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Technopolitical Democratization and Digital Commoning: the Case of the Digital Democracy and Data Commons (DDDC) pilot

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0.1. Metadata

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Resume	This document presents the theoretical background, general objectives, elements, and shape of the Digital Democracy and Data Commons pilot to be carried on in Barcelona, in the context of the DEcentralized Citizen Owned Data Ecosystems (DECODE) project. It explains the two threads of the pilot, the Digital Democracy thread and the Data Commons thread. The Digital Democracy thread is oriented to improve Digital Democracy by integrating DECODE technology with Decidim technology (Decidim is a free software for participatory democracy) and enabling better authenticated, more private, transparent and data enriched decision making. The Data Commons thread is oriented to explore alternatives to the current model of digital economy by using Decidim technology for deliberating upon data policies and deciding upon an experimental data commons constituted during the pilot. The document opens providing a theoretical background of the need for and potential shape of this type of alternatives in the current predicament, defined by datacracy in the political arena (where new big data techniques by powerful actors are strategically used for intervening into politics and culture) and data extractivism in the economic arena (where monopolistic actors exploit citizen's data undermining privacy as well as personal and collective autonomy for profit). Afterwards, the document presents the technical, social and theoretical objectives of the pilot, as well as some evaluation metrics. It then enumerates its various elements: its core theoretical frameworks and concepts, technologies, sociotechnical tools and practices (legal, social, economic), social actors, and data involved in the pilot. Finally, it describes the general shape of the pilot, its various stages, the resources mobilize for its development and some of its outputs.

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[1] This division and specification of authorship levels has been directly copied from the criteria established under the FLOK Society Project - Buen conocer (see: Vila-Viñas & Barandiaran 2015, pp. 38-39).

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1. Introduction

The Digital Democracy and Data Commons pilot will experimentally implement the DECODE mission[2]. The core of the pilot will be a technologically-enabled (via DECODE and Decidim technologies[3]) participatory process for experts, citizens and city representatives to: 1-test the new DECODE-Decidim system[4] (from now on DecidimCODE) for strongly secure, private, transparent and data enriched democratic decision making; 2-deliberate upon data politics and economics, at the local level and beyond; and 3-constitute an experimental digital data commons[5], whose shape will be defined by the ideas and practices coming from the Digital Democracy and Data Commons participatory process itself and later linked to the data commons framework defined with the City of Barcelona[6].

In this document we present the mission, theoretical background, and objectives (sections 1.1, 1.2, and 1.3), the elements (section 2), the preliminary design (section 3), as well as the organization and outcomes (section 4) of the pilot[7].

1.1. Mission

The Digital Democracy and Data Commons (from now on DDDC) pilot is oriented to experimentally implement the DECODE mission. The primary DECODE mission is to develop technologies and tools that enable sociotechnical systems (be they political or economic in character) that give people more individual and collective (democratic) control over their data, while enabling uses that provide more collective benefits from it.

In the pilot, this mission is advanced by the convergence of two technological systems: DECODE and Decidim. As a result, the DDDC pilot has two threads, the Digital Democracy thread and the Data Commons thread. The Digital Democracy thread, the primary one, has a central aim (see the first aim of the pilot, above): testing the DecidimCODE system. Ultimately, this thread speaks to the potential of DECODE technology to push forward Decidim's technology and vision of participatory democracy. The Data

[2] DECODE high-level vision outlined in this article by Francesca Bria: https://www.citymetric.com/horizons/people-should-control-their-digital-identity-barcelona-s-chief-technology-officer-decode

[3] Decidim is a digital infrastructure for participatory democracy sponsored by the Barcelona city council and other organizations. More information at decidim.org.

[4] The Barcelona pilot is based on the technological and conceptual integration of the DECODE and the Decidim technologies. That is what, here, we will be calling DecidimCODE. That technological integration also speaks of a convergence of visions.

[5] For reasons of style, from now I will simplify this expression and will refer to data commons only. The vision and definition of data commons in the context of DECODE is outlined by Project Coordinator Francesca Bria: https://www.theguardian.com/commentisfree/2018/apr/05/data-valuable-citizens-silicon-valley-barcelona

[6] The data commons policy of the city of Barcelona can be found here: https://ajuntament.barcelona.cat/digital/sites/default/files/2018_mesuradegovern_en.pdf

[7] Its intention is to provide a bird eye view of the pilot and its theoretical background, more than a detailed account of its final shape, which will be presented in more detail in later deliverables.

Commons thread, which is a complementary (and somehow secondary) thread, is oriented to cover the other two general aims of the pilot, namely, to collectively deliberate upon data policies and experiment with data commons. Ultimately, this thread speaks to the potential of Decidim to advance DECODE's vision of alternative forms of data governance and digital economy.

The pilot orientation has a theoretical background behind it (exposed in section 1.2.), and can be broken down into a series of more detailed objectives (exposed in section 1.3.).

1.2. Theoretical background[8]

The exposition of the theoretical background is divided in four parts: data capitalism and democracy today (section 1.2.1) provides a brief overlook of new forms of capitalism and their relation with democracy; the section (1.2.2.) "the DECODE alternative" briefly outlines the DECODE vision as it informs the DDDC pilot; similarly, the section (1.2.3.) on "the Decidim alternative" presents the key elements of the Decidim project vision as it affects the DDDC pilot; finally, the "DecidimCODE: Digital Democracy and Data Commons" (section 1.2.4.) outlines the convergence of DECODE and Decidim, as well as its potential for the future.

1.2.1. Data capitalism and democracy, today

As mentioned above, there are two key threads to the DDDC pilot, one connected to Digital Democracy and a second one connected to Data Commons. While the first focuses on the potential of the DecidimCODE system from a political (and specially, governance) viewpoint, the Data Commons thread also attends to the potential of the DecidimCODE system from an economic perspective. The political and the economic perspectives will thereby pervade our discussion of data capitalism and democracy.

1.2.1.1. Capitalism and its discontents

From informational and cognitive capitalism to platform and surveillance capitalism[9]

Capitalism is increasingly based on technology and information. That is already suggested by looking at the lists of biggest corporations by market capitalization, which usually feature corporations such as Apple, Alphabet, Microsoft, Amazon, Tencent or Facebook. Back in the 1990s, internet and digital networks already contributed to push globalization forward as a historical process, beginning with the acceleration of global finance (Castells, 1996). A keys of the rising globalized economy were information and other immaterial assets, such as knowledge, affects, and social relationships; the result was a new form of capitalism: informational and cognitive capitalism (Castells, 1996; Fumagalli, 2007; Moulier-Boutang, 2011; Vercellone, 2006). Different from industrial capitalism, where the transformation of material resources into commodities was at the core of the process of capital accumulation, now information and other immaterial assets were gaining prominence in the generation of economic value. By the late 2000s, in all G7 countries, at least 70% of GDP already depended on immaterial goods (Floridi, 2010: 5). Intellectual property became a central legal mechanism under this new paradigm, as a tool to privately appropriate

[8] This background is more a general synthesis of intellectual coordinates of the pilot rather than a full blown research on the topics addressed in it.

[9] The following two sections are a partial rewriting of passages included in Barandiaran, Calleja-López & Monterde (forthcoming).

such immaterial assets, f.i., via strong copyrights on books and music, patents on technoscientific innovations, traditional medicines and techniques, or animal and plant DNA (Fumagalli, 2007).

The pervasiveness of the digital element in these processes has only increased in the last two decades. In areas ranging from the production of scientific knowledge to everyday relationships in the social field, society and economy have become digitized (McAfee & Brynjolfsson 2017). An example is the increasing penetration of the Internet and digital social networks into the most minimal details of everyday life. The so called web 1.0 (O'Reilly, 2005) exhibited various limits to users' interactions with both digital contents and other users. By contrast, web 2.0 was all about interaction. This exponentially increased the depth and variety of information that could be extracted around human relationships, ideas, and affects. Combined with the always increasing rate of computing power, the development of new technologies and methods of big data, and artificial intelligence (Trevathan, 2006; Manovich, 2013; De Mauro et al., 2015; Zysman & Kenney, 2015, 2016), it provided the infrastructural conditions for a socioeconomic shift. The combination of the free software and the information freedom culture in Silicon Valley stressed (among other things) the centrality of digital services free of charge, and thereby monetization was to be found elsewhere: it was data-based targeted advertisement; free data for free services even as the value of data increased (Carrascal et al., 2013; Arrieta et al., 2018). Corporations such as Google or Facebook were heralding a specific form of informational and cognitive capitalism, which has been variously qualified as "platform", "data" or "surveillance" capitalism. These three adjectives speak of three connected elements that are at the core of contemporary capitalism: digital infrastructures, data, and controlled sociality. Digital platforms have become the basic means of production and management of a valuable resource (data) out of its source, human activities (Srnicek, 2017). Data, considered the new "oil"[10], is processed using data science methods and business intelligence, from modern statistics to Artificial Intelligence and Machine Learning. Subsequently, it is used, in various ways, in data-driven political, scientific and economic processes (Lohr, 2015).

Although ever more people are affected by this, the control of these platforms and the process of extraction, appropriation, processing, and use of data are radically oligarchic. Corporations such as Alphabet, Microsoft, Amazon or Facebook have earned monopolistic positions[11]. The value resulting from platforms and data becomes highly concentrated. From Facebook to Tinder, digital platforms are a way through which large corporations extract data (activity, personal details, opinions, preferences, metadata, etc.), while leaving users with little to say about what is gathered, how it is used or how the resulting benefits are distributed; this institutes a regime of "data extractivism" (as suggested by authors such as Evgeny Morozov[12]).

[10] As put by different authors and publications such as The Economist https://www.economist.com/leaders/2017/05/06/the-worlds-most-valuable-resource-is-no-longer-oil-but-data.

[11] For more analysis and documentation on this point, see an earlier DECODE report by Symons & Bass (2017). Alphabet (which controls Google), Microsoft (a giant from the early days of cognitive capitalism) and Amazon occupy three of the four top positions of the rankings by market capitalization. Facebook occupies the 8th place, but remains the third most visited web, with Google and Youtube (both owned by Alphabet) being the first and the second, according to Alexa and SimilarWeb, as of March 2018.

[12] In talks like https://www.opendemocracy.net/digitaliberties/richard-barbrook-francesca-bria-evgeny-morozov/digital-democracy-and-technological-sovereignty.

On this basis, new forms of surveillance can be built. These corporations have access to more details on the lives of millions of people than any State or corporation to date; they can also act upon it. A few actors have become the owners of both platforms and data, and can first surveil social life and later experiment with it[13]. Surveilling thereby appears as a first step to what we have defined as "surwilling", from unveiling social life to orienting (or "willing") it from above (Calleja-López, Barandiaran & Monterde, 2018). Platforms crucially influence the information people get about others and about the world, be it from friends, social actors, mass media, advertising corporations or beyond. In interaction with grouping social dynamics, it generates the well-known filter bubbles and echo chambers (Pariser, 2011; Jamieson & Capella, 2008). Beyond that, the goal is to shape affect, desire, subjectivity for profit and power (Grizzioti, 2016). In the ultimate, there emerges new forms of knowing and influencing the actions of millions of people, a new technopolitical power that these corporations can and do also put in the hands of States (such as NSA programs[14]), other corporations, or political actors[15].

Part of this surwilling machine feeds back with surveillance by feed the desire of visibility. These platforms nurture and are nurtured by some dynamics already diagnosed by Guy Débord (1967) around the society of the spectacle, heralding a society of hypervisibility and exhibition tied to capitalism. Exhibition and self-exhibition (from the intimate everyday to political opinions and actions, passed through a variety of fiction filters), are stimulated and situated at the center of the functioning of these platforms (Crogan & Kinsley, 2012; Flaxman et al., 2016), which are in turn at the center of an economy of attention and, beyond, of subjectivity.

People's privacy fades away as a result of surveillance; people's personal and collective rights on data (among them, property), dissolve into extractivism; people's personal and collective will are shaped by surwilling. This extractivist, surveillance (Zuboff, 2015) and surwilling capitalism brings us nearer to a Big Brother and Brave New World dystopia. In the following section we touch upon a recent case in point.

Datacracy vs democracy

The rise of Donald Trump in 2016 (and probably, Barack Obama) to United States presidency are examples of how digital social networks and big data operations have a growing impact in electoral processes and everyday life. In the current predicament, democracy has become exposed to "datacracy", namely, to the strategic use of big data and digital platforms to gain and exercise political and cultural power (De Kerckhove, 2017; Gambetta, 2018).

Trump invested 94 million dollars in expert consultants and Facebook's paid advertising services. More importantly, the campaign included numerous examples of political automation: the use of chatbots, posting bots, false profiles and the automated inflation of followers and metrics of activity (Bessi & Ferrara, 2016). These were frequently tied to the diffusion of fake news, otherwise, biased, incomplete or spurious media stories with exaggerated and emotional adjectivation[16]. This fed back with the activity in platforms such as 4chan, Omegle, Reddit and Tumblr, where Trump's

[13] Like in Facebook secret psychological experiments. More information at https://www.theguardian.com/technology/2014/oct/02/facebook-sorry-secret-psychological-experiment-users.

[14] As revealed by Edward Snowden. More information at https://www.theguardian.com/us-news/the-nsa-files.

[15] Such as the Trump or the Brexit communication teams. More information at https://www.theguardian.com/news/series/cambridge-analytica-files.

[16] As analyzed in https://psmag.com/social-justice/how-trump-weaponized-fake-news-for-his-own-political-ends.

followers formed an irregular community, self-appointed as Alt-Right (Nagle, 2017), which showed clear manifestations of sexism, xenophobia, Islamophobia, anti-feminism, intolerance and white supremacy, openly or in the form of satirical jokes and memes (Mendoza-Denton, 2018, Van-Zuylen et al, 2018; Pollard, 2018). He may be have also been supported by Russian espionage and communication experts, who received large financial incentives, showing the geopolitical character of these technopolitical struggles[17]. Finally, there was the hiring of London consulting company Cambridge Analytica, which extracted personal data from 87 million Facebook profiles between 2014 and 2016 to analyze their political preferences, using a Facebook application disguised as a "personality test"[18].

This is not exceptional, though. Cambridge Analytica intervened in the last presidential campaigns of Argentina, Mexico, Brazil, Sri Lanka, Malaysia, China, Australia and South Africa, as well as the referendum that caused the separation of Britain from the European Union, known as Brexit. These cases have drawn public attention to issues such as the vulnerability of online personal data, the power of corporations and States that can access these databases (either legally or illegally) and the use of these platforms for orienting public discourse and action[19]. In words of Facebook's founder and president, Mark Zuckerberg, the platform has no affinity with any political party, and any client can access its services[20]. However, Facebook corporate norms and algorithms keep defining the rules and working as "black boxes". Zuckerberg's company has never shared details of its technical operation or data processing software. The content of Facebook's terms of use, still remain general and non-negotiable. This opacity becomes ever more problematic as the role of platform algorithms, political automation and Artificial Intelligence (including machine and deep learning) systems grow (Trevathan, 2006; Manovich, 2013; Zysman & Kenney, 2015, 2017). This poses a risk for democracy, to the extent that they follow their current corporate and technocratic politics of data and infrastructure, and democracy has to cope with datacracy.

1.2.1.2. What is data?

In advance of our exploration of the alternatives to datacracy and surveillance capitalism nurturing and nurtured by Decidim and DECODE, in this section we briefly discuss a core notion in the debate: data. In the last years, there have been different proposals for conceptualizing it. Each of them goes along a different set of metaphors. Three models stand out: the consideration of data as a resource, typically framed under the metaphor of data as the "new oil" of capitalism; the consideration of data as labor, frequently framed with the metaphor of data as congealed labor; and, finally, the consideration of data as infrastructure, accompanied by metaphors such as that of data as a new soil or as a meta-utility.

As numerous authors have suggested (Wittgenstein, 1953; Blumenberg, 1960; Lakoff & Johnson, 1980) the concepts and metaphors with which we try to understand and frame realities are tied to our practices, ultimately, to different forms of life and the struggles around them. In order to

[17] A dossier on the Trump-Russia issue can be found at https://www.theguardian.com/us-news/trump-russia-inquiry.
[18] A dossier on the whole Cambridge Analytica case can be found at https://www.theguardian.com/news/series/cambridge-analytica-files.
[19] As noted in numerous editorial pieces such as https://www.nytimes.com/2018/03/19/opinion/facebook-cambridge-analytica.html
[20] A fine synthesis of Zuckerberg's hearing at the American Congress can be found at https://www.businessinsider.nl/mark-zuckerberg-testifies-us-congress-cambridge-analytica-russia-bias-2018-4/.

understand the variety of models of data economy, this section briefly digs into some paradigmatic conceptualizations and metaphors that have been proposed to think through data in the public and the academic literatures in the last few years.

Data as... information, resource, labor, infrastructure, and life

Before going into the three metaphors we just mentioned, we will go into a preliminary one, one that, to some extent, can underlie the rest of characterizations: data as information, or as the basis of information. Sources such as the Merriam Webster dictionary tend to directly identify data with various types of information[21] while the Oxford dictionary tends to identify it with either "facts and statistics" or "quantities, characters, or symbols on which operations are performed by a computer". A much better working definition of data can be found in Wikipedia, which puts it as "a set of values of qualitative or quantitative variables", which somehow synthesizes the core of more elaborate approaches that define a datum as "x being distinct from y, where x and y are two uninterpreted variables and the relation of `being distinct', as well as the domain, are left open to further interpretation" (Floridi, 2010: 23). The reasons to prefer it is that facts and statistics can be understood as derived from "values of qualitative or quantitative variables". On the other hand, the reference to computers is not essential to data, a notion that long preceded their invention. Information, on its part, can be interpreted as constructed on the basis of data (see Floridi, 2010 and the literature on information theory more broadly). We move to it now.

Information is a polysemic concept, increasingly used in a variety of fields, which can be approached from a variety of perspectives, from the formal to the biological, from the physical to the economic (see Floridi, 2010, 2013). In the philosophical tradition, information was thought in relation to the the concept of "form". It could speak of the process of giving form to matter (f.i.: giving the shape of a horse to a piece of clay) or mind (f.i.: communicating the idea of a horse to a listener), as the state of an agent resulting from such process (f.i.: the clay or the mind of the listener, who become "informed"), or as the disposition to inform (f.i.: the potential of the form or idea of a horse to shape matter or mind) (Adriaans, 2018).

As a result of the rise of information theory and the information age (Castells 1996), it was a variation of this last meaning, information as a disposition to inform, that has taken preeminence in the last decades. A classical, operational definition of this idea was provided by Claude Shannon (1948). It was oriented to solve problems in communication engineering: it suggested to understand information as a form of entropy, where "entropy, H, of a discrete random variable X is a measure of the amount of uncertainty associated with the value of X". The quantity of information delivered by a message could then be calculated applying the negative logarithm of the probability of a given variable: $I(A) = - \log P(A)$ (Adriaans, 2018). A possible reading then, is to understand information as data that solves uncertainty, that turns the probable into a value, probability into actuality. It is in this transition that information is born.

A limit of this definition lies in its disregard for the content of the message. As a result, much discussion in philosophy of information has been oriented to both cover that lack as well as to find more general understandings of information (Adriaans, 2018). In his semantic reading, Floridi (2010, 2013) has suggested that information should be connected to notions such as "meaning" and "reference", as something that is "about" something and "means" something. He has defined information as "well formed

[21] See https://www.merriam-webster.com/dictionary/data.

and meaningful" data, which can then be subdivided into "factual information" (referring to something that is the case) or "instructional information" (reclaiming a given action or state of affairs). He has also stressed the variety of meanings and uses of the term, so we will not try to

In general, the metaphorics of data as information seems to speak of a reality that is before or beyond the modern distinction between mind and matter. A pattern that can shift its embodiments, a third element that can circulate across the world at amazing speeds and can be shared without depletion. Odorless, tactless, contactless, like ether. This is the image that pervaded much of the literature of the 90s, the image of a society without walls, a city of bits, a transparent government, a digital self.

However, from a pragmatist approach, a key aspect of both data and information is their use, be it communication, control or any other. It particularly (although the phenomenon was much earlier) with the development of big data techniques, the datafication of society (mentioned in 1.2.1.) and the narratives around it when the socioeconomic and cultural centrality of data increases exponentially. It is from the viewpoint of its potential use that the second of the key metaphors around data is built, the one that makes of it the new "oil" of capitalism. From this viewpoint, data is not only a source of information, but also a key resource for the new digital economy: something to be exploited. The metaphorics of data as resource presents data as a raw material to be extracted from its source: human activity. It is a resource to be extracted, processed and stored in big quantities to generate valuable information (individual or unprocessed data holds little Gandomi & Haider, 2014), this information can then, in turn, be sold either as a commodity or as a service (that is, used in relation to platform-based social processes).

Digital platforms as multi-layered sociotechnical systems may be thought, in their current functioning, as fields where human digital activity accumulates, mines that allow to extract data from it, factories that allow to process it, warehouses that store it, marketplaces where buyers can pay either for access to it (raw or processed) or, more frequently, for benefiting from it in the form of services (f.i.: targeted advertisement). Physically, much of this extracting, processing and storing happens in the same data centers. A few actors own the platforms, everyone else owns cheap oil. Most of the value results from the aggregation and processing that allows to extract valuable information from it (refined gasoline), and from the ability to act upon it (the combustion engine of social processes), so small oil is cheap.

Still within a similar metaphorical constellation, one of the current proposals to somehow move away from this landscape is to give back to people their role as active agents rather than sources of data. Under the current paradigm of data capitalism, this means they should be owners of their data, their small oil. As a result, they stop being mere sources and become exploiters too. The data that the mine extracts out of their lives should be appropriated by them, controlled by them. They then can become more traditional subjects in data markets. They should or actually become able to move part of their stock, find brokers that can pay for it, make some money out it. The limits of this usually individualistic approach have been considered in earlier deliverables (Symons & Bass, 2017). In this model, it is brokers who get a bigger share. Small owners, not much more than before.

This is the core of the metaphorics of data as oil, where data extractivism operates upon somehow previous forms of life. However, perhaps it is more interesting to think of these platforms as farms. In farms data are not "mined", extracted raw out of "natural" social activities, instead, these activities themselves are carefully domesticated in advance: surwilling

precedes surveillance, production precedes extraction. Very concrete conditions are set for data to grow out of a structured field of life, out of a sociality defined by interfaces and algorithms. Then these data can be either sold or to be used to operate on the controlled field of life on the platform (a new and intrusive version of Sherry Turkle's life on the screen). From there, it permeates the "outer" world, a world connected to the platform in multi-layered systems of practice that involve digital and analogic layers. These data are especially valuable to be used upon life in the platforms because sociality is better known there, it has been reduced to be acted upon, and the mechanisms of the platform allow more extensive and deeper operativity. More than traditional domestication or slow farming these are lab-like versions of farming. These images are at the core of an alternative metaphor to that of data as oil, a biopolitical metaphorics of data as life.

Personal data and information could be conceived as a digital body. Collective data would be a collective body, in a similar way as we talk of State bodies (in the tradition of Hobbes' Leviathan). All of them inhabiting and emerging out of a digital life in a digital environment. But is important to realize that such digital environment, life and body are tied to the cultural (including the legal) and the physical ones (Echeverria, 1999). In that sense, data farming involves the framing and enframing of digital life but also, increasingly so, the cultural and biological life. After all, there are not so many differences between the mechanisms applied to data and (say) expressions or pictures on Instagram. As we noted in section 1.2.1.1., it is subjects as a whole (not their digital lives only) that are shaped, their affects and forms of relationality, in their personality and their collectivity (Grizzioti, 2016).

Data as resource can thereby be the new oil; it can also be the new life of the digital economy. In the first metaphor, digital activity and life are the source from which this resource is extracted, in a classical industrial metaphor. In the second, digital activity and life are both the shaped source and the shaped target, in a more biopolitical image. This second metaphor somehow speaks of the interplay between surveillance and surwilling that we already mentioned above. In both cases, people and their lives, personal or collective, appear enrolled in a process of reifying subjectivation, subjects are made more than self-made, in the traditional modern idea from René Descartes to John Stuart Mill.

One metaphor to break with these images is that of data as labor. The idea of understanding data as labor departs from a critical view of the current model of digital economy. This model relates free content and free data and this is slowing down AI development and productivity growth (Byrne et al., 2016).

"DaC treats data as natural exhaust from consumption to be collected by firms, while DaLtreats them as user possessions that should primarily benefit their owners. DaC channels pay-offs from data to AI companies and platforms to encourage entrepreneurship and innovation, while DaL channels them to individual users to encourage increased quality and quantity of data. DaC prepares for AI to displace workers either by supporting UBI or reserving spheres of work where AI will fail for humans, while DaL sees ML as just another production technology enhancing labor productivity and creating a new class of "data jobs". DaC encourages workers to find dignity in leisure or in human interactions outside the digital economy, while DaL views data work as a new source of "digital dignity". DaC sees the online social contract as free services in exchange for prevalent surveillance, while DaL sees the need for large-scale institutions to check the ability of data platform to exploit monopsony power over data providers and ensure a fair and vibrant market for data labor" (Arrieta et al., 2018: 2)

A key practical conclusion from this metaphor is to point the potential of unions, and the need to promote them. Strikes would be easier to enforce, authors suggest, in digital platforms. They could also ensure data quality, thereby increasing data returns: rather than cheap oil people could sell gasoline or tires. A model connected to this could be that of data cooperativism, either in its platform cooperative (Scholz, 2016; Scholz & Schneider, 2016) or open cooperative (Bauwens, 2014) model. Core to this strategy is to convince people of an alternative vision of data, and thereby celebrate initiatives such as GDPR and project potential mechanisms for measuring and enforcing (via payment) the value of data. They close with a view of new radical markets promoting skilled data labor in a time where AI may automate up to 50% of jobs (Frey & Osborne, 2017), as corporations such as Facebook or Google have 1 or 2 orders of magnitude less workers than Walmart for the same or more market value.

A fourth set of metaphors derives from the consideration of data as a public good (such as in the open data model) or as infrastructure. In both cases, the implicit assumption is that the State has to occupy a key role in the provision of data under concrete conditions. State-based policies of open data are frequently part of broader Open Government policies (Yu & Robinson, 2012). In its wider versions, however, data coming from public services (f.i.: healthcare) and city processes and infrastructures may be made available as open data[22]. The focus there seems to be in concepts and practices such as innovation, transparency or efficiency. No conditions are put when it comes to the use of those data, it is equally open for corporations, small businesses or citizens. Frequently, because of limitations on the side of the provider (f.i.: data structure, complexity) and the user (f.i.: time, skills, etc.) side (Janssen et al., 2012) it is actors endowed with economic and knowledge capital (f.i.: lobbyist, corporations) who benefit the most of its exploitation (Zuiderwijk & Janssen, 2014). An alternative, still public sector based approach is that of thinking data as infrastructure: data as the roads and bridges of the digital economy. More than a push towards open provision of data as such, the core objective in this case is to carefully align strategic public interests, data and smart infrastructures (Kawalek & Bayat, 2017). This may imply a closed data policy oriented to ensure data quality and the public (or, specifically, national) interest. Data are then exploited via city dashboards for the operativity of “government as a smart system” and “smart cities”.

We can use the following table and categories to synthesize core elements of these four metaphorics.

Comparative metaphorology				
Metaphor	Data as capital or commodity / oil	Data as labor	Data as open an as infrastructure / soil	Data as commons / life
Ownership	Corporate	Individual or collective	Public	Communities / common
Incentives	Profit	Ordinary contributions	Public interest	Common goods & recognition

[22] A good view of the types of public data being released by EU member states can be found in the European Data Portal, at

Organization	Hierarchy / market	Market	Hierarchy / Network	Network
Social contract	Free services for free data	Countervailing power to create data labor market	New deal on data Data-based welfare	Data commonwealth
Examples	Current digital economy	Digital labor marketplace	Open data City Dashboard	Decidim

Table 1: Comparative metaphorology[23]

The question of what data is has not only philosophical but also has socioeconomic and political implications. In the following two sections we present the Decidim and the DECODE alternatives to the current model of data capitalism.

1.2.2. The Decidim alternative

In section 1.2.1.1. we discussed the conflict between datacracy and democracy in the age of digital social networks. We mentioned some of its impacts. An alternative to the existing model is Decidim, the digital infrastructure for participatory democracy sponsored by the Barcelona city council and other organizations. In earlier works within the DECODE project we have presented it; however, we resume now some of the key elements of the vision behind it.

1.2.2.1. Decidim and metadecidim: third generation digital networks for radical democracy[24]

Decidim as a third generation digital network

There are different kinds of digital networks, historically promoted by different actors. In the 90s, the World Wide Web was the paradigm of a first generation of digital networks: informational networks. The WWW was characterized by allowing the publication of information and contents on web pages reachable from any terminal connected to the internet. Although these pages offered different possibilities for interaction, their architecture often enforced various limits to it. The typical model was that of a page with ready made contents, barely modifiable by the people who visited it.

These limits to the interaction also limited the volume of information that websites could obtain from their users. This didn't prevent the flourishing of new economic opportunities supported by digital media: in the 90s Internet and the web was connected to the rise of what Castells (1996) called "informational capitalism", a new step of the capitalism where the production and the appropriation of information become the key in the economic value production. The turn of the century witnessed some of the limits and the potential of this new reality. The dot.com bubble revealed the irrational exuberance behind the hyperbolic growth of the sector.

[23] This table is a combination and amplification of the “Data as capital” vs “data as labor” model found in Arrieta et al. (2018). and the comparison between different models of Data Governance Strategies in Kawalet & Bayat (2017).

[24] This text is an upgraded version of a passage in D.2.3. A preliminary version can also be found in Italian, in Calleja-López, Barandiaran & Monterde (2018).

Around the same time, projects like Indymedia, a participatory network of alternative information built by activists and independent journalists. Both, the bursted bubble and the participatory network occupied an transition step towards what was later called "web 2.0".

Already in the second half of the 2000s, the proliferation of a second generation digital networks begun: the so called "social networks". According to authors like Tim O'Reilly, platforms like Facebook and Twitter made of users' interaction among themselves and with the contents (instead of information) the core of their construction. This, attached to the progressive increase of data extraction, storage, and processing allowed by big data techniques allowed the rise of a specific form of informational capitalism: data capitalism.

In the last ten years, as described in section 1.2.1.1., corporate social networks such as Facebook have grown to the rhythm of an economy based on the study and governing of people's digital attention and behaviour. In so doing, they have become mediators of everyday life and social communication, but with a much greater capillarity than traditional media like television or newspaper. In this way, social networks, which de-intermediate some aspects of social communication (e.g., the need to go through the editorial filter of a newspaper or television), mediate it again. What Castells (2009) defined as "mass self-communication" multi-channel communication from person to person, from one to many, and from many to many, where the message is self-directed, self-selected has as gone hand in hand with what we could define as a "mass capture":, the capture of mass data and human activities. Mass self-communication has risen hand in hand with mass capture, the capture of masses of data, human actions and interactions. Furthermore, and this is a complement to the discussion in 1.2.1.1, in digital social networks, surveillance and control is not only top-down but also bottom-bottom: .people surveil each other (as stressed by Morozov, 2011). Thereby, there are two axes of surveillance, vertical (mass surveillance) and horizontal (mass self-surveillance). While the first tends to be unidirectional, the second is frequently (though not always, as platform settings are variable) multidirectional and reciprocal: it becomes the second face of mass self-communication. Also recurring to the discussion in 1.2.1.1., we may say it frequently turns the latter into mass self-exhibition.

The power of social networks moves from selling advertisement (a concrete type of content) to a deeper shaping of social attention and affects (Floridi, 2010; Grizzioti, 2016), and thereby, behavior. These new forms of corporate influence via technologies, bring about new forms of "technopolitical heteronomy" (Calleja-López, Barandiaran, Monterde, 2018). Key rules of social relations are not produced in and decided by processes, actors or conflicts spread in space and time, but rather are increasingly decided and designed by a limited number of people and specific interests (geostrategic, economic, etcetera).

As an alternative to commercial social networks, also in the second half of 2000, emerged alternative social networks emerged, from Diáspora (with more than 1 million users) to n-1, a platform widely used during the 15M movement[25].

We consider Decidim an example of an emergent model of third generation networks, that we call "political networks". The project is embedded in multiple long-term processes[26]. The software of Decidim, which began as a

[25] The 15M movement was a networked social movement emerged in Spain in 2011. One of its key reclaims was that of a real democracy. The political cycle, ideas and many of the people behind Decidim come from it.

[26] Among them, the digital transition of traditional political institutions (whose participation processes have not yet been taken over by corporate

participatory platform designed to meet the needs of the Barcelona City Hall in terms of citizen participation, is currently used by more than a dozen of cities and, more importantly, it is used by cooperatives[27] and other social organizations.[28] This feeds the hope of benefiting from so called “network effects”. The horizon of the project is to permeate a broad spectrum of circuits and social spheres.

In any case, the differential characteristic of political networks lies in what can be done in them and with them. Digital networks such as Decidim have three fundamental characteristics: firstly, they reduce the centrality of the figure of the prosumer (someone who produces and consumes digital content) and replaces it with that of a clearly political actor; secondly, they do so by articulating spaces that allow the construction of collective identities, wills and intelligences beyond the mere expression, aggregation or circulation of individual tastes and preferences; thirdly, they connect these with decisions that affect the collective plane as a collective.

In this sense, the differences in naming are indicative: instead of a Facebook (a “book of faces”?), Decidim ("we decide", in English) places the political bond at the center of its construction. It doesn't appeal to individuals in a network but to a "we", a decisive “we”. As municipal platforms, political networks provide intervention in institutions and the construction of public policies. Further, its regulative principle is that participants should take part as peers (in our interpretation of the Latin "pars capere" of participation as “taking part as peers”). This applies to political processes run by the State or by any other social organization.

Resuming: in informational networks the key is information; in socials networks, interaction; in the political ones, decision. Each generation collects and modulates characteristics of the previous ones. In the same way that digital social networks built upon, and questioned, the model of informational networks (according to the usual reconstruction of the transition from web 1.0 to web 2.0), political networks build upon, connect with and diverge from, the logic of social networks. Promoting a free multitudinous (no longer mass) self-communication, avoiding its capture, at least on the level of participation, and, potentially, much beyond), is key for the health of 21st century democracy.

Metadecidim: building a recursive citizenry and democracy through technopolitical network

Beyond its condition as a political network status, Decidim is a radically participatory platform. Otherwise: it allows the control and intervention of its participants in all layers of its technological structure, from its internal code (its back end) to its interfaces and participant experience (front end). This is even more distant from the user model of commercial social networks, in which users aren't able to decide on aspects such as the code, the rules of use or data policies.

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platforms and whose progress has been slowed by the challenges and suspicions stirred by participation within institutions and traditional representative dynamics) 2- the processes of democratic transformation opened since the beginning of the 15M movement; 3- the tradition of free software and hacktivism; 4- the awareness of threats to privacy and personal security, and even technological sovereignty, revealed by the leaks of Wikileaks and Edward Snowden.

[27] That is the case of Som Energia, the biggest energy cooperative in Spain. Their participatory site can be found at https://participa.somenergia.coop/.

[28] That is the case of the National Commision of Public Debate, in France. Their participatory site can be found at https://participons.debatpublic.fr.

In this sense, we could suggest that “metadecidim”, an open space and citizen community built around the Decidim project in order to decide over all his aspects, constitutes not only a political, but also a "technopolitical", network itself. This is a network which places the construction of its his technologies at the center of its political action. Confronted with the corporate digital network model of Facebook or Twitter, in which both the code and the data generated by users are proprietary and closed, Decidim is a model of digital network developed with public funding and citizen control. This is an example of what could be defined as a “public-common infrastructure”: financed with public money, designed with, and governed by the citizenry, an infrastructure that increases the technopolitical autonomy of those who use it. Metadecidim makes of Decidim a digital commons. The data and contents generated in it are also a commons, i.e., they remain under the control of the participants (in all that concerns their privacy) and in the public domain (in all its public facets, e.g.: comments in threads). This also implies that the different forms and rules around information, communication and relationships in Decidim are open to modification by the community.

In doing this, metadecidim tries to move forward the idea of a recursive citizenship and a recursive democracy in the network society, where citizens can democratically intervene over the conditions of democracy and its exercise (at least, some of those conditions) (for a similar notion, centered on the concept of “recursive public”, see Kelty, 2008).

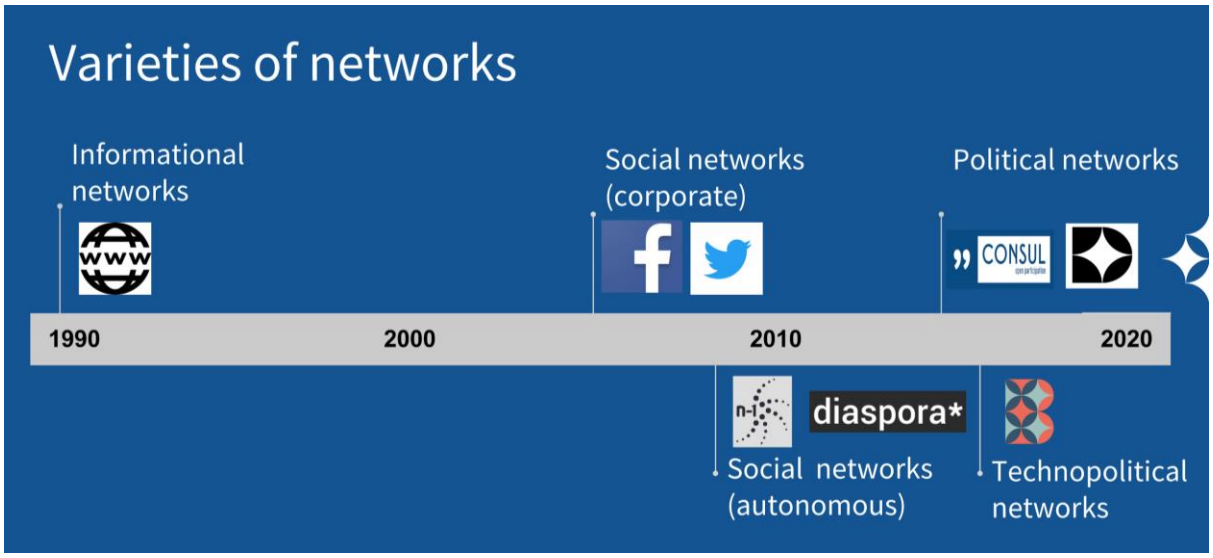

Figure 1: Varieties of digital networks

Political networks such as Decidim are also facing obvious challenges and limits: to reach broad population sectors, to promote their empowered inclusion, to connect effectively with collective decisions (especially in the field of public policy), to develop the sociotechnical systems required for cover all their development needs (from the digital identity management to its connection with the territory), to guarantee its economic sustainability over time, etc.

All that said, political networks like Decidim and technopolitical networks like Metadecidim set a horizon of third-generation, non-corporate networks, opposed to the various forms of data capitalism, and guided by principles such as social and technopolitical autonomy, free self-communication, digital commons and radical democracy. In the end, the Decidim project aspires to serve as both a device and a model for political transformation in a period of crisis of representation and the neoliberal hegemony itself,

towards a more real and networked democracy. A network society of anyone and everyone.

1.2.2.2. Technopolitical democratization

Decidim is a dispositive for technopolitical democratization, that is based on it and that is oriented to move it forward. By technopolitical democratization we understand a technologically supported democratization of any social field (politics, economics, culture, etc.). Crucially, this also includes the politicization and democratization of technology. Decidim, and concretely, installations such as Decidim.barcelona, are a digital infrastructure for participatory democracy, to democratize our current democratic systems and beyond. Metadecidim, on the other hand, is a digital infrastructure based on Decidim software used to democratize Decidim.

In the context of the digital economy, decidim points, first and foremost, towards a democratization of data governance. It also is an example of the democratization of software governance. In both cases, as we discuss later (section 1.2.3.2.), democratic governance is at the base of strong digital commons. The transition from the current model of corporate data and platforms towards technological autonomy and data commons, have technopolitical democratization as one of its conditions. Decidim is, we believe, a key infrastructure on this regard.

1.2.3. The DECODE alternative

The DECODE alternative is primarily oriented to transform the grounds on which the digital economy is based. The two key notions on which such transformation is to be undertaken are data sovereignty and data commons. In the following sections we explore how these notions are understood and moved forward in the context of the DECODE project. If Decidim is oriented to promote technopolitical democratization, DECODE is oriented to promote digital and, specifically, data commoning.

1.2.3.1. Data sovereignty

The core notion within the political thread of the DECODE project, and one of the key ones with the DDDC Pilot (which, as we pointed out, involves others such as Digital Democracy or technopolitical democratization) is that of data sovereignty[29]. Sovereignty has been one of the central concepts in political thought and practice since the fifteenth century. At its core, there is the idea of a “supreme authority within a territory” (Philpott, 2016). To have authority is not merely to have coercive power but to have the right to exercise it as a result of some collectively acknowledged source of legitimacy. The territory helps to define those obliged by such authority.

The translation of the concept of sovereignty to the digital environment affects each of those notions. Firstly, it makes materially difficult to ensure that an authority over data can be “supreme”. Secondly, it opens the question of who is the authority. Finally, it challenges the very notion of territory in its traditional sense. Those three challenges are, obviously, connected and depend of the transition from physical and sociocultural environments to the digital one. Only by remaining tied to the traditional notion of sovereignty does the notion keep some of its operativity.

The problem for an authority to be supreme in the digital environment resides, first and foremost, on the multi-layered composition of digital

[29] Francesca Bria “Our data is valuable. Here’s how we can take that value back: https://www.theguardian.com/commentisfree/2018/apr/05/data-valuable-citizens-silicon-valley-barcelona

environments. The existence, access and operativity of digital environments rely on sociotechnical structures located or owned by a multitude of States and corporations (physical infrastructures, internet server providers, platform corporations, and many more). Each of those can be subject to different regulations. In many cases, the relations between them is that which exists between sovereign nation states, namely, anarchy.

The problem thereby moves to that of locating who are the authorities, supreme or not. And here the problem can be primarily double, it can be the individual who provides the data or it can be the State or supra-state (f.i.: the European Union) to which this person belongs and under whose jurisdiction lives.

Finally, precisely for the multi-layeredness and distributedness mentioned earlier, there is an issue of how to define a territory in the digital environment. In the physical environment spaces are enclosed, they exclude each other and define clear boundaries, in and out; digital environment spaces are networked, either connected or disconnected.

All that said, the recent General Data Protection Regulation (GDPR) builds in this direction by defining a legal European framework for all European countries and citizens. In that sense, with small variations depending on the State, this EU regulation operates as guide States on matters of data. Data sovereignty emerges, primarily, as an element of European sovereignty, understood as a composite of European and State based authorities. As typical of the political and legal construction of the European Union, this redefines the traditional concept of sovereignty as supreme authority within authority.

On privacy

The core notion enshrined by the GDPR is that of privacy. Privacy, however, is a disputed notion, approached from a variety of perspectives, from the descriptive to the normative, from those that look for commonalities in various definitions of privacy (coherentism) to those that look for what defines privacy against other notions (essentialism) to those that try to reduce it to other notions, interests or rights such as liberty or bodily security (reductionism) (DeCew, 2018).

On this front, some authors have focused on the relation between privacy and information, and have defined it as “the ability to determine for ourselves when, how, and to what extent information about us is communicated to others” (Westin, 1967 as paraphrased by DeCew, 2018). Others have more broadly seen as “a concept covering interests in i) control over information about oneself, ii) control over access to oneself, both physical and mental, and iii) control over one’s ability to make important decisions about family and lifestyle in order to be self expressive and to develop varied relationships” (DeCew, 1997). Ultimately, privacy protects personal information, spaces or choices.

Even a more reduced, information-centered approach can be said to promote the social consequences that privacy is oriented to nurture, such as favor “freedom from scrutiny, prejudice, pressure to conform, exploitation, and the judgment of others” (DeCew, 2018). Or, in more positive terms privacy has been understood as providing the bases for equal participation and freedom of expression both in politics and society more broadly (Allen, 2011; Moore, 2010; Reiman 2004; Roessler, 2005).

Privacy is culturally relative, contingent on such factors as economics as well as technology available in a given cultural domain. Today technology makes individual control over information about oneself more difficult than ever before. Personal information (or data) is factual when related to surveillance, and instructional when related to surwilling. The former goes primarily against privacy as a step before the undermining of autonomy.

GDPR is focused on information, or, more concretely, personal data. By personal data it means “any information relating to an identified or identifiable natural person (‘data subject’)”, and

“[A]n identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person.”

From the perspective of DECODE, the primary approach (in works such as Deliverable 1.9) has been focused in operationalizing the notion of privacy present in the GDPR in relation to DECODE technologies, particularly smart contracts and distributed ledgers. Otherwise, to create a new generation of technologies that, rather than undermining privacy, as those noted in 1.2.1., potentiate it.

Redefining privacy and transparency as sovereignty

Above we have noted that many notions such as privacy or transparency can be connected (perhaps even redefined) in terms of data sovereignty. In that movement there is a simplification, a sort of “reduction” of other core notions of the project to that of sovereignty. We take privacy first and transparency second, and try to redefine them in terms of sovereignty understood as legitimate control.

We can understand privacy in a negative sense as “freedom from unauthorized intrusion”[30]. Or, in more positive terms, as “the ability to determine for ourselves when, how, and to what extent information about us is communicated to others” (Westin, 1967 as paraphrased by DeCew, 2018). We can say that, in terms of data, the former, negative sense can be guaranteed by the second, positive one. Privacy can be solidly grounded on the control people have over their data. The same seems to be the case for anonymity as well as for data security. Privacy (or anonymity, or security) as freedom from unauthorized intrusion may be achieved by other means too, such as deterring potential intruders by means others than control. But even if control and authority are not necessary conditions for privacy, they can be taken as sufficient conditions for it: given real control, privacy can be guaranteed.

To take an example: DECODE technology is oriented to guarantee that no one can have access to a person’s data without permission. That is a basic, performative way of understanding privacy in technological terms. This reality is dependent on a deeper one: DECODE technology affords the user to control the terms under which her or his data is accessed. Only by a lack of zeal in the exertion of such control (f.i.: the person provides keys to someone else) can privacy be at risk.

Transparency, on the other hand, can be similarly redefined in terms of personal and collective control and authority. If we understand transparency as “the perceived quality of intentionally shared information from a sender”, we can see that it relies on notions such as that of access to information. To have the power to access such information, otherwise, to have a soft form of control over it, and, even more, the power to hold accountable some person or entity on the basis of that information, is to have transparency. Even if, in transparency, the soft control of information implied in access is granted by a third entity, it is precisely the level of authority what can make the level transparency increase, and, ultimately, go in the direction of accountability. Access and to hold accountable, key notions related to transparency, can thereby be directly linked to the notion of sovereignty.

[30] See https://www.merriam-webster.com/dictionary/privacy

Although in neither of these cases can privacy and transparency be reduced to sovereignty, we believe they can be redefined in this terms or directly connected to this notion. A full blown notion of data sovereignty can help to insert notions traditionally thought in terms of negative freedom (in Isaiah Berlin's terms) such as privacy in terms of positive freedoms such as control: this implies to think them in terms of "freedom for" more than "freedom from", or, perhaps a step further, understanding "freedom from" as derived from "freedom for", privacy as based on power. The DecidimCODE system (which involves technological as well as legal tools) aims to materialize this notion in practice.

Individual and collective: from sovereignty to autonomy?

The assimilation of "sovereignty" and "privacy" has some limits, however. Some of those limits also affect to the notion of data sovereignty itself. We believe most of them can be overcome by recurring to the notion of autonomy.

In the tradition of political theory, the authority of the sovereign is understood as "supreme" (as suggested by its latin etymology, derived from "super anus", the "supreme" or the "super most"); there can only be one sovereign within a given field of authority, be it a physical, digital or legal territory. To speak of every citizen as exerting or enjoying sovereignty would instantly break its operativity, as none could be supreme authority. At most, in democratic regimes, they can take part in sovereignty by intervening in collective decision making. The only way in which all the members of a group can take part in sovereignty is by exerting it collectively. Differently, every individual can exert or enjoy privacy without preventing everyone else from doing the same. There can be individual data privacy, but there cannot be individual sovereignty.

Furthermore, the notion of sovereignty connects to notions such as those of State and territory that are frequently in tension with either the ontological or the political constitution of the digital space.

A potential solution is to go for a concept that is broader than sovereignty: autonomy. Sovereignty is one form of autonomy frequently defined in relation to a collectivity, a State, and a territory. Autonomy frees us from those three constraints. Furthermore, while sovereignty is connected to a more juridical notion of authority and control, autonomy has a much broader scope, that goes from biology (like in Maturana and Varela's notion of autopoiesis) to ethics (in the Kantian tradition) up to the social and the political (in the tradition of Cornelius Castoriadis or the Italian autonomia operaia), from the individual to the collective. An individual can be autonomous with regard to his or her data if she can define the norms around its production, processing and use. Similarly, a collective can be autonomous if its members can together do the same.

A potential objection is that the notion of autonomy may seem too self-referential, too centered of self-control and power over oneself. Sovereignty, on the other hand, can operate over things that may not affect the collective that nurtures it (f.i.: a State may regulate a corporation with a tax residence in its territory even if this corporation does not operate in that country in commercial terms --otherwise, does not deal with its citizens). However, we may say that such authority and normativity others is only a result of the authority and normativity over oneself. It is only because the corporation operates in that territory (a part of the "self" of the sovereign State) that it can regulate. Ultimately, data sovereignty can be understood a specific form of data autonomy. Data autonomy understood as personal or collective authority over data is also more compatible with the notion of privacy, as we discussed it above.

It is also the case that collective autonomy may be curtailed by sovereignty insofar as the sovereign becomes a body detached from the rest

of the “self” that is to give itself its own norms (Hardt & Negri, 2004). In Hobbes, after the social contract, the representative sovereign becomes autonomous, the commonwealth, heteronomous. In Rousseau, on the other hand, the sovereign and the collective tend to remain identical and thereby sovereignty remains autonomy.

Finally, it is worth noting a question of metaphors and forms of life. The language of sovereignty is one that States or supra-states such as the European Union speak, with which they self-identify. Differently, the language of autonomy is generally seen either in the light of the individualism of the Kantian tradition or in the light of the anti-statist tradition of Castoriadis and Hardt & Negri. At a historical moment when sovereignty returns as a central notion in political thought and practice (Gerbaudo, 2017), the fate of these concepts may depend on their position within wider socio-political controversies and struggles.

1.2.3.2. Digital data commoning

The key notion with the economic thread of the DDDC pilot is that of digital (and, specifically, data) commons. In the following sections we explore its various dimensions and outline some of the theoretical basis on which the pilot is grounded.

Public and private goods, State and market.

In standard economic theory, two traditional types of goods have been the public and the private. In one of its early definitions in contemporary economic theory, public goods were described as a goods that are non-rivalrous and non-exclusive or non-excludable, otherwise, goods whose consumption does not and cannot prevent others to use or consume them (f.i.: air or language); differently, private goods were defined by rivalry and excludability, because they deplete with use and others can be prevented from using or consuming them (f.i.: bread or a dress) (Samuelson, 1954). From an economic perspective, a key point is that of the production and management of such goods.

Although public and private goods could be produced and managed by a variety of actors, two paradigmatic social forms of doing so have been, respectively, the State and the market. The State can be understood here as a “politically organized coercive, administrative, and symbolic apparatus endowed with general and specific powers” over people and things within a territory (following Jessop, 2016). On the other hand, a market can be understood as a social form or institution of typified and regular, voluntary, specified exchange involving competition among sellers and buyers (following Rosenbaum, 2000).

Markets (along with firms) have served as a primary institution for dealing with private goods. In a context of enforceable rules of exclusion granted by the State, people must gain legal access (usually, through resources such as money) to a desired good. According to standard economics, it is the expectation of such resource in exchange for the good what drives the production of the private good in the first place.

From a rational choice perspective, however, the production of public goods poses the so called “free rider problem” (Olson, 1965): why would a rational, utility maximizer contribute to the production of a public good (which is non exclusive or non excludable) rather than relying on others to produce it and enjoying it afterwards. That suggested that markets would fail in reliably producing public goods. An early answer was that public goods should be produced and paid collectively to ensure that anyone could have them (Galbraith, 1958); they should be based on “public production. i.e., they are: a. created through collective choice, b. paid for collectively, and c. supplied without charge (or below cost) to recipients” (Sekera, 2014). As an apparatus with power for mobilizing collective

resources (f.i.: via taxation) and enabling, enacting, and supervising collective decisions, the State would have served to partially overcome free riding problems.

A third category: common goods and the common(s)

In the last three decades, particularly following the work of Elinor Ostrom (1990), a third model has been gaining traction: common goods and commons. From an standard economics perspective, common goods are defined by being rivalrous and non-exclusive (f.i.: fishes in a river or grass in a collective field). Similarly to the State and the market, a type of good is frequently associated with a social form: the commons. A commons can be defined as a socioeconomic, cultural and juridical system of appropriation, management and (sometimes) production of shared resources.

According, again, the standard economic literature, if public goods faced the challenge of their production, the free riding challenge, common goods were said to face the challenge of their preservation, the tragedy of the commons. If a rivalrous good or set of them (say, a field of pasture) is offered without exclusion, rational economic actors looking to maximize their benefit will overuse it until depletion (Hardin, 1968). But Hardin´s metaphor proposes the scenario of common goods without a commons, which is better represented by the idea of a res nullius or a no man’s land, a good or set of them that are there to be appropriated and lack social practices and institutions that ensure their sustainability (Ostrom, 1990).

A fourth type of good, so called “club goods” are defined by their attributes of non-rivalry and exclusiveness or excludability (f.i.: paid highways or cinemas). Classifications vary, with some authors including club goods, along with public goods, within a broader category of common goods, which are then defined by being non-rivalrous (Buchanan, 1965).

Crucially, against a reifying justification of the typologies of goods (public, private, common, club) based in their alleged natural attributes, it is important to notice their condition of social constructions and their ties to concrete institutional and practical forms (Dardot & Laval, 2015). Nothing is public, private, common, etc. by virtue of its attributes (f.i.: by being rival or not). Furthemore, to pretend that different types of goods and sociocultural and juridical forms of production, appropriation, management and use (f.i.: public goods with State and public property, private goods with markets and private property, common goods with communities and common property) are as a result of an almost “natural” cost-benefit analysis (that decides the best mode of production and appropriation by looking at the relation between marginal cost and marginal benefit) implies to miss the historically and culturally conditioned settings within and upon which these forms, and economics in general, operate.

Digital commons

Digital commons are a subtype of commons. Sometimes included within the “knowledge” or “information” commons (Hess & Ostrom, 2007), they are a fine expression of the economic transformations resulting from the incorporation of digital technologies into economic processes. The impacts of such incorporation over realities such as texts or images have brought down search costs, replication costs, transportation costs, tracking costs, and verification costs (Goldfarb & Tucker, 2017). That drastically affects the algorithms of the collective action and production of collective goods (for an analysis related to social movements, see Earl & Kimport, 2011). Furthermore, in many cases the value of a digital common good increases with the number of people using it (as the value of a viewpoint when many people share it), turning the tragedy of the commons into the comedy of the commons (Rose, 1994).

Digital commons have been defined as

"information and knowledge resources that are collectively created and owned or shared between or among a community and that tend to be non-exclusive, that is, be (generally freely) available to third parties. Thus, they are oriented to favor use and reuse, rather than to exchange as a commodity. Additionally, the community of people building them can intervene in the governing of their interaction processes and of their shared resources" (Fuster Morell, 2010: 5).

Benkler (2006) coined the concept of commons-based peer production (CBPP) to describe forms of digitally enabled forms of production whose "central characteristic is that groups of individuals successfully collaborate on large-scale projects following a diverse cluster of motivational drives and social signals, rather than either market prices or managerial commands". According to Benkler, this type of form of production "has certain systematic advantages over the other two in identifying and allocating human capital / creativity". According to Benkler, four conditions favour the emergence of CBPP: low capital costs; centrality of human capital; decline of communication costs; and the public nature of the good concerned. Additionally, CBPP is more effective if applied to jobs that can be split into small tasks and independent modules (granularity and modularity), and where the value of monetary reward is small relative to the value of either the intrinsic hedonistic rewards or of the social-psychological rewards

Benkler points out that the resources provided under open access - such as open roads, but that is also the case of OCCs - are also "commons", independently of whether they are provided by markets, states, nature or social sources (self-organization). According to Mayo Fuster, however,

"for the specific case of OCCs, open access alone is not a sufficient condition. To the open access of the common-pool resource (which Benkler points to) we must add a governance design that maintains community control over the collaborative process of building the common-pool resource. In this regard, both open access resources provision and community governance should be considered".

This is the case because "in OCCs, the resource is not already available, but needs to be produced and preserved". Unlike roads, OCCs are usually based on "voluntary and collaborative relationship"; secondly, the outcome of OCCs is not only the good but the community itself. Finally, "infrastructure provision shapes the community and the resource". Thereby, democratic control over infrastructure becomes relevant. Further, Fuster Morell states that "Common-pool-produced resources should not only be regarded according to how they are provided (open access) and owned (property), but to how they are produced. In other words, could the conditions of production (and control over the means of production) be considered an irrelevant question? Should not having the right to exclude others from accessing the commons result in it losing other rights?"

Elements for a preliminary geometry of digital commons

Looking at her well brought up points, we believe a preliminary taxonomy of types of digital commons can be established. This taxonomy can be articulated around three core issues: the question concerning its production (the conditions and the process of its generation), the question concerning its potential (the possibilities and uses it enables), and, more importantly, the question concerning its power (the control over it). As noted by Mayo Fuster, a digital commons are frequently a type of common that needs to be produced (unlike more traditional, natural commons). As earlier models of commons it enables uses and practices. And, finally, it is to be decided upon (specially, its rules). These three variables, production, potential, and power constitute what we may define as "the

common triangle", the three Ps of digital commons, a triangle that allows to think the constitution of a digital common.

The common's triangle: the 3Ps of digital commons

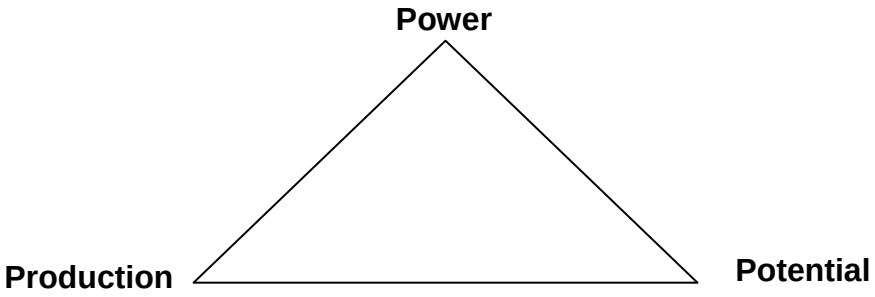

Figure 2: The common's triangle

In the case of data commons, specially those that involve personal data such as the ones that define the digital economy, a fourth category must be included: protection. If production refers to the inputs and potential refers to the outputs of a data commons, the pair protection - power speak of the connection between negative and positive freedom, as exposed by Isaiah Berlin (or, earlier Benjamin Constant). Protection speaks of the freedom from power, from intrusions, such as we discussed when discussing the notion of privacy. Differently, power speaks of the positive control or power over data.

The DECODE diamond: the 4Ps of data commons

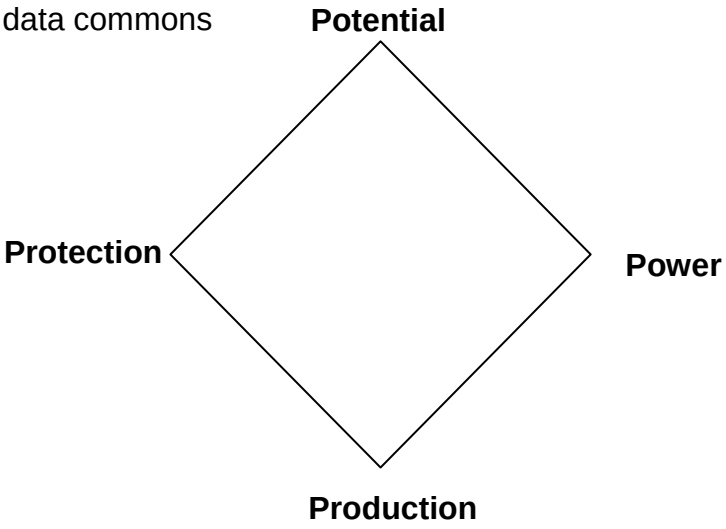

Figure 3: The DECODE diamond

For each of those four categories, there are three variables to take into account: strength, number, and depth. We explore each of them in turn, taking as an example what we believe is the central category of the four from a political standpoint (as suggested by Laval & Dardot, 2015): power.

The strength variable makes reference to the level of control that actors have over the different components of the commons, specially, the shared resources. This can go from full democratic control to no control at all. When no control exists, the common dissolves as such (f.i.: a common to which the people who produced it have no power even to access it is no

common at all). More frequently, between no control and full control, there are forms such as open access, in which actors can use (and thereby have the power to privately decide what to do with) the common good, but not decide upon its general management.

The "number" variable refers to the number of actors who are entitled to such control. This can go from anyone, like in the case of fully open access, to the community who produces it only, where the commons fuses with other models such as the club.

Finally, the variable "depth" speaks of the number of layers on which control is exercised, in the case of digital commons, this goes from the material and technological conditions that sustain the production of the common good up to (say) the community itself, or the concrete digital common good.

The following scheme helps to think these three variables.

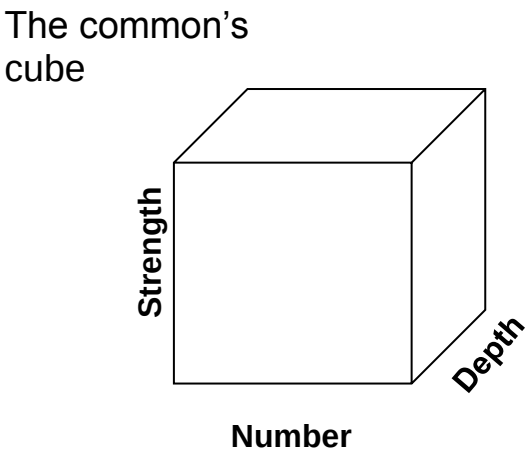

Figure 4: The common's cube

The DECODE digital data commons paradigm: from open data to recursive data commons

We want now to make a preliminary application of this geometry. It will serve us to clearly distinguish two potential models of data commons: the open data as open access model (as suggested by Benkler) and the recursive data model that would be the fullest implementation of the vision underlying the DDDC pilot.

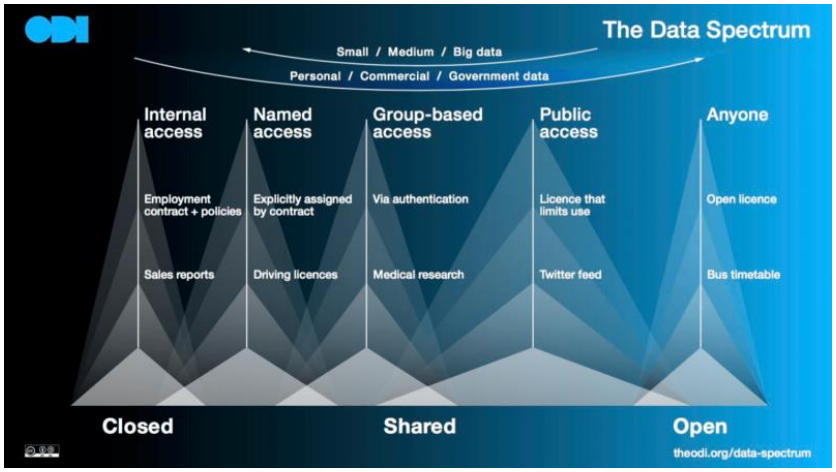

Figure 5: Closed, shared, and open data models. Source: Open Data Initiative

In principle, data commons situates itself between the group-based access (more typical of clubs and club goods, to use the terminology applied in earlier sections) and the pure “open to anyone” model. The difference from closed to open access concerns the dimension that we defined as “potential”: of the capacity to fully use the dataset to the total lack of ability of doing so. Concretely it speaks of the number (who can access) and the strength (with limits or with no limits).

The differences between an open access data commons model and a recursive data commons can be mapped out by using the three basic categories that we presented in the “common triangle”: power, potential and production.

Firstly, there is a question that concerns the dimension of production. As suggested by Benkler, a digital common such as a data commons may be provided by a community, a State or a corporation. Differently, a recursive data common is generated by a community. Part of the recursivity resides in that such common is generated by and fosters the existence of the community (as noted by Fuster Morell). Otherwise, the community is not fully self-grounded and self-sufficient for constituting the commons. For instance, if a State institution is behind the provision of the data, the more appropriate term is to talk of a public or State based commons, rather than a commons simply.

Secondly, there is the dimension of potential. For Benkler, this is the core characteristic that defines a commons. Open access is enough to define a commons. Differently, a recursive data commons requires that some of the uses of the shared resources are oriented to generate more common goods. Otherwise, the use is not oriented to private purposes but rather to feed either the commons itself or wider common circuits. It is this common orientation of the use of the common good what makes it recursive, either because it reinforces its own existence or because it moves it beyond. For instance, against a model case of open access that allows corporate exploitation, a recursive data commons reduces is oriented to reduce such types of activities and, instead, to nurture commons oriented economic models. Moreover, a recursive commons requires that accessibility to anyone and everyone (inclusion, a form equality) and not mere openness is nurtured. This requires to promote uses by common people.

Thirdly, there is the dimension of control. In open access the level of control by members of the community is reduced to one layer, that of the common good rather than also to the type of license or the infrastructure that supports it. The uses are defined by actors other than the users. In the case of the recursive data commons, the community has a strong control over the governance and, thereby, over the very conditions of access to the shared resource. This may mean that a recursive data commons is not a full open access dataset. As seen in the analyses of 1.2., it may be in the interest of democracy that concrete actors are restricted in their ability to exploit concrete data. The core point is that democratic control is exercised.

In synthesis, in the case of open data there is a decoupling between production (could be any actor), potential (could be accessed by anyone, although it is usually those with economic or cultural resources who can exploit it), and power (is frequently controlled by the providers only). In the case of the recursive data commons it is the community that produces, decides upon, and primarily uses (for its own reproduction and for amplifying the commons oriented networks) the dataset.

This second model pushes forward the various dimensions of the commons in terms of production, potential and power, giving primacy to communities against corporations and States--even they portray a closer affinity with

the latter, to the extent that they comply with their function as promoters of public goods.

Recursive data commons: a definition

We can thereby speak of three dimensions of the commons. Depending on how high a given commons ranks in each of these dimensions it can be considered stronger or weaker. For the purposes of the DDDC pilot, we can define the conditions of a strong data commons. A recursive data commons can be provisionally defined as a sociotechnical system involving:

1. A **dataset**;
2. a set of people or **community**;
3. A set of **technological infrastructures** that:
    a. host (1) the dataset or define access to it;
    b. materialize (4) the normative framework of use of the dataset and define people's basic
        i. uses of the dataset
        ii. interactions around the dataset.
4. A set of **norms** (formal, such as licenses, or informal, such as use culture) **and practices** defined by (2) the people and inscribed in (3) the technological infrastructures, which involve:
    a. contributing data to (1) the dataset, otherwise, **putting data in common**
    b. opening (1) the dataset, that is, allowing some form of **common access** to (1) it. This can be done with or without conditions.
    c. establishing a **common (or reciprocal) normative framework** that involves a democratic management by (2) the community of (1) the dataset, of (2) the community itself, of (3) the normative framework, and of (4) the infrastructures that support them (1, 2, 3);
    d. taking collective decisions, otherwise, **deciding in common** upon (1) the dataset, (2) the community, the (3) the technological infrastructures and (4c) the set of rules and practices;
    e. making **use** and generating shared or **common practices** around (1) the dataset, ideally, for generating **common goods** which reproduce or improve upon the characteristics of the existing common.

In synthesis, a recursive data commons can be defined as sociotechnical system of production, appropriation and use of a datasets under conditioned or unconditioned open access, on the basis of a normative framework (be it formal, informal or both) that defines the governance of the dataset, of the community, and of the infrastructure, in a democratic way, and that enables or promotes shared practices that generate goods under a similar model of production, appropriation and use.

The usual open data model of commons gets rid of 4a, 4c, 4d and 4e, and rather speak of a sociotechnical system that allows the open access of data.

The following schema can help to visualize the systemic functioning of practice in these two models of data commons, when looked through the common triangle.

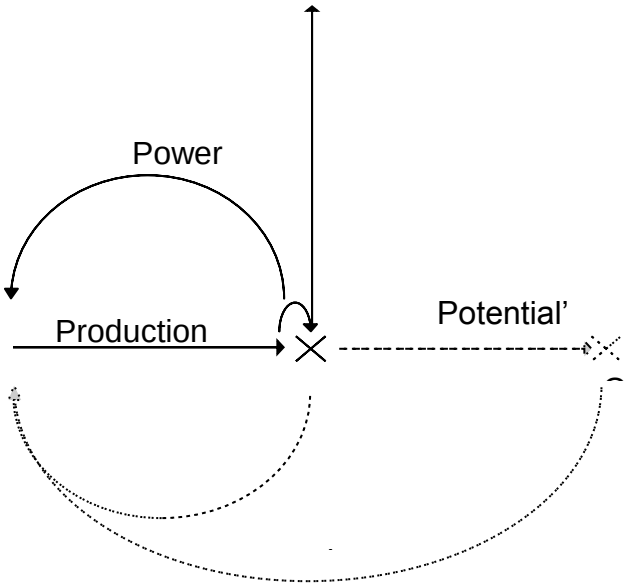

Figure 6: a common's socio-systemic scheme

The open data model of commons only attends to the common good (CG) and its potential, its use via open access. Differently, a recursive data commons attends to the question of how the collective production of data legitimizes (as a result of a principle of reciprocity, like in the case of other cases of commons, more broadly, as argued in Laval & Dardot, 2015) collective control over both the common good and the conditions of production. Furthermore, there is an attention to how this common good can be used (Potential') for the generation of further common goods (CG') or the reproduction of the commons itself (Production').

This model will be experimentally enacted during the DDDC pilot. In section 3.1. we explain how this is the case, and what is its value.

Sustainability

In the context of the DECODE project, Dimmons - UOC[31] has generated a multidisciplinary framework on commons collaborative economy that integrates environmental, socio-economic, gender equality, political, and Internet sustainability dimensions (see Deliverable 2.1). The applicability of the Multidisciplinary framework on commons collaborative economy is articulated around 6 dimensions:

Figure 7: Multidisciplinary framework on commons collaborative economy. Source Dimmons - UOC.

- **Governance:** Regarding democratic enterprises and involving the community that generates the value in the platform governance.

[31] More information at http://dimmons.net/.

Regarding decision-making model of the organization; mechanisms and political rules of the digital platform participation.

- **Economic model:** Regarding whether the project financing model is based on private capital, an ethical finance, or a distributed source (crowdfunding or match-funding); the business models; mechanisms of economical transparency; to what extent the profitability drives the whole plan; distribution of value generated; and equity payment and labour rights. To ensure equitable and timely remuneration, and access to benefits and rights for workers (maximization of income, salary predictability, safe income, protection against arbitrary actions, rejection of excessive vigilance at the workplace, and the right to disconnect).
- **Knowledge policy:** Regarding the type property as established by the license used (free licenses or proprietary licenses) of the content and knowledge generated; type of data (open or not), the ability to download data (and which formats), and the promotion of the transparency of algorithms, programs and data. Privacy awareness and the protection property from personal data and prevent abuse, as well as the collection or share of data without consent. Guarantee the portability of data and reputation.
- **Technological policy:** Regarding the mode of property and freedom associated with type of software used and its license (free or proprietary) and the model of technology architecture: distributed (using blockchain, for example) or centralized (software as a service).
- **Social responsibility** regarding **externality impacts**: These dimensions related to any source of awareness and responsibility regarding the externalities and negative impact such as social exclusion, and social inequalities, regarding the equal access of people with all kinds of income and baggage in an equitable and impartial way (without discrimination) to gain access to the platform; the inclusion of gender, compliance with health standards and safety standards that protect the public. The social sustainability dimensions build upon the literature of social inequality (Baland et al., 2007). Social sustainability is based on how far contributes to conditions of equality through shared value frames, a democratic economy, and the social composition of the engagement base. From a social dimension, Richardson (2015) points to collaborative communities sustainability as a source of change and of reduction in social inequalities (Fraiberger & Sundararajan, 2015; Dillahunt & Malone, 2015; Reich, 2015; Mirani, 2014). Some studies suggest that peer-to-peer activities potentially benefit the below-median-income part of the population more than the above-median-income one, and that sharing platforms can be used as means to redistribute income. Finally, the gender perspective (Waring & Steinem, 1988) has received very little if any attention in online interaction, but the framework helps to cover this gap. The environmental impact, the impact in the policy arena, and the preservation of the right to the city of its inhabitants and the common good of the city; the protection of the general interest, public space, and basic human rights, such as access to housing.

To sum up, once observed the main role of the community in the sustainability of the data commons (which is intrinsically connected with its governance), during the process of implantation of the DDDC pilot, it will be explored on the basis of the framework described so far, where the question of the sustainability of the data commons generated by the platform and its governance is part of the process.

Privacy and the commons: privacy as a common good and privacy for the commons

There are several ways by which the notion of commons and that of privacy are connected in the pilot. One derives from a general reflection on the condition of privacy as a common good (found in DeCew, 2018). The other derives from the work in Deliverable 1.9. Privacy is a common to the extent that,

“Privacy is a common value in that all individuals value some degree of privacy and have some common perceptions about privacy. Privacy is also a public value in that it has value not just to the individual as an individual or to all individuals in common but also to the democratic political system. Privacy is rapidly becoming a collective value in that technology and market forces are making it hard for any one person to have privacy without all persons having a similar minimum level of privacy” (Regan, 1995, 213).

However, the current digital economy works against this common logics (Regan, 1999), from its extractivist logics supported by a lack of critical awareness or practices to spirals of mistrust potentiate decreasing privacy and willingness to share information while increase surveillance techniques (Samarajiva, 1997: 284). The challenge is to change “the network architecture or changing the incentives system” (Regan, 1999), to avoid the rise of a “suffocating society” (Solove 2008).

DECODE works in this direction in various ways. One is advancing in the construction of technological and legal dispositive that allow more control and privacy. The second is by facilitating and stimulating careful sharing. The hope is to generate a positive spiral of trust and commons.

Two examples are the functionalities of the wallet and the Digital Data Commons Privacy Pledge. The wallet affords both high security and careful data sharing. The Privacy Pledge, in turn, gives a pro-commons reading to the basic articles of the GDPR. Otherwise, the increase in protection and power should not be only be decoded in terms of a curtailing of sharing but rather as the basis of new forms of publicity and sharing, protection and power tied to new forms of potential both in an individual and collective key.

1.2.4. DecidimCODE: digital democracy and data commons

As we commented above, the core of the pilot will be a technologically-enabled (via DECODE and Decidim technologies[32]) participatory process for experts, citizens and city representatives to: 1-to test the integrated DecidimCODE system for strongly secure, private, transparent and data enriched democratic decision making; 2-deliberate upon data politics and economics, at the local level and beyond; and 3-constitute an experimental data commons, whose shape will be defined by the ideas and practices coming from the Digital Democracy and Data Commons participatory process itself.

1.2.4.1. Pilot rationale: problems of Digital Democracy and data commons.

There are a series of problems that the DDDC pilot tries to address, and that explain its final shape. A set of those problems gather around the Digital Democracy thread, and have a primarily political edge. The others, converge around the data commons thread, and have a primarily economic edge. Both are, obviously intertwined. We touch upon each of them in turn.

The democratic thread: from Digital Democracy to Distributed Democracy

[32] Decidim is a digital infrastructure for participatory democracy sponsored by the Barcelona city council and other organizations. More information at decidim.org.

The Decidim project vision of a networked participatory democracy faces many challenges. Here we underline three:

The challenge of digital verification with strong privacy. Digital Democracy processes requires ensuring that the person that takes part in a given participatory process and, concretely, that of signing petitions, is able to verify her right to do so. Much of this process requires a combination of online-offline processes of verification. However, from the digital perspective the further challenge is how to do this while maintaining a strong level of privacy and, more broadly, data control of those that use the software. A principle of the Decidim project is that people should be able to exercise their democratic rights without fears of surveillance or retaliation.

The challenge of transparency and reliability of results. Another challenge is that of ensuring the transparency and reliability of democratic results registered in Decidim. People should be able to trust the results of digital democratic processes (in public institutions but also in social organizations), to check them and to be sure that they have not been manipulated.

A third challenge is to enrich participatory processes through data, otherwise, to build collective intelligence for democracy.

Digital Democracy thread challenges		
Verification with privacy	Transparency and reliability	Data for collective intelligence

Table 2: Digital Democracy thread challenges.

By addressing these three challenges, the DECODE system addresses three relevant challenges of digital democracy today: privacy, transparency, and collective intelligence. It furthers the works of the Decidim project and its growing community of users (more than 60.000 people as of September 2018).

Furthermore, because of the way in which DECODE approaches these three challenges, its use of a distributed network of nodes and a distributed ledger for registering all transactions while enabling strong data control, DECODE points beyond current models of digital democracy towards distributed democracy. This is true both in relation to public institutions as well as in relation to communities. Ultimately, the integration is a step forward in the direction of making Decidim more decentralized in several of its functions, and potentially, a step towards distributed democracy.

The data commons thread: from data extractivism to data commons

Now we can touch upon the challenges of the data commons thread. The digital economy has shown its many deficits in the last years (see section 1.2.1). Each of those lacks are challenges for the DECODE project and the pilot.

The first challenge is to increase individual control over personal data. The current lack results in forms of domination that go from surveillance and the erasure of privacy to digital exploitation.

A second challenge is to build towards collective control and benefit from shared data. Although many voices and projects are addressing the issue of

individual control and monetization of data, not so many are interested in fostering collective control of shared data.

A third challenge is to increase critical awareness around these problems. Here there are various scales of action, and the DDDC pilot will be oriented to the local one, primarily.

A fourth challenge is to achieve inclusive, public participation and deliberation on the matter. Similarly, this will be achieved at the local level.

Data commons thread challenges			
Individual control	Collective control and benefit	Critical awareness	Inclusive deliberation

Table 3: Data commons thread challenges

Later in the text we explain how the DecidimCODE system and the shape of the DDDC pilot address each of these challenges (see section 3.1.2.). But before that we have to detail the objectives (1.3.), elements (2.) and general shape (3.1.1.) of the pilot.

1.3. Objectives

The generate rationale of the pilot is to address the challenges just mentioned. However, we can distinguish a set of more concrete pilot objectives. They can be divided in three general types: technical, social and theoretical objectives, each of them with various sub-objectives and metrics to measure their achievement. These objectives directly derive from the diagnostics presented in section 1.2.

1.3.1. Technical

The first set of objectives are technical in character, and are probably the most crucial ones. They can be divided in three types: technological, legal, and toolkit-related.

1.3.1.1. Technological

The first general objective is to test and to help to improve DECODE technologies. Primarily, but not only: the wallet (in the form of an app), the Barcelona Now dashboard (from now on BCNNOW), the distributed ledger, and the DECODE network (see section 2.2.).

A second technical objective is to successfully integrate DECODE technology with Decidim technology, in a way that is privacy preserving.

Some orientative parameters and metrics (the concrete numbers are under discussion) that may allow to evaluate the success of these objectives may be:

1. Tech centered
    a. working DECODE app, ledger, network and dashboard (GDPR compliant and aligned with DECODE mission);
    b. performance measurements (loading time, total flow time, etc.);
    c. number of errors (no errors) in transition between components;
    d. data transferability and alignment across platforms (decidim, ledger, BCNNOW) when closing petitions;
    e. number of privacy breaches

2. User centered
    a. retention rate (from onboarding to signing a petition);
    b. perception of usefulness and usability
    c. cases of deployed integration DECODE-decidim.

1.3.1.2. Legal

Another objective of the pilot will be to contribute to the development and/or testing of new DECODE legal tools (D1.9 and 1.12), such as the Data Commons Privacy Pledge and Smart Rules to manage licensing and GDPR compliance obligations (information, consent, etc.).

Metrics of success will be:

1. adoption of the legal tools by consortium partners and other actors.
2. references in public policy documents.

1.3.1.3. Toolkits

A third technical objective is to use, test and improve a toolkit for sustainable commons. This divides in several sub-objectives:

1. The deliberation around the sustainable commons toolkit as a guide for the constitution of data commons;
2. to explore the possibilities of how to connect DECODE data proposals to the collaborative commons economy;

Some metrics of the success of this will be:

1. number of downloads of the toolkit during the period of the pilot;
2. adoption by social actors and programs related to the collaborative commons economy.

1.3.2. Social

Another set of objectives are social in character, and can be subdivided in various types. They are presented by their level of complexity and time scales.

1.3.2.1. Critical awareness raising

As we noted in 1.2., there is a current lack of critical awareness or of the centrality of data in people's lives and its economic and social implications. This is the case even after the Snowden and the Cambridge Analytica cases. However, the moment is ripe for work on this aspect. A first social objective, which involves all of those participating in the pilot but also a much broader set of people, is awareness raising. The pilot must contribute to extend the DECODE vision to a wide number of people in Barcelona and beyond.

We could think of three metrics of this objective:

1. number of articles or appearances in media at the local, regional or national level;
2. increase in awareness of the issues raised by DECODE (privacy, data sovereignty, data commons, etc.), measured by answers to the surveys to be launched at the beginning and the end of the pilot or by the profile of the people participating in the process in time;;
3. Number of references in and interactions on social media (particularly, Twitter).

1.3.2.2. Participation

A second objective is to ensure that a broad cross-section of expert and of the citizenry in Barcelona is involved in the participatory process. The reason for this is to ensure that citizens are given a say into the future

of data policies in the city and beyond. For this, the pilot will be oriented to ensure that a sufficiently high quality and quantity of participation takes place in the process. In a highly technical process such as the one we are talking about, quality is key. We must ensure the diversity of profiles and the deliberative quality of the process (taking into account issues such as social inclusion or gender equality, to name but two). However, efforts must also be made to potentiate participation numbers.

The metrics of quantity of participation can be divided in online and offline. For the DDDC site will be the following:

1. number of unique visits to dddc.decodeproject.eu;
2. registered users;
3. proposals generated;
4. number of supports for proposals and signatures in petitions.
5. offline, the number of attendees to meetings.

Some metrics of quality of participation will be

1. diversity, with collective and individual actors from different sectors (academia, civil society, public sector, private sector) and personal profiles (gender, age, economic status, education, etc.);
2. a high percentage of participants support for proposals and signatures in petitions,
3. a percentage of participants supports several proposals and sign 2 or more petitions,
4. deliberation in face to face meetings and online conversations.

1.3.2.3. Uptake

A third social objective, which is based on awareness and satisfaction, is social uptake. The pilot should contribute to make more people, communities and institutions to use and/or contribute to the DECODE technology, license, toolkit and discourse.

Here we may in distinguish, thereby, between uptake by users, by developers, by academics and by political actors.

Some metrics of uptake by users will be:

1. number of downloads (during the length of the project);
2. number of organized communities willing to use the technology;
3. number of petitions finished using DECODE technology (during the pilot);
4. a good Net Promoter Score.

Some metrics of uptake by developers will be:

1. number of commits by no-consortium actors;
2. deployment of DECODE nodes by non-consortium actors.

A metrics of uptake (be it for approval or discussion) by academics will be the number of academic citations of DECODE deliverables and publications connected to the pilot.

A metrics of uptake by political actors will be the number of references to DECODE in local, regional, State, and EU policy documents and discussions.

1.3.2.4. Policy impact and social innovation

A fourth, more ambitious objective, which is based on the previous two, is to achieve policy impacts and generate real social innovation. One of the ways in which this could be the case is through the contribution to constitute a sustainable data governance infrastructure for the city of Barcelona. This could happen if the DDDC plays a role as an informative, deliberative or even decision making space for municipal data policies and commons. This would imply to go beyond the existing models of private and

public management of data towards an alternative. More broadly, the idea is that the pilot impacts policy and community practices on the matter, otherwise, that the experiment brings about, first, some recommendations and, second, some replicable combinations of legal, technological and sociotechnical forms.

A metrics of uptake by political actors will be the number of references to DECODE in local, regional, State, and EU policy documents and discussions. This metric would specially apply after the participatory process, until the end of the project, and beyond.

1.3.3. Theoretical

The DECODE project is based on a number of concepts that will be both experimentally developed, put to the test and enriched in the pilot. Two of those such notions are data sovereignty and data commons.

Some metrics to evaluate the success of these notions and the theoretical frameworks behind them will be:

1. references in academic or policy documents;
2. theoretical frameworks and notions are productively used during the pilot;
3. theoretical frameworks and notions are enriched in the process (enrichments tracked thanks to the in the DDDC platform).

1.3.4. Synthesis of objectives

The resumed list is the following:

1. Test and improve DECODE technology;
2. Integrate DECODE technology with Decidim;
3. Develop and test DECODE legal tools;
4. Test toolkit;
5. High quality and quantity participation;
6. Awareness raising;
7. Uptake;
8. Policy and social innovation;
9. Test concepts and frameworks.

Of these 9 objectives, 3 of them (test and improve the DECODE technology, integrate DECODE and Decidim, and develop and test the DECODE legal tools) are primary or necessary, and 6 of them (the rest) are secondary or desirable. They can also be divided in according to the expected time of their full achievement in short term (to be achieved during the pilot, between October 2018 and April 2019), mid term (to be achieved during the DECODE project, until December 2019) and long term (to be achieved after the project).

<table>
<tr><th colspan="2">OBJECTIVES</th><th>Short-term</th><th>Mid-term</th><th>Long-term</th></tr>
<tr><td rowspan="3">Primary</td><td rowspan="3">Technical</td><td>1-Test and improve DECODE technology</td><td></td><td></td></tr>
<tr><td>2-Integrate DECODE and Decidim</td><td></td><td></td></tr>
<tr><td colspan="2">3-Develop and test DECODE legal tools</td><td></td></tr>
</table>

Secondary		4-Test toolkit		
	Social	5-High quality and quantity participation		
		6-Awareness rising		
		7-Uptake		
		8-Policy and social innovation		
	Theoretical	9-Concepts and frameworks test		

Table 4: Pilot objectives[33]

[33] This list of objectives is not definitive. The list may change before the launch of the pilot.

2. Pilot Elements

The pilot relies upon five core elements: technopolitical concepts and multidisciplinary frameworks, digital technologies, sociotechnical tools and practices, social actors, and, finally, data. We analyze each of them in turn, as well as the role they play in the pilot.

2.1 Technopolitical concepts and frameworks

Reduced at a minimum, the pilot has two core normative poles or concepts that are to be explore and enacted. They serve to galvanize other political, legal and economic notions, as well as the roles of the other elements within the pilot. The first is that of "personal and collective data control" that is primarily synthesized in the notion of data sovereignty. The notions of privacy, security, anonymity, transparency, etc. in DECODE can all be subsumed as cases or conditions of either personal or collective data control (see section 1.2.3.1.). The second core concept builds upon the notion of control but goes beyond and puts forward the centrality of "personal and collective production, sharing, governance and use of data": that is the notion of "data commons". The innovation of DECODE in relation to issues of data sharing, democratic governance of data, data economy etc. are ultimately connected to this notion and the theoretical discussions around it.

In order to address these two sides we first present a lean exposition of the operational meaning of such expressions.

2.1.1. Personal and collective data control: towards data sovereignty

As seen in section 1.2.3.1., the concept of data sovereignty is problematic. However, for the purposes of the pilot, we can provisionally define data sovereignty as the individual and collective authority (understood as legitimate control or power)[34] of data generators over the data they generate, or (under certain circumstances) the data derived from those data (including meta-data). To increase such authority by means of a series of legal, technological, and socio-economic dispositives is a key goal of the DECODE project.

Now we move to the second core notion behind the DECODE project, the notion of data commons.

2.1.2. Personal and collective data production, sharing, governance and use: towards data commons

As shown in section 1.2.3.2., there are different conceptions of digital commons. They are more or less demanding in terms of aspects such as the degree of openness or the level of control by those who generate them. For the purposes of this pilot, we want to think a model of highly demanding data commons, such as a recursive data commons. A recursive data commons can be provisionally defined as a sociotechnical system involving:

5. A dataset;
6. a set of people or community;
7. A set of technological infrastructures that:
    a. host (1) the dataset or define access to it;

[34] We can understand authority as a legitimate control over their data.

   b. materialize (4) the normative framework of use of the dataset and define people's basic
      i. uses of the dataset
      ii. interactions around the dataset.

8. A set of norms (formal, such as licenses, or informal, such as use culture) and practices defined by (2) the people and inscribed in (3) the technological infrastructures, which involve:
   a. contributing data to (1) the dataset, otherwise, putting data in common
   b. opening (1) the dataset, that is, allowing some form of common access to (1) it. This can be done with or without conditions.
   c. establishing a common (or reciprocal) normative framework that involves a democratic management by (2) the community of (1) the dataset, of (2) the community itself, of (3) the normative framework, and of (4) the infrastructures that support them (1, 2, 3);
   d. taking collective decisions, otherwise, deciding in common upon (1) the dataset, (2) the community, the (3) the technological infrastructures and (4c) the set of rules and practices;
   e. making use and generating shared or common practices around (1) the dataset, ideally, for generating common goods which reproduce or improve upon the characteristics of the existing common.

In synthesis, a recursive data commons can be defined as sociotechnical system of production, appropriation and use of a datasets under conditioned or unconditioned open access, on the basis of a normative framework (be it formal, informal or both) that defines the governance of the dataset, of the community, and of the infrastructure, in a democratic way, and that enables or promotes shared practices that generate goods under a similar model of production, appropriation and use.

2.2. Technologies: DECODE and Decidim

The two key sets of technologies to be deployed in the Digital Democracy and Data Commons (DDDC) pilot are DECODE technologies and Decidim.

2.2.1. DECODE technologies

The DECODE technology is a complex ensemble of digital tools and infrastructures composed by a wallet, a distributed ledger, a network of nodes, and a dashboard. We describe each of them in turn.

Wallet

The DECODE wallet is a mobile application that serves as interface for safe data storage and management. It operates as access point to the DECODE infrastructure.

Distributed ledger

The distributed ledger is a consensus of replicated, shared, and synchronized digital data geographically spread across multiple sites, countries, or institutions. There is no central administrator or centralised data storage. The distributed software architecture is where concrete rules (smart contracts) and data operations will be registered during the pilot signature process. It will allow the signatures to be stored, audited and tallied. It will also allow to manage shared demographic information. Ultimately, it will operate as a tamper-proof,

public and peer-to-peer based register of the rules and the operations taking place during the signing process.

DECODE network

The DECODE network is a set of nodes that hosts the DECODE ledger, elements of interaction with the Wallet and the distinct pieces of software (Zenroom, DECODE OS, IRMA protocol, etc…).

Dashboard (Barcelona NOW -- BCNNOW)

Data visualization and exploration interface, where City Data (including Decidim data), together with shared sociodemographic information, and the results of the participatory process, will be displayed. DDDC registered participants will be able to access the dashboard through their DECODE wallet, and get personalized information and visualizations.

2.2.2. Decidim

Decidim is an free/open, digital platform for participatory democracy. Its software is fully open and available at decidim.org. Furthermore, Decidim is a common's free and open project and infrastructure involving not only code but also documentation, design, training courses, a legal framework, collaborative interfaces, user and facilitation communities, and a common vision.

Roles

The Decidim technology will play three key roles in the DDDC pilot.

1. Digital Democracy and Data Commons (DDDC). Decidim software will be used to set up a web that will have to key purposes:
    a. facilitate the test of the DECODE technology;
    b. enable the DDDC participatory process;
    c. enable the experimental constitution and democratic governance of the DDDC.

The testing and implementation of the DECODE technology and technopolitical concepts will be carried out on here.

2. Decidim.barcelona. The Decidim.barcelona instance will serve to publicly announce the DDDC participatory process.

3. Decidim.org. As a potential result of the pilot, DECODE technology may be integrated in the decidim software, thereby ensuring compatibility and promoting its use. In the longer term, DECODE legal tools and concepts may be including in Decidim’s social contract, license, and data governance, more broadly.

2.2.3. DecidimCODE: Integrated Flow of technological components[35]

The connection of the various DECODE and Decidim components will be achieved through an integrated flow that will be at work during the final petition signing step of the participatory process. In an ideal case, the process will be the following:

1. The Decidim administrator creates a new petition on the Decidim instance. In this process, the decode-connector is called and creates a new petition object on the ledger. A link to this object is returned to Decidim and associated with the petition.
2. The user accesses the petition through the Decidim website. When choosing to sign a petition with DECODE, the user is directed to the

[35] This section has been developed by the Thoughtworks DECODE team.

DECODE application. Given the id of the petition, the app will retrieve the following information from the Decidim API:
   a. Petition title
   b. Description
   c. Required and optional attributes
   d. URL for acquiring a required attribute

1. In the app, the user is informed of which petition they are signing and which of their information is requested (attributes).
2. If the user is missing a required attribute (e.g. verified residency), they are referred to the external credential issuer. This service shall verify their eligibility to receive a credential (such as a token certifying they are authorised to participate in the pilot, or are residents of the city). No information is shared with Decidim at this time.
3. Once all required attributes are available, the user can sign the petition with a Yes/No, mandatory attributes, and any optional attributes they choose to share. This information is combined with the current status of the petition on the ledger, and the app generates a transaction that updates the count on the ledger. The nature of this smart contract ensures that:
   a. No personally identifiable data is transmitted, only aggregations.
   b. The transaction and the Yes/No choice cannot be traced back to the user, as the app communicates with the ledger over Tor and the Yes/No choice cannot be decrypted to reveal the user's opinion or preference.
   c. Side-channel attacks are blocked because the petition is tallied using homomorphic encryption, so that the total of each signature count is not known until the end of the process (though its integrity can be verified).
4. After the process is complete, the Decidim administrator closes the petition. The decode-connector decrypts the final totals and returns the results to the Decidim instance. No further signing is possible (the ledger will refuse any further transactions).
5. The dashboard can now load data from the Decidim API as well as aggregated results directly from the ledger. Users can explore the anonymised, aggregated overview of petition signatures and the optional data users have chosen to share (e.g. breakdown of support by age group or district).

The following is a synthetic map of the various technological elements and how they connect to each other.

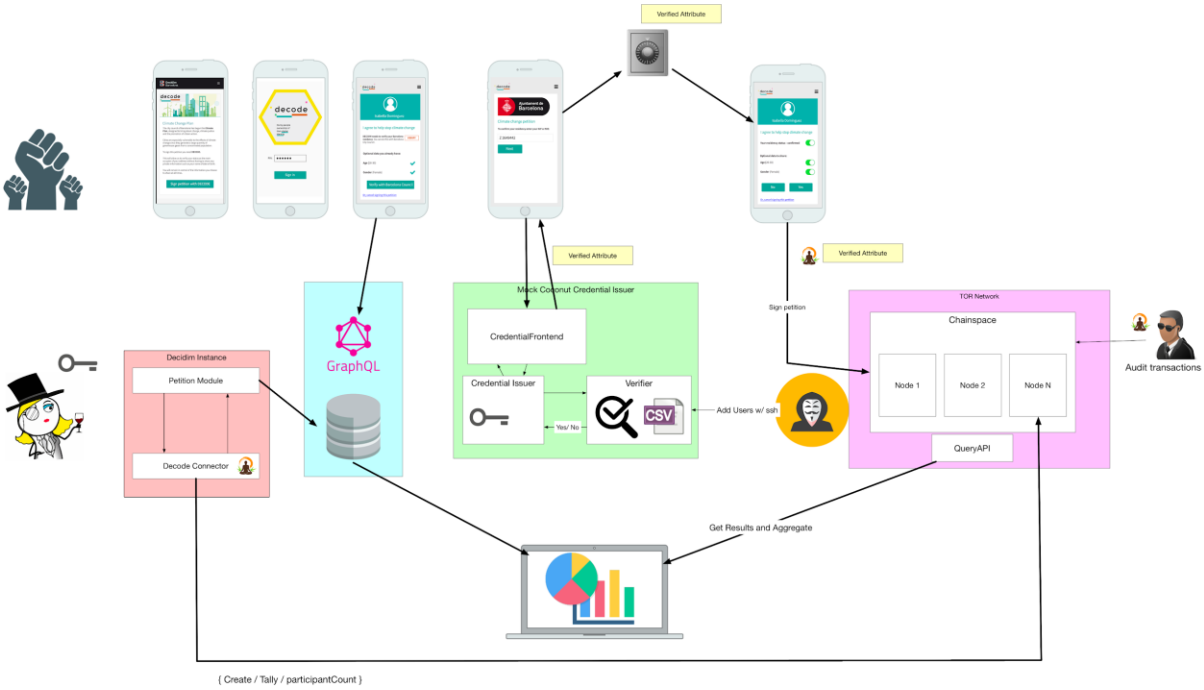

Figure 8: Technical integration schema. Source: Thoughtworks.

2.3. Sociotechnical tools and practices (legal, social, economic)

Appart from the general concepts and frameworks, and the technologies to be developed, deployed and tested, a third key element is that of the sociotechnical tools, practices to be promoted in the pilot. These tools and practices are to be guided by strong criteria of democracy and be oriented to ensure the quality of the recommendations and the sustainability of the data commons to be experimentally generated during the pilot.

A key element of the pilot are the tools establishing the rules applying on various elements. They will primarily apply either to other rules or to the community itself; in other cases, they will apply to the rules themselves.

Legal: Data licenses and smart contracts

The legal tools to be used in the pilot and/or that are to result from it are a crucial aspect of the pilot itself, and of the DECODE project as a whole. The various possibilities and recommendations have been established in deliverables 1.8 (Legal frameworks for digital commons DECODE OS and legal guidelines) and 1.9 (Licensing of digital commons including personal data).

1. Legal tools developed by POLITO will be presented, debated and potentially amended during the pilot (f.i.: discussion of the Digital Data Commons Privacy Pledge or the smart contracts presented in Deliverable 1.9);

The metrics of success for legal tools would be uptake by 1-partners or participants involved in the pilot and 2-other parties.

Social: informal community norms

Various digital interfaces and spaces may help to make explicit the rules of the pilot and of the potential data commons. The key one will be the “pilot basic rules” page, which will be included in the “assembly” space

set up in the DDDC platform. Other “rule” interfaces could be set up as registration screens opening during the pilot registration process.

Economic: Toolkit for a sustainable and sovereign commons

The “Toolkit for the design of a collaborative digital platform” (version 1.0) aims to become a tool that facilitates the design or redesign of digital platforms that want to base their development and management on the democratic qualities dimensions provided by digital commons. Therefore, as we advanced in the subsection 1.2.2.3, this framework may be useful for the development of the sustainability model of the DDDC pilot. Like the framework, the toolkit attends to issues of governance (f.i.: platform interaction and provision), economic sustainability (f.i.: social impact and models of funding), knowledge policies (f.i.: on platform and data), technological policies (f.i.: software licenses, types of architecture, etc.); social responsibility and impact (f.i.: value creation and responsibility towards externalities).

For its implementation, two methods may be used:

- Self-test: which allows the community of participants to check different aspects of the democratic qualities dimensions.
- Conversation: which facilitates the discussion of the different elements to consider in the creation of a platform, on the basis of the democratic qualities dimensions.

During the process, the Toolkit provides some examples linked to the different options for each democratic dimension. At the same time, statistics results of Dimmons research are provided to proportionate a perspective of democratic qualities dimensions adoption.

2.4. Social actors

Any participatory process depends on the people enrolled in its becoming. Following a quadruple helix model of innovation (Carayannis & Campbell, 2009), the DDDC pilot will incorporate, citizen, public sector, private sector, and academic actors. We list some of the communities at the core of the pilot before the rounds of contacts that will precede the launch.

Communities and citizenry

Citizens are at the core of DECODE, both conceptually and practically. The pilot crucially relies on them. There are a series of communities that may be potentially interested and will be the target of the pilot in different stages. The initial ones are the following:

1. The Metadecidim community. This is a community of citizens that helps to co-direct and co-design the Decidim platform and the Decidim project more broadly. It is composed by around 300 people and will be a basic interlocutor;
2. The Democratic Innovation community. This is a bigger community which, to a good extent, overlaps with Metadecidim. The Laboratory for Innovation in Democracy has a action research on data for which DECODE is a central project;
3. Digital economy/sharing economy. This is a very strong community in Barcelona, which are familiar and potentially interested in both the data commons concept and political processes;
4. Data experts, data enthusiasts, and data critique (f.i.: privacy activists) communities. Barcelona counts with numerous communities of people who are experts in data management, interested in data exploitation or critical in their views of data;

5. The Decidim.barcelona community. This is the community of users of Decidim.Barcelona, which may be involved in advanced stages;
6. The citizenry of Barcelona.

Public sector actors

A number of actors and institutions of the city council will be involved in the pilot, if it is to be successful. Some of the core public sector actors (although surely not all of them) are the following:

1. Municipal Institute of Informatics. Already involved as a partner in the DECODE project.
2. Office of Innovation in Democracy. Already involved via Decidim, although not a full partner of the pilot.
3. Barcelona Data Office. A core partner in the participatory process around data policies and data commons.
4. Barcelona Technology Office. Office on charge of the technological policies and projects of the Barcelona city council, connected to the Municipal Institute of Informatics.
5. Barcelona Participation Office. Office on charge of the participatory policies and projects of the Barcelona city council.

Private sector actors

Different types actors coming from the private sector will be included in the project. This will guarantee the diversity of standpoints. There will be actors from Small and Medium Enterprise sector (f.i.: Dribia, Ideas for change), corporate actors (f.i.: Thoughtworks), or cooperatives (f.i.: Alabs) in the field of data and the broader technological sector.

Academia

Different academic actors will also be involved in the process too. Some of there are already so as full partners of the project:

1. UOC.
2. UPF
3. POLITO.
4. CNRS.
5. EURECAT.

Synthesis of actors

Some of the types and concrete actors to be involved in the process are synthesized in the table below.

Communities	Public sector	Private sector	Academia
Metadecidim Laboratory of Democratic Innovation Procomuns/ sharing economy (BarCola)/ Making sense Decidim.barcelona General citizenry	Municipal Institute of Informatics Innovation in Democracy Office Barcelona Data Office Barcelona Technology Office Barcelona Participation Office	Dribia Alabs Social and Solidarity Economy Ideas for change Smart IB Thoughtworks	UOC EURECAT POLITO CNRS UPF

Table 5: Social actors[36]

2.5. Data

Data governance is a key aspect of DECODE. Data are the thing to gain sovereignty over and to be constructed as a commons. In this pilot, there are several potential types and sources of data, and combinations among them.

Data commons should take the form of an ecosystem potentially including various data sources and even data types/licenses.

2.5.1. Types of data

There will be various types of data used in the pilot. The core typology of data is the following:

1. Pilot data (shared or generated during the process, specially, in the DDDC site).
2. Barcelona city council data (f.i.: Decidim, Asia, Sentilo, Odi, City OS, IRIS)
3. Public data from social actors (f.i.: smart citizen, inside airbnb, housing OH-B[37], sharing economy dataset).

Another two potential types may be:

4. Research data based on those datasets.
5. Data defined as relevant during the pilot itself, as part of the constitution of the commons.

2.5.2. Data sharing: survey, signing, and evaluation

Participants in the pilot will be asked to “share” data. This will happen at three different moments using two different venues. The first will be the DDDC web. This first survey will be run at the beginning of the participatory process and will be oriented to gather respondent’s sociodemographic data as well as their views on issues concerning data and the politics around it. This will help to define the communities participating in the DDDC pilot and the visions they hold. The initial questions to be included in the survey are the following:

Variable	Text	Options
GENDER	What is your gender?	Female Male Self-describe
AGE	What is your age?	16-24 25-34 35-44 45-54 55-64 65-74 75-84 85-94 94-more
NATIONALITY	What is your nationality?	List of countries

[36] This list of potential actors is not definitive. The list may change before the launch of the pilot.
[37] For more information, see https://www.ohb.cat/

EDUCATION	What is the highest educational level you have completed?	No studies Primary studies (grade school) Secondary Studies (high school, professional schools) University studies (diploma, bachelor, master, PhD...)
OCCUPATION	What is your job situation?	Employed Unemployed Retired Domestic work Student
CONNECTION	What's your level of internet connection?	TBD
RESIDENCE (I)	Where do you live?	In Barcelona Out of Barcelona
RESIDENCE (II)	What is your district? [for those who live in Barcelona]	Ciutat Vella Eixample Sants-Monjuïc Les Corts Sarrià-Sant Gervasi Gràcia Horta-Guinardó Nou Barris Sant Andreu Sant Martí
AWARENESS (I)	In a scale from 0 to 5, where 0 is "no at all" and 5 is "very much", how worried are you about the management of your data by internet companies?	0-5
AWARENESS (II)	What are the issues that worry you the most about the current ways in which data is managed?	Privacy Security Surveillance Mass persuasion Data exploitation Data monopolies Other (indicate)

Table 6: socio-demographic survey[38].

The second source of pilot data will be the petition signing step itself. As people sign their petitions, they will be given the option of providing information on three variables: age, gender, and district. For this, the possible answers will be the same as in the survey.

The third source of data will come from the responses to the evaluation survey that will be run in the DDDC after the process is finished. Some of the questions will be the following ones:

[38] This list of questions is not definitive. The list may change before the launch of the pilot.

Variable	Text	Answer
AWARENESS (I)	In a scale from 0 to 5, where 0 is “no at all” and 5 is “very much”, how worried are you about the management of your data by internet companies?	0-5
AWARENESS (II)	What are the issues that worry you the most about the current ways in which data is managed?	Privacy Security Surveillance Mass persuasion Data exploitation Data monopolies Other (indicate)
PROCESS EVALUATION	In a scale from 0 to 5, where 0 is “very bad” and 5 is “very good”, what is your overall perception of the participatory process?	0-5
TECHNOLOGY USEFULNESS	In a scale from 0 to 5, where 0 is “not at all” and 5 is “very much”, how useful do you find DECODE technology?	0-5
TECHNOLOGY USABILITY	In a scale from 0 to 5, where 0 is “not at all” and 5 is “very much”, how usable do you find DECODE technology?	0-5
OPEN CONSIDERATIONS	Please, add any other considerations you may want on the participatory process, the technology, or the DECODE project more broadly.	Open

Table 7: Evaluation survey[39].

The data will be used in several ways within the pilot: they will serve to feed the DECODE dashboard, they may be also the first dataset to which the normative conclusions resulting from the participatory process will apply.

2.5.3. Data management during the process

During the pilot, different roles will be assigned to different actors and consortium partners in the management of data used in the process.

[39] This list of questions is not definitive. The list may change before the launch of the pilot.

Data producers: in the pilot, the primary data producers will be the participants. The secondary ones are those generating the city council data and open public data. DECODE organizers of the pilot are only strongly responsible for primary data management (participants). The management of secondary data must only follow the terms defined in the open data licenses that apply to them.

Data controller. According to article 4 of GDPR, “data controller” means “the natural or legal person, public authority, agency or other body which, alone or jointly with others, determines the purposes and means of the processing of personal data; where the purposes and means of such processing are determined by Union or Member State law, the controller or the specific criteria for its nomination may be provided for by Union or Member State law”. T

The data controller for the DDDC dataset will be IMI or UOC or both. Data of the participatory process will be hosted in a secure server controlled by IMI or UOC or both. Data coming from the signing tep using DECODE technology will be hosted in the user’s smartphone.

Data processor. According to article 4 of GDPR, “data processor” means “a natural or legal person, public authority, agency or other body which processes personal data on behalf of the controller”. There will be various data processors of the data. During the participatory process, the BCNNOW will connect to the DDDC via its open Application Programming Interface (API). For the signing, BCNNOW will connect to the DECODE system.

3. Pilot design: thinking through Digital Democracy and Data Commons (DDDC)

3.1. General view

3.1.1. Description of the pilot

The Digital Democracy and Data Commons will be a technologically-enabled (via DECODE and Decidim technologies[40]) participatory process for experts, citizens and city representatives to: 1-test the new DECODE-Decidim system[41] (from now on DecidimCODE) for strongly secure, private, transparent and data enriched democratic decision making, 2-deliberate upon data policies, at the local level and beyond, and 3-constitute an experimental data commons, whose shape will be defined by the ideas and practices coming from the participatory process itself.

The DDDC pilot has two threads, the Digital Democracy thread and the Data Commons thread. The Digital Democracy thread, the primary one, is oriented to move Decidim towards a more distributed model of infrastructure, one that goes from participatory to Digital Democracy, and where people have more personal and collective control over their data. The Data Commons thread, which is complementary (and somehow secondary), is oriented to exploit the potential of Decidim to advance DECODE's vision of alternative forms of data governance and economy in a democratizing direction. The former thread is closer to the notion of data sovereignty (and autonomy); the second thread adds the dimension of data commons.

The process will run on a Decidim software installation: the Digital Democracy and Data Commons site (dddc.decode.project.eu). The process will be announced via Decidim.barcelona channels (web, twitter, mailing list, etc.), and various social actors (see social actors section 2.4) will be called to take part, in order to ensure a wide public reach (objectives 5 and 6 of the pilot). During the process, the DDDC site and the DECODE technology will allow to circulate information, deliberate, share data and take collective decisions. Potentially, and depending on the becoming of the process, the DDDC might remain as a democratic forum for influencing Barcelona city data policies as well as data governance (objectives 7 and 8). This would contribute to the implementation of the collective dimension of the data sovereignty and the data commons concepts (objectives 8 and 9).

We resume now the steps of the process for participants. First, people will be invited to take part in the launch event (October 18th), which will be connected to a more reflexive symposium (October 16-17th), and will include a presentation and a workshop. From that day on, people will be able to register and sign into the DDDC following the usual process of the Decidim software: an email account will be enough to carry on all activities (proposing, commenting, etc.) except for the decision making step staged at the end of the participatory process, which will make use of the DECODE system.

[40] Decidim is a digital infrastructure for participatory democracy sponsored by the Barcelona city council and other organizations. More information at decidim.org.

[41] The Barcelona pilot is based on the technological and conceptual integration of the DECODE and the Decidim technologies. That is what, here, we will be calling DecidimCODE. That technological integration is also tied to the convergence of visions.

During the first weeks of the process, participants will be asked to fill in a survey that (along with the activity in the platform during the participatory process and the data shared in the decision making step at the end of it) will constitute the DDDC dataset. They will also be able to get information, make proposals, and discuss the shape of data policies and experimentally constitute a data commons. At the end of the process they will be able to take collective decisions on these matters (a set of recommendations for local and European authorities and the rules for the DDDC dataset, tied to objective 8), using the DECODE wallet (contributing to its testing and improvement, objective 1). The wallet will allow users to sign while remaining in strict control of their data, in a strongly privacy preserving way. They will be able not also to sign privately but also to share data (under well defined smart contracts) and check the results (registered in a distributed ledger) in a fully transparent, robust and open manner (objectives 1 and 2.). This serves to implement in practice the individual and collective dimensions of the concept of data sovereignty and its related notions (privacy, security, etc.) (objectives 8 and 9)

The key issues to be decided upon will be, on the one hand, a set of policy recommendations for the city council and beyond, and, on the other, the normative framework (both the formal-legal and informal-community rules) defining the data commons around the pilot dataset (objective 3).

During the process, the BCNNOW dashboard will help to visualize the types of data being aggregated (via the sociodemographic survey) and the processes and interactions in the platform. After the signing step it will also allow to check the results on the distributed ledger (objective 1) and the data shared in connection in the final decision making step. Finally, the data resulting from the evaluation survey will be visualizable too. Other types of data will be used as well, concretely, beyond the pilot-generated datasets, there will be city council open data e.g.: Sentilo, Decidim, etc.) and external public data (e.g.: Sharing Economy, Making Sense, etc.), city council datasets and other data.

The process will deliberate upon and experiment with the technological, legal, and socioeconomic bases for the constitution of alternative data policies and economies (locally and beyond) oriented to nurture data commons (objective 7 and 8). The petition system will serve to take collective decisions (deciding in common) on issues such as the normative framework for the datasets generated during the pilot and the recommendations to be issued to public institutions and beyond (common norms), the data sharing system will allow to contribute data (putting data in common) and the practices emerging from and promoted by the process will favor its use, especially, for collectively beneficial purposes such as ensuring inclusive participation in the process[42] (common uses for the common good).

The pilot will contribute to test the integration of DECODE technology i with Decidim software in practice, potentially being fusing with it in the mid and long term (objective 2). This means Decidim users anywhere will be able to sign petitions and share data, and to do so with much more control than until now. They will also be able to use a customizable dashboard (BCNNOW) to enrich their activity into the platform, nurturing personal and collective intelligence. Finally, they will be able to ensure the results of processes in the platform are registered in a trustable, transparent and robust manner.

[42] The sociodemographic data gathered in the initial survey will be used during the process to diagnose lacks of diversity among participants and trigger specific outreach mechanisms oriented to counter such lacks. Also, concerns expressed by people in the initial survey may be prioritized in the debates promoted during the pilot.

As we see, the DDDC pilot will involve all elements mentioned in section 2 above. We will explain now how it addresses the challenges of the Digital Democracy and the data common threads, and then will move to the concrete steps and shape of the pilot.

3.1.2. Addressing challenges in practice: towards digital democracy and data commons

Above we distinguished a double thread of challenges addressed by the DDDC pilot. One tied to Digital Democracy, other tied to data commons. After exposing the various elements of the pilot and briefly presenting its general shape, we can point out how the problems exposed earlier are addressed by the pilot elements.

In section 1.2.4.1. We divided some key challenges that DECODE and the DDDC pilot are designed to address. We divided them into a Distribute Democracy thread and a Data Commons thread. After presenting the elements and the general shape of the pilot we can specify how these challenges will be addressed in n practice.

Digital Democracy thread: challenges and tools

The triple challenge of verification with privacy, transparency and data enrichment within the Digital Democracy thread has defined the design of various DECODE technological components.

Verification with privacy is advanced by the combination of the wallet, encryption mechanisms, attribute based credentials[43] (ABC), the use of the Tor network[44] and GDPR compliant smart contracts[45] that define data access and use. People using DECODE can be sure that Decidim admins and any government will have much more difficult to know who they are and what they sign.

Transparency and reliability are advanced through the use of a distributed ledger technology (DLT), that, in connection with the wallet and integrated with Decidim in the DDDC, registers signatures in a tamper-proof way.

Finally, data enrichment is promoted by the design of the BCNNOW dashboard, which is also connected to the DDDC.

Digital Democracy thread: challenges and tools		
Verification with privacy	Transparency and reliability	Data for collective intelligence
Wallet Encryption ABC Tor	DLT Wallet Decidim	BCNNOW Dashboard Decidim

[43] "Attribute Based Credentials (ABC) are a form of authentication mechanism that allows to flexibly and selectively authenticate different attributes about an entity without revealing additional information about the entity (zero-knowledge property)". Definition taken from https://privacypatterns.org/patterns/attribute-based-credentials .

[44] Tor is a software for anonymous communication.

[45] "A smart contract is a computer protocol intended to digitally facilitate, verify, or enforce the negotiation or performance of a contract". Definition taken from https://en.wikipedia.org/wiki/Smart_contract

Smart contracts		

Table 8: Digital Democracy thread. Challenges and tools

Ultimately, the advance towards distributed democracy specially takes place by the development of a distributed and auditable system for petition managing, where one instance may set up a petition (Decidim.barcelona for instance), another instance do the tallying (several nodes hosted in Dyne for instance) and a third one do the audit (any user with a DECODE wallet well known to the community). This, along with a stronger privacy preserving tool such as the wallet allows to set up new, more distributed governance forms.

Data commons thread: challenges and tools

The fourfold challenge of data sovereignty, democratic governance, critical awareness, and public deliberation is addressed in the pilot either through the DECODE system, through the DecidimCODE system, or through the shape of the participatory process and its media campaign.

Similarly to the case of secure signing, data control is achieved through the combination of the wallet, encryption mechanisms, attribute based credentials, the use of the Tor network and GDPR compliant smart contracts that define data access and use.

The challenge of collective control and benefit is addressed by the combination of the technologies just mentioned with Decidim, which allows to collectively intervene over the rules of personal data management of a given dataset.

The challenge of critical awareness addressed in the pilot by organizing a well-publicized participatory process with a variety of actors and a strong communication strategy.

Similarly, the pilot will be a space where to experiment with public deliberation on data policies and the digital economy.

Finally, part of the role of the pilot is to test technologies (the DECODE and the DecidimCODE system), apply legal tools (the DECODE legal toolkit) and think institutional arrangements (by connecting the process to the Barcelona Data office and European via recommendations) that help to construct such alternatives.

Data Commons thread: challenges and tools			
Individual control	Collective control and benefit	Critical awareness	Inclusive deliberation
Wallet Encryption ABC Tor Smart contracts & other legal tools	Decidim Wallet Encryption ABC Tor Smart contracts & other legal tools	Communication campaign Media appearances	DDDC Outreach campaign

Table 9: Data Commons thread. Challenges and tools

3.2. Phases

The pilot will include several stages, of which the central one will be the participatory process that will run from October 2018 to March 2019.

3.2.1. Phase 1 (May-September)[46]. DECODE technology UX testing and integration with Decidim.

As a first step, the DECODE wallet will be tested and improved with community members through a series of User Experience sessions. These sessions will be oriented to ensure a high quality in its functioning and usability. In the case of the wallet, this task will be led by Thoughtworks and UOC.

A second key aspect of the pilot will be the integration of the DECODE technology with Decidim technology. The result will be deployed in a Decidim instance called "DDDC", acronym for Digital Democracy and Data Commons, the name of the pilot. This task will be led by Thoughtworks.

3.2.2. Phase 2 (September-October). Process final design and launch.

For the preparation and launch of the process, there will be a series of final key preparatory steps:

1. fully design the participatory process and mobilize the resources to run it.
2. design and set up the elements of the process in the DDDC platform.
3. design and launch a communication campaign.
4. Contact key actors.

These three tasks will be lead by UOC with the help of IMI and Eurecat, in task 1, as well as NESTA, in task 3. Part of this process involves to put the conditions to guarantee a clear and resourceful piot, as well as the involvement of key actors.

3.2.3. Phase 3 (October-March). Participatory process.

A complex deliberative process such as the one designed for the DDDC pilot requires multiple steps that go from an information stage, through a proposal and debate moment, up to a decision making and evaluation stage. On this we take inspiration from other process run in Decidim.barcelona[47]. The various phases of the participatory process are described in the following pages.

1. Pilot launch, survey & diagnostic (October 18th)[48].

The participatory process will begin with a launch event where the discussion on data commons will be opened. In addition to that, a survey will be launched to evaluate the profiles and the perceptions of the people involved in it. Concretely, in this stage we will have:

[46] Phases 1, 2, and 3, the "preparation" steps, specially, 1 and 2, are not strictly part of the pilot, but rather preconditions for it.
[47] An example is the structure of the process of design of the new participation norms for the Barcelona City Council.
[48] This phase overlaps with Phase 3.

- Launch & diagnostic meeting. 1 meeting with stakeholders and the general public to present the pilot. It will have three tracks, legal (led by POLITO), political (LED by UOC), and economic (co-led by UOC and CNRS).
- Launch of the survey. The survey will be run through the DDDC platform and will be announced by various decidim.barcelona channels (f.i.: social media).
- In this stage, a process of diagnostic and information on the situation of the politics and economy of data both in Barcelona and globally will be carried on. Much of the diagnostic will be taken from DECODE deliverables but also will result from the collaboration with different social actors through the DDDC and the event mentioned above.

Outputs:

- Diagnostic materials at DDDC platform (deliverable & meeting based).
- 1+ blog posts in partners' websites.
- 1 article.

2. Proposal gathering (November 1st-15th);

On this stage, the DDDC platform and face-to-face meetings will facilitate the gathering of proposals coming from both participants in the process and DECODE deliverables. Potential proposals to define and promote data commons will be extracted from those deliverables (f.i.: Digital Data Commons Privacy Pledge, toolkit for sovereign data commons) and uploaded into the DDDC site.

The face to face event will take place at Sharing Cities Summit[49] (12-15th November):

- 1 session (closed -- morning) at Sharing Cities Summit: POLITO, CNRS, UOC and other invited actors.
- 1 session (open -- evening) at procomun meet-up of the Sharing Cities Summit.

Proposals are divided in areas (f.i.: a) types of data, b) formal (legal) and informal rules of the commons, etc.) and signed on the go (using petition system)

Outputs: proposals at the DDDC.

3. Debate & prioritization (November 15th -- December 15th);

In this stage, debate sessions will be organized and announced via de DDDC platform. They will also take place online. People will be able to support and comment on the proposals (coming from both DECODE partners and participants) gathered in the previous phase. Various metrics, including digital supports in DDDC, may serve to prioritize proposals.

The face to face meeting will take place at the Smart City Expo

- 1 session (economic): led by CNRS and Dimmons/UOC, with other invited actors to discuss the economic aspects;
- 1 session (legal): proposal for the smart contracts and license;

[49] For more information on the Summit, see http://www.share.barcelona/.

- 1 session (political/governance): led by Tecnopolitica/UOC for debating the governance model and other political aspects.

A possibility may be to run an ask me anything (AMA) session with the DECODE team via the DDDC.

This stage may also involve sessions at the Laboratory for Innovation in Democracy, organized by Tecnopolítica-IN3/UOC devoted to data policies.

4. Proposal elaboration (15 December - 1 February);

During this step, the DECODE team members will elaborate upon the proposals gathered and debated in the previous phase. They will work independently in assigned tasks and meet once per week either face-to-face or online to put decisions and work in common.

5. Participant feedback on the elaboration (1 February - 15 February);

The results of the elaboration will be posted in DDDC and shared with participants for feedback via the various media channels available to the consortium.

6. Review of participant feedback (15 February - March 1st);

The feedback will be gathered and processed by the DECODE team for potential amendments of the initial result.

7. Final signing (March 1st-10th)

The initial issues to sign upon will be:

- Validation (yes/no) of principles of community principles.
- Validation (yes/no) of the final format of the Digital Data Commons Privacy Pledge.
- Validation (yes/no) of other questions to be decided during the process.

8. Return to participants (March 10th - March 22nd);

The definitive result of the process will be posted in DDDC and the Decidim.barcelona platform.

1 closing meeting & hackathon:

- Session with stakeholders and general public.
- 1 hackathon, including a series of challenges such as: 1-define ways of using the gathered information for improving either democratic or data policies (challenge of common data for the common good); 2-open information on the participatory process and DECODE infrastructure and challenge participants to relate particular signatures or data with particular people (challenge of privacy and security).

Outputs: 1-recommendations on data policies at the municipal and european level; 2-rules of the dddc dataset; 3-analyzed datasets.

9. Final evaluation of the process (March 22nd - April 1st).

Participants will receive a survey using DDDC, asking their opinion on the participatory process and the technology. The DECODE team will run a final

evaluation of the process in the following weeks. A real time evaluation will be run during the process.

Participatory Process General Calendar								
Launch	Proposals	Debate	Elaboration	Feedback	Review	Signing	Return	Evaluation
Oct 18	Nov 1-15	Nov 15 Dec 15	Dec 15 Jan 1	Feb 1 Feb 15	Feb 15 Mar 1	Mar 1 Mar 10	Mar 10 Mar 22	March 22 April 1

Table 10: Participatory process calendar.

Events Calendar		
Event	Date	Participants
Pilot launch	October 18th	Experts Stakeholders General public
Sharing Cities Summit	November 12th	Experts, stakeholders & general public
Smart City Expo	November 13-15th	Stakeholders
E.T.	February	General public
Closing event	March	Stakeholders & general public

Table 11: Event calendar

3.2.4. Phase 4 (April - onwards). Evaluation

After implementing the participatory process, an evaluation report will be generated on the pilot as a whole. It will look at three key objects.

1. The technology;
2. The participatory process (this will result from the evaluation included in phase 4 of the process);
3. The pilot as a whole in relation to the DECODE Project.

The elements presented in section 2 will help to more carefully break down the objects of evaluation. The objectives stated in 1.3 will serve as a reference for the evaluation.

General Pilot Calendar

Phase 1 April -- September	Phase 2 September -- October	**Phase 3** **October -- March**	Phase 4 April -- onwards
DECODE technology testing integration with Decidm	Participatory process design and launch	**Participatory Process (pilot)**	Evaluation and analysis

Table 12: General pilot calendar.

3.2.5. Beyond the pilot

After the pilot, the DDDC instance could contribute to maintain open the collective deliberation and action upon Barcelona City Council data policies with a procommon orientation.

Actions of advocacy (following NESTA's lead) could also be carried on.

4. Basic organization & outcomes

The participatory process will be based on a collaboration between Technopolitics and Dimmons teams at UOC, enriched by the outcomes of WP2, as well as IMI and Eurecat contributions. The technology will be developed by Thoughtworks and Eurecat, with contributions by IMI and UOC.

4.1. People & roles

Each institution within the consortium will take the lead on the aspects of the pilot of their expertise.

People & roles			
Owners	UX	Participatory process	Technology
IMI / UOC	Thoughtworks UOC	UOC	Thoughtworks Eurecat

Table 13: Teams and roles.

4.2. Resources

The workforce to be mobilized for this pilot included in the WP task T5.2 “Barcelona pilots specifications and implementations“ is the following:

Resources					
UOC	IMI	EURECAT	THOUGHTWORKS	DYNE	UCL
10PM 15.000 EU	2PM	3PM	1.5PM	1PM	1PM

Table 14: Resources.

4.3. Links to other deliverables

The pilot will be connected to other deliverables within the DECODE project. The list, below.

Deliverables & Leaders		
D1.9	Licensing of digital commons including personal data	POLITO
D1.12	Licensing of digital commons including personal data - update.	POLITO

D2.1	Multidisciplinary framework on commons oriented sharing economy	UOC
D2.5	Technopolitical democratization and digital commoning: the case of the Digital Democracy and Data Commons (DDDC) Pilot	UOC
D5.3	Data analysis methods and first results from pilots	EURECAT
D5.4	Prototype Data Visualization Tool	EURECAT

Table 15: Deliverables & Leaders.

4.4. Outputs

Several outcomes will result from the pilot. We mention some of them here:

- An academic article based on the analysis of the data commons conception and use;
- Effective visualization of related data in BCNNOW dashboard - D5.9 Tools for data visualization;
- Field testing new legal tools (particularly Digital Data Commons Privacy Pledge) derived from work in WP2;
- Field testing of the governance and the sustainability of data commons frameworks derived from work in WP2;
- Effective testing of privacy aware, distributed petitions system via DECODE wallet.
- Effective testing of data aggregation to gather in a privacy aware way demographic information on decision making processes;
- Effective testing of distributed and auditable system for petition managing, where one instance may set up a petition (Decidim.barcelona for instance), another instance do the tallying (several nodes hosted in Dyne for instance) and a third one do the audit (any user with a DECODE wallet well known to the community).

5. Conclusion

In this deliverable we have presented the Digital Democracy and Data Commons pilot, its mission, theoretical background, and objectives (sections 1.1, 1.2, and 1.3), its elements (section 2), its preliminary design (section 3), as well as its general organization and outcomes (section 4)[50].

As we saw, the pilot has two threads, one tied to digital democracy and another one tied to digital data commons. In the first thread, the advance provided by DECODE seems to point in the direction of a more distributed democracy, a more secure, private, transparent and data enriched digital democracy based on distributed architecture technologies; in the second thread, the advance provided by DECODE opens the possibility of advancing towards more democratic models of data economy, up to strongly demanding models of commons such as recursive data commons.

Democracy, as collective power and equality, is at the core of both threads. It is at the core of the notions of data sovereignty (or autonomy) and data commons. We believe the double connection of Decidim and DECODE, of using DECODE to improve Decidim and Decidim to enact the DECODE mission speaks of the sociotechnological links between these two threads.

The potential relation between commons and democracy has been noted by previous works (Laval & Dardot, 2015; Hardt & Negri, 2009). If earlier we saw the distinction between common goods (as “types” of goods) and commons (as socioeconomic institutions or systems), these authors have suggested the need of moving from commons to “the common” as a transition from thinking about one socioeconomic institutional model among others to think of it as a principle for the potential reorganization of society. It is in the interplay between the three (common goods, common, the common) how the DECODE hypothesis may bring about deeper transformations in the digital economy. Digital commoning as an alternative to the extractivist, surveilling and surwilling digital economy predominant today.

Decidim tries to move forward a democratization of social processes, beginning by pushing institutional politics beyond representative democracy. This is a key element of technopolitical democratization, but is does not stops there. In DECODE, technopolitical democratization may move into a new layer, not that of formal or informal politics, but that of economics. A real democracy today requires this recursivity and this depth: the democratization of the digital economy as a step in the democratization of the network society.

[50] Its intention is to provide a bird eye view of the pilot and its theoretical background, more than a detailed account of its final shape, which will be presented in more detail in later deliverables.

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