Cartography of families of civic tech (Mabi 2017)

Sketching a "rough cartography of civic tech", Clément Mabi claims that instead of using the "classification of tools", we should be looking at the "political positioning of the technology" (Mabi 2017). Such a typology is potentially capable of supporting an understanding of how the tech is created and whether and how it enables place-based politics. Mabi's categorization is organized around two main tensions and the "proximity it maintains with public powers". On the vertical axis we find projects that seek to transform political institutions from the outside (counter democracy) and those that aim for collaboration with political institutions. On the horizontal axis, are the varying degrees of societal transformation that projects aim for – those that want to deepen existing mechanisms and those that want to transform them (see Figure 4). Mabi's typology identifies four clusters or families of initiatives and highlights their respective strategies and goals. The first of these, external critics, are those that focus on deepening representative democracy by increasing transparency of public action and circulation of information. One empirical example of this Regards Citoyens; this initiative uses a web platform that assembles data concerning the parliamentarians' activities, displaying it "in

the form of graphs to allow citizens to follow and evaluate the actions of their representatives" (Mabi 2017). The second cluster are external reformers. They are categorized by Mabi as pursuing the aim of enabling direct participation i.e. creating an interface for citizens and political institutions to collaborate through co-creation of public policy, action and education. These mainly include community intelligence platforms or decentralized policy making platforms (Bhagwatwar and Desouza 2012). The third cluster, critical reformers, are those who mobilize and organize civil society to exert "pressure on those who govern" (Mabi 2017). 'Platform cooperatives', are an example of critical reformers (P2P Foundation). A platform coop is "an online platform that is organized as a cooperative and owned by its employees customers, users, or other stakeholders" (Bauwens and Kostakis 2017). Finally, the fourth cluster identified by Mabi is embedded hackers – those who seek a systematic transformation by working within it, or "hack democracy" by taking responsibilities that are traditionally held by the state. Finland's Open Ministry (Avoin ministeriö) would, for example, fall in this final category, whereby citizens are allowed to propose law and projects directly. Considering these four clusters, the question they prompt here is: in what ways does each of the clusters imagine and seek to enable a different geography of politics and political action? And indeed, in which quartile might the radical municipalist movement of Spain fall?

Both the idea and practice of Mabi's categories of place-based civic tech can be related, to some extent, to the concept of municipalism. Municipalism has become a container term for a range of identity struggles, protests against certain economic policies and to "liberate daily life from the stultification of competitive logic" (Fowler 2017, p. 20). According to Fowler, it is a home for "the feminsation of politics, resistance to structural racism, the reprioritization of ecology, the reclamation of democracy, the protection of public services, opposition to the commodification of land… to name but a few" (Fowler 2017, p. 20). He explains that municipalism creates space for a "preguritive politics" in which the ends are embodied by the means. This 'New or Radical Municipalism' is about practicing socio-political processes like horizontalism, collaboration and radical transparency which, while constituting an "oppositional politics", also open up power structures in extant political institutions to make changes directly (Huan 2010, p. 8). The municipality becomes a self-organized entity capable of actively administrating the ideas and wishes of the local community. In the next section, drawing on the case, we reflect on how radical municipalism can be practiced via a combination of online and offline processes. For now, it is significant to reiterate that radical municipalism

as a movement is grounded in the idea of an unbounded translocalism, where diverse struggles and projects which are united in a "political culture" (Alamany et al. 2017) collaborate with each other to open up extant political institutions.

Synonymous with the idea of Municipalism is the socio-political ecologist Murray Bookchin. His concept of 'libertarian municipalism', "a social thought that is based on anarchist collectivism" (Miliszewski 2017, p. 15) gives a language to a diverse set of movements practicing direct radical democracy. Though most work on municipalism makes reference to Bookchin's philosophy, no academic research has previously used it as a frame to rethink the geography of place-based politics from a starting point of civic tech. In sum, libertarian municipalism describes "a directly democratic self-government, a political system that is based on radical decentralization and confederalism and supported by ecological philosophy" (p. 15). Bookchin asserts that "ecological dislocations," and the environmental crisis in general, are a product of social hierarchies. Furthermore, a radically decentralized, and communitarian "oppositional politics" would comprise of a "rigorous analysis of hierarchy" (Hern 2016, p. 178). Though Bookchin variously rebranded his political program as social anarchism, social ecology and finally communalism (p. 177), his core proposition remained the same: the city should function as a self-governing commune.

The base ideas of self-organization, collaborative governance and place-based political action are apparent in both Bookchin's political philosophy and place-based civic tech. In order, however, to establish the wider potential utility of libertarian municipalism as a conceptual frame for better understanding the transformative potential of place-based civic tech with regards to political action and decision-making processes, it is helpful to first further unpack some of its core component parts. According to Bookchin, under the model of libertarian municipalism each commune or city, would govern itself through a radical form of direct, face-to-face democracy, which much like the Athenian polis would function without any delegated form of authority. Though Bookchin advocates the idea of decentralized democracy, "arguing for local self-reliance and local democratic institutions" (Hern 2016, p. 178), his broader political program was confederalist rather than localist. As Fowler explains, Bookchin's vision is both "utopian and practical, short and long term" where the larger political project would culminate into a "global commune of communes" (Fowler 2017, p. 24). Notably though, is that Bookchin' idea is distinct both from a socialist state-led revolution and an anarchist anti-cooperation ethic. At the crux of his libertarian municipalist project is the need to "stop the centralization of economic and political power" and to "disengage cities and towns from the state

by mutually confederating with each other and developing some sort of network where resources can be moved back and forth" (Editors of Kick It Over Magazine 1986). Fowler contends that Bookchin resists the weaknesses of the historic and contemporary left, which disembeds politics from the everyday and confines it to a "negative, anti- and oppositional" position (Fowler 2017, p. 25). Instead, Bookchin's faith lies in the ability and desire of 'ordinary citizens' to participate and collaborate in political affairs that directly affect their communities.

David Harvey asserts that, whilst on the one hand, Bookchin's ideas are "by far the most sophisticated radical proposal with the creation and collective use of the commons across a variety of scales" (Harvey 2012, p. 85); on the other hand, a major obstacle is to figure out how such a system "might actually work and to make sure that it does not mask something very different" (p. 81). Harvey cautions that while radical "decentralization and autonomy" may seem worthwhile objectives, they are also "primary vehicles for producing greater inequality through neoliberalization"(p. 83). From his perspective, this place-based system of governance is not a necessary, nor a sufficient condition for an egalitarian society. Rather, class privilege could be reproduced in both a polycentric and place-based political system (Harvey 2012, p. 83). Harvey asks, "how can radical decentralization – surely a worthwhile objective – work without constituting some higher-order hierarchical authority?" (Harvey 2012, p. 84) In follow-on, it is similarly important to ask: in which ways does the place-based civic tech deal with the difficulties of equal opportunities within a place? And, if decentralization is not enough, which types of checks and balances can be set in place to make sure socially relegated voices are heard?

Core to the political system of libertarian municipalism is the distinction Bookchin makes between 'statecraft' and 'politics' (Bookchin 2000). Statecraft consists of the operations that engage the state – such as control over regulatory apparatus, governance of society with legislators, bureaucracies, armies and police forces. Contrastingly, politics is the "civic arena and institutions by which people democratically and directly manage their community affairs". Owing to the conflation of politics and statecraft, or administration and decision-making, decentralist politics is often constrained by an ongoing state of "serious confusion between the formulation of policy and its administration" (Bookchin 1995). As Bookchin explains:

> "For a community to decide in a participatory manner what specific course of action it should take in dealing with a technical problem does not oblige all its citizens to execute that policy" (Bookchin 1995).

As will be illustrated below, at times initiatives which fall under the umbrella of place-based civic tech seemingly practice both the co-determining and co-administering of policies. It becomes relevant to identify whether this is an unintended conflation or an intentional action, and moreover, to delineate the potential consequences this approach has on the geography of politics.

Fowler asserts that we can gain some conceptual clarity on Bookchin's ideas by locating them between the political writings of Simon Critchley and Slavoj Žižek. Critchley attributes the contemporary political dysfunction is rooted in the "motivational deficit" of the contemporary liberal democratic society and institutions (Critchley and James 2009). He claims that "the dissatisfaction of citizens with traditional electoral forms of politics and institutions has led to an explosion of non-electoral engagement and activism" that has been "politically remotivating"(Critchley 2007, p. 90). Critchley's idea of anarchic metapolitics offers an emotive understanding to the political motivation and mobilization behind radical municipalism and place-based civic tech as a response to a deeply felt injustice. In stark contrast, Žižek's political imaginary is of a "large-scale, wide-reaching, top-down, centralized policymaking and enforcement" which can counterpose the global and universalizing power of capital (Fowler 2017, p. 28). Hence, Bookchin's Municipalism can be located between these two poles, neither existing in the niches of society, nor establishing a global socialist state.25 Doing so in turn allows us to draw similarities with Arrighi, Hopkins and Wallerstein's world systems perspective and their concept of anti-systemic movements. They explain how it is no longer necessary for global social movements to be contained by the nation-state; rather, they can be transnationally organized as a network (Arrighi et al. 1989). For Bookchin, municipalities could function as nodes in a transnationally organized confederacy. The radical municipalist movement similarly evidences a particular transnational collaborative network which shares place-based civic tech, ways of working and practices of direct-radical democracy, albeit not in the form of a confederacy. Furthermore, the creation of open-source place-based civic in itself seemingly evidences a transnational collaborative effort.

[25] The credit for making this link remains with (Fowler 2017)

The Case of Radical Municipalism – An emerging geography of politics and political action?

In order to understand the particularities of a decentralized geography of politics realized through the utilization of place-based civic tech, a fruitful exercise is to analyze the most advanced experiments in the radical municipalist movement. Spain has been the both the initiator and reference point for the movement, as experiments in self-organization emerged all over the country. The scale of this movement first became publicly evident in 2011, when the Movimiento 15M, or Indignados, saw thousands of Spaniards occupying the squares. They were "mobilized by a generalized sense of frustration, indignation and impotency" that there was no socio-political or economic strategy to deal with the 2008 crisis which "prioritized the concerns of the population" (Castañeda 2012, p. 1).The resulting movement, later to be re-named by its proponents as Radical Municipalism, was self-organized by activists and ordinary citizens, using open-source civic tech, horizontal forms of participation and consensus decision-making.[26] The May 2015 municipal elections saw the mayors of Madrid, Barcelona, Zaragoza, Valencia, A Coruña, Cadiz, Pamplona and Santiago de Compostela elected through 'citizen platforms' (Garcia 2017, p. 463). These platforms are distinct political parties in that they use neighborhood assemblies (offline) and democracy platforms (online civic tech) to "decide everything from their policy agenda to their organisational structure" (Baird 2015). They mark a clear break from party-politics to what we can refer to as 'platform politics' of municipalist confluences (Rubio-Pueyo 2017, p. 8); it is the social movements and activists that own and run the platforms. Furthermore, many cities and municipalities in Spain (and around the world) adapted open-source democracy platforms to suit their place-specific requirements.[27] In effect, a movement of oppositional politics was seeded by "remotivated" civil society as a response to deeply felt injustice (Critchley 2007). Not only does this highlight the significance of understanding the online/offline dynamic of radical municipalism and how it is operationalized using civic tech; it also merits further investigation of the place-based nature of political organization.

In recent years, Barcelona's progressive system of politics and ambitious practices in decentralization has seemingly become a focal point of the germinating

[26] For an in-depth study of the history of the movement in Spain, refer to: (Rubio-Pueyo 2017)
[27] For an up to date list of municipalities where open-source platforms are being used, it is important to visit their websites: (Decidim; Consul 2019)

movement (Gellatly and Rivero 2018). As activists of Barcelona's platform, BComú (Barcelona in Common), write that the municipalist movement is addressing the global crisis of neoliberalism by defending an idea of "bottom up, feminist and radically democratic change" (Baird et al. 2016). Operationalizing everything from neighborhood assemblies to using digital platforms to crowdfund policies, their experience has arguably "become a model of political transformation". They explain that the 'Take back Control' slogan of Brexit and 'Forgotten Man' of Trump are not far removed from the 'Real Democracy' of the indignados or the '99%' of Occupy: "all speak to the desire for a break with the political Establishment and unfair economic system" (Baird et al. 2016). However, framing these desires through an international lens of nations "makes it easier for racist and xenophobic ideas" to emerge, "whereas locating sovereignties at local level makes this association more difficult" (Baird et al. 2016).

Barcelona's online platform, Decidim (meaning 'we decide' in Catalan) is considered seminal to the digital transformation taking place in the city's institutions, economy and politics (Ajuntament de Barcelona). Xabier Barandiaran, who heads the Decidim project explains that these platforms emphasize the "potential of technology to speed up and make possible a more complex participation". They gather collective intelligence from citizen experts through open meetings and workshops, and generate new political networks oriented to decentralized decision-making, commitment and accountability. These digital platforms are, by design, open, place-based and collaborative (Stark 2017). Accordingly, the aim and potential success of the movement relies heavily on not only the co-creation of civic tech by communities within the network, but also, on using it to change offline political processes and engagement to enable place-based political action. Another way of looking at this, is that the openness to collective intelligence of ordinary citizens through the platform evidences a "prefiguritive politics" (Fowler 2017, p. 20) in which the ends – a fairer and more inclusive political system – are embodied by the means – collaboration, transparency and horizontalizm.

Barandiaran and many others (see, for example, Pia Mancini (2014) and Jennifer Pahlka (2012), have emphatically claimed that the design and infrastructure of democracy has not been updated in the last two centuries, while socio-technical innovations continually disrupt our society. Online platforms such as Decidim can be understood as an infrastructural update. They aim to fill in many gaps that an outdated political system creates – the digital divide being just as big as the

rest.[28] Barandiaran states that these platforms address a series of significant socio-political gaps. Notably, this includes a 'precariousness gap' – people are too busy to participate in meetings; a 'cultural gap' – people do not have sufficient information and knowledge to contribute to policies; and, a 'gender gap' – women are often systematically excluded from public participation (Stark 2017). By designing the tech with the citizens, radical municipalists claim they are actively attempting to upgrade democracy for the networked age. Furthermore, the independent status of the platform gives the civil society faith in its transparency and accountability, while at the same time redefining the relationship they have with local government. The operationalization of the online/offline dynamic exposes the burgeoning administrative capacity for civil society and activists to self-organize, engage with local government and collaboratively and transparently make decisions concerning their communities. Arguably, this transformation of political practices within municipalities is part of a larger and more diverse story of collaboration where the tech itself is a product of translocal collaborations. For instance, Decidim (see above) and CONSUL – the two most used open-source platforms, are commonly free for anyone to download, change and use. They are constantly updated and worked on by a group of global volunteers (i.e. the open-source community), along with those based in Barcelona heading the project.

Most open source projects use the online platform Github to co-create. GitHub is a website and service that allows people from around the world to collaboratively work on projects. Very simply, it is a website for version control, meaning it manages and stores revisions of a project tracking contributions made by users.[29] As a report – GitHub: the Swiss army knife of civic innovation? – by Nesta states, Github has already been used in the civic space to manage and serve open data, collaboratively draft legislation and even to facilitate city procurement (Sahuguet 2015b). In essence, open-source civic tech projects put their basic idea on GitHub and volunteers from around the world help to make that idea a usable software. Furthermore, volunteers can also help update the software, write press releases and guides, make proposals for adding features and so on. However, the most unique feature is that they can 'fork'[30] and experiment, freely adding and subtracting

[28] For more information on the digital divide, please refer to: Pippa. Norris, Digital Divide : Civic Engagement, Information Poverty, and the Internet Worldwide (Cambridge University Press, 2001).

[29] For more information on GitHub, please refer to: (Finley 2012; GitHub 2016)

[30] Forking means to copy the repository and freely experiment and change it without affecting the original. For a more elaborate definition, consult: (GitHub Help)

features for their own needs. GitHub, and projects on it, seemingly constitute one instance of how decentralized global collaboration can impact a project rooted in a particular place. Moreover, it also reveals why place-based civic tech commonly being open source is seminal in both the spread and professionalism of the radical municipalist movement. If we accept the premise that the digital or online features of radical municipalism (i.e. administrative capacity to self-organize, transparency, accountability and collaboration) address the gaps Barandiaran talks about and actualizes a version of Bookchin's political imaginary, it becomes clear that the open source ethos has made a large contribution to the radical municipalist movement. Decidim has already been adapted to many different municipalities and continues to be 'forked' and adapted to place-specific feature requirements.[31] If it was not open source, each municipality would have to invest in creating and testing its own tech from scratch.

This open source tech is achieving substantial transformative change in the context of radical municipalism in Spain. Relevant here is the momentum that has been established from regularly bringing together online and offline collaboration exercises. Offline collaboration often takes place at international conferences and hackathons within and beyond the radical municipalist network. For instance, Inteligencia Colectiva para la Democracia or Collective Intelligence for Democracy was two-weeks of prototyping workshops in Madrid. Through these events ten multidisciplinary teams gathered, from across the world, to create projects around citizen participation and technology that enables responsive democracy (Medialab-Prado Madrid 2017). These projects were proposed by local civic activists, supported by institutional actors, after which a team of global volunteers came together to co-create them at the hackathon. They were presented at the Ciudades Democráticas conference in Madrid.[32] While the above was organized to create new civic tech, the ConsulCon was organized to help activists and mayors from around the world adapt and implement the open-source participation tool Consul to their place-specific needs (Consul 2017). Important to note here is that these events have a strong open-source ethos in that there is a unique culture of sharing, mutual aid, openness and peer-to-peer collaboration.

[31] Decidim and many other democracy platforms such as CONSUL and Democracy OS harness the simple infrastructure of the internet and employ decision-making tools to transform the interfaces between citizens and government, increase transparency, design accountability and enable self-organization and management.

[32] For a complete list of projects please refer to: (Medialab Prado 2017)

Similarly, Fearless Cities or International Municipalist Summit 2017 in Barcelona was a gathering of municipalist movements, building global networks of solidarity and support (Fearless cities 2017). Organized by Barcelona en Comú, the city' elected platform (BComú Global 2017), it was a showcase of numerous experiments, with civic tech taking power at a city level to empower citizens' movements worldwide. In some blogs, it was stated that the event was "the 'coming out' party for a new global social movement": radical municipalism (Reyes and Russell 2017a). The meeting brought together 700 mayors, councilors, activists, and citizens from more than 180 cities in more than 40 countries, across five continents, including representatives from approximately 100 citizen platforms (Gellatly and Rivero 2018). The belief that culminated into this summit, as well as prior mentioned hackathons, was that cities and towns "face adversaries who cross borders", this being a reference to the democratic deficit imposed by the dominant socio-political and economic system. Hence, the response must be transnational, in that "the municipalist movement must be internationalist" (Baird et al. 2016). In the context of this article, we conceptualize this as 'place-based political action must be global', whereby a geography of political action can be created as a product of solidarity, organization, cooperation and experience shared across national borders. Moreover, the rhetoric of both harnessing the power of local municipal governments and transnational networks is in keeping with Bookchin's idea of neither laying in the niches of society, nor advocating a global state apparatus. Accordingly, it illustrates how the radical municipalist movement – which refers to ways of working and harnessing the collective intelligence of activists and civil society around the world, more than a formal structure – lays emphasis on enabling new practices of collaboration and politics through collaboratively producing open-source civic tech, and place-based political processes.

Synthesizing Remarks: Decentralization, Independence & Equitability

To summarize the discussion thus far, for those who identify with the radical municipalist approach to the expansion of place-based civic tech, a purported common aim is to develop open-source digital tools which are co-designed, co-owned and co-managed by the users (i.e. citizens, local authorities, and a group of global volunteers). Furthermore, the political scale of implementation of online tools and offline processes depends on the needs of the particular neighborhood;

the places and scales of operation simultaneously become part of a global network of civic tech and municipal activity. Thus, despite the possibility and likelihood for local variation to be a constant feature of the ways in which these actors bring together, practice and situate their on- and off-line activities, they are simultaneously able to collaborate with each other on a global scale. Notable here is their default 'open-source' ethos, not just with regards to the technology, but also for sharing experiences, administrative and technical support, and toolkits for experimentation. Hence, the case of radical municipalism in Spain and its utilization of place-based civic tech suggests that the place-sensitive online/offline dynamic, open source ethos, and an 'oppositional politics' to the dominant political regime are the particularities of this geography of politics.

Turning our attention now to the second supplementary research question, concerning the independent system of politics, we begin by revisting the radical municipalist's claim to encourage the idea of self-organization and self-governance. The latter is pursued, not simply through a series of transparent commitments with local authorities, but also by creating spaces and opportunities for place-based civic tech initiatives to function and experiment irrespective of state involvement. Moving beyond the nation-state and 'taking power back' through radical direct democracy is a uniting theme in the radical municipalist movement. However, to what extent have towns, to paraphrase Bookchin, 'disengaged from the state and confederated with each other to decentralize economic and political power'? Advocates of radical municipalism are often questioned on the "level of responsibility" versus the "level of power" of municipalities (Troncoso 2018b). Joan Subirats, one of the founders of BComú, explains that responsibility is quite high in spite of the fact that power is quite low. This is one of the reasons BComú is trying to spread the municipal movement across Catalonia. However, local political intervention can also be carried out through a global network of cities. For instance, Barecelona, Berlin, Amsterdam and New York are making alliances against Airbnb (Largave 2017), while also creating fairer alternatives like Fairbnb, where the platforms profits are invested back into the community (FairBnB). BComú writes "given that we face adversaries who cross borders, our response must also be transnational" (Baird et al. 2016). As Subirats emphatically confirms, the municipalist movement need not "be limited by the idea that there are no legal powers" (Troncoso 2018b).

More provocatively, cities can also take political action by-passing their obligations to the nation state. An important example here, is that of cities which are willing to take in refugees even if the Spanish government blocks refugee entry. Cities

could unilaterally welcome a certain number resulting in a situation whereby they would be disobeying the national government, yet paradoxically at the same time, obeying the European scheme on refugee relocation (Troncoso 2018b). As Troncoso and Subirats agree, not only does this signal the relevance of transnational organizations like EuroCities which help promote learning and sharing between cities, but also new institutional arrangements and operational interfaces that circumvent the dominant policy regime (Troncoso 2018b). These initiatives further contribute to a translocal geography of political action. They show how politico-economic decision making can begin to be disengaged from the national powers and replaced instead by a coordinated effort with cities 'confederating' with each other on specific issues.

Considering such political action which bypasses the nation-state, radical municipalists also show how changes in the perception of power can lead to a form of translocal politics. This geography of politics and political action can be thought of as one that manages to channel the frustration and mobilization from the streets into the institutions and government, diminishing the idea that citizens and activists cannot enact political change. Seemingly, it is the conceptualization of radical municipalism as a "political culture" that enables it to be situated between the centralized institutional spheres and extra-institutional political organizing and protest movements (Caccia 2017). As writers of the anti-systemic movements would claim, it is precisely the fact that radical municipalists take their protest to the institutions, which opens up the possibility of overcoming the "noncontinuity of rebellion" (Arrighi et al. 1989, p. 29). Hence, rather than simply creating a 'parallel' political geography, we observe that radical municipalists aspire to create a significant, systemic and sustainable change by actively taking back control of their local institutions. They disengage from the national institutions, while simultaneously taking control of local institutions, by operationalizing translocal networks of solidarity, collaboration and sharing.

To what extent then, to return to our third subsidiary question, is the implicit aim of creating a more equitable system of politics achieved through practices which reunify politics with everyday life? Purportedly, as discussed earlier, this has achieved an actively engaged citizenry, mobilizing the voiceless and feminizing politics. According to the Mayor of Madrid, Manuela Carmena, for example, the radical transparency enabled by civic tech brings "psychological security…so that we are all constantly accountable for out political impulses". Transparency also provides fertile soil for debate and constructive politics, where responsibility

is distributed across society. The municipalist movement is one where "citizens become leading forces of change". At the 2017 Democratic Cities conference, in a discussion with Ada Colau, the mayor of Barcelona, Manuela Carmena expressed a desire to move beyond transparency and simple participation: "we must promote collaborative governance". They emphatically explain that this is a "moment to engage" where they must enlarge the participation processes and test "the co-production and co-responsibility of city commons".[33] Digital tools help create the organizational capacity, transparency, responsibility and commitment required for grassroots political mobilization. This also points in the direction of work done by GovLab's Beth Simone Noveck, on the need to break the professionalism of governance and allow the emergence of citizen experts (Fritzen 2017). She explains that we need to "tap into know-how" arising from "the collective intelligence of our communities", and accordingly, "draw power from the participation of the many, rather than the few" (Noveck 2016). Using the knowledge of citizen experts and reunification of politics with the everyday life are also essential features of Bookchin's idea of municipalism. Though digital tools can facilitate collaborative democracy, they cannot alone create the 'remotivated' society (Critchley 2007). With BComú's election, we see that a call for reunification of politics with everyday life also lead to a reversal in the vote share with 40% more votes from the poorest regions of the city. This could serve as an indicator of how engagement changes when local political decision-making and implementation of actual projects is opened up (P2P Foundation 2018).

Along with mobilizing ordinary citizens and giving a voice to the voiceless, Barcelona's municipal government makes claims of feminizing politics. As Laura Peréz, the Councilor for Feminism and LGBTI affairs asserts, "we don't just want one department designing policies against gender-based violence or specific policies and services for women" (Government of Change in Barcelona 2017). Rather, they want the approach integrated in all departments, where all citizens, activists and entrepreneurs of all ages and genders are included and accounted for in the design of policies, public services and infrastructure. As such, an important feature of feminizing politics is to bring empathy to governance. Colau (the mayor of Barcelona) herself claims that she aims to feminize politics, not simply by putting more women in office, but through striving to realign values and "by demonstrating that cooperation is more effective and enjoyable than competitiveness" (Burgen

[33] All the above quotations are from diary reflections at the Democratic Cities Conference Madrid 2017

2015).[34] For instance, Colau meets citizens in different neighborhoods around the city every two weeks where the elderly, immigrants and the youth can freely debate and criticize the actions and policies of government, while also planning the initiation of tangible projects. In doing so, Colau reportedly practices a feminized "political style" that "openly expresses doubts and contradictions"(Reyes and Russell 2017b) and begins with a politics that listens rather than confronts (Beatley 2017). As a report on municipalism explains, the appeal of her practices resides in the insistence on ideas of dialogue, empathy and a sort of collectively built leadership which in turn results in "the figure of a leader…as a shared symbol" (Rubio-Pueyo 2017, p. 13), as opposed to political representation. While we lack primary data to evidence these claims, it is worth noting that (at the time of writing) there have been 9036 proposals accepted on Barcelona's Decidim online platform; there are also a number of active assemblies, including one dedicated to voicing the proposals of the children of the city.

Conclusion

At the start of the article, we asked whether creating a digital space for self-organization allows for the emergence of a self-determining and more place-based geography of politics and political action. By critically reviewing the initiatives and practices of the Radical Municipalist movement, we have seen how collaboration, community, mutual aid, solidarity and political engagement have evidently begun to be rescued from political apathy lessening the precariousness, cultural and gender gaps identified earlier. Moreover, we can observe a shift in the history of disconnection between citizens, social movements and local governments which is a core feature of Bookchin's political imaginary. Notably, the online democracy platforms evidently create organizational capacity for self-organization and administrative capacity for sharing experiences and learning. Arguably, without the operationalization of civic tech, the transparency and accountability of political decision-making and impulses would not be possible in the same way or degree. In that, the spread of the municipalist network as diverse, yet united movements of direct, local self-government owes much to place-based civic tech and the global open-source community. It gives them a united front that operates below and beyond the nation-state. The online network and municipal confluences also

[34] For more information on feminizing politics, refer to: (Cillero 2017)

unbound the dichotomy of global-local by using a combination of subnational and transnational mechanisms.

Our conclusion is not that place-based civic tech, and the municipalist movement specifically, is radicalizing democracy. Rather, by finding a mix of old and new ways, it is holding the present structures and institutions of government accountable for their use of the concept of democracy. To respond directly to the main research question, it cannot be said that the digital alone creates the space for autonomous self-organization; rather the particular type of political processes that are implemented forms an integral part of a place-based geography of politics and political action. The case of radical municipalism is evidencing a clear and compelling narrative of taking power back in a plural and human scaled way (Burke 2016), which is empathetic, open, transparent and dedicated to uniting everyday life with political civic life. We ascribe part of the success of this movement to the incorporation of place based civic tech. This, together with its open-source ethos, broadens the organizational capacity and allows for the emergence new online/offline political processes by updating the infrastructure of democracy. The hope of radical municipalists is that it will result in a transformation of democracy, ushering in a culture of place-based politics and active citizenship through decentralizing the geography of politics and political action.

The furthering of this movement could be the rippling out of a proto-confederation or a politico-economic network that "disengage" municipalities from the national level, while fostering economic autonomy which could influence the next tiers of government. To return to the starting point of the article, there is a lot of attention given to collaborative democracy initiatives sponsored by the government. In contrast, we advocate for more interdisciplinary research which develops and encourages the decentralization of politics and political action and sheds light on the initiatives currently below the radar of academia. As a step towards this, connecting these political movements with other experiments in decentralization like blockchain, commons, and P2P governance is, arguably, a fruitful next step on the agenda both for research and practice of civic technologies.

Chapter 7

Discussion and synthesis: coding future technopolities

Introduction

Though the content covered in this study is relatively diverse and (necessarily) multidisciplinary, it is bound together by the core questions: how can and is emerging digital technology being used for transforming politics and political action? More specifically, how does the design and implementation of socio-technical systems influence the practices of politics? These overarching research questions inspired three further sub-questions which have been explored empirically in Chapters 4, 5, and 6 of this thesis. This chapter will retrospectively use these questions to reflect on the longitudinal nature of the entire research project. This involves not only reflecting on the theoretical and methodological connectivity of the three main chapters, but also using meta-inference to gain new insights and reveal future research agendas. Therefore, the next section briefly re-presents the background and triggers for the research questions, as well as a summary of the main findings from the publications. The following two sections delve into the broader theoretical and methodological findings and insights of the research. Both these sections discursively highlight how the general theoretical and methodological approaches influenced the output, findings, and results of the study. The theoretical section takes the findings and insights from general to specific by thematically clustering them under three main topics that constituted the foundation of the published papers: geography of politics and political action; political theory and practice; and technopolitical innovation. The chapter ends with some concluding statements, along with some recommendations for future research.

Background and summary of findings

As we saw in the previous three chapters, technology, and in particular, emerging technologies like blockchain have a burgeoning impact on how global and local politics is practiced. The predominant trigger and motivation for this research has been the absence of a thorough and rigorous understanding of contemporary 'technopolitics' – defined here as the relationship between digital technologies and political movements and transformations – within social science research. Furthermore, there is limited research previously conducted on the political implications of emerging technologies. That which does exist, lacks the empirical reflections that only surface through a longitudinal multidisciplinary study (Atzori 2015; Bollier 2015; Davidson et al. 2016; Mattila and Juri 2016).

In the initial period of immersion within the blockchain and civic tech world (2016), my search for conceptual frameworks and methodologies to guide empirical research was a demanding and meandering process. Though there were some clues from preliminary studies (e.g. (Atzori 2015; Wright and De Filippi 2015)), and disciplines of Human Computer Interaction (HCI) and Grassroots Innovation Movements (GIM), I progressively realized that these topics needed new cross-disciplinary iterative frameworks to guide both research and practice. I foregrounded the concept of prefigurative politics to create the foundation of my conceptual apparatus (as explained in Chapter 2: Prefigurative politics as a conceptual bridge builder). This was supplemented with conceptual tools and frameworks from post-political theory, libertarian municipalism, social ecology, critical geography, and Science and Technology Studies (STS). The study empirically investigated some of the most innovative socio-political processes and movements which utilize technology to allegedly foster political change. A hybrid form of digital ethnography was the main empirical technique used to apply the conceptual frames to the research question (which is discussed in detail in Chapter 3). The three publications built and applied conceptual frameworks, not only to empirically understand these processes, but also to critically engage with, reimagine and enhance them. Retrospectively, at each stage of the research, there were a number of triggers and puzzles, which were then transformed into succinct, theoretically-informed empirical studies (Table 8). These studies, in turn, allowed me to derive insights around technopolitical transformation in general and map out a cross-related thematic research agenda.

Table 8 – Retrospective research questions

Chapter	Retrospective theoretically-informed questions
4	How do the imaginaries of the creators influence what the blockchain projects politically change? Moreover, how can we design a framework to create more politically rigorous projects and open the existing ones to alternative imaginations?
5	Is there a way to situate government-led blockchain experiments within the frame of technopolitical transformation and post-political theory to understand whether and how they recentralize power?
6	Given the scale of the movement around civic tech why is it largely unexplored in academia? In that, what makes this 'collaborativist' movement different from the anarchist and institutionalist approaches? Where do we situate these initiatives in the larger scheme of technopolitical transformation?

The three questions set out in Table 8 were individually investigated in the published papers. A number of curious linkages, which were formed in the initial stages of the research, are developed further in this chapter. Actors from each of the three subject areas – blockchain projects in general (4), government-led blockchain projects (5) and the civic tech movement (6) – are all creating or using technologies that could change the way politics is practiced today (albeit not always explicitly). It is remarkable then, that these three social and political innovation worlds are so separated in practice. The question that this prompts is: whose and which contextual, socio-economic and political ambitions maintain this separation? Throughout the thesis, I have identified and analyzed these particularities, as well as how they are actualized in practice. This entire chapter is dedicated to addressing the missing links and potentialities between these worlds. Furthermore, this chapter elucidates the themes that bind the empirical chapters together. The synthesis map below (Figure 5) provides a visual aid that outlines how the main chapters were structured and how they are linked to each other.

The technopolitical innovations analyzed for this study can be divided into blockchain/DLT-based and open source civic technologies on the level of technical infrastructure. The prior cluster can then be sub-divided into two empirical clusters: blockchain projects in general and government-led projects. The latter mainly focused on what this thesis terms as place-based civic technologies. These three empirical clusters were addressed with specific research questions in the three empirical Chapters 4, 5 and 6. As explained earlier, all of the chapters are threaded together by the overarching question of how digital technology is and can be used to transform politics and political action i.e. (de)code and (re)code a technopolity (synthesis). Table 9 summarizes the three empirical chapters and their key findings. It begins to elucidate how the papers' findings substantiate and build on each other. This is followed by discussion which identifies, explores and analyzes the methodological, theoretical and meta-level linkages between the three chapters. This exercise, which is supplemented with tables and other visual aids, shows how the theoretical and methodological approaches are connected to each other and also how they acted as a scaffolding for the entire research process. Furthermore, it reveals how they were used to answer the main research questions, as well as a corresponding research agenda for future studies.

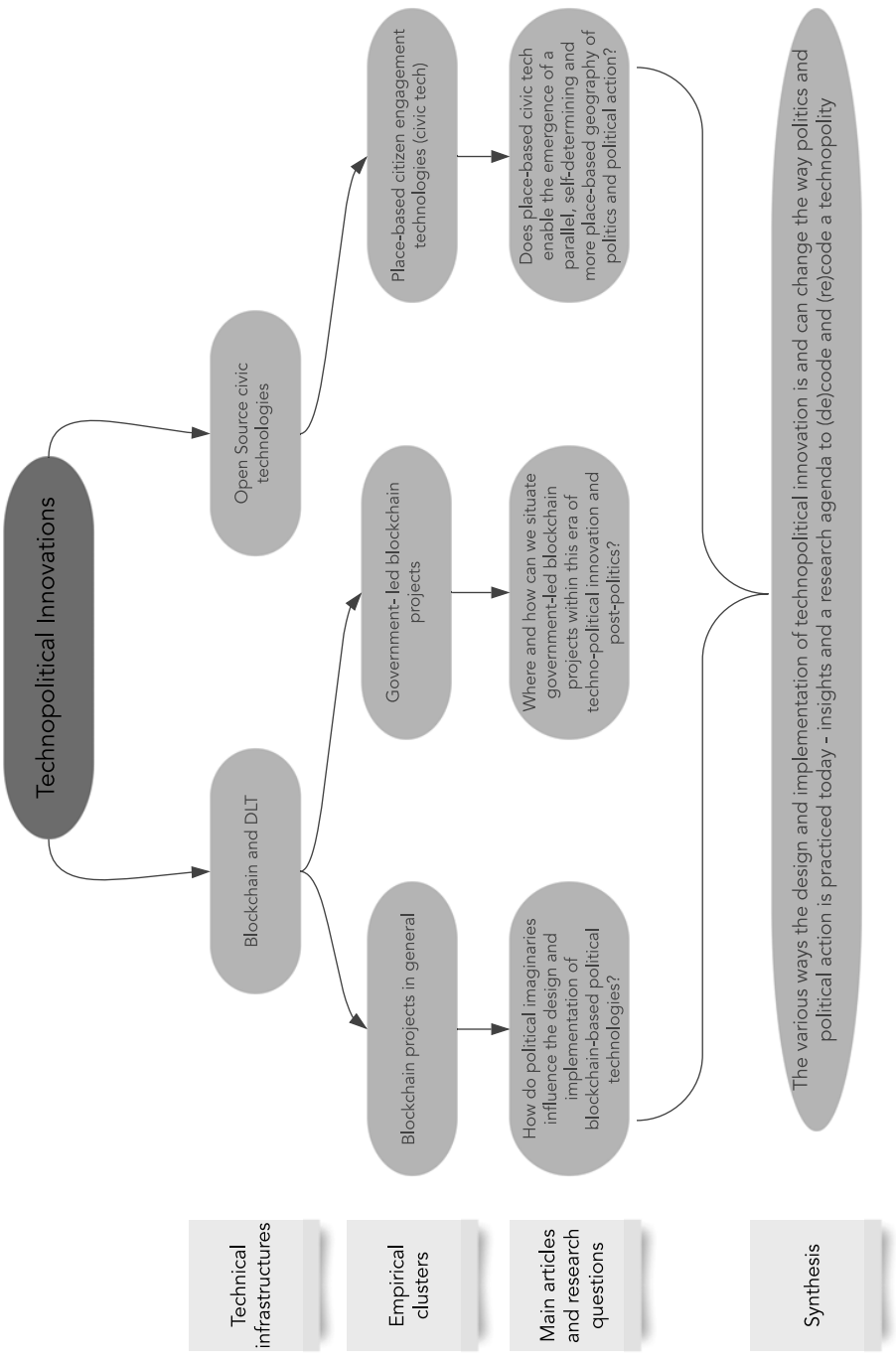


Figure 5 – Synthesis map

Table 9 – Summaries and key findings of publications

Chapter	Summary	Key Findings
4	This chapter creates a vocabulary and general understanding of blockchain innovations by deriving a framework that unpacks the political imaginaries underlying blockchain projects/ experiments in general. It also debates some of the most common misconceptions of blockchain's design principles. It finds and explains the idea that technology already embodies the political reality it attempts to enable i.e. it is prefigurative.	• Political imaginaries of blockchain projects determine the types of socio-economic and political actions that can emerge from, within, or on these interfaces. • Two higher-order clusters of projects are crypto-anarchists (new institutional arrangements) and crypto-institutionalists (updating old arrangements) • For technopolitical innovation to engender more accountable forms of trust and create a more politically equitable society, technopolitical imaginaries need to be rigorously analyzed. • Only after this rigorous analysis can technopolitical innovations open up to alternative imaginations.
5	This chapter takes the case of government-led blockchain projects to reflect on their transformative capacity and situates these innovations in the ongoing discussion of post-politics. The chapter concludes by articulating a call to not only analyze and contribute to the algorithmic design of blockchain projects i.e. the affordances and constraints they set, but also to analyze the metapolitical narrative underpinning them i.e. the political imaginaries underlying the various government-led projects.	• The chapter shows how the post-political is used as a strategy by governmental agents to impose an algorithmically enforced post-political condition for citizens • Blockchain projects can be considered to 'depoliticize by design', and hence, also re-politicize by design. • Regulating behavior through code can be used as a strategy for 'shrinking political agency'. • A post-political imaginary is formed by the idea of a recentralization of power, and repressing or foreclosing various types of collaboration like translocal geographies of political action.
6	This chapter focuses on the global civic tech movement's activity in Spain. It introduces the idea of 'place-based civic tech' as prefiguratively embodying a politics that is parallel, self-determining and place-specific. It looks at how technology has been created in a global political movement – radical municipalism – to decentralize power and political action. Many of the topics touched upon in the earlier chapters surrounding power, decision-making and political processes are addressed by looking at the case of civic tech. Most importantly, the case not only shows how the design and implementation of political technologies can be a collaborative process from start to finish, but also, that the political imaginaries embodied through a technology are crucial to engagement with the platform.	• The chapter coins the phrase 'place-based civic tech' as citizen engagement technology that is co-designed, co-owned, and co-managed by its users and a global open-source community • The radical municipalist movement creates a compelling narrative for a place-based movement creating a translocal geography of political action • Creating a dynamically online-offline space for self-organization enables cities to disengage from the dominant politico-economic regime while still engaging with local institutions that can give more agency to the citizen

Reflections on the contributions of a hybrid online-offline methodology

The main methodological approach used for all the data collection and analysis both online and offline was digital ethnography. Chapter 3 goes into great detail accounting for, and explaining, the process of selecting and applying individual methods used for empirical research in this thesis. Not only does it detail how and which data was collected, but in conjunction with the empirical chapters (4-6), it also highlights how it was analyzed and operationalized. In this section, I briefly reflect on what they collectively helped achieve with regards to advancements in knowledge (refer to last section in Chapter 3 for detailed reflections on data collection and analysis). The main methods and data types used for the empirical chapters are listed below:

Table 10 – Methodological approaches and data types

Chapter 4	Chapter 5	Chapter 6
Workshops		Workshops
Cyber immersion		Hackathons
White papers		Vision statements
Interviews (expert, political and practitioners)		
Online Relays (with social innovators)		
Digital ethnography (3.5 year immersion)		
Debate analysis (TCPs and online forums)		
Non-verbatim field notes		
Virtual archiving		
Participant action research at events		
Blog analysis		

Overall, data collection was an iterative exercise for this research, as each social world came with its own particularities. For the empirical research in Chapter 4, there were hundreds of projects that could have potentially been researched, and an active social world to be part of, both locally (in Amsterdam) and online. However, there was an absence of a framework to critically analyze their political implications and impact. The contribution arising from this part of the research

was the creation of a reflexive framework which allows both researchers and practitioners to identify and proactively analyze how their political imaginaries would be actualized through their project. In this respect, Chapter 4 is a timely piece considering the speed at which blockchain experiments are advancing. Using digital ethnographical and traditional data collection approaches proved most efficient for this part of the research, as the social world of blockchain was very welcoming in 2016.

For Chapter 5, the primary approach used to study government-led blockchain projects was to become immersed in the social and innovation world of institutional actors working with blockchain. This too, was a relatively convivial process considering the lack of experts in the field and the need for more research. Attending conferences, seminars, conducting meetings and workshops, interviews and so on, at European institutions in Brussels, as well as national institutions in the Netherlands and Wales, allowed entry into the institutional world of blockchain. Data collection from institutional actors exposed the lack of understanding about political theory and human geography in the space, and hence, the chapter was written as a reflection paper, backed by empirical research. Post-political theory allowed for an apt theoretical frame to reflect on why political transformation through blockchain is so difficult when led by institutions. Furthermore, Chapter 5 builds on the framework of political imaginaries and categories developed in Chapter 4, to better conceptualize both the nature of the post-political and crypto-institutional projects.

The civic tech and radical municipalist social world investigated for Chapter 6 was perhaps the most challenging to enter. It was comprised of a relatively small, globally dispersed and un-hyped world of activists, coders and local politicians who collaborated via hackathons, hybrid relays and online (e.g. on GitHub). Entry into this world was mostly through recommendations and building personal relationships. Another barrier to entry was the fact that the majority of this social world worked in Spanish and Portuguese, and most of the projects were implemented in the Spanish-speaking world both in Latin America and Europe. After investing time to first strengthen my command over Spanish, and making sure I was in multi-lingual teams participating in these events (both online and offline), I was able to progressively immerse myself in this world. Often, data collection both in the form of process diaries and interviews was challenging because of language barriers and cultural translations. However, as it turned out this actually ended up adding a certain depth to the data, as findings were corroborated by

various actors who helped with transliterating ideas. In other words, even writing the process diaries was a collaborative analytical process.

Overall, I can note that, to really employ a place-specific approach to the study, it was necessary to consult work on digital ethnography, since the 'place' was both online and offline. Translocal place-based innovation necessarily uses the internet in some way to collaborate. Within the spaces of technopolitical innovation, particularly blockchain and civic tech, empirical research without cyber-immersion would be shallow and inadequate. The criticism of using new digital approaches has been highlighted by many (Murthy 2008; Xenitidou and Gilbert 2009; Masten and Plowman 2010; Caliandro 2014; Ardévol and Lanzeni 2017). However, having been immersed in the blockchain and civic tech spaces for 3.5 years (inclusive often of actively participating in hackathons, proposal writing and debates myself), I observed that the social worlds of the internet are growing more and more influential in orienting the daily lives of innovators, decision-makers and politicians. While a lot of collaborative work is still conducted offline and in-person, there are numerous examples of activities that were only enabled through the internet. Such activities include, but are not limited to: translocal action plans (e.g. implementing citizen participation platforms like Consul in different municipalities across the globe); co-creating political software (e.g. civic technologies mentioned in Chapter 6, as well as blockchain projects that have globally dispersed teams mentioned in Chapter 4 and 5); consulting and working with online platforms for decision-making and project implementation (e.g. consulting democracy platforms for policymaking, or carrying out city projects, as well as carrying out participatory budgets with citizens and municipal governments). If more social scientists do not begin employing hybrid research techniques, academia will lose valuable data that could aid the theoretical and practical advancement of political transformation. Deriving from Pink et al., I can see how researchers must engage with a multiplicity of research sites, no matter how unconventional they may seem at first (Pink et al. 2016, p. 71). Furthermore, as highlighted in the last section in Chapter 3, the aim should not be to gain an objective understanding or simply validate assumptions, but rather, use a multiplicity of theoretical and methodological approaches (or triangulation) "as a strategy for justifying and underpinning knowledge by gaining more knowledge" (Flick 2004, p. 179).

General theoretical findings and insights

The conceptual approaches used to understand the phenomena of technopolitical innovation contributed to the design of the research questions themselves. Table 11 below lists the main concepts that were used in the individual papers, whereas, Table 12 tabulates how particular concepts molded research across the three papers.

As we see in Table 11, there is a significant overlap in the theoretical frameworks used in the three chapters. However, these, along with other conceptual molds were operationalized in different ways in each of the chapters. Moreover, understanding how the same concept was applied across the three different contexts exposes the inherent connection (or 'golden thread') that binds this thesis together: how different philosophical and political premises play into the design and implementation of technopolitical innovations. This also sheds light on the power relations of different stakeholders, economic and order building imperatives and global-national-local narratives of political change. Table 12 below explains how the different theories acted as a scaffolding which oriented the data collection, analysis, findings and insights of the study. They were not just a means to conducting the research, but also objectives of the research itself, where the empirical analysis was used to test and enrich various concepts.

Table 11 – Main theoretical frames of empirical chapters

Chapter 4	Chapter 5	Chapter 6
Transition and transformation theory	Post-politics	Place-based geography
Creative destruction	Prefigurative politics	Open Source Ethos
Prefigurative politics		Cartography of political positioning
Techno-determinism		Municipalism

Table 12 also explains how the theoretical framing that underpins all the papers relate to each other. For instance, the place-based approach is intrinsically linked to translocalism and municipalism in terms of political theory. A relational understanding of place allows us to identify and analyze how different cities and municipalities can develop ways of working and political processes in concert, effectively by-passing their national and regional levels. In that, a translocal political

movement, like Radical Municipalism is identified and understood as a place-based approach to political organization and mobilization. Furthermore, literature on post-politics helps us understand how such translocal technopolitical movements are reconfiguring 'the political' by re-politicizing fields of political action that were effectively depoliticized through technopolitical innovations. Table 12 gives us a clear idea of how the underlying mission of the project is a cohesive aim i.e. to understand how technopolitical innovation can transform the practice of politics. By giving a succinct overview of how different conceptual molds influence the research in the three empirical chapters, it also provides a springboard into discussing the major theoretical findings and insights of the entire project.

Geography of politics and political action

While up to this point, each of the publications has been dealt with relatively independently, the next sections cluster the findings and insights according to three main themes that stand out from the project. Doing so elucidates the novel theoretical contribution to the respective subject areas, new connections within the different fields, and the (potential) impact of the study on both the theory and practice of political transformation.

This section discusses how the relationship of geography and practice of politics was conceptualized and better understood through the project. Earlier, it was mentioned that the starting point of the discussion is that any civic or political technology has a geographical component to it. Not only could this be present in the design and creation of the technology, but also, in the use and operationalization of political practices. The main concern of the project itself was to better understand how both the design and implementation of technopolitical systems can enable new political processes. In the following, we will theoretically connect this concern to the different topics investigated in this research from a geographical perspective.

Collaborative innovation practices in the digital age

In Chapter 6, we saw how technology was co-created through a process of translocal/global collaboration. It was conceptualized as "place-based civic tech" where "local activists, organizations, councils and citizens collaborated with the global open-source community" to create and use these technologies. This

Table 12 – Concepts across research papers

Main Concept	Chapter 4: Political Imaginaries of blockchain projects	Chapter 5: Post-political trap	Chapter 6: place-base civic tech
Place-based approaches and critical geography	Using the relational understanding of places, how they are trans-locally constituted, allowed for a reflection on how different projects would be implemented. A place-based political imaginary in a blockchain project would necessitate that the initiative was responsive to the context-specific needs of a particular place. In turn, a place-responsive approach would show in the nature of the project (commons-based or profit-centered), scale (municipal, national, translocal or global) and governance (decision-making mechanisms and consensus). Furthermore, it aided in understanding how features like "Access, Inclusion & Empowerment" could be misconceived within a project.	The concept of place premises and deepens post-political theory by providing another angle on concepts such as depoliticization, shrinking political agency and collaboration practices. In conjunction with an understanding of political imaginaries from chapter 3, we can note how 'place' is operationalized as a strategy to delimit a citizen's role as a political agent. For instance, if a crypto-institutionalist project creates a techno-social infrastructure that operationalizes decision-making processes at a national level, it also redefines and restructures how politics occur on a place-based, translocal and municipal level. Furthermore, it sheds light on how place-based rhetoric present in national and European policymaking is used as a guise rather than a rigorous frame that structures 'the political'.	The relationality of place is central to the findings of 'place-based civic tech' which is construed as a translocal movement co-designed by local government, civil society and global volunteers. It uses 'place' to conceptualize this "digital space for autonomous self-organization" and critically questions "the emergence of a parallel, self-determining and more place-based geography of politics and political action" (p.98). It links to the other papers by exposing how technology with a place-based imaginary is part of a translocal political movement and is implemented to enact political transformation.

Table 12 continues on next page

Table 12 – *Continued*

Main Concept	Chapter 4: Political Imaginaries of blockchain projects	Chapter 5: Post-political trap	Chapter 6: place-base civic tech
Prefigurative Politics	The idea that digital technology, and in particular politico-economic technology, personifies a 'prefigurative politics' by design is a fundamental and long running premise of all three of the published chapters. This chapter shows that all blockchain projects "embody the politics and power structures they want to enable in society" and how these "affordances and constraints" they set are determined by the "underlying political imaginaries".	This chapter builds and tests the concept of prefigurative politics by using the case of government-led projects to show how hard-coding allowances and constraints within a system will regulate political agency and even influence behavior of citizens. It reflects on how the metapolitical narrative or political imaginaries impose a post-political 'condition' on citizens prefiguratively. In that, a political agent, is effectively depoliticized by algorithm.	This chapter shows that the concept of prefigurative politics extends to all sorts of digitally mediated processes, including platform cooperatives and citizen engagement technologies. It uses the concept to show how the ways in which the "ends – a fairer and more inclusive political system – are embodied by the means – collaboration, transparency and horizontalism".
Techno-determinism	Techno-determinism highlights a key stance that this thesis takes with respect to technology. This chapter sets the scene for the next chapters concerning this concept. In sum, the thesis is opposed to the idea that social relations, organizational structures and cultural practices are a product of a society's techno-political and economic infrastructure. It holds that our efforts and choices of designing and using particular systems are deliberate and enable specific socio-economic realities.	This chapter asserts that the deliberate choices that policymakers and governments make while designing and implementing infrastructures can in turn delimit the political agency of a citizen. However, the key takeaway is that, as citizens and users of the technopolitical infrastructure, we are actively choosing to be part of these systems. A crypto-institutional project, instead of a crypto-anarchist project, will only perpetuate the mainstream through majority use.	The civic tech movement shows how technology for citizen engagement can be co-designed by local government and citizens in a reflexive and dynamic way. This sheds light on how the separation between the crypto-anarchists and crypto-institutionalists sets "affordances and constraints" that are more strict and deterministic, since they are not collaboratively built and managed. Furthermore, it highlights the point that no technopolitical innovation will automatically gain enough traction to perpetuate the mainstream on a city-municipal scale without a corresponding (grassroots) political movement.

Post-politics	The post-political condition is one in which the political agent is depoliticized through global consensus and order building. This framework shows how historically cypherpunk or anarchist ideas of 'decentralization' and 'disintermediation' can be operationalized with a strategy of depoliticization. It shows 'law is code' (De Filippi and Hassan 2016), implying that an algorithm can 'dehumanize trust' and effectively eradicate 'the political' arena altogether: it is no longer possible to disobey the system. This entirely reconstructs ideas of access, inclusion or empowerment through a technopolitical infrastructure.	This chapter uses post-political theory to investigate the transformative capacity of government-led blockchain experiments. It uses concepts of prefigurative politics and categories of blockchain projects, built up in the previous sections, to understand the nature of 'the political'. Moreover it addresses one of the foremost debates in post-political literature: whether the post-political is a condition or contingent strategy deliberately imposed. It also uses concepts built up in Chapter 6 to provide an alternate understanding of how innovation can be carried out.	This chapter empirically shows how different concepts in this table have been applied in translocal socio-political movement. This shows how there are ways to avoid the 'post-political trap' which featured in Chapter 5. It also sheds light on one of the major insights of this thesis: that collaboration between institutional and citizen-led clusters of blockchain projects is a powerful and compelling route to political change.
Translocalism and municipalism as political theory	While there is no explicit mention of either of these concepts, this chapter gives examples of how political imaginaries of different projects will be operationalized at different scales. For instance, transition theory and peer-to-peer governance highlight how we can conceptualize blockchain projects which will work to employ translocal strategies to socio-political change.	The Radical municipalist movement, a translocal political movement, shows how a "re-politicization" can occur in the "contemporary post-politics". Municipalism and the civic technologies it uses provides us with an example of how "the political" can be reconfigured to allow for more "affordances and constrains" for the citizen. This can also be tied to Chapter 4, where political imaginaries of crypto-institutional projects would need to operationalize a more innovative understanding of the scale of politics.	Chapter 6 builds the vocabulary and provides the empirical data of the Radical Municipalist Movement in Spain and beyond. Furthermore, it conceptualizes "place-based civic tech" as a municipalist political technology which enables a new narrative in post-politics.

movement was, thus, simultaneously global and local. For this to be possible, various new ways of working and collaboration needed to be implemented. Digital collaboration, whether through the use of team collaboration platforms like Slack or development platforms like GitHub, was carried out, irrespective of geographical location and national affiliation. This provides us with several insights on the nature of collaboration itself in the digital age.

Remote teams that were studied during the course of the research were not only spread across the world, but they were also using new 'ways of working'. Irrespective of what types of civic or political technologies they were building, teams were faced with certain challenges which they dealt with through deciding patterns: "common design elements you can draw on as you construct a recipe that's right for you" (Bartlett 2019). These patterns could, for instance, include liquid leadership (Szollose 2011), the structure of open cooperatives (Pazaitis et al. 2017), or decentralized patterns like those of the Enspiral Network (Irving 2015). However, we also learnt that many forms of digital collaboration involved an iterative process of deciding how to collaborate geographically. While participating in the Social Innovation Relay organized by DRIFT and SIC, for example, participants met for a one day in-person workshop which was followed by online collaboration for over two months. This new way of working enabled by-passing of issues of geographical proximity in creating, assessing and implementing various plans with the aid of the digital.

One of the major findings with regards to collaboration in the digital age was that it was not simply the patterns, geographical location of the team, common purpose or motivation, that allowed for innovative forms of collaboration. The uniqueness of these emerging forms of collaboration is the fact that all the elements form a symbiotic relationship with each other that is uncommon in other forms of innovation. Moreover, we noted that the ways of working, products, and operational paradigms were often value-driven. In basic, this meant that teams would collaboratively set out certain values which would guide they entire process of innovation and creation. While this will be further reflected upon in later sections, a key sight with regards to geography of politics and political action is that new forms of digital collaboration allow for values to take precedence over geography. In other words, place-based and local innovation no longer needs to be carried out only in particular geographical places. Instead, technopolitical innovations can employ a prefigurative strategy to operationalize a 'value-driven' geography of political action. This also means that collaborative innovation practices are

unbounded in a geographical sense, where national, regional or local narratives, norms, cultures and modalities are not alone in deciding the aims and purpose of the innovation. This was evident in the examples of place-based civic tech, particularly Consul (Consul 2019), where the radical municipalist movement spread to some cities in Latin America from Spain even though there might not have been such a movement in neighboring cities or even countries. It was these sort of insights that helped us conceptualize place-based, translocal political movements in Chapter 6. Furthermore, it is also these insights which give us a glimpse at how various actors like governmental agents, innovators and citizens can actively take part in collaboration activities that enable political change.

Hackathons and civic tech

Much like many of the collaborative innovation practices, hackathons present us with an interesting case to understand the changing geography of political innovation and action. Collective intelligence for democracy (Textbox 8) saw collaborators coming from across the world to brainstorm, create and disseminate technology for political transformation. While it is worth noting in itself that this collaboration occurs between groups of volunteers for an intensive period in place, bound by a particular mission, it is even more remarkable that these volunteers aid a form of grassroots political movement in places that they are institutionally, professionally and personally disconnected from. In that, this implies that these volunteers are functioning as activist-agents of place-based political missions which actualize a translocal geography of political action.

We can note how civic tech activists, through an open-source ethos are operationalizing a dynamic and global geography of politics and political action. For instance, Consul (Consul 2019), place-based civic tech is available freely to fork (i.e. copy, redesign and implement). While models, frameworks and studies may have been available before the advent of the open-source movement and the internet, the easy download and reuse of political technologies was not. In other words, while cities were previously capable of forming a translocal collaborative political movement, the open-source movement drastically changed the speed and efficiency with which this could happen. Furthermore, the new forms of collaborative innovation combined with open-source ways of working opened up the doors for technopolitical transformation in a completely new way. Hackathons, as an innovation practice in themselves, also provide us with an apt example of

how collaboration activity can prefiguratively embody a horizontal 'process' as a political act in itself.

Blockchain and geography of political action

This thesis has shed light on how the advent of blockchain projects has given rise to various new spaces of social interaction, which has altered many aspects of online communities. New blockchain-enabled spaces of innovation (e.g. creating technology), financial transactions (e.g. cryptocurrencies), economic exchange (e.g. remittance systems) political movements (e.g. BitNation, Democracy Earth) and cultural production (e.g. art and music collectives on the blockchain) have drastically transformed many aspects of online communities. As noted earlier, these can be thought of as counter institutions that could eventually transform or replace politico-economic structures that govern society and delimit the political agency of the citizen. In turn, this has had substantial impact on offline communities and economies, and how they operate within a globalized geography of political action with new features and potentialities. As reflected upon in Chapters 5 and 6, blockchain has the potential to upgrade the infrastructure of political action such that it dramatically accelerates the phenomenon of time-space compression (Harvey 1990, p. 241). According to Harvey, this is predominantly seen as something that allows space to be encapsulated by time. Chapter 5 shows us how political imaginaries of blockchain projects define the nature and effect of specific types of time-space compression. Blockchain could enable global cryptocurrencies like Bitcoin, as well as place-based communities currencies such as in the case of Colu. Each blockchain project potentially creates a different version of time-space compression, and thus, alters the geography of the global political economy very differently. It becomes the prerogative of researchers, practitioners, politicians, to choose the nature of this time-space compression through understanding how different political imaginaries will influence political practices.

In Chapter 5, the post-political lens allowed us to conceptualize and understand the phenomenon of "depoliticization by design" with regards to blockchain technopolitical innovation. In this, one of the major insights gained from amalgamating the findings of the three empirical chapters is that, while blockchain theoretically has a potential for decentralizing and redistributing power equitably, current-day innovation shows a trend towards the recentralization of power. Where law is actively articulated as code, we are set relatively fixed affordances

and constraints which limit our political and economic agency. While blockchain may create a translocal-global geography of political action, it could also further the depoliticization of a citizen as a political agent. Hence, it becomes even more important to focus on the prefigurative components of the software as they determine what and who is depoliticized. In other words, in technopolitical innovation, the potentialities and capacity of political agency itself is decided. Our findings elucidate how there are potentialities to redistribute power – geographically, economically and politically. However, a lot more research is required to: comprehend the varying practices of innovation and their influence on political transformation in place; map the flows of already enabled blockchain systems from online to offline places and vice versa; understand the role of geographical places in the blockchain ecosystem and their use as spaces of political contestation and agency and explore the use of geographical rhetoric in the design and implementation of such technology. This project has begun this journey, by creating critical conceptual lenses, answering some of the crucial questions, debunking some misconceptions and myths and enlightening a research agenda for both academics and practitioners.

Political theory and practice

This section discusses the findings and insights by which the study contributes to political theory and political practice. This includes the timely and seminal deepening of political theory through the conceptualization of emerging forms of technopolitical innovation, but also, (research) praxis-aimed frameworks which could guide future experimentation and implementation.

Civic tech as a case for post-politics

As we learnt in Chapter 5, the 'political' and 'politics' belong to two different analytical registers, which makes it hard to empirically assess the radical or emancipatory quality of actually existing politics. Scholars suggest that post-politics should be solved through empirical studies of existing political movements. Much like government-led blockchain initiatives, the civic tech and Radical Municipalist movement provide us with an apt case for solving the "empirical puzzle" of the post-political and how to avoid the "trap" (Beveridge and Koch 2017). One of the major topics in the study of post-politics is political agency. With regards to

any technopolitical innovation, we must question how a citizens' political agency is being changed. For civic-engagement technology, we can map the political positioning of the innovation, as was described in Chapter 6. This cartography of political positioning is fed by the types of political practices it enables and how it delimits a citizens' capacity to act politically. Furthermore, this is also related to Chapter 4's claims that these practices and political positions are informed by the imaginaries and values that underlie the technology itself. Hence, the change to a citizens' political agency can be directly tied to the imaginaries, collaboration practices and decision-making processes that it employs.

Civic tech gives us one instance where technology is used directly and deliberately with the aim of granting more affordances and privileges to the citizen. It shows what kind of affordances and constraints are possible while engaging with the current institutional paradigm and visible nodes of power i.e. local/municipal governments. Furthermore, it also shows us one instance where citizens are encouraged and incentivized to take part in local politics and policymaking by using technopolitical innovation in combination with grassroots political mobilization. Hence, in contrast to government-led and crypto-anarchist initiatives, civic tech shows us how algorithmic governance can be used to create a more equitable and place-based distribution of power to re-politicize the political subject. Prefiguration, in this respect, can be understood as a strategy (Murray 2014), where it can be used to distribute power differently than has previously been considered; it 're-politicizes' (Critchley 2007) the society by creating alternate systems that could replace existing ones. In that, the example also serves to depict a scenario in which the citizen is no longer encouraged to behave as a 'consumer' of politics, but rather, an active agent who is constantly reconfiguring 'the political' by stretching his affordances within the institutional setting. While this finding validates the hypothesis that algorithms can influence political behavior, it also presses us to design civic tech carefully with place-responsive political imaginaries that create a more self-determining political system. Additionally, it becomes clear how technopolitical projects that are inherently collaborativist do not have the aims of economic order building. There are also actors and movements within the dominant institutional paradigm that are seeking to expand the role of a citizens' political agency. Hence, various movements of political activism and change can use the examples provided in this thesis as inspiration to re-politicize the political agent using technology.

Blockchain-enabled civic tech – learning to research the scale of politics

One of the quintessential questions of political theory concerns the scale upon which politics is most desirable and equitable. Many of the theorists consulted for this study have wholly different responses to the scale of politics that a political transformation should enable (Rancière 1999; Bookchin 2000; Massey 2005; Mouffe 2005; Žižek 2011; Harvey 2012). For instance, Chapter 6 discusses Bookchin's ideas of libertarian municipalism and communalism which are bound by the idea that cities, as self-governing communes should unite under a decentralized confederacy. Contrastingly, Harvey and Žižek would advocate for a more global system of governance and government (Žižek 1999; Harvey 2012). As we learnt in Chapter 4 and 5, blockchain can be operationalized as a technopolitical innovation for various scales of politics. In that, it becomes imperative to question which scale of politics is actually desired for a more equitable distribution of power. In turn, this also revises the question of at which scale does radical political transformation actually take place in a manner that creates a more distributed form of power? While this study has exposed the urgent need of incorporating technopolitical innovations in the study of political theory, it also makes a call for more experimentation in political innovations. For political theory to stay relevant and impactful, it will need to incorporate many new subjects and methodologies for research.

This study has elucidated how some of the most radical practices in political transformation have escaped the attention of academia, and would benefit greatly from rigorous study and creation of new frameworks of practice. Civic tech and blockchain worlds require researchers to study relatively untrodden research sites, like hybrid (online-offline) communities, team collaboration platforms, blogs, and other such online worlds. However, digital ethnographic methods provide an apt frame to begin understanding where political imaginaries concerning the scale and nature of politics are being formed. Crediting earlier premises and the open-source ethos, this thesis makes the claim that the scale of politics that is desirable is an empirical puzzle that needs to be solved through experimentation. Accordingly, political theory has a lot to learn from agile software development, where creating rigorous, yet easy, experiments is key to understanding what works best. Put more simply, political theorists, activists and practitioners are encouraged to carry out short, testable scenarios with different political scales to create more place-responsive political transformation. For instance, participative policy-making could be tested on different scales to see what works in a particular place, rather than using a one-size-fits-all approach applied to a region.

Similarly, the in-depth immersive studies in blockchain (Chapters 4 and 5) showed how the design and implementation of blockchain-based civic tech is in desperate need of rigorous empirical frameworks from the perspective of political theory. If blockchain is to be operationalized for socio-political or economic transformation, one project or system will not fit all places and economies. Specific frameworks which focus not just on testing different political scales, but also different consensus mechanisms, incentive structures and economic infrastructures, will need to be developed. Doing so will help answer questions such as: what would direct democracy look like on the blockchain; could communalism and a digital confederacy benefit from a blockchain infrastructure; how could blockchain be used to implement a place-based geography of political action and more self-determining policy regime? Addressing such questions iteratively can thus be seen as a goal not just of blockchain innovators, but rather, a consortium of actors that includes political theorists, politicians and activists.

This thesis has contributed by beginning to update political theory with new empirical subjects (such as blockchain and civic tech), methodologies of research (hybrid forms of digital ethnography) and insights. It has also illuminated (above) a series of prompts that give direction to future research and a more theoretically informed form of technopolitical activism.

Open-source governance, innovation and political movement

One of the major research findings that, for reasons of space constraints, could not be given apt consideration in the three main chapters, was the question of whether and how the ethos of open-source and free-culture movement could be adapted and employed for institutional transformation. While open-source is an ethos which has allowed for grassroots mobilization in the software world, open-source can also be thought of as an ethos that opens up ways of working for local government and other place-based institutions that could enact political change. In other words, open-source could be considered as one of the values of a prefigurative strategy to change governance structures and patterns. For instance, political innovation could follow the model of copy-left whereby any software, artistic or cultural work is distributed freely on the precondition that all future works derived from it are held by the same conditions (GNU - Free software foundation 2019). In that, local governments could, for example, use this license to make sure that not only civic tech, but governance plans and methods also, could be freely distributed, amended

and used by all municipalities willing to ascribe to the movement. Similarly, different forms of commons ownership and self-management that exist in the open-source software world could be used to understand and experiment with aspects of local governance which can be self-regulated by citizen groups. Furthermore, it could also aid in the hybridization of governmental organization, not only through the use of technology, but also operationalization of a diverse political movement such as the open-source movement.

Participative, collaborative or direct politics

One of the sub-aims of the thesis has been to conceptualize and analyze what the role of the citizen should be in the political process. Chapter 6 highlights some of the ways that municipal governments in Spain and beyond are attempting to enhance the capacity and agency of citizens in policymaking, decision-making and planning processes. Such initiatives fall under the headings of participative or collaborative democracy. However, some scholars are talking about citizen participation beyond collaboration, claiming that there is an "over-focus" on collaboration (Dean 2018). This ascribes to similar ideas of the post-political thinkers where the oppositional-revolutionary politics has been repressed and foreclosed under the guise of participative and collaborative politics. Furthermore, there has been a "miscasting of agonistic opportunities for participation as forms of collaborations" (Dean 2018, p. 180). One of the interview respondents during my fieldwork (see Chapter 6) made a similar point, claiming that these forms of participative democracy initiatives are not truly collaborative; they do not change infrastructure of governance to integrate more roles for the citizen. In her opinion, blockchain-based governance according to commons principles could transform governance towards a more "directly democratic" system. Similarly, the P2P Models project is exploring ways of 'bootstrapping' blockchain to commons governance by identifying the congruence between blockchain's affordances and Elinor Ostrom's principles for the commons (1990).

While experimenting with technopolitical innovations to implement new infrastructures for democracy is an important task, political theorists have a lot of puzzles to solve about the nature of collaborative and participative democracy in general. What, actually, would a bottom-up collaborative democracy look like? Some of the possible answers may lie in experiments that are already being carried out in Spain; other, more provocative examples of 'stateless democracy', may lie in

the municipalist movements in Kurdistan – including, for instance, the women's revolution in Rojava (see Biehl 2015). Hence, a guiding principle for technopolitical transformation could be exported to academic/research activism by beginning to create new and testable versions of collaborative politics.

Future technopolitical transformation research

This section offers a closing discussion on the contribution of the findings and insights for important debates in the field of techno-politics: the future of the relationship between technology and political change. It binds and cross-fertilizes the specific findings of the three main chapters to address the main research questions of the study with regards to the future conceptualization and experimentation in the field of techno-politics.

Definition of value in technopolitical systems

Incentives are commonly understood as a person's reason for acting towards a specific goal. In the blockchain world, incentives and their design are considered one of the most innovative features of the technology. An "incentive-centered design is one that aligns the incentive of an individual with the overarching goal(s) of a system or institution" (Jain 2018). Incentive design spiked in popularity with the alleged sharing economy platforms like Airbnb and Uber. However, in this model, the companies charge commission to their users for maintaining the database, and in turn, accumulate profits for themselves. The interests of the users are divergent and in conflict (Dickson 2017). Blockchain projects could, contrastingly, attempt to align the interests of all parties towards a communal good. During the empirical exploration of blockchain projects, we noted how incentives were employed in multiple fields, including: social media (Steemit, Akosha); prediction markets and planning (e.g. Augur, Gnosis); governance and self-management (Boardroom, Democracy Earth, Bitnation); data collaboration (Ocean, Numerai); computation and currency (Bitcoin, Ethereum), and many more.[35] As Verbin and Esmail explain, "in taking methods developed for simple systems and extending them into complex systems, we have taken a principle that was designed to incentivize algorithms to play by the rules, and applied it to people" (Verbin and Esmail 2018).

[35] Refer to Angel list ecosystem of blockchain projects for more examples of fields incentive structures have been applied to.

We found that blockchain projects are often incentivizing intrinsically human activities like participating in governance or writing blog posts. However, this inherent belief in the value of incentive systems relies on the Bitcoin model. For instance, the social media platform Steemit awards tokens to bloggers based on their regular activity and popularity. While the Bitcoin model provides a simple incentive structure, our empirical study validated that many projects were treated as "run-of-the mill blockchain based cryptoeconomic systems" without acknowledging their complexity and difference (Verbin and Esmail 2018). Furthermore, we also concluded that it is not simply the alignment of values that allow for building a robust incentive system. It takes multidisciplinary knowledge in terms of conceptualization of political imaginaries, public policy puzzles, behavior economics and cryptography. Verbin and Esmail claim that behavior factors and psychology are not given enough credence in the design of technopolitical systems. In that, this thesis echoes one of their claims: "we think it imperative that experts in actual human economic behavior, such as public policy experts, behavioral economists and social scientists, be included in the teams designing cryptoeconomic systems, in order to ensure their long-term utility, viability and success" (Verbin and Esmail 2018).

In sum, the findings show that incentive systems are crucial to the success of a blockchain project for political transformation, as this is what regulates the behaviors of those who use it. However, it is also clear that these systems are increasingly difficult to build on the blockchain; at least this is so with regards to a crypto-anarchist project, since it is like building an economy from scratch. We found that blockchain projects have an immense transformative potential with regards to some of the most pressing socio-political problems, such as incentive alignment and disruption of deep-rooted interests like economic order building. Hence, if we acknowledge that incentives in any political system are determined by certain underlying values, a guiding principle for designing and implementing technopolitical projects would be to begin thinking through them. For instance, if equal opportunity would be one of the values on a municipal-run decision-making platform, only the design features, consensus mechanisms and incentive structures which suited the value would be used. Furthermore, if the (co-)creation of technopolitical systems began with values, the creators and managers of the systems, in this case the municipality, would have to provide a justification of how equal opportunity was aligned with other values.

The online-offline dynamic of hybrid social worlds

This thesis has empirically evidenced the intrinsic connection of the online and offline worlds in the spaces of technopolitical innovation. It has done so in two ways. First, by employing digital ethnographic methodologies, it has shown how innovation is carried out in a hybrid way both online and offline (refer to Chapter 3 and 6). This was apparent both where research sites for political mobilization are now located (refer to Sociopolitical Worlds and Localities in Chapter 3), as well as how and where decisions were made and carried out. Second, it has done so by showing how 'online' technopolitical systems are influencing behavior, norms, practices and geographies of political action (Chapter 4, 5 and 6). The online-offline dynamic is an established academic topic in many domains such as social worlds (Liu et al. 2012), social networks (Subrahmanyam et al. 2008), and even social movements (Harlow 2012). Chapter 6 has added to this growing body of literature empirically and theoretically by highlighting how civic tech utilizes this dynamic both in the creation of the technology, and as a means to influence politics. It has added to the field by explicating that any translocal geography of political action is premised on this online-offline dynamic.

In the language of prefiguration, it is precisely this dynamic which creates the conditions of possibility for a translocal prefigurative strategy to take place. If the worlds were not so fluidly connected, place-specific norms and cultures would not be translated when moving from online to offline and vice versa. Thus, an additional finding of the thesis is that social science research has to move past the binary of online and offline socio-political worlds (see also next section), not only in terms of content (i.e. analyzing topics of civic tech and blockchain), but also in terms of methodologies (i.e. creating and expanding methods that consider the digital as an intrinsic part of social life).

Contributions to algorithmic governance studies

The societal, political and cultural significance of algorithms on the internet is widely acknowledged in the academic community (Mager 2012; Latzer et al. 2014; Danaher et al. 2017; DuPont 2018). This thesis has explored arguments and debates concerning both algorithmic governance in general, as well as in direct relevance to blockchain (Chapter 4 and 5). Studies have already begun to conceptualize and analyze the interplay of techno-social change by combining these with "institutional approaches to incorporate governance by technology or

rather software as institutions" (Danaher et al. 2017, p. 1). In this thesis we show how the design of technopolitical innovations, and the selection of algorithms, has a direct influence on both shared social norms and the reality (direct democracy in Spain); as well as being a basis of social order (crypto-institutional projects like e-Estonia). The thesis empirically supports the claim that 'algorithmic selection' to some extent shapes daily hybrid lives (online-offline), innovation activities, political mobilization, agency, perceptions and even behaviors.

If this claim is accepted to a certain extent, it becomes relevant to understand how we can ensure the effectiveness and legitimacy of their design and implementation. In other words, combining the findings of the three chapters allows a reflection on how to make algorithms for technopolitical innovations not only an effective and efficient way to accomplish political goals, but also procedurally open, inclusive, place-based and self-determining. In all three empirical chapters, we highlight the importance of and collaborativist approaches towards actually designing our technologies for political change. Chapter 4 highlighted the importance of carefully articulating political imaginaries. Chapter 5 furthered this by explaining how technopolitical innovation could avoid the post-political trap i.e. depoliticization by algorithm. Chapter 6 showed us a collaborativist's way forward, where the designers of the technology are also the owners and managers of the technology. In that, this thesis endorses the collective intelligence approach (Pitt et al. 2014) to the design of (civic) technologies, whereby citizens collaborate with local institutional actors in deciding the affordances and constraints that the algorithm sets out. It shows how the civic tech movement has created a compelling narrative for implementing a place-based and self-determining political process through this collaborativist approach.

This also leads to a critical insight about prefigurative political activism and civic tech in general. Whenever 'place-based civic tech' is made, an affordance could be made for actively and continually deciding on political structures. For instance, a participatory budgeting platform that is co-designed by citizens and government means that they could co-decide on how the budget functions in the first place: they could decide on the rules of the game on an equal footing. If one of the ways this budget is made allows citizens to initiate and carry out rule-change, it automatically makes this a dynamic technopolitical experiment which is constantly under renewal and transformation. It is effectively co-run by the two parties. This would be in stark contrast to a wholly municipal-run participatory budget, which would not allow rule-change by citizens. Hence, a guiding principle for

technopolitical innovation is to make an algorithmic affordance for allowing the users of technopolitical systems to influence the rules themselves. Such a guiding principle could also fall under an open source ethos (as discussed earlier in the Open-source governance section (p. 135).

Dehumanizing trust

In Chapter 4 and 5, we brought up the topic of dehumanizing trust i.e. "encouraging trust in computation [and algorithm] rather than trust in humans and institutions" (Gikay and Stanescu 2019, p. 66). This is apparent in the dominant narrative around blockchain: its capacity to disintermediate from traditional institutions of power (Golumbia 2016; Radziwill 2018) and eliminate the need for trust in human relations (Nathan and Scobell 2012; Konashevych 2017). The subject of trust is central to blockchain's narrative, partially because it was created with a general mistrust of financial and political institutions. While many studies consider the dehumanization of trust neutrally as an inherent 'design principle' of the technology, our findings show that how trust is conceptualized in a project is a crucial imaginary that prefigures certain behaviors, norms and interactions (Chapters 4 and 5). On the one hand, the creation of a technopolitical innovation that algorithmically executes complex contractual relationships through autonomous self-executing contracts written in code, eliminates any form of human trust or good will. On the other, many affordances can be made to substantiate trust in human relationships through collaboratively deciding how the execution will take place. In other words, the forms of trust can be co-decided by those who will participate in the system, such that a more hybrid blockchain can aid various political processes.

This thesis has analyzed the patterns evident in how trust is conceptualized in crypto-institutional, crypto-anarchist and civic tech projects. While transparency, distribution of power and decentralization of decision-making are cited in all three clusters of tech, they are actualized and coded very differently. Crypto-institutionalists equate trust to transparency, where decisions are transparent, but the power for making them (and hence the trust mechanisms) remains with the institution itself. Crypto-anarchists have varying trust and consensus mechanisms, but predominantly operationalize one that completely dehumanizes trust; they leave as much as possible to the algorithm, while designing trust collaboratively (as is apparent in the case of the Decentralized Autonomous Organization or DAO). Civic tech practitioners effectively reconfigure trust by creating new systems of

accountability between citizens and government. The last of these shows how political agency in the design of trust can have a dramatic impact on how the technology will be used for political transformation. In sum, while there is a certain element of dehumanizing trust present in most technopolitical innovations, the design (affordances and constraints) and designer's political imaginaries decide how it will be actualized.

A technopolitical guiding principle which could be a potential import for other domains of political activism is that the conceptualization of trust between different parties using the system is central to determining the sort of change that will be possible. For instance, carrying forward the example of a participatory budget from the above discussion of 'contributions to algorithmic governance' (p. 138) allowing citizens to propose rule-change involves a particular conceptualization of trust. This operationalization of trust creates an affordance in a citizen's political agency to take part in political change. Hence, technopolitical activists and users can model and test how different conceptualizations of trust create different algorithms, and in turn, political systems. This will help determine which forms of trust can be practically implemented on a technical level.

Technology and the meta-politics of power

As we have seen in all three of the empirical chapters, as well as the above, the design and implementation of technology for political transformation prefiguratively influences how power relations will be operationalized within a given system. It creates the affordances and constraints which are underpinned by the sets of power relations that are possible. While this finding has been empirically substantiated (refer to Chapter 4), another relationship that stood out will also need further research in order to be conceptualized adequately: whether and how the metapolitical narrative underpinning technologies influences how the system is operationalized and evolves over time. If the narrative does influence a technopolitical projects implementation, the imaginaries and values are not only laced within the code of the technology, but also reflected in how users interact with the technology. More simply, this would mean that users understanding of, and desire to, use the system, is influenced by the metapolitical narrative i.e. their alignment with a project's political imaginaries.

For instance, our respondents felt no ownership and personal relationship with an e-government software run by the Estonian central government. Contrastingly, in

Spain, respondents showed that ownership, agency over and contribution to civic tech can exist (for example, Consul). This shows how an open-source narrative has a profound impact on a users' self-identification and relationship with the technopolitical innovation. In turn, this narrative of power, determines how these users (in the case of civic and political technologies: the citizens) will perceive not only their own political agency to influence the technology, but also how they will interact with the processes it introduces for political transformation.

(Re)coding a technopolity

This thesis has articulated frames, developed concepts and carried out a longitudinal empirical study to (de)code how emerging technologies are impacting political transformation. While investigating the versions of a polity blockchain and civic technologies are prefiguring, it has also emphatically stressed the urgent need for reactivating our agency in designing and implementing these systems. In other words, this has aimed to not only (de)code the existing technopolitical innovations, but also (re)code them to create a more equitable political system.

Technology is not neutral; but neither are its designers or users. It is through considerable, deliberate efforts, in conjunction with individual and collective choices that technopolitical innovations reframe our socio-economic and political realities. It is the responsibility of researchers, practitioners, citizens and politicians to design and implement solutions to avoid the 'post-political trap' by technopolitically reconfiguring 'the political'. The onus to redraw boundaries of access, empower the citizenry, create new forms of organization, re-politicize the economy, and indeed, (re)code the technopolity, is not singularly on any one type of actor.

If there is one route to (re)coding that this project has identified as genuinely transformative, it is that of collaboration. It is through radical experiments in collaboration that technopolitical innovations can engage a variety of actors in redesigning the contemporary political apparatus. We need to develop testable empirical puzzles that will aid us in envisaging new techno-institutional models for different political scales. Only then will we be in a position to discern the appropriate modes of politico-economic organization that will sustain such technopolitical transformation.

With the case of Radical Municipalism and its translocal geography of political action, we see a shift in the history of disconnection between citizens, local nodes of power and (techno)political movements. While they have diverse actualizations in different places, they are united in their ethos and purpose: to create a more self-determining and translocal geography of politics. To reiterate, it is not that these movements are radicalizing democracy. Rather, by finding a mix of old and new ways, they are holding dominant institutions and structures accountable for the use of the word democracy. Our findings show that such emerging forms of collaboration express a symbiosis in perspectives on purpose, design and geography. They are value-driven. In other words, translocal collaboration gives us one instance of where shared values are detached from geography and its narratives. It is through exporting, adjusting and developing the political and social imaginaries of such movements that this thesis encourages (re)coding contemporary technopolitical innovations.

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Summary

This PhD rests at the intersection of technopolitical innovation and implementation, governance solutions and translocal political movements. Emerging technologies like blockchain and civic tech allegedly have a burgeoning impact on how local and global politics are practiced. While there are experimental tech projects ranging from remittance systems to decision-making platforms, studying their influence on political transformation is largely absent in academic literature. Concurrently, post-political scholars emphasize the repression and foreclosure of the genuinely 'political', rampant depoliticization and growing political apathy in society. This watershed moment – where experimental technologies for political transformation are actively being created in times of heightened political deficits – is precisely the nexus in which the principal aim of this thesis is located. It aims to produce a rigorous empirical study to decode, and in turn, guide, technopolitical transformation to create a more equitable political system.

The thesis foregrounds the perspective that technologies personify a 'prefigurative politics by design' i.e. they embody the politics and power structures they aim to enable in society. The thesis confines its focus to blockchain and civic technologies and identifies three empirical research clusters: blockchain projects in general, government-led blockchain projects, and civic tech (technologies specifically created to enable participative politics). Accordingly, the overarching research questions used to assess developments in these fields are: *how can and is emerging digital technology being used for transforming politics and political action? More specifically, how does the design, implementation and use of technopolitical innovations influence the practices of politics?* **Chapter 1** explains how I arrived at this question and how they break into three sub-questions which are treated as three empirical puzzles.

Chapter 2 elaborates on the theoretical background of the thesis. By drawing on literature from Science and Technology Studies (STS), critical geography, post-politics, algorithmic governance, social ecology and place-based politics, it articulates an analytical frame to question the design and implementation of technopolitical projects. It goes into detail of how prefigurative politics can be used as a conceptual bridge builder between the concepts from the abovementioned disciplines. Moreover, it sets up the language and conceptual apparatus to delve into the empirical chapters and ends with theoretically-informed research prompts.

Chapter 3 familiarizes the reader with the iterative methodological approach adopted during the course of the project. It shows how the research was formed and framed through a digital ethnography approach. By elaborating the core principles of the approach, and how they bind together the explorative data collection and analysis, the chapter shows how the research evolved over time. The main components of the approach are presented: immersion in online and offline social worlds, cyber-immersion routines, and participatory action research in localities and at events. After providing details on the types of events, workshops, expert interviews and hackathons which were key in the data collection, it also expounds on how the data was analyzed using the analytical frame and innovative forms of pattern analysis. Finally, the chapter contains a series of textboxes that give supplementary information on concepts and events that may be unfamiliar to the reader.

Chapter 4 is the first empirical chapter of the thesis. It addresses the first empirical cluster by asking the research sub-question "how can we identify, cluster and analyze the underlying political imaginaries of blockchain projects that shed light on the potential technopolitical transformation?". It shows how blockchain projects personify prefigurative politics by design, and expounds on the many misconceptions that surround blockchain projects with regards to their transformative capacity. It responds to the state-of-play in the blockchain research space by advancing a clear agenda for further politicizing the political imaginaries underlying blockchain projects. In that, the chapter shows how identifying and unpacking these imaginaries is crucial, since it determines the types of socio-economic and political actions that can emerge from, within and on these interfaces. Furthermore, it finds that only through a rigorous analysis of imaginaries can technopolitical innovations open up to alternative imaginations.

Chapter 5 takes the second empirical cluster, government-led blockchain projects to address the second research sub-question: whether all government-led technopolitical projects are inevitably confined within or structured by the 'post-political condition' or is it a 'contingent political strategy' implemented to delimit citizens political agency and recentralize power? By situating these projects in the ongoing discussion of post-politics, this chapter reflects on the nature of the potential transformation of government-led projects i.e. their influence on citizens' agency, effects of economic order building, and the absence of collaboration in the 'political'. It finds that the post-political is used as a strategy by governmental agents to impose an algorithmically enforced post-political condition for the

citizens. Yet, if these projects can be used to depoliticize the citizen by design, they can also be used (re)politicize the citizen. The chapter concludes by expressing the urgent need to not only analysing and contributing to the algorithmic design of technopolitical projects, but also the meta-political narrative underpinning them.

Chapter 6 zooms in on the global civic tech movements activity in Spain to address the third research sub-question: "does creating a digital space for autonomous self-organization (i.e. place-based civic tech) allow the emergence of a parallel, self-determining and more place-based geography of politics and political action?" While most academic studies discussing civic tech highlight government-initiated projects, this chapter introduces the concept of 'place-based civic tech': citizen engagement technology co-designed, co-managed and co-owned by local government, civic society and global volunteers. By empirically exploring the Radical Municipalist Movement, it shows how these practitioners are activating a place-based and translocal geography of politics and political action. This movement is simultaneously local and global, online and offline. It finds that creating a dynamically online-offline space for self-organized political action that is supported by a translocal network enables both disengagement from the dominant socio-economic and political regime, while also engagement with local nodes of power and citizens.

Chapter 7 binds the thesis together by providing a general discussion and synthesis of the entire project. Not only does it reflect on the methodological and theoretical coherence of the empirical research questions and chapters, but it also uses meta-inference to (de)code future research agendas and insights. It begins by retrospectively summing up and mapping the findings of the study and continues on to highlight the strengths, weaknesses and rigor enhancing steps the research took. After detailing the general theoretical findings by showing how conceptual molds were used across the empirical chapters, it clusters the findings and insights according to three themes. First, it explores the relationship of the geography of political action with technopolitical innovation and practices. Second, it expounds on the need for political theory to engage much more with technopolitical innovation and implementation to both analyze and guide a potential political transformation. Third, it outlines specific debates and ideas that need to be further analyzed to develop the field of technopolitics itself: the relationship of technology and political change. It ends with concluding remarks for (re)coding a technopolity.

Acknowledgements

A PhD is known to be an arduous, alienating and exacting journey which challenges even the most competent lone wolfs. That said, there are a number of people that made this process not just easier, but also worthwhile and enjoyable. Let's begin with my supervisors, who had their hands full and (probably) no idea what they had signed up for employing me. They entertained, supported and streamlined my rapidly evolving ideas in a research area that barely existed (technopolitics) about a technology that was controversially confusing (blockchain). Dirk, for leaving his door open for a 'quick' post-lunch conversation which always took hours. I am profoundly grateful for having one of the most reachable, open and cooperative supervisors. Your support and diligence in helping me craft this thesis according to my interests was a core factor in keeping me motivated. Though this faith and independence also left some scars of academic trauma. Regardless, your excitement about our ideas, our cordial interactions and complexity-relieving conversations made this a fun process. Alex, without whom writing, let alone publishing articles would have been a suicidal endeavor. Your focus and artful precision was inspiring on so many levels. Thank you for hearing me out, making sense of my muddled up conceptualizations, and helping me aptly articulate these on paper. Though your hundreds of track changes crashed Microsoft Word (and my intellect) on several occasions, I was honored to have you as a supervisor. I would also like to thank my promoter, Han, who helped solve several bureaucratic battles and gave me a place in RSO. A special thank you to Aicha and Diana, without whom navigating through the WUR bureaucracy would have been dangerously frustrating.

Next, I owe my gratitude to everyone in the SUSPLACE project. Ina, Dirk and Anke for their enthusiasm and energy all through. Kelli and Diogo, thanks for being normal. The relief of thinking you guys aren't weirdos the first time we met at the bar didn't last long, but it turned out quite well. Kelli, for being able carry out both components of a conversation: listening and talking. Diogo for sharing our geeky interests and introducing and sustaining my relationships with sours. Both of you, for becoming the first Wageningen family. Lorena, for pushing me. Not just to injure me, but also to work, think and play harder. WasteLab will hopefully not remain our dream, and we'll be able to cook together again. Thanks to Malin and Catia for being amazing guides in Cardiff. Siri, for making me realize it is okay to 'pull a Siri' once in a while. Thank you to all the karaoke enthusiasts (just Angela) for forcing us to smile at least once a training. Elgars for his consistent

commitment and showing us his world of farms. Sara, for bringing peace even in the most unpleasant circumstances. Anastasia for coming up with the most boundary-pushing team experiences. Marta, for dancing, since we never really managed to understand each other. Marie, for sharing an irritation of technotards (worth looking up). Andris for bringing energy to the table in the day and partnering up to lose it during the course of the night. Ale(ssandro), for showing me that there can be an inverse relationship of time spent awake and energy produced. Alice, for provoking a change in atmosphere in without really trying. Thanks to Elisabete for our conversations during the fresh-air and fruit breaks in the middle of the trainings. Thanks to Steve, Abid, Terry, Usha and Brodies for making the secondments in Cardiff enjoyable. Also, a big thank you to the remainder of the supervisors and partners of SUSPLACE.

I owe some of my deepest gratitude to my collaborators, interviewees and people with whom I attended events and conferences. In particular, I'd like to thank people I encountered in Madrid during the hackathon Collective Intelligence for Democracy: Anna, Sanne, Devin, Pierre, Vanessa, Yago, Mariel, CS, and Gonzalo. The people at MediaLab Prado, ParticipaLab, Consul and Madrid government were all inspirational in this process. I'd like to thank the blockchain and civic tech community in Amsterdam and online, Blockchain Pilots, slack teams, Samer (P2P Models), Jay, and the hundreds of other people who I interacted with during these years.

There are two people who practically acted as harnesses during the emotional roller-coaster of the past three years. First, there is my mother – who along with her usual undying support – often (quite strategically) asked me 'why don't you just quit?' pushing me yet another time to achieve something that takes time and dedication. You have been my rock. Thank you for that, and everything else you have done for me. And for the first time lumped in the same category as a mother, there is Dimitri. While the list of the diverse reasons I owe you is a bit lengthy for here, I am very grateful to call you family. You were there for the good, the bad, the parts that neither of us can remember and you're probably there right now. I genuinely don't know whether I would have finished if it wasn't for you. With regards to family, I would also like to thank people who supported me in the background: Kaka and Kaku, Ishpa and Zahid Khalu, Tariq, Asim bhai, Fauz and Abid bhai, Sara apa and Saad. I'd also like to send a special thank Alex (2nd) who helped me remain stable and thrive. I hope you continue to guide many heroes' journeys.

Next I would like thank the Wageningen party-drivers. You guys are the only reason anyone should stick around in that town for so long. In no order of importance: Niki, for always asking if you can ask a question. Thanks for always being there, supporting unachievable ideas (like leaving the village) and staying as close as family. Vale, for bringing elegance to chaos. Ha. No. Thanks for being a partner in Bourbon crimes. Costas, for imagining me as a Lion and still befriending me. We should do that thing, before those things stop working. Giorgi for showing me extreme cynicism is actually something that leaves you smiling. Gautham for powdering up problematic bilateral relations and being a consistent gollemer. Stefano for laughing the way he does, and being one of the most diversely interested (and -ing) people I have ever met. Tibo for the couch sessions, food, and the in-depth cleaning advice. Edo for always beating everyone at foosball. Monse for giving me the best table in best room in droef, and being a crucial water supplier. Sine for looking at people the way she does. Imie letting us go to Prague. Joao for feeding my coffee obsession. Christos for de hop en liefde. Lavinia for calling everyone darling. Simon for creating a legendary series of annual trips. Elena for that last caipa.

Along with this crew, there were several individuals who played an important role during these years. Saku for being right here, all the time, while being across many continents. I owe you both my sanity and insanity. You yelling at me and then bursting out in laughter swearing at me is definitely one of the highlights of the last three years. Sam for truly inspiring me that you can really do everything successfully at once and creating a home for me in Wageningen. Chiara, for being so aligned in depressive phases and happy days. Mathieu for always taking conversations to the deeper levels and for the endless nights of Maneige-like experiences. Saad for sticking through thick and thin, proud and embarrassing, hydrated and dehydrated. You're apparently my oldest close friend. Jaffar for being Jaffar. He gets it. Cla(udia) for balancing her craziness with mine and letting me make fun of her. Also, for introducing me to a caper. Chris for unknowingly and unwittingly being an inspiration and a brother. You're the only person I would travel the world with. Aku for showing me how to chop an onion. We only get closer as the days pass. Jonne for being the most peacefully supportive young person in my life, while also being the talented artist who made the cartoons in this thesis. Nellie for giving life to lifeless times. Jen for letting me into her home, and Lucy for introducing me to almond butter. I'd like to thank everyone I lived with and around in Droef, it was really great: Taco (get back to tennis-player modeling), Joris (always your

#1 fan), Tatiana (you're definitely going to teach me to surf one day), Claudia (no more stories), Leo (keep diversifying), Jorge (study some social sciences). Last but not least, I'd like to thank Alex (3rd) who has soaked me in whatever I needed during the end-days of writing up the thesis. You were consistent in your use of knoblauch, and that leaves the best after-taste.

I'd also like to give some space to express my gratitude to some inanimate objects that played a role in this process: noise-cancelling headphones that tamed my distracted mind, lever espresso machines, Abussey Junction, white chocolate bloks, rice, and paper. Sci-hub and Bookzz for liberating academics and learners like myself around the world to work from anywhere and read anything. The online Bays for proving art and media for support. The open source movement for liberating technology and radical municipalists for creating hope.

Unacknowledgements: Though this is probably quite uncommon, I would also like to acknowledge those people and experiences that brought me down, made me struggle and fight harder without whom this process would have been so much more pleasurable, shorter, and lighter. I hope you enjoyed it.

About the author

Syed Omer Husain (1991) was born in Islamabad, Pakistan. He completed his undergrad in Philosophy, History and Literature (along with a sort-of minor in social sciences) at Lahore University of Management Sciences (LUMS) in 2013. While the undergrad was disciplinarily and topically diverse the focus towards the end was on philosophy, policy and politics pertaining to the globalizing world. He went on to pursue a masters in Global Studies (World Politics and International Relations) at the University of Pavia in Italy through the Fund for Cooperation and Development. After the first year, he went on an Erasmus Exchange to Antwerp University. He interned and was later employed by the research group on Public Administration and Management (PAM). He graduated in Italy with 110/110 cum laude honors in 2015. His work during this time comprised of creating a scheme and adapting a coding system to understand the longitudinal evolution of the European Commission, and working on conceptualizing multi-lateral democracy apparatus from an institutional point-of-view. In 2016, Omer started working at the Rural Sociology Group (RSO) at Wageningen University after being awarded the Marie Curie Fellowship by the European Union. His doctoral research was conducted as part of the EU-funded project SUSPLACE, a comprehensive project exploring the full potential of sustainable place-shaping practices.

Omer hopes that his interests, aims and ideas have evolved by the time you are reading this, making this feature irrelevant and outdated.

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Wageningen School of Social Sciences (WASS) Completed Training and Supervision Plan

Name of the learning activity	Department/Institute	Year	ECTS*
A) Project related competences			
SUSPLACE Introduction Course	WU - SUSPLACE	2016	0.5
Writing Techniques	WU - SUSPLACE	2016	1
Writing Research Design	RSO, WU	2016	6
Spatial thinking in the Social Sciences	WASS – SUSPLACE	2016	4
Research Skills	WU/BEN	2016	1
Facilitation of Place-based Development	Royal Haskoning DHV	2016	1.5
Sustainable Place-shaping	WU/BEN	2016	2
Development in Science, Policy and Society	Cardiff University	2018	1
Shaping Places, Crossing Disciplinary Boundaries	Aveiro Summer School, University of Aveiro	2017	2
Masterclass – European Week of Regions and Cities – Cohesion Policy	Regional Studies Association (RSA) + EU	2016	3
Sustainability Project Skills	Except	2016	1.5
B) General research related competences			
Collective Intelligence for Democracy Hackathon	MediaLab Prado	2018	5
Sustainability Science and Place Shaping	Cardiff University, Welsh Government, Visionary Analytics	2018	1
Valorisation of research	WU and Visionary Analytics	2017	1
Social Innovation Relay	Social Innovation Community (SIC) and DRIFT	2018	3

Name of the learning activity	Department/Institute	Year	ECTS*
C) Career related competences/personal development			
Personal Leadership	SUSPLACE	2018	1.5
Tailormade Career Development	SUSPLACE	2018	2
Spanish Post-beginners course	Cardiff University	2018	3
Total			**40**

* One credit according to ECTS is on average equivalent to 28 hours of study load

Funding and credits

This research described in this thesis was conducted as a part of the SUSPLACE project. SUSPLACE is Marie Curie Innovative Training Network (ITN) project funded by the European Union's Horizon 2020 research and innovation program under the Marie Skłodowska-Curie Grant agreement no. 674962.

The thesis does not reflect the opinions of the European Commission.

Financial support for printing this thesis came from the Rural Sociology Group (RSO) of Wageningen University.

Cover Design: Syed Omer Husain
Artwork: Jonne Bonnet
Layout: Renate Siebes | Proefschrift.nu
Printing: Digiforce – ProefschriftMaken