decode

Deployments of pilots in Barcelona

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DECODE

DEcentralised Citizens Owned Data Ecosystem

D5.6 Deployment of Pilots in Barcelona

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PU	Public	**X**
PP	Restricted to other programme participants (including the Commission Services)	
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CO	Confidential, only for members of the consortium (including the Commission Services)	

Approved by: Francesca Bria (Chief Technology and Digital Innovation Officer, Barcelona City Hall)
Date: 31/10/2018

This report is currently awaiting approval from the EC and cannot be not considered to be a final version.

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Abbreviations

BCN	Barcelona
IoT	Internet of Things
MVP	Minimum Viable Product
TW	ThoughtWorks
TH	Thingful
UOC	Universitat Oberta de Catalunya
SC	Smart Citizen
WP	Work Package
IMI	Municipal Institute of Information Technology / Institut Municipal d'Informatica
PET	Privacy Enhancing Technologies
BCNNow	Barcelona Now (tool described in detail in deliverable D5.3)
SCK	Smart Citizen Kit
POLITO	Polytechnic University of Turin
CNRS	French National Center for Scientific Research

Introduction

The DECODE pilots are a fundamental part of the project as they must serve to engage large number of citizens and local communities to demonstrate the use of the different privacy-enhancing, decentralized and rights-preserving digital tools we are developing, while also integrating the legal, economic and social aspects of the data commons development. In particular, as stated in the description of work, in WP 5 (see figure 1), Barcelona and Amsterdam DECODE pilots must:

- *Demonstrate* Project Values
- *Experiment* legal, economical & social models studied
- *Inform* the architecture designed
- Build & Engage communities
- *Promote* adoption of DECODE technology

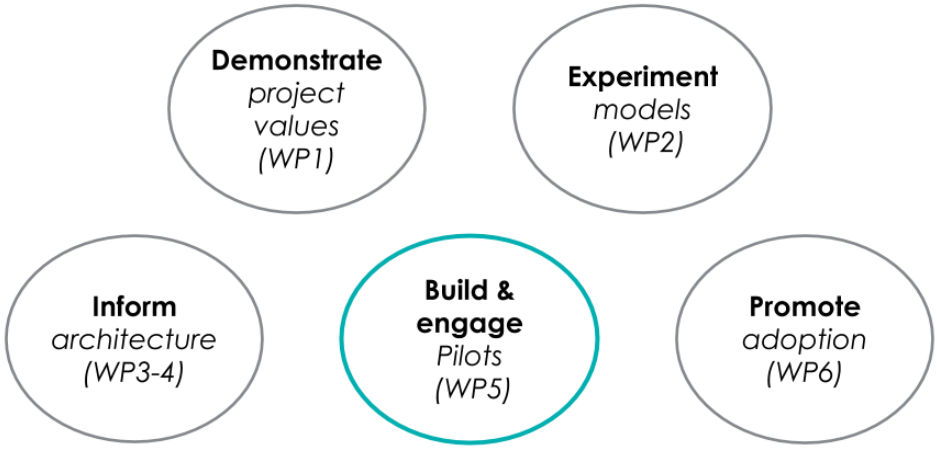


Figure 1: Keywords relating WPs to pilots, extracted from the WP5 description

The present document is a short report that describes the work devoted, up to date, to the development of the two pilots in Barcelona, which will enter a crucial phase starting in October 2018. It is structured as follows: First, we present a general view of the pilots in Barcelona, how they fit together, and a description of their common structure (also strongly related with the ones developed in Amsterdam) and status. Once the pilot's framework has been set, we devote the following section to provide extended details on the user engagement, pilot vision and scope based on the creation of privacy-enhancing city data commons, external partners involved in the development, tech details and sustainability plans. The concluding section of this short report is devoted to those remarks, lessons learned and impact, which should guide the development of the experiments that will be run in the coming year.

This short report must be understood as a follow-up and as an updated description of pilot selection and methodologies presented in D1.1 "DECODE scenarios and requirements definition report", with a particular focus on the Barcelona's pilots. Also, it is strongly tied with the suite of deliverables related to the BCNNow tool[1], D5.1"Barcelona Open Data, Sentilo and IRIS API available", D5.2 "CityOS connection" and D5.3 "Data analysis methods and first results from pilots".

At the policy level, it is relevant to mention that DECODE is considered as one of the flagship projects at the Barcelona City Council Digital Strategy developed by DECODE coordinator and Barcelona CTIO Francesca Bria[2]. As a result of this strategy, a new Ethical and Responsible Data Management Policy was established six months ago, which includes DECODE as a new critical decentralized data infrastructure to work towards Barcelona Data Commons. The pilots also tie with the policy scenarios outlined in DECODE's deliverable D1.10.

Last but not least, the final deliverable related to pilots, D5.11, (to be published in December 2019) must be considered as an extended updated version of this document. Given the *agile methodology* followed, it will summarize this and earlier deliverables and will also contain further details on the development of the pilots.

[1] http://bcnnow.decodeproject.eu
[2] https://ajuntament.barcelona.cat/digital/en

Barcelona Pilots: General vision

The Barcelona pilots have one clear goal in addition to those shared with DECODE: Use the city as a laboratory to develop, enable and sustain city data commons. This means, that the pilots must aim at testing the use of DECODE technology with real users, in order to enable real data sovereignty for citizens and offer communities the possibility of commonly sharing data to enhance the public good. By combining private and public sources of data city problems can be addressed by the crowd, that is, solving them collectively, while also preserving citizen's digital rights such as privacy and the right to information elf-determination. The technopolitical details on what data commons is left for deliverable D2.5 "*Technopolitical Democratization and Digital Commoning: the Case of the Distributed Democracy and Data Commons (DDDC) pilot" lead by UOC which has been published in September 2018.* The data commons vision within the context of DECODE was also outlined in an article by DECODE Project Coordinator for the Guardian[3]: "Our goal is to create "data commons" from data produced by people, sensors and devices. A data commons is a shared resource that enables citizens to contribute, access and use the data – for instance about air quality, mobility or health – as a common good, without intellectual property rights restrictions".

To that end, and given the extended exploration performed in Barcelona as described in D1.1, we have tried to build a unified common framework for pilot development that is depicted in figure 2. Specifically, what we aim to realize is:

- **Citizen Science and IoT Data Governance pilot:** Testing the concept of granular data sharing permissions - data entitlements- at different levels (individual, community and public) with privacy enhancing technologies (PETs) and IoT devices. This has the aim to crowdsource data and to that end we must raise awareness with interested communities and work with them to define policies for the use of crowd-sourced aggregated data. The secondary objective of the pilot is to test privacy-enhancing (PETs) technology with low-risk personal data in order to consider its later expansion to more sensitive domains such as health and others.

- **Digital Democracy and Data Commons pilots:** Test PETs technology to protect political opinions of citizens in digital democracy platforms, while enabling them to generated anonymized datasets that collectively serve to detect city problems. We also aim to apply state of the art distributed ledger and cryptography technology to the open democracy platform decidim (decidim.org) to discuss collectively the data governance policies and use of

[3] https://www.theguardian.com/commentisfree/2018/apr/05/data-valuable-citizens-silicon-valley-barcelona

the aggregated generated datasets for public good. Such use should allow for transparent, auditable, yet privacy aware management of political initiatives support. This open democracy governance experiment will directly inform the city of Barcelona ethical and responsible data strategy.

While we do not consider it as a pilot by itself, it is relevant to mention at this stage the role of the Barcelona Now[4] tool developed during this first project stage. In order to demonstrate and integrate the technology tested in the two pilots, the consortium has built this data commons analytics and visualization tool, which in conjunction with the DECODE wallet (described in the deliverable D1.4 "First version of DECODE architecture" section 2.6.3), is the main interaction point for users to visually interact with the datasets and policies being discussed and created.

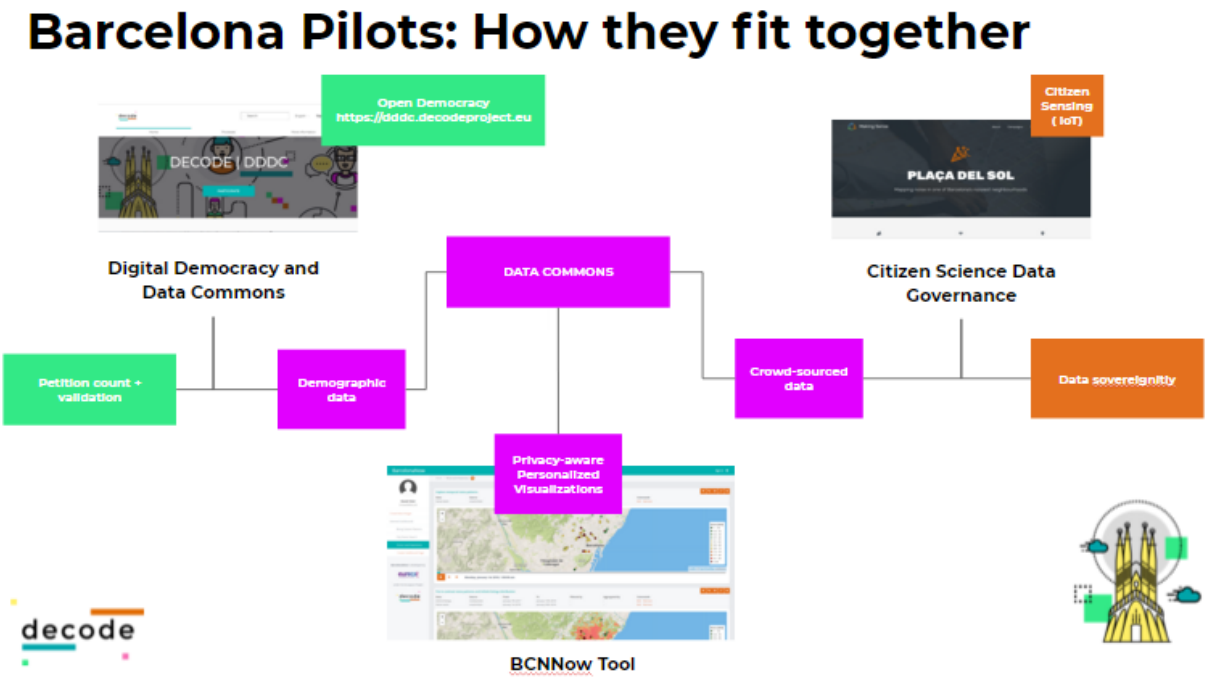


Figure 2: Schematic view of Barcelona pilot framework.

[4] http://bcnnow.decodeproject.eu

Pilot phases

All the pilots have followed the same plan of development, which is depicted in figure 3 below.

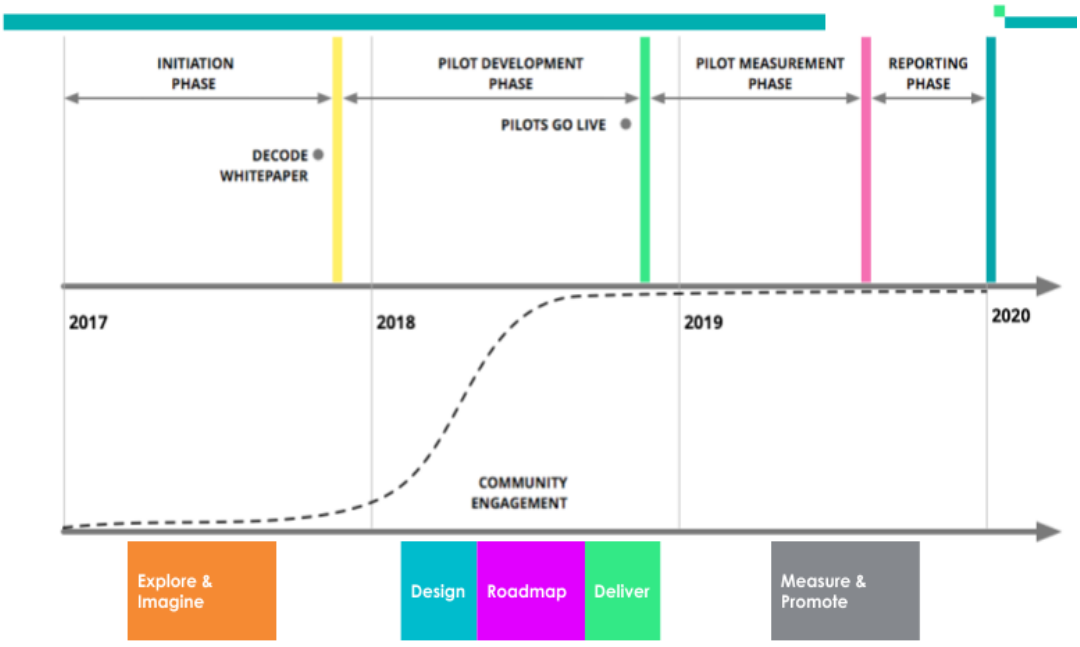


Figure 3 Pilot development stages

The initial exploration phase was described in D1.1 and mainly consisted of the Barcelona pilot candidates' assessment process and the two inceptions developed in the city.

Then a design phase was developed in conjunction with the external pilot partners (key partners from already existing communities, not part of the Consortium). In this phase, a set of *pilot pitches* was developed stating more precisely the aims and functional requirements of the technology to be built, the user focus groups who needed to be involved in the pilot and an assessment of the technology/platform infrastructure status which is currently used by the pilot partner, which will be enhanced by the addition of DECODE modules. All this exploration phase served to inform a variety of DECODE aspects, among which the design of the DECODE architecture (described in D1.4 "First version of DECODE architecture") as well as legal and technical definitions of the smart rules definitions (D1.8 "Legal frameworks for digital commons DECODE OS Legal Guidelines" and D3.5 "Initial definition of Smart Rules and Taxonomy"). All of the present aspects were worked out in both the 1st DECODE tech symposium and the General Assembly general consortium meetings, described in deliverable D7.2 "1st Periodic Report".

With all the information in place, the DECODE tech partners started interacting with the tech leads of the pilots to design a *smooth* integration of the developed components. In a parallel fashion, intensive contacts between IMI BCN as city pilot coordinators and pilot partners were held to establish clear governance roles, a calendar for user engagement and a general framework for collaboration.

It is to be noted that the process of designing and implementing the pilots yield a clear lesson: As DECODE technologies are highly experimental and make use of state of the art technology, its *adoption cost* by external partners is an important factor to consider, that might hinder in the future the uptake of the software being built at large scale. To avoid this, the consortium agreed -jointly with pilot partners- to follow a simple set of rules regarding relation with pilot partners:

- *"DECODE integration to be **minimally invasive** on ongoing projects"*
- *"Pilots need to **walk the last mile** by themselves"*

Which can be translated in the fact that DECODE technology is built with a general application objective in mind, but specific connectors to the technology are built for each pilot, that the external pilot partners, with a minimal knowledge on IT aspects, must implement and adapt to their user experience themselves.

The next pilot phase, that of delivery, started with the 2nd DECODE tech symposium and is currently ongoing at the time of writing this deliverable. In this stage, DECODE technical partners are building together with pilot partners the pieces and connectors that will allow the pilots to become a reality and scale up, and at the same time, testing with real user groups has started to inform design decisions. All these pilots' activities have been coordinated with two pilot kick-off specific workshops lead by TW. The DDDC pilot was performed in June 5th in the Fabra i Coats building with members of TW, EURECAT, UOC and IMI BCN. Regarding the Citizen Science Data Governance pilot, it was celebrated in July 18th in the TW BCN office with TW, EURECAT, TH, SmartCitizen and IMI.

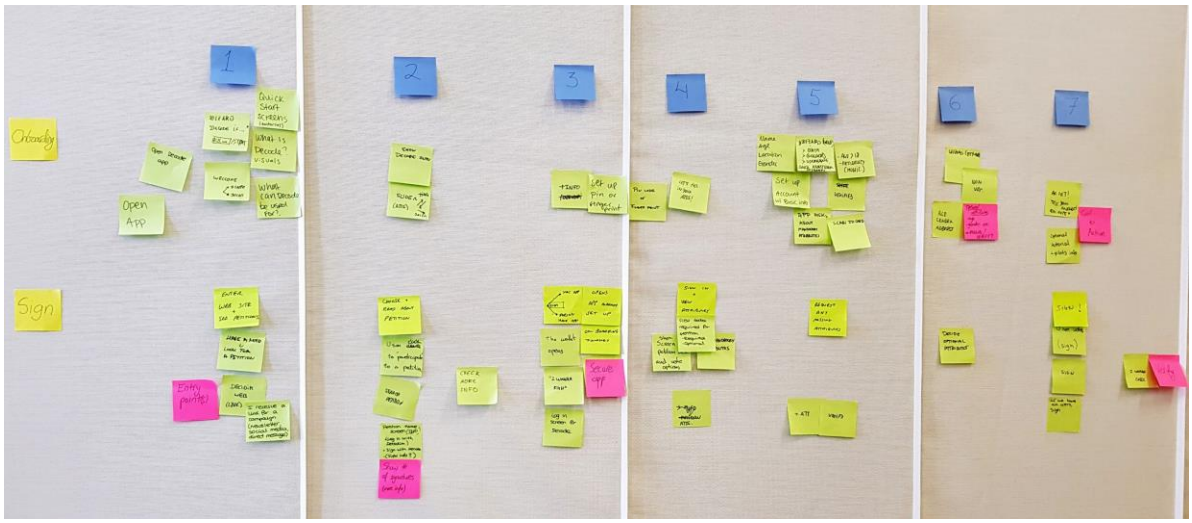
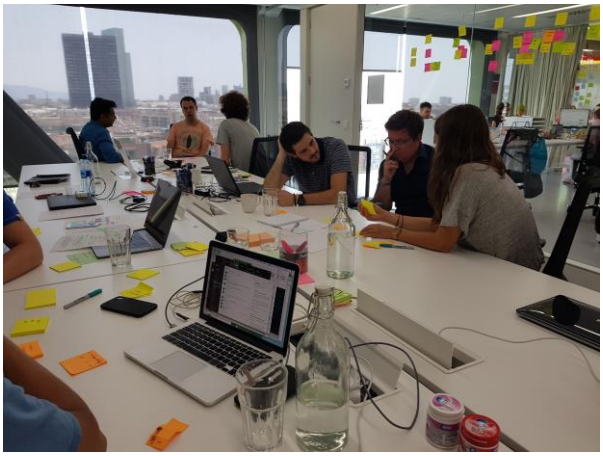


Figure 4 Development kick-off workshop - Digital Democracy and Data Commons pilot



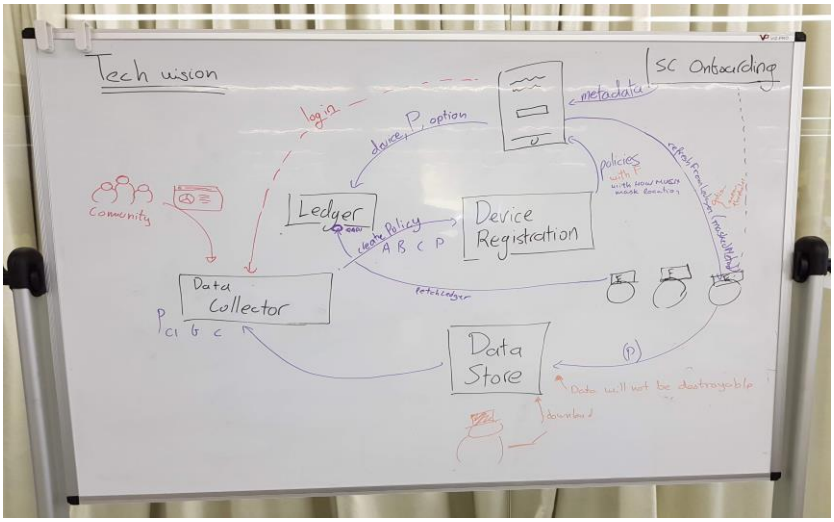


Figure 5 Development kick-off workshop - Citizen Science Data Governance pilot

The final phase of the pilots was kick-started with the official launch of the Barcelona pilots, which took place in Barcelona on October 18th at Fabra i Coats during the Digital Cities, Digital Freedoms[5] event included in the Barcelona Open City Biennale[6] and is described with more detail in a devoted section.

What is left now is to *put to production* the tech developed and start engaging with the users, learning from their interactions and testing how the built technology can be used to realize the legal, social and economical objectives of the project.

The consortium partners involved in the Barcelona pilots are IMI BCN with the coordination, TW acting as tech lead in charge of the DECODE Wallet and Eurecat dealing with the integration with the BCNNow infrastructure. Also, for the Digital Democracy and Data Commons pilot, UOC is managing the relation with the tech pilot partners and leading the user engagement and relation part while Thingful is leading the tech integration part with the pilot partner on the IoT respectively.

[5] More information in http://digitalcities.flossbcn.org/
[6] More information in http://www.biennalciutatoberta.barcelona/

Current status of the pilots & Next steps

The plan for user engagement for both pilots has been presented in public and with the communities in the DECODE Symposium included into the Barcelona Open City Biennale programme, specifically in the DECODE kick-off event (see concluding section), and thus engagement phase has started.

On the technical side, for the IoT pilot, the infrastructure is being adopted by pilot partners, and is expected to be put to production at the beginning of 2019, available for the communities to use. The outstanding technical tasks underway include:

- Finalisation of protocols to encrypt, aggregate and decrypt sensor data securely, informed by Decode architecture principles and a Threat Model specific to this pilot.
- Implementation of interfaces between pilot components, specifically the device management services, secure data store, Barcelona Now dashboard and user-facing Wallet application.
- Integration with the ledger, currently schedule for early 2019.

The current status of the technical development for the Distributed Democracy and Data Commons pilot is that the scale model has been validated and integrated to the pilot infrastructure by the pilot partners and is ready while the work with user testing has started with four iterations, and it will continue to evolve. The application and its interfaces are currently working. Towards the launch of the pilot, the development team is currently focusing on testing the interfaces between the data commons services, ledger, and Wallet application. The app will then be packaged for distribution on app stores.

In the following, we provide more details on each pilot concerning roles and responsibilities, concrete scope, technical infrastructure and user engagement.

Citizen Science and IoT Data Governance pilot

The Citizen Science and IoT Data Givernance pilot is done in collaboration with the SmartCitizen IoT platform[7] and Ideasforchange[8], which were the main promoters of the CAPS project Making Sense EU[9]. They dynamize and empower communities of neighbors in Barcelona that aim at crowdsourcing city data on environmental issues such as noise to later analyze the data and make concrete proposals for call of action to solve city problems.

They have two main motivations to participate to the project.

1. The first is a **privacy risk** that has been expressed by user communities when publicly sharing data from IoT devices streaming from within their private houses. The users would like to experiment with advanced forms of data sharing beyond an "all or nothing" publishing scheme.
2. Secondly these groups of users would like to use devices **to gather even riskier personal data sources** such as health data, for which they need a platform flexible enough to allow for sharing usable data while allowing users to keep control. The IT lead at SmartCitizen will be in charge of adopting the DECODE connector and technology built by the consortium. Users from the existing Community coming from the previous EU project will participate in the workshops to define and provide feedback about the UX as well as in the pilot itself.

Technical infrastructure

The pilot is aimed at addressing the above mentioned citizens' worries with its technical design. It will use the DECODE Wallet to connect to the SmartCitizen infrastructure and link the sensors provided by SmartCitizen to their users with their DECODE accounts. The wallet provides access to encryption schemes facilitated by the custom DECODE developed, easy to use, cryptographic virtual machine and scripting language Zenroom[10], which is described in the deliverable D3.3 "Data Privacy and Smart Language requirements, its initial set of smart rules and related ontology". Using the wallet, the users will be able to select from a range of appropriate and diverse data sharing policies from predefined groups that have

[7] https://smartcitizen.me/
[8] https://www.ideasforchange.com/
[9] http://making-sense.eu/
[10] https://zenroom.dyne.org/

been previously discussed and agreed with their communities. In the future, those policies might be set dynamically, but this step is currently beyond the scope of the project. This possibility is however included in the design with the aim that external developer communities pursue this goal.
Once the user has decided on which of the policies they wish to apply to the stream of data coming from the device or devices within their home, they will be able to create an encrypted stream of data from the device which only the designated recipient will be able to decrypt. For the purposes of this pilot, this will be a dashboard or view within the BCNNow platform.

The users will then be able to use their DECODE wallet in order to prove their memberships of their chosen groups, and so obtain access to the personalized views of the different datasets generated and shared according to different rules in the BCNNow tool. We also hope to be able to record formally (potentially using the Chainspace[11] ledger described in the deliverable D1.4 "First Version of Decode Architecture", section 2.6.4) the data sharing agreements encoded in the policies.

Following is a brief description of the interaction flow between the components shown in figure 6.

1. The community draft one or more data entitlement policies during workings run by MakingSense/SmartCitizen.
2. The drafted policies are passed to an entity who then "creates" an instance of this policy within the Policy Directory component. To do this they need to obtain a public key from Eurecat who will have created a public/private key pair that they will use in order to decrypt the data for that policy.
3. The policy creator then makes a call to the Policy Directory to actually create the policy within the system. This call will contain the public key obtained from Eurecat, as well as the set of operations defined for the policy. This may include operations like calculating moving averages for particular sensors, binning the data, or obfuscating the precise geographical location of the sensor. After this call has been made the policy will be available within the Policy Directory for participants to apply to their devices.
4. Once a user has agreed to be part of the pilot they will have installed onto their mobile phone the DECODE wallet. They will then go through the existing SmartCitizen onboarding flow, which configures the physical device they will have in their home. Once configured the SmartCitizen onboarding application will send some initial metadata about the device (its location and position) to the user's DECODE wallet via a QR code.
5. On receiving this information the DECODE wallet will store this information securely at which point the user will have claimed ownership of the device.

[11] https://chainspace.io/

The wallet will make a request to the Policy Directory component for a list of available policies, and these policies will be rendered in a simple UI which will allow the user to choose one or more to apply to their device.

6. Once a user has decided which policies to apply they will make this choice via the wallet, which will either write this information to the Ledger via a smart contract, or the wallet will initially interact directly with the Stream Encoder to write new stream configuration directly.
7. In the former model the Stream Encoder regularly queries the Ledger to check for new stream configurations, and should new configurations be found it will create the appropriate streams.
8. Creating a stream here means first subscribing to SmartCitizen's MQTT broker which emits events for all SmartCitizen devices.
9. Once subscribed to the topic for the device, we then start receiving events emitted by the device approximately every 30 seconds.
10. The Stream Encoder is then responsible for applying any filtering or transformation operations to the data (the Data Transformer block in figure 6), and then encrypting this data using Zenroom (using the target dashboard's public key), and then writing it to the Encrypted Datastore. There is an ongoing discussion about the exact encryption algorithm to be used here, but this is the basic idea.
11. The BCNNow dashboard is then responsible for pulling data from the Encrypted Datastore on an independent schedule. This data is processed by the Data Collector / Decryptor component which also uses Zenroom to decrypt the data. The dashboard is able to do this as it already has the corresponding private key.
12. In order for a user to view the dashboard, they can then go to the BCNNow platform and request access to the dashboard. The BCNNow dashboard will then generate a login validation request which is sent to the user's wallet.
13. If all is well, the wallet then validates the login and returns an attribute to the dashboard, which proves that the user has the right to access that dashboard.

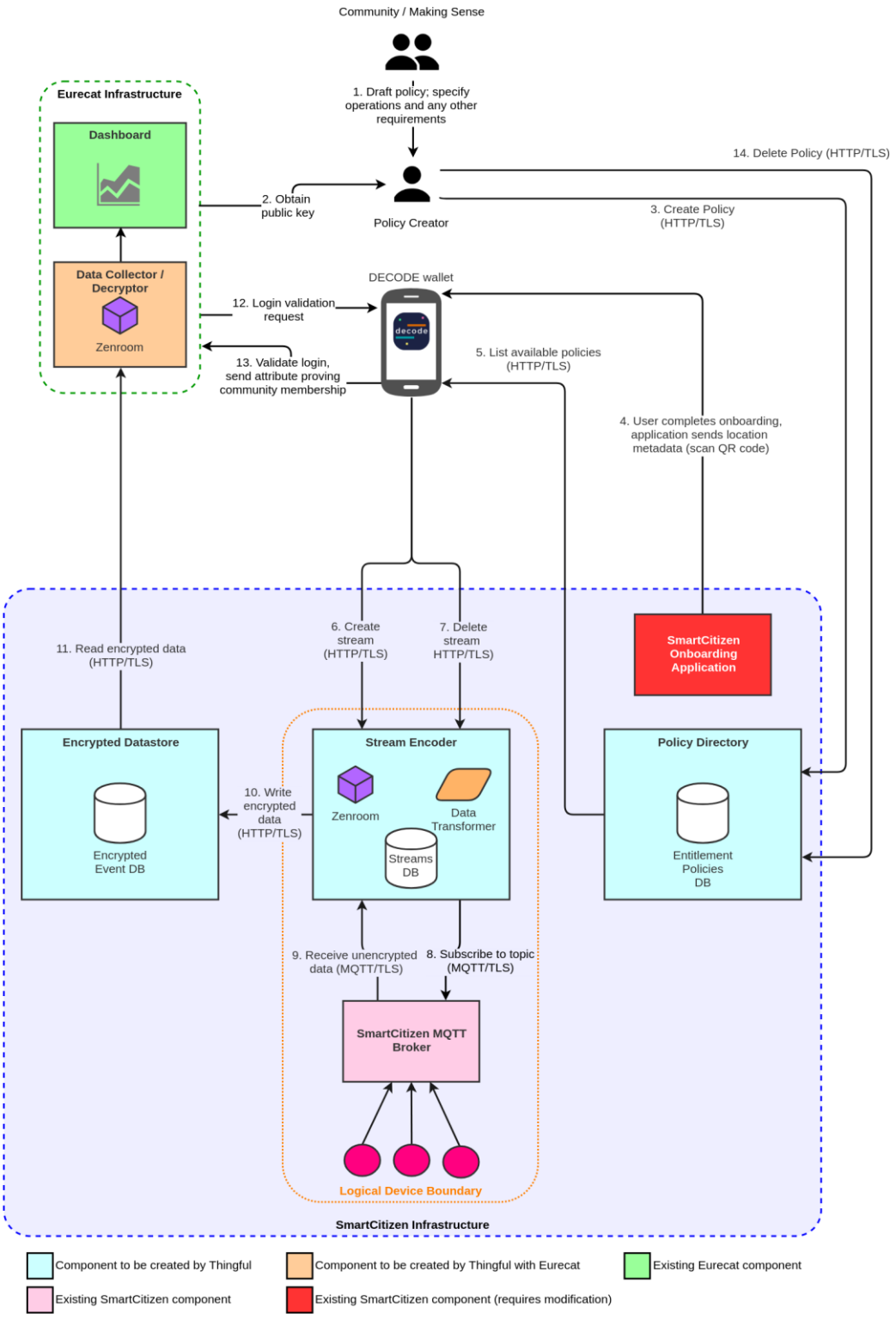


Figure 6 Preliminary plan of integration for the IoT pilot. A design by Thingful.

A schematic view of the scale model design is presented in figure 6. The system allows for an integration with the Chainspace ledger, yet, depending on time and scope constraints, this integration will be done within the scope of the project or left for future development if uptake is successful.

User engagement plan

Through the Citizen Science Data Governance pilot, we will join existing communities who have been involved in previous initiatives, such as Making Sense EU an H2020 project and TRIEM[12]. The connection of both communities is an opportunity to merge a group of citizen previously involved with IoT devices and decided upon data control and governance.

In order to take profit of the community expertise, advance in the citizen data control and create new tools that can deliver to society, we propose the following calendar:

1. Kick off DECODE pilot (October 18th)

   Introductory session to Decode Project and the Barcelona pilots

2. IoT and data governance pilot launch (November 8th)

   Workshop introduction and activity of awareness. Also, a presentation of key aspects (DECODE, IOT Technical and Legal Aspects)

3. Personal data awareness and entitlements (December 4th or 5th)

   Debates and co-creation activities around personal data, data sharing and privacy, where the communities consider their privacy preferences and deciding what data to share, who with, under which conditions and for what purpose. The goal will be co-create the DECODE entitlement policies for the pilot

4. Technology onboarding (February 4th, 5th or 6th)

   Activities regarding DECODE onboarding, how to set up the DECODE wallet, how to use it, access to the BCN NOW tool through the wallet, and introductory session on the new SCK 2.0.

5. Data gathering campaign (From February to April 2019)

   Data gathering campaign from "Technology onboarding" session until April 2019.

6. Data awareness and action planning (March 12th, 13th or 14th)

[12] https://www.ideasforchange.com/triem/

Activities on data visualization an exploration with BCNNow tool and how engage participants with the generated data and co-design the final action.

7. Final action and wrap up (April - May)

   Final event, feedback session and next steps for the pilot community.

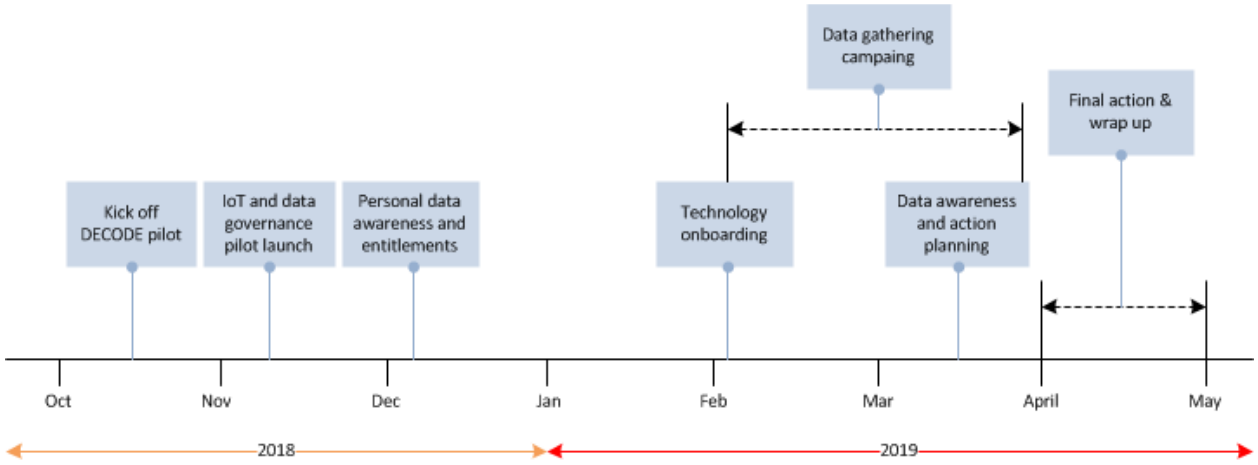


Figure 7 User engagement calendar - Citizen Science Data Governance pilot

Digital Democracy and Data Commons pilot

This pilot is developed in collaboration with the team behind the participatory democracy portal of the city of Barcelona, decidim.barcelona[13]. While this architecture depends on the Barcelona City Council, its governance schema is diverse, horizontal and complex. The pilot integration depends on the decidim tech lead by ALABS[14].

The main incentive for the pilot partner to participate is to allow them to tackle a recurring problem they expressed throughout the inception process: The constant tension in the relation between transparency, accountability and privacy with regards to the use of data in democratic processes. Being DECIDIM a platform for political participation, their managers do not want to be able to recognize the identity of the participants and their opinions, expressed in the form of supports to initiatives. To that end, they never store participant personal details. However, at the same time, they would like that the participatory online processes being held in the platform obtain legally binding status and also confidence among their user base, and for that a degree of transparency and accountability is needed. Last but not least, they want to leverage the potential of the data involved in the participatory processes to know better their user base demographics and at the same time map city problems.

The pilot tackles the challenges described above while adding value to a platform which currently is used by more than 60.000 users and which has been spread to dozens of cities near Barcelona and beyond the Spanish boundaries as well.

The complete set of details, objectives and technopolitical implications of this pilot has been discussed in the deliverable D2.5 and have been already briefly introduced in the preceding section. In short, two main objectives have been set:

1. The technological objective is to test DECODE PETs technology including Zenroom, Chainspace, Tor-dam[15] network, the DECODE wallet, the distributed decodeOS[16] running on custom arduino hardware and the Coconut[17] attribute based credential scheme.
2. The social objective is to gather a relevant set of experts, activists and citizens to start shaping and defining what a City Data Commons should look like. To

[13] http://decidim.barcelona
[14] https://alabs.org/
[15] https://github.com/DECODEproject/tor-dam
[16] https://decodeos.dyne.org/
[17] https://arxiv.org/abs/1802.07344

that end, they shall use a mix of in-person meetings and the participation through the DECODE-Decidim system, also known DDDC platform[18] for supporting initiatives while maintaining user privacy. At the same time allowing for crowd-sourcing of aggregated demographics of users that will be later visualized in the BCNNow tool.

Technical infrastructure

By using our PETs distributed ledger, Chainspace, and elliptic curve encryption schemes in a simple and intuitive way via Zenroom, the users can privately support initiatives of their choosing validating against a Zero-knowledge attribute based credential scheme, Coconut, that entails them to support initiatives once and revoke their votes.

At the same time, by the use of the DECODE Wallet, they can optionally and fully consciously disclose part of their personal details and aggregate them to the final petition counts. In all this process, the infrastructure handlers do not hold any information on user private choices nor their identities.

A schematic design of the technical integration is shown below, yet its final details will be left for the final deliverable D5.11 "Final report on the Barcelona Pilot".

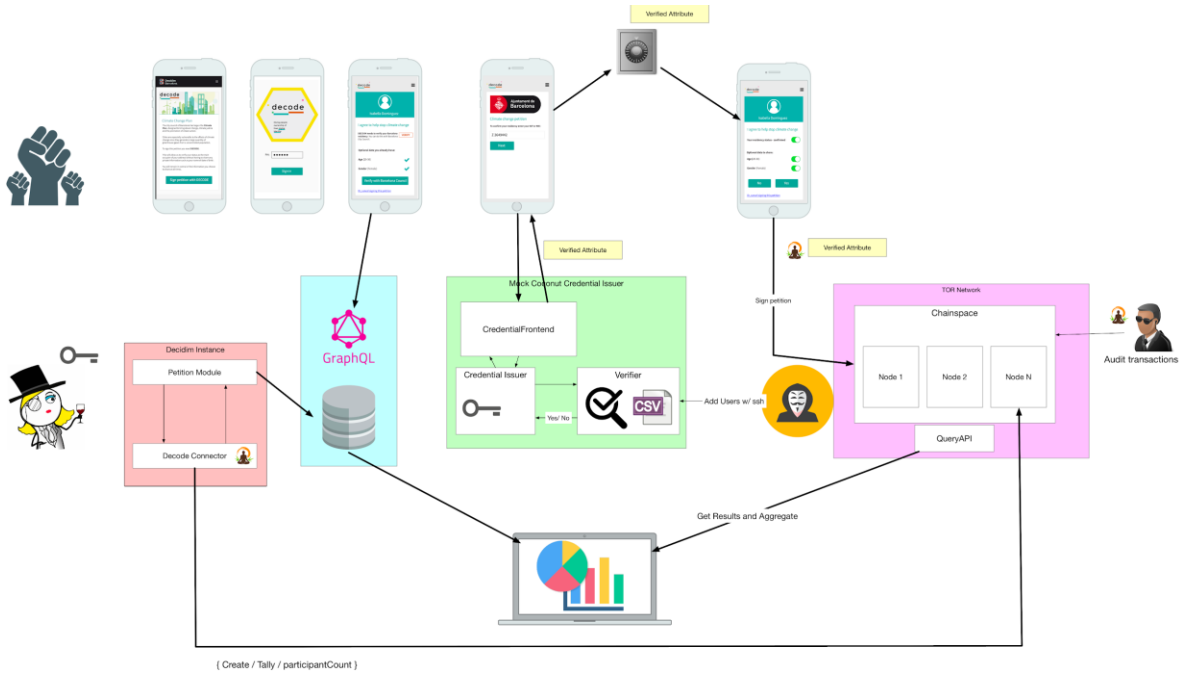


Figure 8 Preliminary integration plan for the Digital Democracy and Data Commons pilot.

[18] https://dddc.decodeproject.eu, participatory process which allows signing digital petitions in a secure, private, transparent and data enriched way; to deliberate on data regulation, policy and economy; and, finally, to build an experimental data commons.

Following is a brief description of how the components come together to realise this value proposition:

1. A user chooses to participate in a petition on the DDDC website, which is available only to verified participants
2. The user is directed to the app. If a verified id attribute is not found in the app, the user is directed to an external credential issuer. After checking the user's id status, a signed attribute is loaded into the app, while no data is shared with DDDC.
3. The user then sees an overview of the petition and which data is being requested. The user can choose to share optional anonymized data such as age range and neighborhood of residence. The user can sign with a secured Yes or No vote, thus preventing side-channel attacks which would expose the user's opinion.
4. When signing the petition, the selected attributes are cryptographically combined with the residency and a unique identifier related to the petition. This is submitted to the ledger as a transaction that can be verified by all nodes. The result is an updated count of votes that is fully encrypted and dissociated from the user's identity and device. There is no way to know which user voted and how they voted, but at the same time the cryptographic validations ensure that only verified residents have voted and each vote is valid within the parameters of the petition (i.e. one single Yes/No vote, no double votes, etc.).
5. During this process, no data is actually shared with Decidim. Petition results are decrypted only when the petition is closed by the administrator. At that point, the aggregated, anonymised results can be viewed in the Barcelona Now dashboard. The dashboard draws data from both the Decidim open API, as well as directly auditable data from the ledger itself.

User engagement plan

The Digital Democracy and Data Commons pilot will work with communities and citizen, public sector, private sector and academic actors following a well know open innovation model. Based on these social actors, and in order to achieve the participatory process goals detailed in the DDDC website, has been developed a user engagement calendar.

Below it is showed a brief description of the social actors involved and the user engagement calendar, more detailed information can be found in the deliverable D2.5.

Social actors

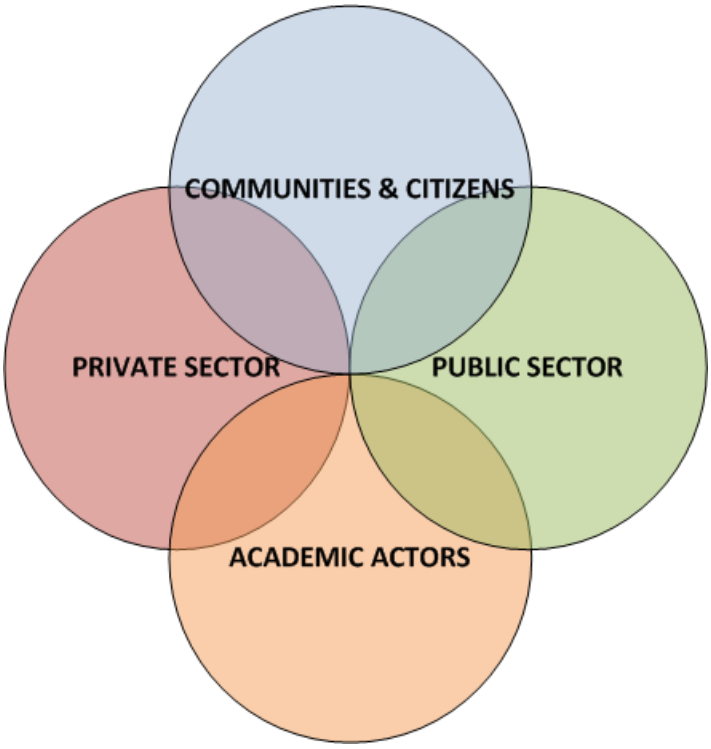


Figure 9 Social actors involved in Digital Democracy and Data Commons pilot

- Communities and citizen: Metadecidim community, Democratic Innovation community, Sharing economy, Decidim.barcelona community, barcelona citizens
- Public sector: Municipal Institute of Informatics, Barcelona Technology and Digital Innovation Office, Barcelona Data Office, Barcelona Participation Office, Directorate of Innovation in Democracy.
- Private sector: Ideasforchange, Smart IB[19], DRIBIA[20], ALABS[21], TW.
- Academic actors: UOC, POLITO, CNRS, EURECAT

[19] https://smart-ib.coop/
[20] http://www.dribia.com/
[21] https://alabs.org/

User engagement calendar

1. Pilot launch, survey and diagnostic (October 18th)
   Pilot presentation and diagnostic meeting with stakeholders as a part of the DECODE Symposium organized in Barcelona. This first session will be completed with a survey that will be launch to the Decidim community users.

2. Gathering of proposals and data (November 7st- November 30th)
   Through the pilot platform and a specific session will facilitate the gathering data and proposals. The meeting will be in the Sharing cities summit Barcelona in November 12th.

3. Debate and prioritization (December 1st - December 20th)
   Debates to support and comment the proposals will take place during the Smart City Expo in Barcelona, in the Democratic cities event and in the Metadecidim community session.

4. Elaboration of proposals (December 20th - February 15th)
   DECODE team will work weekly in the proposals. Additionally, a meet up will be run to exploit the data obtained in the process.

5. Participant feedback on the elaboration (February 15th - February 28th)
   The results will be published in the pilot platform and shared with the stakeholder in order to get feedback.

6. Review of participants feedback (February 28th - March 5th)
   DECODE team will analyse and process the participant feedback.

7. Final voting (March 5th - March 20th)
   A final voting based in the principles of the data commons governance will be performed.

8. Return to participants and final evaluation of the process (March 20th - April 1st)
   Final event that will include a session with the community, stakeholders, general public and press. Moreover the result will be published in the pilot platform https://dddc.decodeproject.eu and in the Dedicim.barcelona.

   Participant opinion will be required through a survey in order to evaluate the process. After that, the DECODE team will work in a final analysis and evaluation.

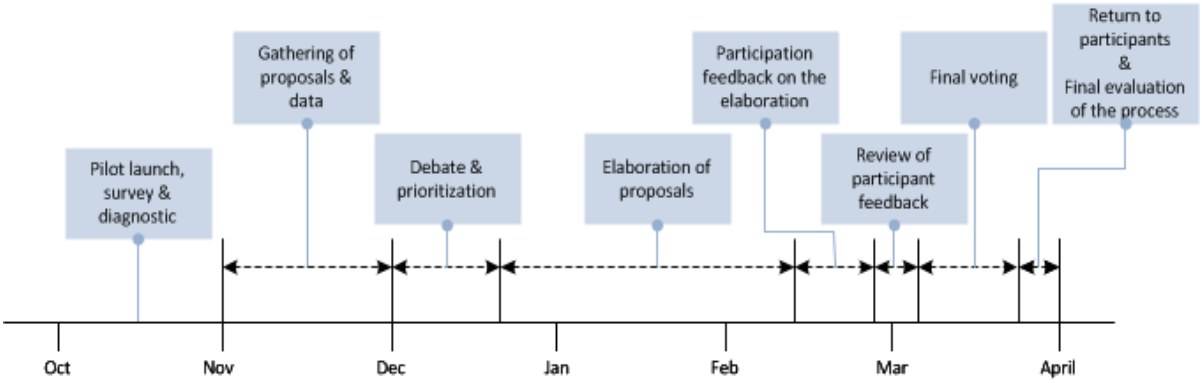


Figure 10 User engagement calendar - Distributed Democracy and Data Commons pilot

Launching the BCN pilots - Public phase

The DECODE data policies and Barcelona pilots were presented on October 18th in the Digital Cities and Digital Freedoms22 an event programmed by the City of Barcelona in collaboration with DSIscale and DECODE during the Barcelona Open City Biennale23.
The presentations were made through three different panels. The first panel was named "Distributed technologies for data sovereignty: DECODE Barcelona Pilots". The session was chaired by Oleguer Sagarra (DECODE Barcelona pilots technical coordinator) and the following speakers:

- Mara Balestrini (Ideas for change)
- Guillem Camprodon (Fab Lab Barcelona[24])
- Antonio Calleja (UOC)
- Guy Samuel (TW)
- Pablo Aragon (Eurecat)

Initially, the session was focused in making known DECODE goals and how they are going to be applied to both pilots in order to test DECODE's technology and approach. Both pilots were presented indicating their scope, how have been integrated with DECODE technology and how are going to address real-world problems with concrete calendars for working with city communities. Finally, the BCNNow platform was presented, which is the interface where citizens can explore data from the pilots in Barcelona, together with public data and make sense of them.

[22] http://digitalcities.flossbcn.org/
[23] https://www.biennalciutatoberta.barcelona/
[24] https://fablabbcn.org/

Figure 11 Barcelona pilots' kick-off

The second panel named "Blockchain for the social good" built on the DECODE project demonstration to show how it is possible to build wider European ecosystsems that use blockchains for social good. In the panel DECODE Project Officer Fabrizio Sestini spoke about the sustainability of such initiatives and what the EU is doing to foster innovation in this field through the Blockahin for Social Good EU Prize.

Figure 12 Blockchain for Social Good

Figure 13 Ethical Digital Standards and Data Commons in Cities

After the first two panels, the event hosted a policy panel that analyzed the policy impact of initiatives like DECODE that are putting in the digital addenda of cities and Member States the need to enable data sovereignty, implement ethical and transparent data management plans and introduce ethical digital standards. Project Coordinator Francesca Bria and Waag Founder Marleen Sticker took part in this panel, emphasizing the strong policy impact of projects like DECODE.

After the sessions above, a workshop for presenting in detail the DDDC pilot was performed. In this session, the results of the analysis of legal, economic and data governance models developed in the DECODE project will be presented and discussed. Likewise, a survey will be launched to know the sociodemographic composition and the visions on the digital economy of the people participating in the process.

Figure 14 DDDC workshop: pilot presentation and diagnosis

Conclusions

This short report provides an update on DECODE pilot development and deployment status in Barcelona. At the time of writing, one can consider that the pilots have been publicly launched and their *Engagement and Measurement phase* has started. To officially mark this milestone, an event in Barcelona was held involving key stakeholders interested in the pilots as well as the communities directly involved.

The present document summarizes the current status of each pilot, describing shortly the lessons learned in the process of developing them, and future steps to scale and make the pilots sustainable. It updates related deliverables and presents a comprehensive vision of the Barcelona pilots, including phases, relevant actors, scope, vision responsibilities as well as technical design.

This document sets the roadmap for the development of the final phases of the DECODE Barcelona pilots, yet, its full deployment will depend on a variety of factors (technological, legal and sociological), given we enter a stage of uncharted territory. In particular, we will now begin:

- the integration with pilot partners' technology (last mile deployment)
- to test user adoption and feedback,
- to collect metrics to test the success of the goals of the project.
- to define datasets licenses
- the scale up of a brand new technology, that has not yet been tested at this level before.

Therefore, the full completion of the project scope will be mainly but not only dependent on the ability of the partners to overcome any unexpected challenges that may arise, in particular in the interaction of governance, technology and social dynamics. Up to now, the work has been delivered in line with the development Roadmap, and the work done by all the partners inside and outside of the consortium alike has been outstanding up to the present date. However, we want to emphasize that pilot deployment should be considered as a starting point of the project's phase two and not as the end of the road. It is now where practical, complex and interdisciplinary challenges begin, with real users from existing active communities, and those will need prompt and efficient solutions.

With the realization of the pilots, the main objectives of work package 5 are being realized, and the links between the different DECODE project streams of work further strengthened. This close collaboration is only expected increase, especially with regards to WP2 and WP6 on the user engagement, governance framework of data commons, and the measurement of impact and sustainability phase.

Last but not least, the realization of the pilots and the interest they have raised are yet another sign of the relevance and ambition of the objectives that the DECODE project aims to achieve. The DECODE pilots are thus a real proof that these aims and goals that can shape a more inclusive and democratic digital society that puts citizens' rights at the center are today a step closer than they were at the beginning of this journey.