Empowering Digital Democracy

Roberta Fischli and James Muldoon

This article examines the role of digital technology in enabling and enhancing democratic practices and forms of governance. It contributes to emerging debates on democratic innovations by proposing a novel theoretical account of decentralized participatory democracy. To develop our account, we draw on the experience of two EU-funded projects, D-CENT and DECODE, which produced innovative citizen participation platforms and digital public infrastructure. Bringing democratic theory into conversation with critical data studies and the new municipalism movement, we theorize how these projects advanced three political aims: organizing political communities to build collective power, empowering citizens through direct participation in decision making, and transforming political institutions. The article then analyzes the strengths and limitations of these projects to draw lessons for policy makers and practitioners for future digital democratic experiments.

Keywords: Digital democracy, democratic theory, data commons, democratic innovations, digital public infrastructure, participation, new municipalism, decentralized participatory democracy, D-CENT, DECODE

Digital technology has played a leading role in recent experiments that attempt to revitalize democratic government (Bernholz, Landemore, and Reich 2021; Simon et al. 2017). Its advocates claim that digital platforms and online fora have the potential to create more trust in public institutions, engage citizens in participatory action, and enhance the quality of democratic decision making. What is more, the past decade has indeed experienced a rapid spread of digital tools in democratic governance around the world. In France and Brazil, for example, citizens have engaged in large-scale deliberation in online spaces on national issues (Landemore 2020; Simon et al. 2017). In Iceland and Spain, meanwhile, political parties such as the Icelandic Pirate Party and the Spanish Podemos have used digital tools to crowdsource policies, set legislative priorities, and allocate municipal budgets (Gastil 2021; Landemore 2015). In turn, political scientists have studied the conditions under which these tools lead to better-quality democratic processes and more empowering outcomes for citizens.

This article contributes to this discussion in three respects. First, it traces the contours of an emerging body of literature on what we call *digital democracy*, which has previously been studied across a range of disciplines using different terminology, such as democratic innovations, e-participation, civic tech, and data commons (Gilman 2016; Hague and Loader 1999a; Sadowski 2021; Smith 2009). Bringing democratic theory into conversation with critical data studies (CDS), it shifts the focus from more traditional forms of digital democracy toward proposals that prioritize questions of power and political transformation. This also helps us to develop a nuanced account of the potential value of digital technology for democracy and the challenges involved, as well as important lessons for the emancipatory and complementary functions it could perform.

Second, we offer a new theoretical lens to interpret emerging experiments in digital democracy, which we call *decentralized participatory democracy*, developed from an analysis of two European pilots: D-CENT (Decentralised Citizens Engagement Technologies) and DECODE (Decentralised Citizen-Owned Data Ecosystems). This approach is attentive to questions of structural power and shows how political collectives can build organizational power by mobilizing citizens through digital

Corresponding author: Roberta Fischli (roberta.fischli@unisg.ch, Switzerland) is a PhD candidate at the University of St. Gallen, Switzerland. She was previously a visiting researcher at Georgetown Law and the University of California, Berkeley. She is a research and teaching assistant at the School of Economics and Political Science (SEPS) at the University of St. Gallen.

James Muldoon (james.muldoon@essex.ac.uk, United Kingdom) is a reader in management at the University of Essex. He is the author of Platform Socialism: How to Reclaim our Digital Future from Big Tech *(2022) and* Building Power to Change the World: The Political Thought of the German Council Movements *(2020).*

doi:10.1017/S1537592724000409

technologies (Klein 2022; Muldoon 2022). Informed by the new municipalism movement, our approach shifts the locus of decision-making power from the institutions of the nation-state to more local and decentralized institutions of municipal associations and organized citizen networks (Russell 2019; Thompson 2021). With participatory democrats, it seeks to open the structures of power to citizens and democratize broader aspects of the state and society (Forestal 2022; Landemore 2020). However, it also broadens the range of institutions under analysis, moving from formal political structures to systems of "neoliberal urbanism" (Thompson 2021) and instances of "digital public infrastructure" (Fischli 2022; Zuckerman 2020) that aim to counteract corporate power and democratize the digital economy.

Our analysis is animated by a broader vision of the transformation of individuals and social structures through participatory processes, which goes beyond a limited set of administrative reforms characteristic of many recent approaches to participatory democracy (Fung 2004; Smith 2009). Rather than framing political and governance issues as practical problems to be solved, our approach focuses on the structures of power that might pose barriers to the realization of its normative goals. In some democratic innovations, "participation" is figured mainly through cogovernance schemes in which administrators retain the upper hand and usually control decision-making processes (Fung and Wright 2001). Decentralized participatory democracy, in contrast, is best characterized as an attempt to open up new pathways for citizens to exercise genuine control over political processes through the use of digital technology.

Following from this, the third contribution of this article is to interrogate the strengths and limitations of the discussed projects to draw lessons for policy makers and practitioners for future digital democratic experiments. Drawing on empirical material about these cases, we focus on one experiment from each set of projects and highlight the factors that subsequent empirical analyses identified as contributory to success or failure, such as strong political leadership, a favorable political context, continuous community engagement, and an agile administrative department willing to embrace changes (Sagarra et al. 2019). We also highlight factors that may hinder success, such as changes in political power, administrative inertia, technical obstacles, and a lack of willingness by governments to devolve decision-making power to citizens. In this way, the article contributes to the ongoing effort to bridge normative democratic theory with the empirical study of political institutions (Fung 2007).

The method we adopt for this project is in line with what Hélène Landemore (2020, 20) has called "inductive political theory," a "form of political theory that builds on the generalization, refinement, and deeper exploration of collective intuitions already widely shared in the public as well as those tested on the ground by activists." Inductive political theory, as we understand it here, is a method that draws inspiration from an engagement with democratic experiments tested on the ground by activists and politicians. The idea behind this approach is to learn from specific empirical examples of democratic practices to develop normative concepts and institutional principles. This bottom-up approach of theorizing departs from more traditional, deductive, forms of political theory, which tend to take theoretical principles as given and apply them to the world. With its focus on learning from real-world experiments, it is characteristic of a more recent turn within political theory that wishes to engage more closely with the insights and experiences of citizens, policy makers, and activists "on the ground" (Herzog and Zacka 2017; Wolff 2020).

That said, we do not conduct our own primary research involving interviews with stakeholders. Rather, we synthesize existing research related to the projects, drawing from extensive project documentation, academic articles, and activist reflections on the two sets of projects, D-CENT and DECODE, that represent a particular European tradition of decentralized participatory democracy made possible through digital technology. Together, these two EU-funded projects constitute nearly a decade of experiments with digital democracy from which we can learn (Morozov and Bria 2018; Simon et al. 2017). While some of these pilots have been discussed in previous literature, they have not yet been properly contextualized within a specific tradition of democratic practice (Bernholz, Landemore, and Reich 2021; Gastil 2021).

An analysis of these two European initiatives makes an important contribution to the primarily US-centric literature on democratic government and highlights two sets of democratic innovations that can be integrated into existing participatory frameworks. They complement the range of innovative experiments in governance taking place in the United States (although primarily at a municipal or state level). Many of these experiments tend to be animated by the deliberative tradition (Landemore 2020; Neblo, Esterling, and Lazer 2018; Newsom 2014) and analyze how digital technology can facilitate online deliberative spaces to provide citizens with new avenues for participation in democratic politics and generating legitimacy for existing institutions (Bernholz, Landemore, and Reich 2021; Cohen and Fung 2021; Fishkin et al. 2018; Gastil 2021). We want to add to this debate by drawing attention to a different set of experiments that focused on how digital technology could contribute to building the collective power of citizens and facilitating their direct participation in, and transformation of, political institutions.

The article proceeds as follows. First, we define our conception of digital democracy and situate it in the long-standing debate about the potentials and challenges of digital technology for democracy. Then, we introduce the

https://doi.org/10.1017/S1537592724000409 Published online by Cambridge University Press

D-CENT pilot and show how it aids the development of a decentralized participatory democratic perspective on digital democracy. Following this, we analyze empirical findings of the pilots from D-CENT through the lens of CDS. Next, we introduce the DECODE pilot and show how the decentralized participatory democratic tradition is developed and extended by this pilot to include a novel conception of digital public infrastructure (Fischli 2022; Zuckerman 2020). We then analyze empirical evaluations of one of its pilots through the lens of CDS to identify the conditions for failure or success. We conclude by reflecting upon the lessons that could be learned from these recent innovations in digital democracy.

Digital Technology, Power, and Democracy

Ever since the advent of the internet, digital technology has been heralded either as the ultimate harbinger or destroyer of democracy. Cyber-enthusiasts emphasized its emancipatory and decentralizing potential (Barlow 1996; Negroponte 1995), while others were more skeptical, cautioning against a "Big Brother" surveillance society (Davies 1996). An important point raised in this first wave of digital democracy literature during the 1990s is that for a digital democratic project to be successful, its technologies must be anchored in the communities it seeks to serve (Hague and Loader 1999a). Similarly, Hagen (2000, 56) argues that digital technology "is not an independent force working for the better or worse of democracy," but rather amplifies existing trends, which requires a close consideration of the social, political, economic, and cultural factors of the political system in question. Finally, and crucially for our undertaking, political scientists at the time noted that debates on digital democracy had been "highly Americanocentric," which risks an overly narrow focus on this geographic region and adds little value to debates outside the United States (Hoff, Horrocks, and Tops 2000, 2).

Fast-forward two decades, and the debate about digital democracy is still in full swing. Techno-optimists embrace digital technology's potential for a democratic revival (Cohen and Fung 2021, 25; Forestal 2022), while skeptics warn of "post-truth politics, polarization, and radicalization" (Hannan 2018, 214). Against this background, what is needed is an analysis of how digital technology could be harnessed to improve the functioning of democratic government. However, as the editors of *Digital Technology and Democratic Theory* note, democratic theorists have so far paid insufficient attention to the ways in which digital technology has had a profound effect on democratic institutions and practices (Bernholz, Landemore, and Reich 2021, 3).

Digital democracy, as we define it here, refers to a sociotechnical system that incorporates the use of digital technologies to enable or enhance democratic practices and forms of governance. It incorporates a diverse array of practices, from open-government initiatives that foster greater transparency and legitimacy to citizens providing ideas to governments and even making binding decisions on policies and legislation. What is essential to our broad definition of digital democracy is not the size, scale, or institutional location of new innovations, but the presence of digital tools in new forms of democratic practices. That said, we regard society and (digital) technology as inextricably linked. Scholars from science and technology studies (STS) have long pointed out that technology is not neutral and that "artifacts have politics" (Winner 1980). In other words, while society changes and evolves with the new affordances offered by digital technology, users also adapt the technology to fit their specific needs. Julie E. Cohen (2012, 27) summarizes this relationship well when she argues that "as we struggle to shape our technologies and configure our artifacts, they also and quite literally configure us, guiding us toward the well-worn paths that render the material a matter of habit." Similarly, Barry Hague and Brian Loader (1999b, 10) argue for the importance of citizens being "exposed to the current capabilities of ICTs [information and communication technologies] and … encouraged to consider whether and how they might be utilized to the betterment of their individual and collective lives," and to "allow them to decide for themselves what use ICTs may be to them." In this article, we adopt this perspective by attending not just to how the introduction of digital tools affects citizens, but also to how citizens make use of technology to pursue their own ends.

Importantly, digital democracy specifies only the *mechanisms* for enhancing democratic practices, which makes it theoretically open to a variety of democratic ideals and practical goals. At the same time, many of these reforms gesture toward what Hélène Landemore (2020, 11) has described as an "open democracy," understood as a "general accessibility of power to ordinary citizens" through new avenues of direct citizen participation. Considered as a progressive shift away from the concentration of power in relatively closed and oligarchic institutions, transformations made possible by digital democracy could in the future come to fundamentally reconfigure representative institutions in ways that open up the possibility of speaking of a new type of democratic regime (12).

Digital democracy can be an alternative to traditional ideas of representative government, but it does not have to be. For example, crowdsourcing policies for a political party or a one-off consultation of citizens would count as instances of digital democracy without significantly altering the structure of a democratic regime. However, there are also more fundamental processes, such as establishing permanent extra-electoral institutions, that push toward a reconfiguration of political power, which in turn changes core aspects of how representative democracies operate.

As we will see, the political actors responsible for the D-CENT and DECODE projects were particularly attentive to questions of equalizing power between democratic

https://doi.org/10.1017/S1537592724000409 Published online by Cambridge University Press

citizens and seeking to open pathways to transform the political system. Rather than conceiving of the problem of politics as a lack of opportunities for ongoing discussion, they centered their analysis on the distribution of political power and the domination of the political process by wealthy and powerful elites. By properly contextualizing these experiments of digital democracy, we aim to contribute to existing discussions developing an approach that shows how political collectives can build organizational power by mobilizing citizens through digital technologies.

Within the digital democracy literature, it is perhaps Hélène Landemore's research project that shares most with the theoretical framework developed here. In "Open Democracy and Digital Technologies" (2021), Landemore imagines how key institutional principles of her new paradigm of open democracy—a vision of democratic popular rule that centers on the role that minipublics with lottocratic and self-selected representation play in allowing a broader range of citizens to access decision-making power—could be facilitated using digital tools. Drawing inspiration from recent democratic experiments in Iceland and France, Landemore argues that technologies have rendered the promise of deeper democracy considerably more plausible through new forms of empowered citizen participation in policy making and decision making. These institutions range from online platforms for policy development to referenda and participatory budgeting. Through these tools, citizens gain a capacity to exercise agenda-setting power by creating new proposals and—with a sufficient level of support—seeing these through to new policies and laws.

To this approach, with which we substantially agree, we seek to add a greater attentiveness to the dynamics of political power and how democratic communities can mobilize to challenge entrenched structures of power and transform political institutions. We place less emphasis on the institutional design of a minipublic and instead look to the vitality and democratic agency of people organized through social movements and municipal institutions. With Landemore (2021), we argue that digital democracy, understood from this perspective, allows for a progressive shift away from the concentration of power in relatively closed and oligarchic institutions.

To do so, we bring literature on democratic theory into conversation with CDS, which are chiefly interested in the ways in which "data are generated, curated, and how they permeate and exert power on all manner of forms of life" (Iladis and Russo 2016, 2). The relationship between digital technology and power is one that has been widely documented, particularly in the context of social welfare (Eubanks 2018), the workplace (Ajunwa 2020), or the digital economy more broadly (Cohen 2019; Zuboff 2019). That said, CDS offer an important lens of analysis for the two projects we are interested in, as they do not just seek to "expose data power, but to challenge its operation and promote alternative data imaginaries and practices" (Kitchin 2022, 80). In the development of our account of decentralized participatory democracy and the subsequent assessment of the two pilots, we pay attention to three questions inspired by the CDS research agenda: Did the democratic experiments challenge existing (data) power relations? Did they empower citizens with concrete counterinterventions that facilitate participation in decision making and emphasize data literacy and activism (Kitchin 2022, 80)? And to what extent did they transform (political) institutions through new "data imaginaries" and activities?

Decentralized Participatory Democracy

Our aim in the next two sections is to develop a perspective on the possibilities of digital democracy that focuses on citizen empowerment through the use of digital technology. In this section we start by theorizing the first of two experiments, the D-CENT pilot. D-CENT was a Europe-wide project in digital democracy that developed digital tools to assist citizens, political parties, social movements, and municipal governments to undertake democratic processes. It was EU-funded, starting in October 2013 and ending in May 2016, with all the code development uploaded to GitHub. D-CENT developed a "toolbox" of digital software for democratic governance, including citizen notifications of legislative decisions, a collaborative policy-drafting tool, a social network for citizens, a new voting system, and an open authentication and identity management tool (D-CENT 2016). These were distributed via an open-source platform that enabled any organization or government to utilize them for new projects (D-CENT 2014). Collaborating with partners in different cities, the project involved software developed and tested in four large-scale pilots across Spain, Iceland, and Finland:

- Better Reykjavik: a social network for citizens with a participatory budgeting platform (My Neighborhood) used by the city of Reykjavik, which enabled citizens to discuss and propose new policies and suggest how part of the city budget would be spent.
- Decisions Helsinki: a tool employed by the city government to allow citizens to follow notifications of municipal policy decisions that are of interest to them.
- Decidim Barcelona and Decide Madrid: a digital participation platform used by the city of Barcelona and the city of Madrid to enable citizens to propose, discuss, and vote on policies for the city government.

In D-CENT, the central concern for designers was developing technology that would support modes of participation that would allow citizens to have a more direct role in policy making and decision making. The pilots

https://doi.org/10.1017/S1537592724000409 Published online by Cambridge University Press

were part of a wave of participatory democratic experiments in the wake of Occupy Wall Street, the 15M movement in Spain, and the European "squares movements" in the early 2010s that sought to address the disparities of political power between citizens and political elites (Kioupkiolis and Katsambekis 2014). These mobilizations set up collective assemblies, built broad coalitions, created new programs of reform, and called for more participatory processes to be incorporated into democratic states. They were driven by criticisms of the failure of representative democracy—namely the oligarchic structure of political parties and the disempowering effects of representative institutions—leading many citizens to feel increasing dissatisfaction with their politicians and democratic institutions (Foa and Mounk 2017; Manin 1997). In municipal elections in 2015, Barcelona en Comú won the mayor's office on a mandate to bring a new type of politics to the city. Its leader, housing activist Ada Colau, championed a vision of participatory democracy for the city and implemented changes to how the city related to technology companies and citizens.

The background of the main activists who developed these projects was in the Indymedia scene in the 1990s, the free and open software movement, the anti-globalization movement, and the pink tide in Latin America (Bria and Morozov 2022). These efforts to create innovative forms of digital democracy were inspired by the desire to learn from the experiences of Project Cybersyn in Chile (1971–73)—an attempt to create a digital network for the democratic control of the national economy during the presidency of Salvador Allende (Medina 2011). Francesca Bria, then Barcelona's chief technology and innovation officer, was the project coordinator for both projects and played a key role in their development. She recounts how her team was "consciously drawing on the Latin American experiences" to design "genuinely European alternatives to Web 2.0" (Bria and Morozov 2022). Barcelona was also the center point of each set of pilots and had been a leading example of smart-city innovation during the early 2010s (March and Ribera-Fumaz 2019).

To understand the political perspective of these experiments, we can draw on the theoretical tradition of "new municipalism" represented by the Fearless Cities summits, in which Barcelona was a key player (Thompson 2021). This tradition is important because it reveals how citizen platforms such as Consul are not apolitical technical devices that can be plugged into different political systems with little regard for political context. Moreover, the new municipalists who came to power in Barcelona and elsewhere argue that the city is a strategically important site for contesting power. There are a variety of "municipalisms," from the pragmatic to the entrepreneurial, but the expansive and transformative program of these activists imagines how power can be devolved from the nation-state to municipal institutions that are closer to democratic citizens (Aldag, Kim, and Warner 2019; Saunier 2002; Thompson 2021). This was based on an idea that these institutions will be more responsive to citizen demands and better able to be controlled by organized citizen power. The variety of municipalism developed through the Fearless Cities network was united around a proactive and contentious vision of challenging neoliberal urbanism and building centers of power in municipal institutions (Thompson 2021).

Drawing from this municipalist tradition, we theorize three specific aspects of a decentralized participatory democracy as embodied in the D-CENT projects: using digital technology to build collective power, facilitating direct participation in decision making, and transforming political institutions. At its base, this is a variety of participatory democracy and shares many of the common goals of this tradition, seeking to create opportunities for citizens to participate directly in political decisions that affect their lives (Lafont 2019; Pateman 1970). We use the adjective "decentralized" in this context to refer to the particular confluence of new municipalism, a radical reformist ideology, and the use of digital technology, which came together in these two sets of pilots. The idea of shifting—or decentralizing—power from the nation-state to citizen networks and municipal authorities was essential to these projects and is captured in both their names. In contrast to certain other forms of politics at the local level, such as New England town hall meetings, these projects had a more contentious and transformative vision of challenging how power operated and seeking to transform political institutions.

To start, the software trialed in the D-CENT pilots promises a unique pathway for citizen empowerment by allowing citizens to participate online in specially designed spaces with a real impact on government decisions (Neblo, Esterling, and Lazer 2018). If used appropriately, it could enable citizens to reverse what Hélène Landemore (2020, 5) describes as the "enclosure of power" that occurs in representative democracies in order to make this power accessible on a more egalitarian basis. Citizens have multiple pathways on these digital platforms to have their voices heard in proposing new legislation, commenting on potential laws, and voting on laws and city budgets (Monge et al. 2022). The platforms add to a rich ecology of different associations in which citizens can participate, which includes both formal and informal processes of deliberation and decision making. In theory, this provides new opportunities for citizens to express their views and reach an audience on issues of public concern.

Deliberation with other citizens is an important aspect of these digital platforms, but it is not the primary perspective around which they are organized. Instead, these municipal movements are about returning power to ordinary citizens by building on the potential of the

https://doi.org/10.1017/S1537592724000409 Published online by Cambridge University Press

urban setting to construct what Bertie Russell (2019) has called "a politics of proximity," which refers to the strategic importance of the municipal level as a space that is potentially more accessible to direct citizen participation and more open to transformative change. Ada Colau, the former mayor of Barcelona, characterizes the movement as "an agora, not a temple," referring to the open arena for deliberation and citizen input into policy making in the city-states of ancient Greece (Russell 2019). The city offers a closer connection between citizens and representatives and more pathways for the former to participate in politics.

Second, digital tools can create new participatory processes that enable a broader mobilization and organization of political communities (Rahman 2017, 751). At the same time as they give citizens a voice in government, the tools also become embedded in a broader organization of citizens around key issues (Peña-López 2017). Research shows that citizens' motivation to participate and prioritize political activity in their lives is closely tied to their perceived ability to influence political decisions (Fung 2004). These digital platforms provide new forms of political contestation around projects that citizens feel they have a degree of control over. Participating on digital platforms becomes part of a broader process of citizens making demands, organizing through social movements, and advocating for their communities (Klein 2022, 32). This process of demand formation allows political communities to build power by increasing communication and strengthening networks in grassroots organizations. In this way, the process of proposing, deliberating, and voting on issues of importance helps communities to generate power through common action.

As Steven Klein (2022, 37) points out, "democratic institutions not only distribute power as decision-making rights, but also realize power by organizing the disorganized over and against the already organized, such as the wealthy and incumbent state actors." His perspective of a "democratic power approach" (27) to understanding the proper role of democratic institutions provides a useful lens to highlight our more empowered and transformative view of digital democracy. According to Klein's approach, democratic institutions are not simply formal procedures, but also "substantive mechanisms for organizing different actors, interests, and groups in society" (27). Thus, for an institutional order to be properly democratic it should organize collective power by assisting individuals to participate in collective activities and coordinate with others, particularly those who are less wealthy and powerful (27). Klein's approach and new municipalism share an emphasis on democratic institutions that generate the collective dimension of political power and help to equalize power between citizens in a democratic regime. Democracy, in this view, is best understood as entailing both fair procedures that guarantee a minimum level of inclusion and equal influence and mechanisms that help to organize and mobilize citizens and equalize power between them.

Third, decentralized participatory democracy includes a transformative dimension that can produce a qualitative shift in how democratic government functions through a transfer of power to citizens. This transformative perspective contributes to our understanding of an important dimension of democratic practice related to the creative agency of democratic actors and their capacity for institutional innovation (Asenbaum 2021b). It also chimes with other recent transformative perspectives within democratic theory that seek to institute changes to the current configuration between neoliberal capital and the state (Asenbaum 2021a; Kioupkiolis 2019).

Thus, instead of asking how digital technology can contribute to increasing the legitimacy of existing institutions, we should also be attentive to how it could change them. Even though citizen platforms often gain attention by participating in municipal electoral politics, this engagement is not limited to appropriating the powers of the state to use it for progressive ends. Rather, new municipalists are concerned with transforming the institutions by opening them to a broader vision of collective self-government. They have pursued progressive policy agendas that, at their most radical end, have included calls for "the democratization of society and the socialization of production" (Akuno and Nangwaya 2017). But even less radical manifestations have included ideas around introducing more cooperative principles into urban economies and creating networks of community wealth-building (Guinan and O'Neill 2019). When Barcelona en Comú were elected they pursued a democratic-socialist agenda of developing the cooperative economy, instituting progressive procurement strategies, remunicipalizing some public services, and promoting greater social rights for citizens (Blanco, Salazar, and Bianchi 2020).

Municipalists do not understand this as simply a transfer of power from national institutions to municipal ones, but as a change in *how this power is developed and used.* The city is framed as a strategic site for developing citizen power and challenging traditional party politics by providing citizens new avenues to participate through digital platforms (Thompson 2021). This is why municipalists attempt to forge international connections between cities and demonstrate how corporate power across the globe affects citizens in similar ways, connecting local issues with global networks of power (Russell 2019). Yet the notion of place and proximity plays an important role in this style of transformative politics. A municipalist politics is one that is interested in more than winning as many seats as possible; it seeks to forge connections between citizens, mobilize resources to build political power, open up municipal institutions to organized citizens, and develop a policy agenda. Building on the demands of the Spanish 15M movement for "real democracy," the substantive

https://doi.org/10.1017/S1537592724000409 Published online by Cambridge University Press

policy agenda of municipalist movements centers upon ways in which democratic principles can be extended from the political sphere of the state to other social and economic institutions to distribute power and decision making to ordinary citizens.

Decide Madrid and Consul

In this section, we turn to an analysis of one of the most prominent experiments within the D-CENT pilot to assess how successful it was in implementing these principles. In doing so, we investigate if the technology in question was used by citizens to build collective power and challenge existing power relations, if it provided citizens with "practical counterinterventions" that facilitate participation in decision making, and whether it transformed political institutions through the promotion of new "data imaginaries" and activities (Kitchin 2022, 80).

The cornerstone of the D-CENT project was in Madrid, where "Decide Madrid" was launched in 2015. The project was greeted as "a decentralization of power that equips communities with the instruments to make decisions collectively … [t]o encourage the use of digital infrastructures that can be reappropriated and to ensure they can be accessible and that people can learn to use them" (Roth, Lander, and Pin 2018, 115, quoted in Charnock, March, and Ribera-Fumaz 2021, 590). Today, Decide Madrid is one of the best examples of Consul, the open-source software developed by D-CENT.

This software underpins a participation platform that enables citizens to perform a variety of tasks (D-CENT 2014, 14–15). First, it allows citizens to propose policies to the city government. If they pass a given threshold of approval from other citizens, these proposals become subject to a vote that sends the proposal forward to be reviewed by the government. The platform also enables citizens to discuss proposals that have originated from the city government or from a collaboration between citizens and government, and to engage in participatory budgeting. Furthermore, citizens can use the platform as a discussion forum on a variety of topics other than legislative proposals. In short, Consul allows citizens to participate digitally in five areas (debates, proposals, polls, processes, and participatory budgeting), thereby contributing to "three moments of the policy cycle": agenda setting, policy analysis, policy formulation—and, to a limited degree, policy monitoring (Royo, Pina, and Garcia-Rayado 2020, 7).

In public and policy circles, Decide Madrid is widely considered a success. In 2018 it won a United Nations Public Service award and is listed in the OECD Observatory of Public Sector Innovation. The Consul software has been exported to more than 35 countries, and has been used by 135 institutions and 90 million citizens (Consul 2022). For example, D-CENT software was used to build a participatory budgeting platform in Reykjavik and to allow Finish citizens the right to propose new bills to parliament if they received support from 50,000 other citizens. In Madrid, a strong communications plan from the city and high expectations from citizens led to elevated participation levels in the initial stages of the project. By the end of 2018, more than 400,000 users were registered on the platform, with participatory budgeting being the most popular aspect of the software (Royo, Pina, and Garcia-Rayado 2020, 2). What is more, citizens had used the platform to decide over one thousand action items, including choosing which squares should undergo renovation (12).

Reports conducted during and after the project, including exploratory case studies that consisted of interviews with politicians and civil servants as well as desk research, indicate three main factors were particularly relevant for the project's success (Royo, Pina, and Garcia-Rayado 2020, 1). First, support by political leaders, specifically the serving mayor, was crucial in successfully launching the platform because it improved the coordination of council departments and ensured the financial, political, and managerial support required to develop and sustain the platform (13). This allowed citizen engagement to be integrated into more traditional structures of the city government. Moreover, the city council went to considerable lengths to avoid the traditional restrictions on citizen participation in Spain by committing to take the results of the polls and participatory budgets as binding, irrespective of the number of participants—a factor that has been key to the technology's implementation and internal institutionalization (14).

Second, and in line with Hagen's (2022) observations, contextual factors played a significant role in the success of the technology. Madrid has had a long experience of neighborhood-based associations collaborating with the municipality in the coproduction of public services (Royo, Pina, and Garcia-Rayado 2020, 6; Sánchez Medero and Pastor Albaladejo 2018). The possibility of direct citizen participation in public affairs and individual or collective petitions is recognized in the 1978 Constitution. Another was the political crisis that preceded the pilot's implementation. Spain, and particularly Madrid, were the locus of a political crisis, which in turn provided fruitful soil for an initiative that sought to empower citizens and give them a more prominent voice in local policy making. Spain also had a long history of embracing digital technology and being at the forefront of civic tech initiatives.

Third, the project prioritized a user-friendly design for the technology. To make proposals and comment on all sections of the platform, citizens only needed to provide an email address. Voting on proposals, however, required information that confirmed citizenship, such as a national identity number, their date of birth, and their postal code. The platform also attempted to be open to citizens with

https://doi.org/10.1017/S1537592724000409 Published online by Cambridge University Press

disabilities by allowing many of the participatory activities and the verification process to be undertaken offline, which included distributing printed signature forms to support citizen proposals.

From a decentralized participatory democracy perspective, the D-CENT project did indeed meet its own political aims: citizens used the participation platform to rally around shared issues, desires, and concerns, thereby providing a pathway toward building collective power (Klein 2022, 32). In enabling citizens to have their voices heard, decide on action items, engage in participatory budgeting, and contribute their ideas to the policy cycle, the Consul software allowed participating citizens to facilitate direct access to decision making. By changing the way in which citizen proposals entered the policy cycle, the software used in the pilot also transformed political institutions. However, the CDS research agenda also highlights a number of challenges that need to be addressed in future iterations.

One of the most important challenges concerns questions of representation and inclusion. Despite an initial peak in popularity, overall registration rates for the platform remain relatively low (less than 10% of the population is registered). While the software theoretically challenges existing power relations by empowering citizens equally, it fell short of a more widespread form of citizen participation. This fact deserves attention, as one of the stated goals of the activists behind the project was to enable a broader range of ordinary citizens to access a political process dominated by wealthy and well-organized elites. Which part of the citizenry used these tools most is currently unknown. This lack of insight into the demographic and socioeconomic background of participants is a feature of the technology, not a bug: the technology was specifically designed to *not collect* these sensitive attributes of the citizens using the platform, thereby protecting their privacy. This makes it difficult to assess how participation was distributed among different social groups, and to come up with new ideas as to how to reach the underrepresented.

Research indicates that public awareness of Decide Madrid tends to be strongest among university-educated citizens (Simon et al. 2017, 49). This raises a well-known concern that opening up new opportunities for participation could exacerbate existing inequalities by empowering those with more time and resources over less influential members of society (Elliott 2023; Neblo, Esterling, and Lazer 2018, 30). This issue was not adequately addressed in the pilot and requires active prioritization if these tools are to become part of an empowering digital democracy.

What is more, the lack of data related to questions of representation and inclusion highlights an uncomfortable tension between privacy and public value inherent in projects that seek to navigate this difficult terrain: from a privacy perspective, we would like to see as little data as possible being collected, while from a technological—and indeed, public policy—perspective, more datapoints are better for understanding how the process is functioning. In the pilot, designers followed a data minimization principle, which, while being attentive to people's privacy, also resulted in a lack of information for addressing issues around diversity and inclusion. There is no "quick fix" to deal with these substantive questions, and it makes democratic inclusion and deliberation even more important for any city or community that contemplates implementing such technologies.

On a more optimistic note, research suggests that small changes to the institutional structure of digital platforms through a well-designed recruitment strategy can enable a broader cross section of the community to participate (Neblo, Esterling, and Lazer 2018, 53–68). Neblo and colleagues use empirical evidence from their experimental trials in online deliberation to suggest that reaching out to diverse groups of citizens and encouraging them to participate can help to ameliorate concerns about the overrepresentation of dominant groups.

A second challenge relates to the process through which participation on the platform translates into creating binding laws, which ties directly into the practicality criterion of the CDS research agenda. Even though the platform was designed to minimize the administrative burden on citizens, one issue was that it was difficult for citizens to identify duplicate proposals, which in turn led to a lot of citizens proposing similar ideas, making it harder for a proposal to reach the necessary threshold of votes. Despite 25,418 proposals being made by the end of 2018, only two, "Madrid 100% sustainable" and "single ticket for public transport," reached the voting phase and were enacted as legislation (Royo, Pina, and Garcia-Rayado 2020, 11–12). In response, some citizens sought to add previously unsuccessful proposals into participatory budgeting votes or polls to avoid the high threshold of required votes (13). This suggests that greater attention needs to be given to improving the practicality of such counterinterventions, such as by introducing filtering and sorting processes that could aggregate proposals, or by lowering the threshold of required votes to ensure that more citizen initiatives were successful. That said, lowering the threshold for required votes might introduce new risks to representation and inclusion, as it would make it easier for well-organized interest groups to achieve their policy goals by mobilizing (or manipulating) fewer members of the public. Thus, increasing citizen power by lowering the threshold of required votes would have to be balanced against other democratic concerns, such as avoiding elite capture. Where possible, such efforts would have to be accompanied by rules or guidelines designed to prevent such coordinated collective action.

It also appears that citizens were excited, but not ultimately convinced, about the project's ability to meaningfully promote different data practices. Subsequent

https://doi.org/10.1017/S1537592724000409 Published online by Cambridge University Press

reports noted a perceived lack of transparency over how proposals would become new laws (Royo, Pina, and Garcia-Rayado 2020, 15). Citizens interviewed about the pilot indicated their strongest motivation was the possibility of seeing their contributions implemented as law or taken into account in the policy-making process. The fact that so few of their proposals appeared to make it into the final stages of the process raised skepticism that the process was merely for show and that the governing party was not committed to genuine empowerment of citizen voices. Thus, figuring out how these tools can be made widely accessible is crucial not just on a technical but also on a normative level, especially if the serving government promises to treat proposals as binding. For digital participation platforms to attract serious interest from citizens and truly promote a different data imaginary built around collective power, they should prioritize equalizing access for all citizens; adopt a user-friendly design; and install processes that are easy to navigate and understand, and which will see the creation of binding laws if the appropriate steps are taken.

In the next section, we turn to a second set of pilots that sought to institute what Zuckerman (2020) and Fischli (2022) have coined "digital public infrastructure." At first glance, an idea about citizen-controlled data may seem far removed from participatory platforms and digital democratic tools. But a cursory look at the CDS research agenda and the new municipalism movement reveals a common theme of building collective power in public institutions to allow citizens to participate more directly in processes of self-governance.

Digital Public Infrastructure

The DECODE pilots and the idea of building digital public infrastructure can be understood as an extension of the decentralized participatory democratic approach to the economic domain of data markets. Whereas the D-CENT pilots were about using digital tools to create new participatory forms of governance, DECODE sought to build a public system of data governance by counteracting the power of Big Tech firms and developing an ecosystem of public and cooperative alternatives. In other words, rather than exploring ways in which existing democratic institutions could better function through greater levels of citizen participation, the DECODE pilot sought to democratize the digital economy by building public systems of data governance.

Building on the legacy of D-CENT, DECODE was an EU-funded three-year project running between January 2017 and December 2019 in Amsterdam and Barcelona, designed in response to concerns about the loss of control over people's data when using large centralized corporate platforms. The overarching aim of the pilots was to implement a new municipal data policy that challenged the power of Big Tech companies and created a new infrastructure for managing citizens' data (Sagarra et al. 2019).

DECODE was again conceived of and coordinated by Francesca Bria, and gained significant attention as a leading innovator in creating new digital infrastructure for the city that enabled citizens to gain greater control over their data (Cardullo, Kitchin, and di Feliciantonio 2019; Charnock, March, and Ribera-Fumaz 2021). It was recognized that municipal data generated by citizens would be crucial for future city administrations to run public services. A 2018 poll indicated that 73% of respondents would "share personal data in an effort to improve public services if there was a simple and secure way of doing it" (Nesta 2018, para. 5). City governments, such as those in Barcelona and Amsterdam, are an important site for the development of such prototypes because they are responsible for delivering basic services to citizens and can be more amenable than national governments to transformative political projects. They also often have regulatory powers over tech companies and can act on behalf of local citizens to counteract the power of global digital platforms. The pilots sought to allow citizens to manage their own devices for generating data and create a "data commons" as a shared public resource that was accessible and transparent in how data was collected and used (Old and Bass 2020, 4).

These pilots were:

- Digital Democracy and Data Commons: Barcelona City Council integrated a new mechanism into the digital democracy software Decidim to enable citizens to sign petitions anonymously while still using authentication requirements, such as place of residence.
- Citizen Science Data Governance: this Barcelona pilot used citizen-placed sensors in homes and neighborhoods to gather data on social and environmental issues, such as noise levels and pollution, to create a municipal data commons through data shared anonymously by citizens.
- Gebiedonline (Neighbourhood Online): this pilot tested more privacy-preserving attribute-based credentials on users accessing a local neighborhood social network in Amsterdam, giving them more control over the data they shared.
- Amsterdam Digital Register: this pilot enabled citizens to access information stored in a municipal database through blockchain technology to verify their age without having to share their full identity or social security number.

The need for such an intervention in the digital economy arises due to tech companies, such as Airbnb and Uber, now playing a more active role in shaping the agenda

https://doi.org/10.1017/S1537592724000409 Published online by Cambridge University Press

of urban governance. While these companies began by attempting to ignore and evade regulations, many now see themselves as partners with governments in urban policy and law making (Pollman and Barry 2017). These companies aim to co-shape not simply the terms of their own regulation, but also broader patterns of urban life in housing, tourism, transportation, and planning (van Doorn 2020). Sarah Barns (2017, 56) has argued that these companies follow a logic of "platform urbanism" in which "platform-based business models ensure the generation of urban data largely takes place within proprietary data ecosystems." Private companies such as Google's Sidewalk Labs in Toronto and other smart-city projects have attempted to privatize previously public data in urban environments. The confinement of this data to private silos limits the value that can be generated from it. In response, the DECODE pilots directly challenged privatized corporate power over digital life and sought to reclaim power for the public sphere, where it could be exercised democratically.

Just as in the D-CENT pilot, this idea is an important element of a broader new municipalist strategy, which is concerned not only with transforming the state and developing new forms of municipal governance, but also with intervening in a capitalist economy. Municipalists have pursued projects of "community wealth building" and have developed networks of worker-owned cooperatives as part of an ambition to create "cooperative cities" (Guinan and O'Neill 2020; Sutton 2019). The idea is to support alternative forms of economics that promote solidarity, cooperative activity, and collective self-provisioning. A key pillar in this program is the remunicipalization of public services and utilities as a mechanism to prevent rent-seeking behavior from private companies with monopolies over essential services. In Barcelona, this also included counteracting the power of short-term-rental companies such as Airbnb and a more stringent regulation of the tourism industry, which affected residents' capacity to find affordable housing (Blanco, Salazar, and Bianchi 2020). Asserting public power over citizen-produced data can be understood in the context of this remunicipalization of privatized public assets. It draws on a tradition of municipal socialism and shows how it could be applied to the digital economy (Cumbers 2012; Muldoon 2022).

In this context, digital infrastructure consists of the systems and tools upon which much of our current economy and society operate: artificial intelligence, web services, computational systems, regimes for the accumulation of data, and proprietary software platforms (Rahman 2018). There is now a large literature on the infrastructural role large tech companies play in modern economies and the public sphere (Aytac 2022; Cohen 2023; Rahman 2017; van Dijck, Nieborg, and Poell 2019). In response, critics such as Ethan Zuckerman (2020, 2) have called for "a robust ecosystem of public service digital spaces, tools and resources," to provide internet users with basic tools so they have more control over their online experiences. Europe has invested significant resources in its digital policy to become a leading regulator of technology companies, particularly with its Digital Services Act and Digital Markets Act.

The move to counteract the concentrated private power that tech companies have accumulated can be usefully interpreted through the CDS research agenda, which prioritizes practical initiatives that enable citizens to build collective power, imagine different data practices, and challenge existing power relations. Whereas D-CENT was chiefly interested in empowering citizens in their political role as decision makers, the DECODE pilot sought to empower them vis-à-vis technology corporations, as data producers. The idea of digital public infrastructure understood through this lens is a concrete way in which citizens can challenge and transform existing power relations—particularly regarding their dependency on large tech companies—and collectively use the data they generate for their own public benefit.

The DECODE pilot advanced three main principles in the digital economy: (1) creation of a data commons, (2) democratic data governance, and (3) data sovereignty. First, digital public infrastructure involves creating new institutions for the governance of a data commons, understood as a collective pool of information generated by citizens that can be democratically managed and yield public value. This strategy differs considerably from other, more market-oriented, approaches that envision digital empowerment through the strengthening of individual property rights. Such approaches would offer individuals the possibility of selling their data to third-party actors as a means to supplement their income and accommodate the intuition that people should enjoy a share of the value their data generates (Cheneval 2021). This accepts the current propertization logic of personal data and attempts to expand the benefits for individuals in their interactions with companies. At the same time, the introduction of new individual property rights around personal data could have adverse effects on privacy, particularly in the contemporary digital context where a small number of technology companies continue to enjoy widely asymmetrical power relations with users. Even advocates of individual data ownership schemes have acknowledged that offering individuals property rights over their data is not likely to change the current power imbalance between corporate actors and users, as the former would continue to enjoy rights to primary data use (Fischli 2022). As a result, individuals might be incentivized to produce even more data about themselves than previously, making privacy a privilege for the wealthy.

Data commons, on the other hand, depart from this market logic, as they entail shared resources that are collectively governed through democratic participation

https://doi.org/10.1017/S1537592724000409 Published online by Cambridge University Press

(Ostrom 2015). In the digital realm, the data commons model is adopted by institutions such as Wikipedia and the Creative Commons, and by free and open software (Muldoon 2022; Old and Bass 2020). What is more, collective data related to mobility, energy use, and well-being has the potential to help public authorities act on important issues related to transport, health services, and the environment. With appropriate legal and technical safeguards in place, this citizen data can be used without endangering the individuals who did not share their information. We can imagine a data commons that functions as a repository of publicly available statistical data that could be accessed by everyone and used to generate further value, or a combination of private and public data that could be used under certain conditions by public authorities to enact big infrastructure projects (Old and Bass 2020). Contemporary examples include the National Cancer Institute Data Commons research data repository, and the data trusts piloted by the Open Data Institute (Old and Bass 2020, 15).

Second, this conception of a data commons requires a new understanding of democratic data governance to assist with its stewardship. DECODE tested new methods through which people could be given more control over their data through a "public-commons" model (Milburn and Russell 2018). The project was financed by public institutions and was directed from a municipal institution consisting of public servants and elected representatives. Yet it also involved groups of citizens, university researchers, digital activists, volunteers, and staff from foundations. Governance over the data took place through a public organization but involved democratic action and civic participation by communities. There is a tension within this model between control exercised by public bureaucrats, on the one hand, and the power of organized citizens, on the other (Monge et al. 2022, 21). This leads to the need to build great knowledge and capacity among civil servants and the public so that both can be properly involved in managing the project, or creating synergies with other digital tools, such as the Consul software, that make it easier for citizens to voice their priorities and concerns.

Third, this idea of democratic data governance also relies on a "data sovereignty" approach to deal with private companies seeking to benefit from citizens' data. In the pilot, the city government made revisions to procurement deals with private companies, including "data sovereignty" clauses so that companies were obliged to provide governments with data they had gathered in a machine-readable format (Old and Bass 2020, 8). This enables the government to make use of the data and turn it into a public good that can be stored in a privacy-preserving manner in the public domain. This idea of data sovereignty concerns the assertion of public ownership over data created by citizens as a prima facie position rather than private companies automatically assuming ownership over data that can then be commercially exploited. Previously, ownership over data produced on digital platforms was a difficult subject because multiple parties could potentially claim some kind of proprietary interest in the data. Data sovereignty clauses assert a presumption in favor of open data so that others can build off the data to develop new tools and services. Changing the rules of procurement services is seen as essential to building a new generation of digital public infrastructure.

Barcelona's Citizen Science Data Governance

For a more in-depth analysis, we have selected the Barcelona pilot focusing on creating a data commons, because the Amsterdam pilots were about establishing a proof of concept for the technology rather than utilizing it in collaboration with the municipal government to build the capacity of local communities (Old and Bass 2020, 24). In one of the Barcelona pilots, one hundred city residents deployed sensors in their neighborhoods that would connect to the city's data network and gather information on urban issues such as noise pollution and air quality (28). The aims of the pilot were to run a social test on people's willingness to share this type of data, test the cryptographic technology used for data gathering, and cocreate data-sharing policies (Sagarra et al. 2019). Citizens could choose to share this data as part of a broader data commons to create public value from the information they generated. This was part of a new decentralized system of data governance and identity management that enabled citizens to take part in a privacy-enhanced data-sharing regime. By using a specially designed app, each individual citizen could select their preferred anonymity level and control which aspects of their data they shared for public use, if any. This data could then be integrated into the City Hall digital infrastructure. In theory, such a digital public infrastructure enables companies, cooperatives, and other public departments to build off the data while sharing the insights generated from the data with the citizens who produce it. This creates a regulated environment in which data can be shared and used for the public good and for business purposes.

The pilot successfully continued to engage stakeholders and gather data from the sensor network. In total, 24 sensors were deployed with 1.7 million readings over a period of three months, and 330 people attended community sessions (Sagarra et al. 2019, 47). Subsequent project evaluations revealed that a key reason for the pilot's success was its early and frequent community consultations. The pilot team spent time setting up a series of community workshops in which they introduced the technology and facilitated discussion around shared goals and how the sensor kits could address local community problems. DECODE designers considered it necessary to make the

https://doi.org/10.1017/S1537592724000409 Published online by Cambridge University Press

data available and accessible to residents while also equipping them with the knowledge to make decisions about how the data would be used (Old and Bass 2020, 34). This is in line with the CDS research agenda that prioritizes not just practicality, but also data literacy and digital initiatives that benefit the local community (Kitchin 2022).

The project also had a well-planned dissemination strategy to promote public awareness of the tools and the benefits of having free and open data commons (Symons and Old 2020, 8). This also involved building a community of people who supported the use of the technology and could participate in communicating the project to a broader audience. The pilot designers learned that participants were best activated through a combination of online and offline participation, involving in-person "workshops, deliberations, and interactive sessions" (Old and Bass 2020, 27). There were a variety of digital tools and online fora that participants could use, but many of the objectives of the pilot were achieved through in-person participation (27).

Another key factor supporting Barcelona's data commons pilot was the strong leadership played by the mayor's office through the creation of the post of chief technology and information officer (CTIO), which elevated the importance of the project within the bureaucracy (Monge et al. 2022, 19). The political support of the mayor and the managerial resources of a senior department figure helped to push through the reforms and maintain a coherent vision of a digital economy based on democratic principles. This leadership also relied on a broader coalition of forces from across civil society to help to legitimize the project and provide necessary support, creating a community of practice around the project (19–20).

One downside of the central role this leadership played was that the project became highly reliant on the role of a charismatic leader, and struggled to institutionalize the reforms in the wider bureaucracy once Francesca Bria's term was finished. After new local elections in 2019, Barcelona en Comú lost ground and a new political party (the Socialist Party) entered into coalition government and took charge of digital policy. This shifted the priorities of the government "from digital sovereignty to digital humanism," according to researcher Antonio Calleja-López, which changed the willingness of the city administration to continue building its capabilities with regard to leveraging a data commons (Monge et al. 2022, 16).

Barcelona's history as a city that has embraced digital innovation and civic participation made it easier for the city's administrative departments to adapt to the new institutional and regulatory innovations as part of the pilot. In 2011, the city's municipal government had committed to making Barcelona one of the world's leading smart cities and digital innovators (March and Ribera-Fumaz 2019). But unlike earlier digital innovations in the early 2010s, the DECODE project made it a priority to develop the capabilities of public institutions rather than outsourcing the technical side of the project to external consultants (Monge et al. 2022, 20). Designers of the pilot recognized that the capabilities of administrators within municipal institutions would need to be developed to achieve the goals of the pilot.

One of the main challenges for the pilot was the lack of staff trained in data science within the administration, which translated into poor data literacy (Monge et al. 2022, 17). There was also the difficulty of encouraging changes to working practices around the adoption of free and open-source software as part of the project. A degree of organizational inertia and resistance to change was combined with genuine concerns about the capability of free and open-source alternatives to meet the organizational and technical needs of the city in the long term (15). On top of these challenges, the pilot faced technical issues around how to integrate the data collected in the pilot with the city's existing data infrastructure. The city was aided in its efforts through the rollout of new software, but there was a broader need to "map the whole data universe in the city and integrate all the existing datasets into a single data lake," which is a complex project that would take significant time (15).

Given the limitations of the size of the pilot and the nature of the data being collected, it is as yet unclear how such a data commons would interact with a broader ecosystem of digital firms and services. The vision for the model is for civic associations, cooperatives, and small and medium enterprises to be able to create additional value from the data and to use it on terms set by the public authority. But it is difficult to judge how successful such a model would be at the level of a city with only a small pilot as the case study. It is on this point that designers of the pilot hoped that it could serve as an impetus for larger funding from the EU and for articulating a democratic approach to data governance that could be replicated in other cities and at an international level.

Bringing CDS back into the conversation, we can draw an additional set of conclusions. To start, because of its limited scope and size, such a pilot faces significant limitations in its ability to counteract existing power relations between citizens and large technology corporations. This is underscored by the limited success of the city in marketing its data sovereignty clause to data-generating businesses. During its time of operation, Vodafone remained the only large company that agreed to the city's terms, and it took almost a year to finalize the conditions of the deal (Monge et al. 2022, 11). Against this backdrop it is important to remain realistic about the degree to which such initiatives can challenge Big Tech's control over social media apps or other key digital infrastructure. Digital public infrastructures, including the way they were envisioned and tested in the DECODE case, are specifically *not* designed to follow the addictive and extractive logic of

https://doi.org/10.1017/S1537592724000409 Published online by Cambridge University Press

"surveillance capitalism" to create a panoptic surveillance state, or generate exploitable insights about people's most intimate information (Zuboff 2019). Thus, the main role of the pilot was to promote a different data imaginary and different practices that challenge the paradigm of private companies controlling smart-city initiatives. With its novel approach toward data sovereignty in public procurement contracts, the Barcelona pilot served as a reminder that a more emancipatory digital future is possible.

If the concept of digital public infrastructure was to have a larger impact on this issue in the future and increase citizens' collective power, it would have to be expanded from a very limited model of urban infrastructure into much broader domains that would begin to replace key functions currently performed by private tech companies. In either case, implementing sufficient democratic—and technical—safeguards to avoid "data creep" and ensure individual privacy and self-determination remains crucial for the democratic legitimacy and desirability of such efforts. To navigate this tension between individual privacy and collective empowerment, we suggest a "solidarity-based data governance" approach recently put forth by Prainsack and colleagues (2022). This approach adopts a rationale that prioritizes collective data ownership and control to "ensure that the benefits and costs of digital practices are borne collectively and fairly," while being restricted to instances where "data use creates public value" that "benefits people and communities without posing grave risks" (2022, e773).

In sum, the ultimate success of the DECODE pilot heavily depends on the criteria and expectations one adopts. The broader horizon of the Barcelona project was to begin building a working prototype of a data commons to reveal the possibilities of alternative models of building a digital economy—a task the project undoubtedly achieved. What is more, the pilot has attracted considerable public and academic attention and inspired a follow-up project called "The New Hanse" in Hamburg. Thus, we can conclude that the political aim of these experiments to empower citizens through digital technologies has succeeded in the greater scheme of things. By offering a different data imaginary and different practices, the DECODE project has shifted the Overton window from a model of data as a commodity extracted by corporations from passive citizens to one in which citizens make use of public institutions to gain control over how their data is collected and used.

Conclusion

In this article, we have sought to highlight a particular tradition of decentralized participatory democracy that relies on digital technology to achieve its goals. In this tradition, citizen engagement in government decision making is justified not simply in the instrumental sense of leading to more efficient policy making, but for the sake of cultivating a more participatory democratic society. At the same time, we have sought to contribute to an emerging and exciting research program on digital democracy, which interrogates how digital tools can be embedded in political institutions to facilitate democratic practices. These forms of digital democracy are still in their infancy and many skeptics question the efficacy of these initiatives, pointing to instances where they failed to attract significant public interest or have remained disconnected from sites of power (Gastil and Richards 2017, 760). Against this attitude, we have argued that there can be a wide range of positive democratic-use cases for digital tools. Technology can have an important role not simply in allowing people to produce and share content on social media, but in revitalizing democratic governance by empowering citizens through new kinds of democratic institutions and practices that promote different data imaginaries and offer practical counterinterventions.

An overview of the pilots under examination in this article reveals a number of important conditions for the success of experiments in digital democracy. The first is strong leadership behind the project and the ideological support of political authorities with the will and resources to fully implement the initiative (Monge et al. 2022, 19). When this leadership was changed in the case of Barcelona, the project faltered, indicating that more needed to be done to institutionalize the reforms so they were not overreliant on the actions of a single office holder. Nevertheless, and in line with existing research in this area, it might be difficult to transplant proposals from one political context to another without the same background conditions, organizational culture, and balance of political forces (Hagen 2000).

A second lesson is that successful initiatives tend to have strong public support achieved through continuous stakeholder engagement and by passing genuine decision-making power to citizens. A robust dissemination and communications strategy was essential to both projects, as was a commitment to cocreation at each stage of the project cycle, allowing citizens to make suggestions and for these to be included in future iterations of the pilots. That said, for citizens to express confidence in the process and outcome, it is important that they feel like their voices are heard, making practicality of these interventions a central criterion for the success of these initiatives.

Third, digital democratic practices should be seen as part of broader processes of citizen empowerment that require online and offline mechanisms and rely on the creation of virtuous circles of citizens making demands, participating in political processes, and building grassroots power. When citizens feel as if they have a greater say in political decision making they become more engaged and hold officials more accountable (Fung 2004). This, in turn, strengthens the democratic process and leads

https://doi.org/10.1017/S1537592724000409 Published online by Cambridge University Press

government agencies to be more responsive and to incorporate more direct forms of participation in their governance structures. The pilots show that digital democracy is effective when paired with face-to-face assemblies, forms of deliberations, and stakeholder meetings.

As we have shown with our theorization of decentralized participatory democracy, these pilots should encourage democratic theorists to engage more seriously with how digital democracy changes the underlying conditions for democratic government. Digital technology allows scholars to return to debates about the practical possibilities of participatory democracy at scale in ways that were not possible even a decade or so ago. It also highlights how resources available in neighboring disciplines, such as new municipalism and CDS, can inform key discussions in democratic theory (Kitchin 2022; Russell 2019). Drawing on these disciplines, we have shown that an attentiveness to how these technologies alter the fundamental dynamics of power between social groups is key to understanding how effective they will be as tools of democratic empowerment. This approach also broadens our frame of analysis from a narrow focus on formal democratic institutions to a larger one on "digital public infrastructure" through which citizens can exercise power and democratize the digital economy.

At the same time, our examples also show that merely setting up scalable technology is not enough if citizens do not feel like their voices are being heard. Thus, while these instances of decentralized participatory democracy present a way to overcome "traditional" challenges faced by classic participatory approaches, they replace them with new challenges, such as securing digital literacy, promoting representation and inclusion, and responding to the threat of coordinated collective action. In other words, digital technology can be used to promote democratic ends, but its success depends strongly on historical context and the attitude of the actors involved, as well as the guidelines and benchmarks that accompany its implementation.

The same holds for democratic experiments that seek to take on powerful technology corporations. As the DECODE project in Barcelona showed, the success of such citizen empowerment efforts might be limited and largely ineffective unless it is accompanied by more fundamental changes in the structure of ownership and control of the infrastructures and underlying technologies that so strongly shape the digital economy as we know it. This adds an important notion for future experiments in digital democracy. As the creation of digital public infrastructure in Barcelona revealed, at times, the true emancipatory quality of such projects is to provide a new vision for what is possible, inspiring follow-up experiments in different cities, and ultimately paving the way to a more citizen-led digital future.

References

Ajunwa, Ifeoma. 2020. "The 'Black Box' at Work." *Big Data & Society* 7 (2): 1–6. DOI: 10.1177/2053951720938093.

Akuno, Kali, and Ajamu Nangwaya. Eds. 2017. *Jackson Rising: The Struggle for Economic Democracy and Black Self-Determination in Jackson, Mississippi*. Montreal, QC: Daraja Press.

Aldag, Austin M., Yunji Kim, and Mildred E. Warner. 2019. "Austerity Urbanism or Pragmatic Municipalism? Local Government Responses to Fiscal Stress in New York State." *Environment and Planning A: Economy and Space* 51 (6): 1287–1305. DOI: 10.1177/0308518X19844794.

Asenbaum, Hans. 2021a. "The Politics of Becoming: Disidentification as Radical Democratic Practice." *European Journal of Social Theory* 24 (1): 86–104. DOI: 10.1177/1368431020935781.

Asenbaum, Hans. 2021b. "Rethinking Democratic Innovations: A Look through the Kaleidoscope of Democratic Theory." *Political Studies Review* 20 (4): 680–90.

Aytac, Ugur. 2022. "Digital Domination: Social Media and Contestatory Democracy." *Political Studies* 72 (1): 6–25.

Barlow, John Perry. 1996. "A Declaration of the Independence of Cyberspace." Davos: Electronic Frontier Foundation, February 9. https://perma.cc/GL7C-A3HB.

Barns, Sarah. 2017. "Visions of Urban Informatics: From Proximate Futures to Data-Driven Urbanism." *Fibreculture Journal* 29: 31–50. DOI: 10.15307/fcj.29.204.2017.

Bernholz, Lucy, Hélène Landemore, and Rob Reich. Eds. 2021. *Digital Technology and Democratic Theory*. Chicago: University of Chicago Press. DOI: 10.7208/chicago/9780226748603.001.0001.

Blanco, Ismael, Yunailis Salazar, and Iolanda Bianchi. 2020. "Urban Governance and Political Change under a Radical Left Government: The Case of Barcelona." *Journal of Urban Affairs* 42 (1): 18–38. DOI: 10.1080/07352166.2018.1559648.

Bria, Francesca, and Evgeny Morozov. 2022. "Francesca Bria on Decentralisation, Sovereignty, and Web3." Interview by Evgeny Morozov. *The Crypto Syllabus.* https://the-crypto-syllabus.com/francesca-bria-on-decentralisation.

Cardullo, Paolo, Rob Kitchin, and Cesare di Feliciantonio. Eds. 2019. *The Right to the Smart City*. Bingley: Emerald. DOI: 10.1108/9781787691391.

Charnock, Grieg, Hug March, and Ramon Ribera-Fumaz. 2021. "From Smart to Rebel City? Worlding, Provincialising and the Barcelona Model." *Urban Studies* 58 (3): 581–600. DOI: 10.1177/0042098019872119.

https://doi.org/10.1017/S1537592724000409 Published online by Cambridge University Press

Cheneval, Francis. 2021. "Property Rights of Personal Data and the Financing of Pensions." *Critical Review of International Social and Political Philosophy* 24 (2): 253–75.
Cohen, Joshua, and Aachon Fung. 2021. "Democracy and the Digital Public Sphere." In *Digital Technology and Democratic Theory*, eds. Lucy Bernholz, Hélène Landemore, and Rob Reich, 23–61. Chicago: University of Chicago Press. DOI: 10.7208/chicago/9780226748603.003.0002.
Cohen, Julie E. 2012. *Configuring the Networked Self: Law, Code, and the Play of Everyday Practice*. New Haven, CT: Yale University Press. DOI: 10.12987/9780300177930.
Cohen, Julie E. 2019. *Between Truth and Power: The Legal Constructions of Informational Capitalism*. Oxford: Oxford University Press. DOI: 10.1093/oso/9780190246693.001.0001.
Cohen, Julie E. 2023. "Infrastructuring the Digital Public Sphere." *Yale Journal of Law and Technology* 25 (S1): 1–40. https://law.yale.edu/isp/publications/digital-public-sphere/uniformity-and-fragmentation-digital-public-sphere/infrastructuring-digital-public-sphere.
Consul. 2022. "Consul: Free Software for Citizen Participation." Amsterdam: Consul Democracy Foundation. https://consuldemocracy.org.
Cumbers, Andrew. 2012. *Reclaiming Public Ownership: Making Space for Economic Democracy*. London: Zed Books. DOI: 10.5040/9781350222151.
Davies, Simmons. 1996. *Big Brother: Britain's Web of Surveillance and the New Technological Order*. London: Pan Books.
D-CENT. 2014. "Open Source Co-Operation Platform for Citizens." D-CENT Project, January 7. https://dcentproject.eu/open-source-co-operation-platform-for-citizens.
D-CENT. 2016. "D-CENT ToolBox: Technologies for 21st Century Democracy." D-CENT Project, June. https://dcentproject.eu/wp-content/uploads/2016/06/D-Cent-toolsbox-final-spreads-1.pdf.
Elliott, Kevin J. 2023. *Democracy for Busy People*. Chicago: University of Chicago Press. DOI: 10.7208/chicago/9780226826318.001.0001.
Eubanks, Virginia. 2018. *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor*. New York: St. Martin's Press.
Fischli, Roberta. 2022. "Data-Owning Democracy: Citizen Empowerment through Data Ownership." *European Journal of Political Theory*. Forthcoming. DOI: 10.1177/14748851221110316.
Fishkin, James, Nikhil Garg, Lodewijk Gelauff, Ashish Goel, Kamesh Munagala, Sukolsak Sakshuwong, Alice Siu, and Sravya Yandamuri. 2018. "Deliberative Democracy with the Online Deliberation Platform." Paper presented at the 7th AAAI Conference on Human Computation and Crowdsourcing (HCOMP 2019), Stevenson, WA, October 28–30. https://www.humancomputation.com/2019/assets/papers/144.pdf.
Foa, Roberto Stefan, and Yascha Mounk. 2017. "The Signs of Deconsolidation." *Journal of Democracy* 28 (1): 5–15. DOI: 10.1353/jod.2017.0000.
Forestal, Jennifer. 2022. *Designing for Democracy: How to Build Community in Digital Environments*. Oxford: Oxford University Press. DOI: 10.1093/oso/9780197568750.001.0001.
Fung, Archon. 2004. *Empowered Participation: Reinventing Urban Democracy*. Princeton, NJ: Princeton University Press. DOI: 10.1515/9781400835638.
Fung, Archon. 2007. "Democratic Theory and Political Science: A Pragmatic Method of Constructive Engagement." *American Political Science Review* 101 (3): 443–58. DOI: 10.1017/S000305540707030X.
Fung, Archon, and Erik Olin Wright. 2001. "Deepening Democracy: Innovations in Empowered Participatory Governance." *Politics and Society* 29 (1): 5–41. DOI: 10.1177/0032329201029001002.
Gastil, John. 2021. "A Theoretical Model of How Digital Platforms for Public Consultation Can Leverage Deliberation to Boost Democratic Legitimacy." *Journal of Deliberative Democracy* 17 (1): 78–89. DOI: 10.16997/10.16997/jdd.963.
Gastil, John, and Robert C. Richards. 2017. "Embracing Digital Democracy: A Call for Building an Online Civic Commons." *PS: Political Science & Politics* 50 (3): 758–63. DOI: 10.1017/s1049096517000555.
Gilman, Hollie Russon. 2016. *Democracy Reinvented: Participatory Budgeting and Civic Innovation in America*. Washington, DC: Brookings Institution Press.
Guinan, Joe, and Martin O'Neill. 2019. *The Case for Community Wealth Building*. London: Polity Press.
Hagen, Martin. 2000. "Digital Democracy and Political Systems." In *Digital Democracy: Issues of Theory and Practice*, eds. Kenneth L. Hacker and Jan van Dijk, 54–69. London: Sage. DOI: 10.4135/9781446218891.n4.
Hague, Barry N., and Brian D. Loader. Eds. 1999a. *Digital Democracy: Discourse and Decision Making in the Information Age*. London: Routledge. DOI: 10.4324/9780203984031.
Hague, Barry N., and Brian D. Loader. 1999b. "Digital Democracy: an Introduction." In *Digital Democracy: Discourse and Decision Making in the Information Age*, eds. Barry N. Hague and Brian D. Loader, 3–19. London: Routledge. DOI: 10.4324/9780203984031-9.
Hannan, Jason. 2018. "Trolling Ourselves to Death? Social Media and Post-Truth Politics." *European Journal of Communication* 33 (2): 214–26. DOI: 10.1177/0267323118760323.
Herzog, Lisa, and Bernando Zacka. 2017. "Fieldwork in Political Theory: Five Arguments for Ethnographic

Sensibility." *British Journal of Political Science* 49 (2): 763–84. DOI: 10.1017/S0007123416000703.
Hoff, Jens, Ivan Horrocks, and Pieter Tops. Eds. 2000. *Democratic Governance and New Technology: Technologically Mediated Innovations in Political Practice in Western Europe*. London: Routledge. DOI: 10.4324/9780203449738.
Iliadis, Andrew, and Federica Russo. 2016. "Critical Data Studies: An Introduction." *Big Data and Society* 3 (2): 1–7. DOI: 10.1177/2053951716674238.
Kioupkiolis, Alexandros. 2019. *The Common and Counter-Hegemonic Politics: Re-Thinking Social Change*. Edinburgh: Edinburgh University Press. DOI: 10.1515/9781474446167.
Kioupkiolis, Alexandros, and Giorgos Katsambekis. 2014. *Radical Democracy and Collective Movements Today: The Biopolitics of the Multitude versus the Hegemony of the People*. Farnham: Ashgate.
Kitchin, Rob. 2022. *The Data Revolution: A Critical Analysis of Big Data, Open Data and Data Infrastructures*, 2nd edition. Los Angeles: Sage.
Klein, Steven. 2022. "Democracy Requires Organized Collective Power." *Journal of Political Philosophy* 30 (1): 26–47. DOI: 10.1111/jopp.12249.
Lafont, Cristina. 2019. *Democracy without Shortcuts: A Participatory Conception of Deliberative Democracy*. Oxford: Oxford University Press. DOI: 10.1093/oso/9780198848189.001.0001.
Landemore, Hélène. 2015. "Inclusive Constitution-Making: The Icelandic Experiment." *Journal of Political Philosophy* 23 (2): 166–91. DOI: 10.1111/jopp.12032.
Landemore, Hélène. 2020. *Open Democracy: Reinventing Popular Rule for the Twenty-First Century*. Princeton, NJ: Princeton University Press. DOI: 10.23943/princeton/9780691181998.001.0001.
Landemore, Hélène. 2021. "Open Democracy and Digital Technologies." In *Digital Technology and Democratic Theory*, eds. Lucy Bernholz, Hélène Landemore, and Rob Reich, 62–89. Chicago: University of Chicago Press. DOI: 10.7208/chicago/9780226748603.003.0003.
Manin, Bernard. 1997. *The Principles of Representative Government*. Cambridge: Cambridge University Press. DOI: 10.1017/CBO9780511659935.
March, Hug, and Ramon Ribera-Fumaz. 2019. "Barcelona: From Corporate Smart City to Technological Sovereignty." In *Inside Smart Cities: Place, Politics and Urban Innovation*, eds. Andrew Karvonen, Federico Cugurullo, and Federico Caprotti, 229–42. London: Routledge. DOI: 10.4324/9781351166201-15.
Medina, Eden. 2011. *Cybernetic Revolutionaries: Technology and Politics in Allende's Chile*. Cambridge, MA: MIT Press. DOI: 10.7551/mitpress/8417.001.0001.
Milburn, Kier, and Bertie Russell. 2018. "What Can an Institution Do? Towards Public-Common Partnerships and a New Common-Sense." *Renewal: A Journal of Social Democracy* 26 (4): 45–55.
Monge, Fernando, Sarah Barns, Rainer Kattel, and Francesca Bria. 2022. "A New Data Deal: The Case of Barcelona." Working Paper IIPP WP 2022/02, February 18. London: UCL Institute for Innovation and Public Purpose. https://www.ucl.ac.uk/bartlett/public-purpose/wp2022-02.
Morozov, Evgeny, and Francesca Bria. 2018. "Rethinking the Smart City: Democratizing Urban Technologies." City Series Papers, No. 5. New York: Rosa Luxemburg Stiftung, New York Office. https://rosalux.nyc/wp-content/uploads/2021/02/RLS-NYC_smart_cities_EN.pdf.
Muldoon, James. 2022. *Platform Socialism: How to Reclaim our Digital Future from Big Tech*. London: Pluto Press.
Neblo, Michael, Kevin M. Esterling, and David M. J. Lazer. 2018. *Politics with the People: Building a Directly Representative Democracy*. Cambridge: Cambridge University Press. DOI: 10.1017/9781316338179.
Negroponte, Nicholas. 1995. *Being Digital*. New York: Knopf.
Nesta. 2018. "At the Dawn of GDPR, Nesta Warns It Is High Time for Data Innovation, Not Just Regulating 'Business as Usual.'" Press release, May 25. London: Nesta. https://www.nesta.org.uk/press-release/at-the-dawn-of-gdpr-nesta-warns-it-is-high-time-for-data-innovation-not-just-regulating-business-as-usual.
Newsom, Gavin, with Lisa Dickey. 2014. *Citizenville: How to Take the Town Square Digital and Reinvent Government*. New York: Penguin.
Old, Rosalyn, and Theo Bass. 2020. "Common Knowledge: Citizen-Led Data Governance for Better Cities." Paper D1.12, January 28. London: Nesta. https://www.nesta.org.uk/report/common-knowledge-citizen-led-data-governance-better-cities.
Ostrom, Elinor. 2015. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press. DOI: 10.1017/CBO9781316423936.
Pateman, Carole. 1970. *Participation and Democratic Theory*. Cambridge: Cambridge University Press. DOI: 10.1017/CBO9780511720444.
Peña-López, Ismael. 2017. "Participation in Spanish Municipalities: The Makings of a Network of Open Cities." Blog post, March 3. Bengaluru: IT for Change. https://itforchange.net/mavc/blog/2017/03/03/participation-in-spanish-municipalities-the-makings-of-a-network-of-open-cities.
Pollman, Elizabeth, and Jordan M. Barry. 2017. "Regulatory Entrepreneurship." *Southern California Law Review* 90:

383–448. https://southerncalifornialawreview.com/wp-content/uploads/2017/03/90_383.pdf.
Prainsack, Barbara, Seliem El-Sayed, Nikolaus Forgó, Łukasz Szoszkiewicz, and Philipp Baumer. 2022. "Data Solidarity: A Blueprint for Governing Health Futures." *The Lancet Digital Health* 4 (11): e773–74. DOI: 10.1016/S2589-7500(22)00189-3.
Rahman, K. Sabeel. 2017. "From Civic Tech to Civic Capacity: The Case of Citizen Audits." *PS: Political Science & Politics* 50 (3): 751–57. DOI: 10.1017/S1049096517000543.
Rahman, K. Sabeel. 2018. "The New Utilities: Private Power, Social Infrastructure, and the Revival of the Public Utility Concept." *Cardozo Law Review* 39: 1621–89. https://cardozolawreview.com/wp-content/uploads/2018/07/RAHMAN.39.5.2.pdf.
Roth, Laura, Brad Lander, and Gala Pin. 2018. "Democracia radical en el Ayuntamiento." In *Ciudades sin miedo: Guía del movimiento municipalista global*, eds. Gerardo Pisarello and Barcelona en Comú International Commission, 113–121. Barcelona: Icaria.
Royo, Sonia, Vicente Pina, and Jaime Garcia-Rayado. 2020. "Decide Madrid: A Critical Analysis of an Award-Winning e-Participation Initiative." *Sustainability* 12 (4): 1674. DOI: 10.3390/su12041674.
Russell, Bertie. 2019. "Beyond the Local Trap: New Municipalism and the Rise of the Fearless Cities." *Antipode* 51 (3): 989–1010. DOI: 10.1111/anti.12520.
Sadowski, Jathan. 2021. "Who Owns the Future City? Phases of Technological Urbanism and Shifts in Sovereignty." *Urban Studies* 58 (8): 1732–44. DOI: 10.1177/0042098020913427.
Sagarra, Oleguer, Xavier Hoffmann, Xavier Clotet, Ricard Espelt, Antonio Calleja-López, Javier Rodríguez, Pau Balcells, et al. 2019. "Final Report on the Barcelona Pilots, Evaluations of Barcelona Now and Sustainability Plans." Report D5.9, December 23. DECODE Project. https://decodeproject.eu/publications/final-report-barcelona-pilots-evaluations-barcelonanow-and-sustainability-plans.html.
Sánchez Medero, Gema, and Pastor Albaladejo, Gema. 2018. "The Quality of Participatory Processes in the Urban Redevelopment Policy of Madrid City Council." *Lex Localis: Journal of Local Self-Government.* 16 (4): 841–72. DOI: 10.4335/16.4.841-872(2018).
Saunier, Pierre-Yves. 2002. "Taking up the Bet on Connections: A Municipal Contribution." *Contemporary European History* 11 (4): 507–27. DOI: 10.1017/S0960777302004010.
Simon, Julie, Theo Bass, Victoria Boelman, and Geoff Mulgan. 2017. "*Digital Democracy: The Tools Transforming Political Engagement*." Democratic Innovations Paper Series, February 20. London: NESTA. https://www.nesta.org.uk/report/digital-democracy-the-tools-transforming-political-engagement.
Smith, Graham. 2009. *Democratic Innovations: Designing Institutions for Citizen Participation*. Cambridge: Cambridge University Press. DOI: 10.1017/CBO9780511609848.
Sutton, Stacey A. 2019. "Cooperative Cities: Municipal Support for Worker Cooperatives in the United States." *Journal of Urban Affairs* 41 (8): 1081–1102. DOI: 10.1080/07352166.2019.1584531.
Symons, Tom, and Rosalyn Old. 2020. "Project Communication, Exploitation Plans, Events Report and Overall Project Impact." Report D6.7, January 9. DECODE Project. https://decodeproject.eu/publications/project-communication-exploitation-plans-events-report-and-overall-project-impact.html.
Thompson, Matthew. 2021. "What's So New about New Municipalism?" *Progress in Human Geography* 45 (2): 317–42. DOI: 10.1177/0309132520909480.
van Dijck, José, David Nieborg, and Thomas Poell. 2019. "Reframing Platform Power." *Internet Policy Review* 8 (2). DOI: 10.14763/2019.2.1414.
van Doorn, Niels. 2020. "A New Institution on the Block: On Platform Urbanism and Airbnb Citizenship." *New Media & Society* 22 (10): 1808–26. DOI: 10.1177/1461444819884377.
Winner, Landon. 1980. "Do Artifacts Have Politics?" *Daedalus* 109 (1): 121–36.
Wolff, Jonathan. 2020. *Ethics and Public Policy: A Philosophical Inquiry*, 2nd edition. London: Routledge. DOI: 10.4324/9781351128667.
Zuboff, Shoshana. 2019. *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*. New York: Public Affairs.
Zuckerman, Ethan. 2020. "What Is Digital Public Infrastructure?" *Academic article series*, November 17. Washington, DC: Center for Journalism and Liberty. https://www.journalismliberty.org/publications/what-is-digital-public-infrastructure.