

The Barcelona Imaginaries: A Decade of Digital Politics

Abstract: Over the past decade and a half, Barcelona has been widely recognized as a "smart city". Since 2015, it has also gained attention as a "rebel city", with an alternative imaginary to that of the corporate smart city and, more broadly, others launched from Silicon Valley. This article analyzes a decade of opposing imaginaries around digital politics in the Catalan capital. It illustrates how Barcelona moved from a narrative of smartness to one of technological sovereignty and, from there, to one of technological humanism. These shifts went hand in hand with institutional innovations that reinforced, successively, the centrality of public-private, public-common, and, finally, public-private-community partnerships (with this latter model representing a return of the centrality of the public-private axis). Drawing on fieldwork and desk research, the article systematically maps numerous visions and projects associated with these three imaginaries. Finally, the study uses the case of Barcelona to understand recent changes in digital capitalism.

Keywords: smart cities, technological humanism, technological sovereignty, sociotechnical imaginaries, smart privatization, technopolitical democratization

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Recent decades have witnessed a cultural, political and economic struggle over the definition of the digital city.¹ The "smart city" concept was coined in the 1990s, but it was at the beginning of the 2010s when it gained strength (Mora, Bolici & Deakin, 2017), turned into an agenda² by corporations such as IBM (Dirks and Keeling, 2009). The corporate "smart city" was presented as a way to run cities more efficiently and exploit the emancipatory promise of digital technologies. Smartness was associated with technological innovation, budget optimization and high-tech business at a time of economic decline and austerity in the public sector after the 2008 financial crisis (Paroutis, Bennet & Heracleous, 2014). However, the corporate smart city is far from undisputed (Hollands, 2008; McFarlane & Söderström, 2017) and Barcelona has been a prominent example of that conflict.

The Catalan metropolis has consistently ranked among the top smart cities in the world for more than ten years. This was a result of the city council's promotion of the corporate smart city agenda in the period 2011-15, a "smartification" process happening in dozens of cities worldwide at the time. Nevertheless, between 2015 and 2019, Barcelona became the cradle of one of the most recognizable alternatives to it, and more broadly, to the Silicon Valley view of technology (Sadowski, 2020): the technological sovereignty concept, tied to a sovereign digital city agenda. Against the corporate smart city, the sovereign digital city stressed the centrality of citizens' right to control the direction and design of the new technological mediations (digital infrastructures, data, services, etc.) that are reshaping urban life.

In recent years, between 2019 and 2023, a third concept gained ground, both in Barcelona and elsewhere: technological humanism. In the Catalan capital, representatives of this new agenda have advocated for putting "humans at the center" of digitalization, outlining an updated version of liberalism that reclaims what we may label as a digital capitalism³

¹ We use this formula to refer to the vision of a city hypermediated by digital technologies, which may or may not be labeled "smart".

² In this introduction and the first part of the next section, we use the terms "concept" and "agenda" as generic placeholders, which will be substituted from the second part of the next section onwards by the terms derived from our analytical framework.

³ We follow Schiller (2000) in understanding digital capitalism as a market-driven logic that influences and governs technological systems and is extended by them, deepening phenomena such as consumerism and social inequalities. On the other hand, we prioritize the use of the formulas "technological sovereignty" and "technological humanism" over "digital sovereignty" and "digital humanism" (without completely avoiding the latter two) because of their preeminence in the context of Barcelona, even if they perform a problematic

"with a human face". Locally, this agenda oscillates between an ordoliberal and a social liberal call for public regulations, and institutions that ensure digital markets and specific human rights against emerging, corporate or state, digital "Leviathans". Unsurprisingly, under such explicitly liberal coordinates, the calls for radical alternatives to digital capitalism that were part of the technological sovereignty period in Barcelona are missing in the case of technological humanism. In a broader sense, the political imagination and political economy behind these three concepts and agendas (smart, sovereign, and humanist) differ. More importantly, these three ways of seeing and constructing digital cities and societies, in dispute in Barcelona, seem to be operating at higher scales around the world.

What are the precise connections between these three concepts and agendas in the city? What narrative and institutional forms have been tied to them? What are their relations with digital capitalism and its potential alternatives? In order to provide context for these questions, in the following section we first briefly review some of the literature on smart cities, technological sovereignty, and technological humanism, and then provide an analytical framework and methodology that will allow us to empirically explore them in the third section, the case study, and the fourth section, the comparative analysis.

Struggles around and beyond the digital city: reviewing and analyzing conflicting imaginaries

Reviewing imaginaries: Smartness, technological sovereignty and technological humanism

In recent decades, technological corporations have shaped the digital infrastructures upon which urban environments are being rebuilt. Eager to make long-term profitable investments and to commodify and extract value from ever larger parts of the social body (Barns, 2019), sovereign wealth funds, asset managers, tech companies, and sovereign wealth and investment funds have channeled massive amounts of money into initiatives related to the "digitalization of cities" (Baykurt & Raetzsch, 2020). Globally, the concept

synecdoche by identifying the part —the digital— with the whole —technology. Taking those caveats aside, the reader may take the terms in these two conceptual pairs as interchangeable. It is also relevant to note that technological sovereignty and humanism go beyond the city scale and represent broader views on technology and society, as seen in some of the examples analyzed in this article.

of "smart city" and the agenda built around it have frequently been synonymous with entrepreneurship, commodification, privatization, externalization, and public-private partnerships, placing for-profit companies at the center of the creation of "efficient and innovative" urban services and infrastructures (Hollands, 2008; Morozov & Bria, 2018; Voorwinden, 2021). Neoliberalization processes, which had already been shaking the foundations of public administration for decades, found a complement in technological solutionism, a doctrine that sees every problem as a technical problem that can be solved by technological (frequently private) means (Morozov, 2013). This convergence of neoliberalism and tech solutionism around the smart city contributes to transforming public services into technocratic corporate-like structures (Abildgaard & Jørgensen, 2021), thereby eroding public values and advancing a privatized city model (Voorwinden, 2021): an institutional process that we may dub "smart privatization". This type of "smartification" equals top-down management aimed at planning and directing urban life through digitalization, with an emphasis on hard infrastructure (mobility, energy, security, communications, waste, etc.) and automation (Vanolo, 2014). The central figure in smart narratives is (at best) a generic prosumer or (at worst) a passive user-consumer of digital services, while in practice technocrats and corporations shape the digital city (Kummitha & Crutzen, 2017; Wyly et al., 2018).

In a measured response to the corporate smart⁴ city concept and agenda, a primarily academic literature has studied and advocated for an alternative: a holistic approach that emphasizes human capital (e.g. learning, diverse knowledge) and social capital (e.g. local networks) as key metrics for measuring the success of a digital city (Mora, Bolici, & Deakin, 2017)⁵. In this literature, bottom-up governance aimed at generating public value takes precedence over technocracy and corporate interests, ideally resulting in a digital city where people —the human and social aspects— play the central role, rather than technology. Since 2015, Barcelona city's digital policies have been guided by what may seem two examples of such a "holistic" approach: technological sovereignty and

⁴ Given that this corporate version was the foundational ground of the smart city concept and agenda, and that such version was also the basis of the original Barcelona smart city model, in what follows we skip the adjective "corporate" and use the term "smart" to refer to "corporate smart". That simplifies the style of the exposition.

⁵ Among the positions outlined in other reviews of the literature, such as Kummitha and Crutzen (2017) or Echebarria, Barrutia and Aguado-Moralejo (2021), these two broad views, corporate and holistic, are the most clearly defined.

technological humanism. Far from being identical or a local anecdote, they connect to different sociotechnical agendas playing at higher scales.

Contemporary debates around technological sovereignty rose to prominence in the global arena in the second half of the 2000s⁶, with narratives and initiatives launched by national governments such as those of France (with calls for a "sovereign cloud") and China (with advances towards "internet" or "cyber sovereignty"). Technological sovereignty posed a challenge to the earlier, liberal narrative of the "open internet" tied to markets and governance institutions led by the United States (Pohle & Thiel, 2021). Over time, the concept of technological sovereignty has encompassed meanings, processes and practices ranging from state geopolitical security to national economic development, and from citizen empowerment to citizen surveillance (Becerra & Waisbord, 2021; Chander & Sun, 2021). Different actors have employed the concept in diverse ways, with equally diverse political-economic agendas in mind. Nevertheless, a common meaning of technological sovereignty seems to refer to the ability of a particular actor (e.g. states, individuals, social movements) to control a reality (e.g. data, content, algorithms), aspect (e.g. regulation, production, consumption), or precondition (e.g. physical infrastructures, minerals) of the digital world (and, thanks to that, the wider, connected world), at scales ranging from the local to the supranational.

Finally, the concept of technological humanism is far from new in the academic literature (see Mora, 1979). Furthermore, a "humanistic approach" has been noted within the smart city literature for some time (Echebarria, Barrutia & Aguado-Moralejo, 2021). The recent critique of Big Tech seems to be consolidating an agenda around it, at the city scale and beyond. There has been a global call to prioritize human interests in digitalization, which has been echoed across the ideological spectrum, from liberal (Zuboff, 2019) to Marxist scholars (Fuchs, 2022), and from business forums (such as the Mobile World Congress in Barcelona) to artistic and academic circles (such as the Digital Humanism Initiative led by the Vienna University of Technology).

However, the objective of this paper is not primarily to delve into the concepts of smartness, technological sovereignty, or technological humanism in the

⁶ Preceding debates and struggles against technological dependency can be found as early as the 1970s in the Global South (Dos Santos, 1972).

abstract. Rather, this work aims to examine their narrative and institutional performativity within the ‘actually-existing sociality’ of a digital city (Rose 2020), it aims to explore their connection to diverging agendas in the specific context of Barcelona city’s digital politics. In the literature, the Catalan capital has been identified as an example of an alternative to corporate city digitalization. Authors such as Sadowski (2020), Lynch (2021), Charnock, March, and Ribera-Fumaz (2021), Sadowski, Viljoen, and Whittaker (2021), and Rosol and Blue (2022) have emphasized the counter-systemic, progressive and promising character of Barcelona's policies. Nevertheless, they have not yet addressed later developments, such as technological humanism, and their links to potential reconfigurations of digital capitalism. Beyond this empirical novelty, our paper offers an original systematic analytical framework, as we expose in the following section.

Analytical framework and research methodology

To address some of the issues posed by these different literatures on smart cities, technological sovereignty and technological humanism, and examine the tensions between these three concepts and agendas in the context of Barcelona, we use an analytical framework supported by the tradition of Science and Technology Studies. Its anchoring notion is that of sociotechnical imaginaries, which has proven valuable for studying the corporate smart city (Söderström, Paasche & Klauser, 2020; Sadowski & Bendor, 2019). According to Jasanoff (2015: 4), sociotechnical imaginaries are "collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology". She notes how sociotechnical imaginaries cut across traditional divisions between meaning and materiality, society and technology, description and prescription, present and future. And they connect various scales of digital societies: they tie the micro-level of "human subjectivity" (Jasanoff, 2015: 14) and "sites of agency (individuals)" (Appadurai, 2002: 49) with the meso-level of "political orders and technoscientific projects" (McNeil et al., 2017: 449) and the macro-level of broader "forms of social life" (Jassanof, 2015: 4) or "globally defined fields of possibility" (Appadurai, 2002: 49).

To explore conflicting sociotechnical imaginaries in Barcelona, in this article we take two complementary analytical approaches: narrative and institutional. We examine narratives because they are a crucial form of articulating the "publicly performed visions" and

"shared understandings" typical of sociotechnical imaginaries. Narratives allow us to trace the struggles and conflicts for political predominance played out around different sociotechnical imaginaries, as well as the internal diversity of those imaginaries. Sometimes a public narrative perfectly embodies an imaginary while other times it may mark only its incipient beginning. In others cases, a set of narratives may share "family resemblances" (to use Wittgenstein's classic formula) and contribute to or gravitate towards a single imaginary, resulting either in a blend of narratives or in one of those narratives becoming more central than others for the imaginary in question. Thus, clear conceptual analysis becomes key. In terms of scales, in the third section, the case study, and the fourth section, the comparative analysis, of this paper we examine the views of subjects, of technology and politics, and of broader social horizons present in narratives around digital politics in Barcelona. As a result, they become, respectively, the micro, meso and macro units of our narrative analysis.

Following Jassanof, in our analysis we also look at how imaginaries are "institutionally stabilized" in Barcelona, primarily, but not only, around the city council and its policies⁷. Our second methodological step, centered on institutional analysis, also takes a multi-scalar form. It first attends to specific individuals at the micro-level. Then, taking into account that technologies are shaped by institutions and become institutions themselves (Pinch, 2008; Winner, 1986), it looks at concrete technological projects and political organizations, their practices and arrangements, which constitute the meso-level of our institutional analysis. Finally, the macro-level of our institutional analysis looks at the broader political economy logics that are promoted or embodied by those actors, projects and organizations, which gain or lose influence depending on the period.

Methodologically, we have combined these various levels of narrative and institutional analysis to perform a richer comparative analysis, given that comparison is a key tool for studying sociotechnical imaginaries (Jassanof, 2015: 24). In summary, in the comparative analysis section we use the categories in the following table (Table 1) to study and contrast the shifting sociotechnical imaginaries in Barcelona during the period 2011-2023.

⁷ To that extent, we approach the imaginaries under analysis not primarily from a broad social perspective or as they coagulate in media or daily conversations, but rather from a political-institutional perspective, as they materialize in city council –as well as some activist and corporate– publications and projects.

	Narrative analysis	Institutional analysis
Micro	Subjects	People (political, intellectual, and technical actors)
Meso	Technology & politics	Key projects & organizations
Macro	Systemic horizon	Political economy logics

Table 1. Types and levels of analysis.

Digging further into the macro-level of institutional analysis requires a special step: differentiating between several logics in terms of political economy. To do so, we distinguish between public, private, and common logics (Dardot & Laval, 2015) of promoting and governing digital innovation and technology in the city. Each of these logics points, respectively, to the priority of public-oriented actors (frequently galvanized around the State), private-oriented actors (e.g. companies and markets), or commons-oriented actors (typically represented by communities, associations, social movements, etc.) in aspects such as the funding, delivery, appropriation and, more crucially, the governance of innovation and technology. In order to chart these different institutional and political economic logics (public, private, common), as well as their combinations (e.g. public-private, public-common), we use the following diagram (Figure 1), which we see more as a useful tool to systematize positions and projects studied in this article than as a theoretically definitive analytical framework.

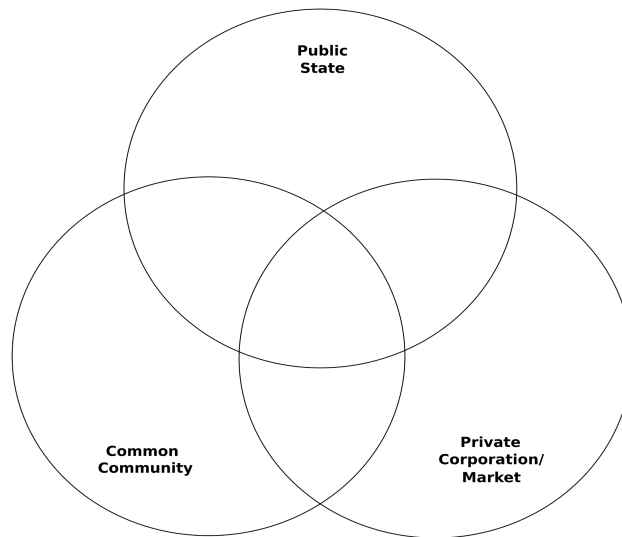


Figure 1. Venn diagram of institutional logics and political economy.

It is important to note that, since "an imaginary is neither cause nor effect in a conventional sense but rather a continually rearticulated awareness of order in social life" (Jasanoff, 2015: 26), in our analysis we have deployed a typological, descriptive and interpretive strategy more than a modeling or explanatory one (Jaakola, 2020). Our aim is not to look at imaginaries in order to explain them or to explain other things thanks to them, but rather to map and characterize them, pointing to their connections with various actors, institutions, and struggles. Furthermore, we aim to show how narratives and institutionalizations change in time, and note what this might tell us about sociotechnical transformation. To do this we rely on a double qualitative research strategy encompassing socio-legal research and ethnographic methods. The socio-legal research consisted of an in-depth and systematic review of publications, reports, and regulations related to the digital politics, economy and infrastructures of the city, drafted primarily, but not exclusively, by Barcelona City Council. The ethnographic strategy was divided in two: first, militant or activist research and, second, in-depth interviews. On the militant or activist side, during the last seven years, one of the authors has been deeply involved with grassroots and municipal projects. This has allowed him to intervene in and document the evolution of technopolitical processes in Barcelona. This type of militant or activist research generates exploratory, situated, practical and theoretical hypotheses oriented by and towards the construction of an "alternative sociability" (Colectivo Situaciones, 2003).

On the interview side, another coauthor conducted 15 one-hour-long, one-to-one, semi-structured interviews with different Catalan actors (such as public servants, academics, and civil society) concerning issues such as data protection, AI ethics, and digital politics. This multi-layered methodology mitigates the shortcomings of single-sided approaches.

3. Case study: Barcelona's sociotechnical imaginaries

The smart imaginary and the digital city in Barcelona

Over the past few decades, Barcelona has undergone a significant transformation. From its industrial character of the 19th and 20th centuries it became a global tourism capital and later a Southern European hub of digital capitalism around the turn of the millennium (Balibrea, 2001; Charnock, March and Ribera-Fumaz, 2011). This last shift was particularly marked by the adoption of the "smart city" imaginary during the 2011-2015 mayoralty of Xavier Trias and the right-wing Catalan nationalist party *Convergència i Unió* (CiU), which involved a rebranding of the city, a cultural reconfiguration, and a new technological model (March & Ribera-Fumaz, 2014). This process, as studied in the literature, followed the general orientation of smartification elsewhere, so is only briefly characterized below in both narrative and institutional terms.

During the 2011-2015 political period, Barcelona successfully positioned itself as a leading smart city. The narrative outlined by the Barcelona City Council architect-in-chief, Vicente Guallart (2012), pointed towards the construction of slow cities within a smart city, to turn Barcelona into a metropolis characterized by walkable, self-sufficient and slow production neighborhoods located within a hyperconnected, fast production, zero-emissions city. The narrative social horizon during this mandate may be considered that of a "sustainable" digital capitalism, insofar as, under the Smart City banner, the city council aimed to push a narrative of global competitiveness, innovation, urban sustainability, and the transformation of city services through the processing and use of big data. The city had already launched an open data strategy called Open Data Barcelona in 2010, which advanced during the 2011-2015 period. This strategy aimed to make data controlled by the city council open and accessible to everyone as raw data, with frequent updating, high levels of accessibility, usability, reusability, and under free licenses (Garriga-Portolá, 2011). However, this rather technocentric (if not technocratic)

project, and its associated narrative of technological openness, remained limited and subordinated to a wider smart imaginary.

In broader terms, the city council entrusted Big Tech companies with the task of designing, testing, deploying, and managing the technologies and strategies needed to build a new type of city (March & Ribera-Fumaz, 2014), following the typical smart privatization dynamics outlined above. When mentioned, the notion of "smart citizens" involved the vision of localized digital prosumers who could benefit and contribute to smartification processes but who were not expected to articulate a critical examination of the overarching framework or intervene in the overall direction of the digital city. As in other smart cities, the construction of subjects oscillated between narrative appeals to a "general citizen" and an institutionally "absent citizenship" (Shelton & Lodato, 2019). Preexistent "citizen-oriented" tech innovation institutions such as the Barcelona Fablab, inspired by the early model of the corporate-friendly, American MIT Media Lab, and even the more locally rooted Ateneus de Fabricació, launched during this 2011-2015 mandate, had a rather technocentric, depoliticized character.

Moreover, in Barcelona, global tech companies and business institutes were heavily involved in promoting global events, and allied intellectuals supported the smart imaginary for narrating and institutionalizing technology-city relations, with ample support from the public sector (Cerqueira, Piqué Huerta & Miralles, 2019). CiU promoted the first Smart City Expo (SME) and boosted the Mobile World Congress (MWC) with the declaration of Barcelona as Mobile World Capital for the period 2013-2023. In the aftermath of the 2008 crisis and with austerity politics in full swing, the neoliberal, privatizing logic was not limited to the tech sector or even to Barcelona. "We must address the scarcity of public resources through public-private partnerships and by leveraging resources across all regions," suggested Miquel Barceló Roca, ex-General Director of the Catalan Institute of Technology. This was a wish shared by many of the 149 personalities (overwhelmingly white men) involved in drafting the White Paper "Barcelona, capital of a new state" (Ajuntament de Barcelona, 2014). Regardless of narrative claims concerning Catalan statehood and sovereignty (a traditional theme of pro-independence sectors in Catalonia, on the rise during this period), these calls went hand in hand with extensive privatization of public assets and public-private partnerships in the tech sector at the regional level, especially intensive in the Catalan capital (Jiménez & Cancela, 2021).

Barcelona's Quest for Technological Sovereignty

The sovereign turn: a new imaginary on technology and the city

In 2015, Barcelona's digital politics experienced a shift in its sociotechnical imaginaries. A group of citizens and activists connected to the 15M/Indignados⁸ and other social movements won the local elections, disrupting the party *status quo* (Roth, Monterde and Calleja-López, 2019). With the election of Barcelona en Comú and activist Ada Colau for the city government, the municipal digital strategy changed from an uncritical adoption of the smart imaginary to a radical strategy that prioritized "people's digital sovereignty" (Bria, 2019). Under the leadership of Chief Technology and Digital Innovation Officer, Francesca Bria, the city government launched several policies and strategies along with a new "technological sovereignty" narrative (Ajuntament de Barcelona 2016a). This represented an alternative to the smart city concept when it was still trendy and largely uncriticized in policy circles.

In 2016, the city council released government measure entitled "Transition towards Technological Sovereignty" (Ajuntament de Barcelona, 2016) intended to help citizens, social actors, and public institutions develop the political power and technical capacities to jointly design technologies, control and organize information to improve local services, and reinvest gains derived from data, initiatives more typical of politicized tech communities than smart city franchises. The plan sketched a very explicit objective: to address the challenges of the city and situate citizens at its center. This involved enshrining the figure of the sovereign citizen, a radically political and technopolitical actor that was called to shape the digital city, rather than the absent citizen or the citizen as prosumer of smart narratives. Such a call challenged the established vision of technology as normatively neutral reality, to be managed by so called experts or corporations.

This call for technological sovereignty did not emerge out of a vacuum in Barcelona. From a position far removed from its then frequently state centric version, in Spain this imaginary had been nurtured by hacktivists and autonomous movements. For such

⁸ A networked social movement that occupied squares all over Spain in 2011 to denounce austerity politics and reclaim "real democracy". It unleashed a statewide political cycle resulting in the emergence of new political parties such as Podemos and a municipalist wave.

groups, the technological sovereignty narrative outlined a vision of "technologies developed by and for civil society" aimed at social transformation, technological diversity, and personal and collective autonomy (Haché & Franco, 2011; Haché, 2014). This view had been embodied in technological projects ranging from free software to free hardware, and from self-managed servers or cryptocurrencies to social networks such as N-1, a community-built and -funded platform used by the aforementioned 15M/Indignados movement (Gil García, 2012). Instead of simple "technological sovereignty", we could group such experiments and narratives under the quasi-oxymoronic label of "technological anarcho-sovereignty"⁹ (or "technological autonomy") due to their grassroots character and their frequent anarcho-socialist (or autonomous Marxist) orientation. In a similar direction, another antecedent worth noting is Guifinet, one of the most successful experiments of grassroots technological development in Catalonia in the 2010s. Frequently associated with tech sovereignty narratives, Guifinet is a "free, open and neutral telecommunications network", with over 37,000 active nodes, run as a commons (Guifinet, 2021). On top of this infrastructure, various small- and medium-sized companies and cooperatives offer telecommunication services to more than 50,000 people, in a private-common experiment in which the common logic (shared resources, democratic governance, equal access, etc.) operates as the overarching framework.

As we can see, the city council's call for technological sovereignty represented a significant shift in digital politics at the municipal level, but was rooted in earlier narratives and experiments present in Catalonia and Spain's technopolitical culture and activism, tied to political movements ranging from 15M to Catalan separatism, and from anarchism to cooperativism. This created a unique opportunity to experiment with transformative innovation.

Decidim: a digital infrastructure for technopolitical democratization

Probably the main example of that experimentation is Decidim, a digital platform for participatory democracy resulting from technopolitical processes crucially shaped by the 15M/Indignados movement (Calleja-López, 2017). Decidim is a participatory democracy

⁹ The notion of anarcho-sovereignty has been used previously by Gerbaudo (2017).

software for running hybrid, online-offline democratic processes, currently utilized by more than 3.5 million users and hundreds of organizations worldwide, from City of Mexico to the European Union, and from cooperatives to civil society groups. Barcelona City Council launched the project in 2016, under the leadership of the Directorate of Democratic Innovation Services, a directorate established within the city's Participation Council during Barcelona en Comú's first term of office. Decidim.barcelona, a website based on Decidim software, has given more than 130,000 registered Barcelona citizens a platform to suggest, discuss, shape, and supervise city policies. Considered a free political network (as opposed to earlier informational and corporate social networks) by their founders (Barandiaran et al., 2024), Decidim aims to provide a space for citizens to intervene in municipal politics and veer away from the corporate smart city model (March & Ribera-Fumaz, 2018).

The project faces many challenges, from funding and usability to process evaluation and inclusive participation (Balcells, Bravo & Padró-Solanet, 2023). However, most of these issues are discussed and potentially addressed by the Metadecidim community, a growing group of actors united around the project. Unlike the typical situation under a smart privatization scenario, Decidim is not controlled by a corporation or even the city council. Rather, it is the outcome of a sociotechnical ecosystem composed of programmers, hacktivists, academics, civil servants, and citizens, the Metadecidim community, which has its own Decidim-based website (meta.decidim.org) and periodically meets face-to-face. In this ecosystem, public institutions (crucially, the Barcelona City Council, but also a growing number of organizations) fund the project, hackers and SMEs (many of them cooperatives) develop the software, and the broader community deliberates and takes key decisions over both the software and the project as a whole (Barandiaran et al., 2024). In 2019, Barcelona City Council shared control of the Decidim brand and repositories with the recently set up Decidim Association, officially forming a public-common partnership.

If, as noted above, technologies are institutions in the making, Decidim aims to democratize public policy and institutions, but also to democratize itself as an institution. It outlines a narrative and institutional model of "technopolitical democratization", understood as a recursive democratization of technology and politics (Calleja-López, 2017). The project aims to go beyond not only the dominant, closed, proprietary software model, but also beyond that of free and open source software (FLOSS), into a democratic

software model that involves hackers and experts, but also common citizens, in its participatory and deliberative design and development. In spite of its many challenges, these processes represent a dynamic that we may dub as "technopolitical commoning", which goes against the grain of the smart privatization processes of the 2011-2015 period. They strive to restore a public ethos and public values (transparency, universality, citizen needs...) in state institutions, while ushering in a democratic, 'technocratic' and commons-oriented approach to technology aimed at breaking with the prevailing oligarchic, technocratic and private-oriented stance. In spite of its many challenges, Decidim has been seen as a tentative response to digital capitalism's archetypical infrastructures such as Facebook and Twitter, and the platform urbanism of Amazon or Airbnb (Rose, 2021).

Piloting and scaling up the public-common: from data commons to the Cities Coalition for Digital Rights

In 2018, the Barcelona City Council aimed to surpass the earlier open data model by launching the "Government measure concerning ethical management and accountable data: Barcelona Data Commons" (Ajuntament de Barcelona, 2018). According to Bria (2019), this measure was aimed at establishing a "New Social Pact on Data" to maximize data benefits while guaranteeing data sovereignty and privacy. Data was viewed as a crucial infrastructure for the city, capable of aiding in better, faster, and more democratic decisions, encouraging innovation, enhancing public services, and empowering people. To galvanize these efforts, a Municipal Data Office was established. Data switched from being viewed as an asset that offered a competitive edge, as it was under the earlier smart city imaginary, to being seen as social infrastructure that should be public to nurture common wellbeing.

For Barcelona City Council, data should promote innovation and productivity, but do so under a technopolitical regime that grants citizens and communities the ability to gain personal and collective control over such data (i.e. data sovereignty). Beyond the local grassroots, this vision was connected to initiatives such as the Horizon-EU project DECODE (Decentralised Citizen Owned Data Ecosystems), also led by Bria and tied to growing European narratives of technological sovereignty. One of the pilot experiments in Barcelona pointed beyond the narrative of "data openness" towards a radically democratic vision of "data autonomy" and "recursive data commons" (Calleja-López,

2018). Nevertheless, the data commons agenda was only partially piloted and institutionalized by the end of this political term, and was mostly abandoned in the following one (Monge et al., 2022).

The technological sovereignty imaginary also framed digital innovation as a tool for pursuing a more plural economy that stimulates social and environmental transformation (Ajuntament de Barcelona, 2017). Efforts were directed to creating an open technological ecosystem that could strengthen the social, solidarity and pro-common digital economy, under forms such as platform cooperativism (Ajuntament de Barcelona, 2019). Even at core events of digital capitalism in the city such as the Smart City Expo, spaces such as the Sharing Cities Action (a debate space promoted by the city council, universities and civil society —see Fuster Morell, 2018) argued for the need to democratize the digital economy and outlined social horizons that could be connected to different versions of democratic socialism, not unlike other projects of the period such as Decidim (Barandiaran et al., 2024).

Lastly, as a promoter of a state-wide and global municipalist movement, Barcelona en Comú aspired to reach other metropolises to build a movement of rebel cities. In the digital field, this materialized in the initiative "Cities Coalition for Digital Rights", a network of cities (that included Amsterdam, Berlin and São Paulo in its foundation) aimed at "protecting and upholding digital rights at the local and global level" (Cities Coalition for Digital Rights, 2018). Transforming technology required building solidarity networks between cities around the world, committing to expand democracy and fighting against challenges such as platform tourism.

The institutional transformations in the city during this term of office fell short of their higher narrative intentions. Nevertheless, from Decidim to the Cities Coalition for Digital Rights, from technological sovereignty to technopolitical democratization, in the period 2015-2019 Barcelona posed a challenge to the smart and, beyond, the Silicon Valley imaginaries.

Technological humanism: towards a digital capitalism with a human face?

A shift of imaginaries from sovereignty to humanism

The tide began to turn in May 2019 when Barcelona en Comú narrowly missed the top spot at the local elections. After weeks of negotiation, it formed a government with the center-left, Catalan Socialist Party (PSC) and retained Ada Colau as the city's mayor. However, as a result of these negotiations, the PSC took control of technology policy in the city council. While some aspects of the narrative and plans of the previous term of office survived, others did not, and new priorities emerged.

At the 2019 Smart City Expo, the city council booth featured the slogan "Humanizing tech for Barcelona," marking a shift from the previous call for technological sovereignty. The technological sovereignty narrative carried strong political connotations, in some quarters tied to the Catalan pro-independence movement, which the Socialist Party (both in Catalonia and Spain) opposed. More crucially, technological humanism represented a narrative with cultural and moral undertones, rather than the critical and alternative edge of technological sovereignty in political and economic terms. The emphasis on technological humanism was embodied by two key spokespeople: the first was Laia Bonet, a politician of the Catalan Socialist Party, and the Barcelona city councilor in charge of the digital transition area; the second was Jose María Lassalle, formerly member of the right-wing Popular Party and secretary of state in charge of the information society and digital agenda of Spain, who acted as a public intellectual.

The basic narrative tenets of Barcelona's technological humanism can be found in Lassalle's (2019) work (who, in turn, echoes Zuboff, 2019, among other authors). It denounces the emergence of omnipresent and omnipotent "cyber-leviathans" from the concentration of knowledge and power in specific corporations and states, based on the extension of digital technologies. Lassalle advocates for ending these monopolies, which he sees as undermining freedom and threatening the model of economy, of polity, and even of humanity that modern liberalism helped to build. His narrative calls for a new social pact for the digital age defined by technological humanism, a renewed liberal democracy, and an updated economic ordoliberalism. The first situates the human being as the center of the new digital world, the second appeals to an active citizenship in the technological sphere, while the third legally guarantees the rights of *homo digitalis*,

particularly the right to own their data, and establishes the rules of the game for new information markets. Ultimately, Lasalle's humanist narrative projects the figure of a human being understood as a citizen-consumer (Cancela, 2019), and its social horizon seems that of a refurbished, Third Way form of digital capitalism with ordoliberal undertones, a capitalism "with a human face" (Calleja-López, 2021).

This humanist narrative is deeply rooted in European cultural history and seems designed to offer a new brand for a *Made in Europe* technology model, a profitable alternative to American or Chinese "cyberleviathans", one potentially exportable to places like Latin America using postcolonial links. Calls to embrace digital humanism, promoted by advertisements and PR content of Spanish corporations such as Telefónica or Bankia in the early 2020s, could signal an attempt at a recomposition of Spanish and European digital capitalism. However, it is worth noting that companies like Telefónica operate as a local front or "face" for global, digital corporations (Cancela and Goikoetxea, 2023). Moreover, American Big Tech is already signing up to narratives calling for putting the human at the center of digitalization, especially when it comes to AI projects.

Human, all too human: from ethical AI to public-private-community partnerships

Lassalle's work has been central for the diffusion of the humanist imaginary in Barcelona and Spain, reinforced by Catalan and Spanish media, as well as by spaces such as the Forum for Technological Humanism led by Lassalle himself at the ESADE Business School (symptomatically, a business-oriented educational space). Lassalle's (and his supporters') intellectual and political labor brought technological humanism to Spanish institutions at the local and national levels: the Ministry of Economy, the Secretary of State for Digitalization (SEDIAgob), and the Barcelona City Council, all controlled by the Socialist Party, actively promoted it in the 2019-2023 period. At the local level, this materialized in various policies that reoriented the heritage from the tech sovereignty period. Two paradigmatic examples were the government's strategies on artificial intelligence (Ajuntament de Barcelona, 2021a) and innovation (Ajuntament de Barcelona, 2021b), launched by the Barcelona City Council Commission for Digital Innovation, Electronic Administration and Good Governance for the 2019-2023 period.

In an innovative vein, the AI initiative included policies such as the opening of a register for AI algorithms, setting up an International Observatory on Urban Artificial

Intelligence, and creating local supervisory and advisory organs on this new technology. This AI government measure also emphasised the need to open spaces for public debate about technology under the banner of technological humanism. The measure defined technological humanism as a "model of technological development centered on the human being, that reduces social inequalities and protects human rights, in which technology is at the service of people and the general interests" (Ajuntament de Barcelona, 2021a: 7). In the case of AI, this translated into a call for an "ethical AI" designed according to a set of principles that go from "human action and supervision" to "social and environmental commitment". In the footsteps of Lassalle's suggestions, the government measure proposed to turn Barcelona into the capital of technological humanism and promote this imaginary as the basis of a new European model for tech development, via partnerships such as Eurocities, or even as a global model, via the network of Cities Coalition for Digital Rights (at this point linked to UN Habitat). But perhaps symptomatically, at the moment of its constitution, the local Advisory Board on Artificial Intelligence, Ethics and Digital Rights did not include representatives of civil society organizations among its founding members. Furthermore, the board, like the AI algorithm registry, made little or no progress during the political term.

The institutional form of the tech humanism imaginary becomes even clearer in the 2021 government measure on innovation (Ajuntament de Barcelona, 2021b). Some aspects of this measure extended lines of work opened during the tech sovereignty period: policies promoting data as a public good, strategies intended to narrow gender and class-based digital divides, initiatives aimed to tackle algorithmic discrimination, and a general view of the design and deployment of technology as a relevant social matter that demands some form of community involvement. The measure went beyond Lassalle's suggestions into a social liberal direction in its attention to welfare issues. However, while pilot programs to address the digital divide advanced during the political term, other aspects such as data governance went backwards to the earlier model of technocratic management.

Furthermore, in contrast to the public-common logic promoted during the previous term, the new strategy privileged the "public-private-community partnership"¹⁰ (abbreviated PPCP). In the government measure on innovation, PPCPs are presented along with public-private partnerships (abbreviated as PPP) as the key to addressing the challenges of digital transformation by "seeking public and private commitment" and establishing coordination and participation mechanisms for the "good governance of the city's digital future" (Ajuntament de Barcelona, 2021b: 9). The neoliberal flavor of this grouping of PPPs and PPCP can be better understood when looking at the central initiative mentioned in the document, Bit Habitat.

The Barcelona Institute of Technology for the Habitat (Bit Habitat) is a municipal foundation established under the *Convergència i Unió* government, in 2014. Its first relevant project was its involvement in a public-private partnership of Barcelona City Council with tech giant Cisco and Schneider Electric to renovate *Ca l'Alíer*, an old industrial building. Since 2018, the building has served as headquarters for the foundation, as well as for Cisco's co-innovation center in the city. Bit Habitat's last core mission, as stated in the 2021 government measure, is to advance urban innovation by fostering "quadruple helix" partnerships (that is, involving, public, private, academic and civil society actors) across four dimensions: co-creation, transformation, dissemination, and education. Crucially, the measure shows that Bit Habitat's governance structure as comprising, at the top, a board of trustees consisting of political representatives and private donors, then an executive committee comprising city council members, a scientific council composed of representatives from academia and the public, and a business council that includes private sector representatives. The working commissions, the key entry point for civil society organisations and individual citizens, form the lower layer of the governance structure. Although the measure advocates for the PPCP model, the proposed governance structure exhibits the relevance of public and private actors and the minor role of community involvement. A minor or nonexistent role that could also be

¹⁰ We use the public-private-community partnership formula as it is the more common terminology both in the city council document and in the public policy literature. We do so even though it implies a blurring of the distinction between political economy logics (public, private, common) and key actors frequently associated with those logics (state, market or companies, and communities, respectively). It may be a revealing blur insofar as the central political economic logics of tech humanism are the public and, even more, the private one, as they galvanise around the neoliberal, public-private partnership model. To that, the "community" is added as an afterthought that may not even contribute with a logic of its own.

detected in other areas such as data governance or AI supervision, as we mentioned earlier.

Other initiatives included in the government measure on innovation are the Correos project (planned to open in 2025), which would provide the private tech sector with a large space in a strategic city location to launch a startup incubator, and the Barcelona Innovation Coast project, oriented to ensure knowledge transfer from university to the private sector, as well as to set up a sandbox for emerging and disruptive technologies. These are two examples of the regained centrality of private, corporate and financial actors in digital plans at the municipal level.

Institutionally, instead of radicalizing the dynamics of technopolitical commoning of projects such as Decidim, which pushed forward citizen participation and public-common partnerships, the innovation measure placed public-private partnerships back at the heart of Barcelona's digital city project, revealing a return of smart privatization. However, as we conclude our review of the 2019-2023 period, it is worth noting that, even under the dominance of technological humanism, the earlier Decidim model of technopolitical democratization and commoning resisted and grew in these 4 years. It did so under the leadership of the Directorate for Democratic Innovation Services, hosted by the Participation Council, which remained controlled by Barcelona en Comú. A central project has been a new Athenaeum of Digital and Democratic Innovation, called "Canódom", which runs collaborations with tech activist organizations (an example is Guifinet, which offers free wifi in the neighborhood around this new center). Another relevant initiative, referred to as "democratic digitalization", has promoted the use of alternative digital platforms in schools, and has been framed as the nemesis of Google Classroom and other proprietary learning platforms. To this extent, the tensions between diverse imaginaries, with their diverging narratives and institutional forms, has continued.

Comparative analysis and discussion

Mapping the terrain and time: institutions, narratives, logics and struggles

After this overview of the 2011-2023 period, we want to resume and systematize some of the positions found. Using our political economy diagram (presented in Figure 1), we can

situate the key technological projects and political institutions and organizations mentioned in our study, as well as the political economy and governance logics they embody (see Figure 2, below). We have placed them according to their promotion of a private, public or common logic, or combinations of the three into "partnerships".

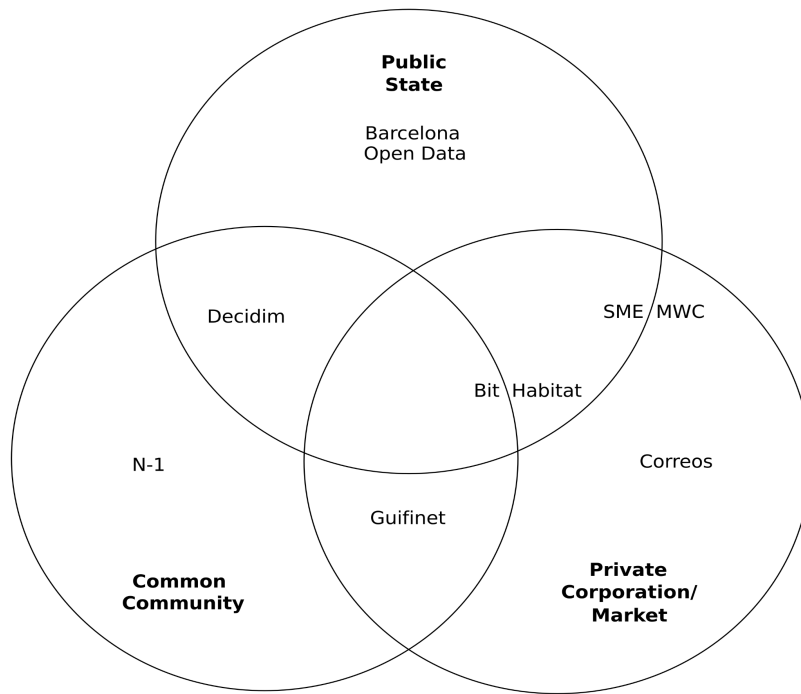


Figure 2. Key projects, institutions and political economy logics.

As we have seen, those projects and institutions perform different, sometimes opposing narratives. Therefore, the same analytical scheme, based on political economy logics, helps to map and situate (as in Figure 3, below) the narratives on technology and the city mentioned in the case study.

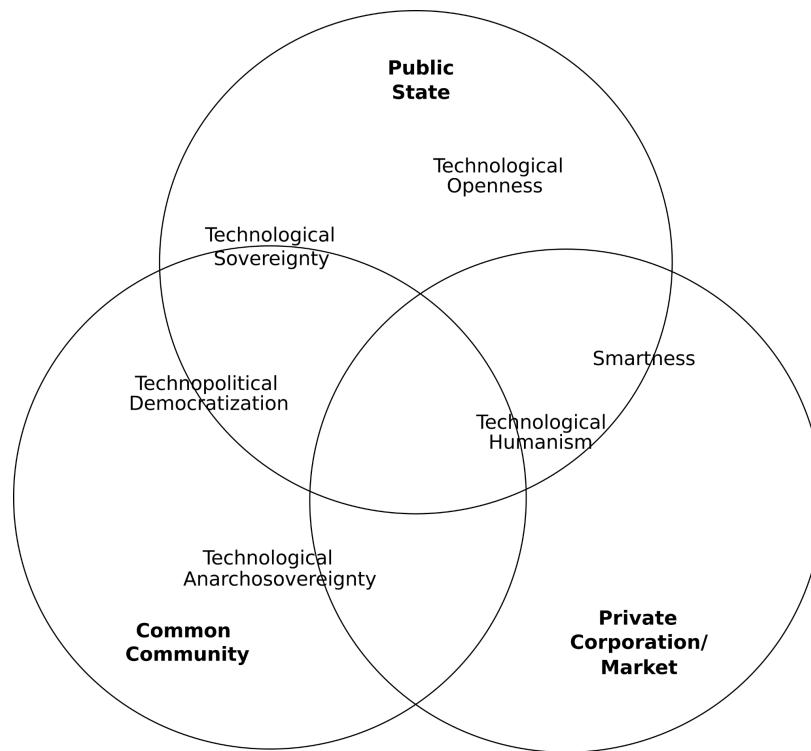


Figure 3. Sociotechnical narratives and political economy logics.

Our case study has shown a diversity of sociotechnical imaginaries tied to a single case of a digital city. Two of those imaginaries (the sovereign and the humanist) are usually gathered in the smart city literature under the generic "holistic", "counter-hegemonic" or "alternative" label. Thus, as it maps the internal institutional and narrative diversity of those imaginaries, this paper contributes to the literature on smart cities by showing radically diverse materializations within the holistic model. Furthermore, our case study contributes to the smart city literature on Barcelona by examining technological humanism, and by differentiating between connected narratives sometimes collapsed under the technological sovereignty imaginary in Barcelona and beyond, such as technopolitical democratization and technological anarchosovereignty/autonomy. Their differences can be both recognized and systematized using our analytical diagram, which helps to situate each narrative according to the weight of its association with different political economy logics and actors. As the Venn diagram of Figure 3 makes clear, we have outlined a field of possibilities that cannot be reduced to a single or even to three

imaginaries. However, not all of the narratives have equal prominence: conflict, association, subordination or convergence are some of the dynamics that define their relative positions within broader imaginaries.

In Barcelona, the smart, sovereign, and humanist imaginaries have been the ones more fully developed both narratively and institutionally, and thus have been the main object of our attention. The local ascendancy of these imaginaries in terms of their "public performance" and relative "stabilization" (to use Jassanof's words) primarily depended on their connection to specific public institutions, which can make policy and mobilize resources (economic, human, media, and others). Hence, we now deploy our narrative-institutional analytical framework presented earlier (Table 1) to dissect these three key imaginaries, and associate them with the three political terms under study (Table 2, below).

Sociotechnical Imaginary	Smart	Sovereign	Humanist
Parties and political terms	Convergència i Unió 2011 - 2015	Barcelona en Comú 2015 - 2019	Barcelona en Comú / Partit Socialista de Catalunya 2019 - 2023
Narrative analysis			
Subjects	Prosumer, user-consumer	Sovereign citizen, (techno)political actor	Human, citizen-consumer
Technology & politics	Technocratic Oligarchic	Critical Radically participatory	Ethical Collaborative, Technocratic
Systemic horizon	Neoliberal, "sustainable" capitalism	Democratic, "radically participatory" socialism	Ordoliberal / social liberal capitalism "with a human face"
Institutional analysis			
People (political, intellectual, and technical actors)	Trias / Guallart Business ideologues and technocrats	Colau / Bria Technopolitical activists	Colau / Bonet / Lassalle Tech humanist & business ideologues

Key projects & organizations	SME/MWC	Decidim	Bit Habitat
Political economy logic	Public-private	Public-common	Public-private-community

Table 2. Political periods and sociotechnical imaginaries.

Our narrative analysis in the third section (the case study) has shown that, in terms of subjects, the prosumer gave way to the centrality of the sovereign citizen and this, in turn, to the hybrid conception of the human as citizen-consumer. In terms of visions and practices of politics and technology, the technocratic and oligarchic approach of the smart period was replaced by the radically participatory one of the sovereignty period, which then gave way into a form of ethical and collaborative view, with a technocratic revival, under technological humanism. Finally, social horizons changed in time too. The initial vision of a neoliberal, "sustainable" capitalism tied to the zero emissions smart city narrative gave way to the democratic socialist view of a sovereign digital city during the technological sovereignty moment. This was succeeded by a Third Way type of digital capitalism "with a human face", oscillating between ordoliberalism (especially in Lassalle's formulation) and social liberalism (in some of the government measures).

On top of the narrative analysis, we have explored our case study from the institutional viewpoint. At the micro-level, business ideologues and technocrats took center stage in the period 2011-2015, were succeeded by technopolitical activists and, later, by tech humanist and (again) business oriented actors. The meso-level of projects and organizations displayed more continuity, as illustrated by some key examples: the Smart City Expo was established during the *Convergència i Unió* term and remained under *Barcelona en Comú*, albeit with some new spaces and slogans. Decidim emerged during *Barcelona en Comú*'s first political term and grew and evolved during her second term. Finally, in the 2019-2023 term of office, Bit Habitat, a foundation created during the *Convergència i Unió* period, was consolidated as a reference organization, while the Smart City Expo shifted its focus towards tech humanism. From the macro-level perspective of political economy, the trajectory is clear: the initial push of the private sector and public-private partnerships under the Xavier Trias government shifted to a new emphasis on the public sector and public-common partnerships during the first Ada Colau

term. Later, the private logic, which had continued operating, regained strength, and the public-private-community partnership became the new model, promoted by the Socialist Party of Catalonia. In this sense, we can see how changes at the meso- and macro-level of the institutional plane were slower (and probably less) than those on the narrative plane.

Beyond the local, we can also look at the interplay between the spatial scales of sociotechnical imaginaries. In the case of the smart imaginary the initial impulse came from neoliberal politicians, technocrats and companies that tried to land in Barcelona the narrative first pushed by global corporations such as IBM. Grassroots technopolitical culture and emerging EU narratives were able to partially counter that push and prefigure the technological sovereignty imaginary. This materialized in projects like Decidim that, in turn, helped to push the narrative forward elsewhere, as Barcelona became a global benchmark of a rebel digital city. Then, a small institutional shift (a center-left party gaining some power in the city council) opened an opportunity for technological humanism. What began as a global trend in cultural and intellectual terms took hold at the local level around projects like those mentioned in the AI government measure, with the help of actors like Lassalle, the Socialist party and shifting economic incentives. But also at the state level, in both public (e.g. SEDIAgob) and private institutions (e.g. Telefónica, ESADE).

From a purely chronological perspective, we have presented a series of succeeding imaginaries. However, it is worth noting a stable element, shared by the three periods described in the article: trust in technology. This trust was uncritical and enthusiastic from 2011 to 2015, critical and yet positive from 2015 to 2019, and measured and optimistic from 2019 to 2023. In a Whiggish reading of imaginaries, it may seem that progress has taken place. The initial polarization between Convergència i Unió's tech solutionist and neoliberal views and Barcelona en Comú's tech sovereignty and democratic socialist views may seem to have been mediated under the Socialist Party's humanist oscillation between ordoliberalism and social liberalism. However, from the viewpoint of the more radical readings of the technological sovereignty imaginary, what has taken place during the tech humanism moment is a step back towards earlier neoliberal forms of smart privatization that put corporate and technical actors back at the heart of the digital city. This development drastically shrunk the opportunity opened by the 2015-2019 period, even if various projects and ideas from that period have remained alive, showing the internal complexity of public institutions and their dynamics.

The futures of digital cities and societies, and the sociotechnical imaginaries around them, are always a complex field of struggle, both narratively and institutionally, temporally as well as spatially. Our analysis has presented a variety of performative matches and mismatches between narrative visions and institutional materializations, as words and deeds relate in complex ways. In temporal terms, the paper has shown that narratives sometimes preceded and contributed to institutional changes, and sometimes resulted from them, but were always impacted by institutional power, by being modified, amplified or stifled by it. It has also shown that changes in policy narratives can be faster, while institutional battles are slower and somehow longer-lasting, because organizational transformations and, especially, political economic logics, have a long-term character. It is therefore unsurprising that institutions like the Smart City Expo and Bit Habitat, or the overall centrality of private logics, survived the more radical 2015-2019 period and have recovered in full force since 2019. Complexity also unfolded spatially. We have seen the collaborative or conflictual relations between realities seemingly situated at different scales, challenging (once more) that separation. In some cases, narrative or institutional components of 'global' imaginaries have operated or taken root at the 'local' level, in others, 'local' features have been tentatively scaled up, and yet in others, both seemed to co-emerge, probably driven by shared structural (such as political economic) factors and actors. Crucially, the struggles in Barcelona seem to link to, embody or precede conflicts not so much at other scales but in other arenas, which tie digital city struggles with broader ones, around technology, society and economics.

5. Conclusion: technopolitical lines of flight

Over the past decade, Barcelona's digital politics has undergone various shifts. During the 2019-2023 period the imaginary of technological sovereignty, which was once strongly associated with counterhegemonic visions and institutions, has gradually given way to a new imaginary that emphasizes humanistic compromises. This shift is characterized institutionally by a move away from public-common partnerships, where the private sector played a subordinate or inexistent role, to public-private ventures with a community flavor. Meanwhile, in narrative terms, radical socio-economic and socio-technological critique dwindled with this transition.

The aforementioned case study highlights, at the city level, the remarkable resilience of digital capitalism, which readily adapts to shifts in narratives and institutions in order to survive. It also shows that a mere four-year period is utterly insufficient to begin reversing long-term economic and sociotechnical dynamics. At the same time, it underscores the complex nature of urban technopolitical struggle, which demands the constant development of new strategies in order to reclaim the right to the digital city. New narratives (on subjects, technology and politics, and social horizons) along with new institutional forms associated with them, are necessary, at the local level and beyond, if (digital) capitalism is to be challenged. To conclude we want to insist on the idea that other (digital) cities and societies are possible. And that as the old adage suggests, traces of such new worlds –variegated, precarious, and conflictual– already exist in the shell of the old.

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