



# DEcentralised Citizens Owned Data Ecosystem:

Data sovereignty for citizens

**decode**

MyData 2017 - Helsinki

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Barcelona CTIO,  
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**DECODE in a  
nutshell...**

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# What is DECODE?

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- DECODE provides tools that put individuals in control of whether they keep their personal information private or share it for the common good
- DECODE will be a free and open source ecosystem of tools, validated in real life context
- EU– H2020 - CAPS call flagship project (5 ML)
- 3 years (Jan. 2017-Jan. 2020)

**[decodeproject.eu](http://decodeproject.eu)**





**Preserve the digital  
sovereignty of European  
citizens**

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# Who is DECODE?



14 partners, 6 countries (ES, NL, UK, FR, IT, SW)





# Data commons vs data extractivism

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# Why DECODE?

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## Current paradigm

- Data is a **fictitious commodity**, that can be sold and traded in markets
- Data handling & monetization is **opaque**
- Even if there is regulation, there is **no possible enforcement**
- We produce the data, *they* own it
- Benefits of data *sharing* are privatized (“surveillance capitalism”)

## Intended paradigm

- Data is a **common resource & infrastructure** where to build upon (new services)
- Data handling and usage is **transparent & privacy-friendly**
- Data is shared according to rules set by **common** (enforceable) **governance**
- Shared benefits of data sharing
- New political, economic, and legal regime that recognize **social and communal rights to data**

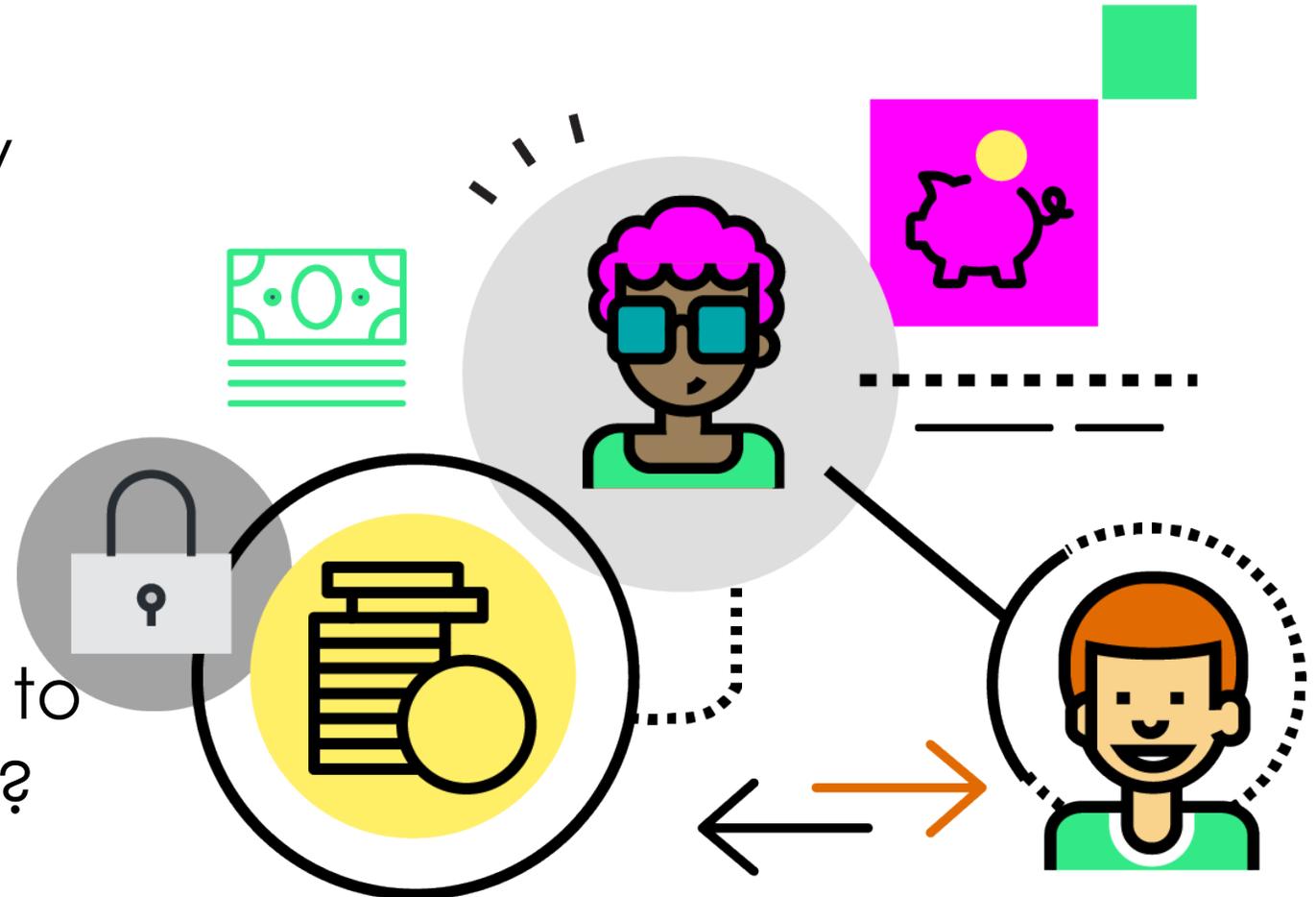
# Where is DECODE relevant? (1/n)



## Sharing Economies... ?!

but with whom are we really sharing our needs and desires?

Can we build platform cooperatives & alternatives to current predatory platforms?



# Where is DECODE relevant? (2/n)



## Internet of Things...

communicating on our behalf...

but who are they speaking with and about what?

Can we have data entitlements for the IoT?



# Where is DECODE relevant? (3/n)

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One can **detect issues** and collaboratively **solve** them!

One can **decide in a democratic way** based on trust

but if data is a monopoly of a few, **collective intelligence** is lost...



# Challenge: Enabling the Data Commons

Can we **regain control** of our data?

We want to decide **who** to share it with, under which **rules**, **when** and for **what** purpose?

In short: Real **data sovereignty**

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# DECODE ARCHITECTURE

## Blockchain technology

Trust and security, distributed data and identity management

## Open standardization

Data portability, Blockchains, Smart contracts, IoT

### 7. Services and Applications; User Interactions and interfaces

+SOTA.4 Formal language for the management of data access and privacy (smart rules)

### 6. Data Application

+SOTA.3 Attribute-based cryptographic identification system based on blockchain technology

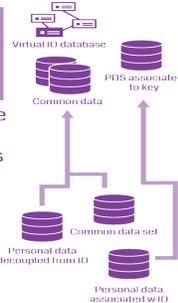
### 5. Data Abstraction

+SOTA.2 Salable Distributed Ledgers  
+SOTA.5b IoT semantic ontology

DECODE NODE

### 4. Data Gathering and Distribution

+SOTA.1 Fully Distributed architecture for data management  
+SOTA.5b Recommendation systems



### 3. Edge Computing

+SOTA.5a Decentralized data access  
+SOTA.6a Privacy-preserving, discrimination-aware data mining

DECODE OS

### 2. Connectivity

Secure operating system with SOTA p2p networking and network awareness



### 1. Physical Devices

Open hardware specification for "maker" technology



DECODE HUB

Executable smart rules

## Legal regulatory policy

Compliance with privacy regulations and digital rights.

Integrated approach (social, legal, economic, technical)  
Formalized by smart rules that represent social contracts and rights

## Economic regulatory policy

Antitrust and market regulations, development policy.

## Democratic participation

Distributed digital rights (smart rules that manage privacy data access)  
Education and awareness

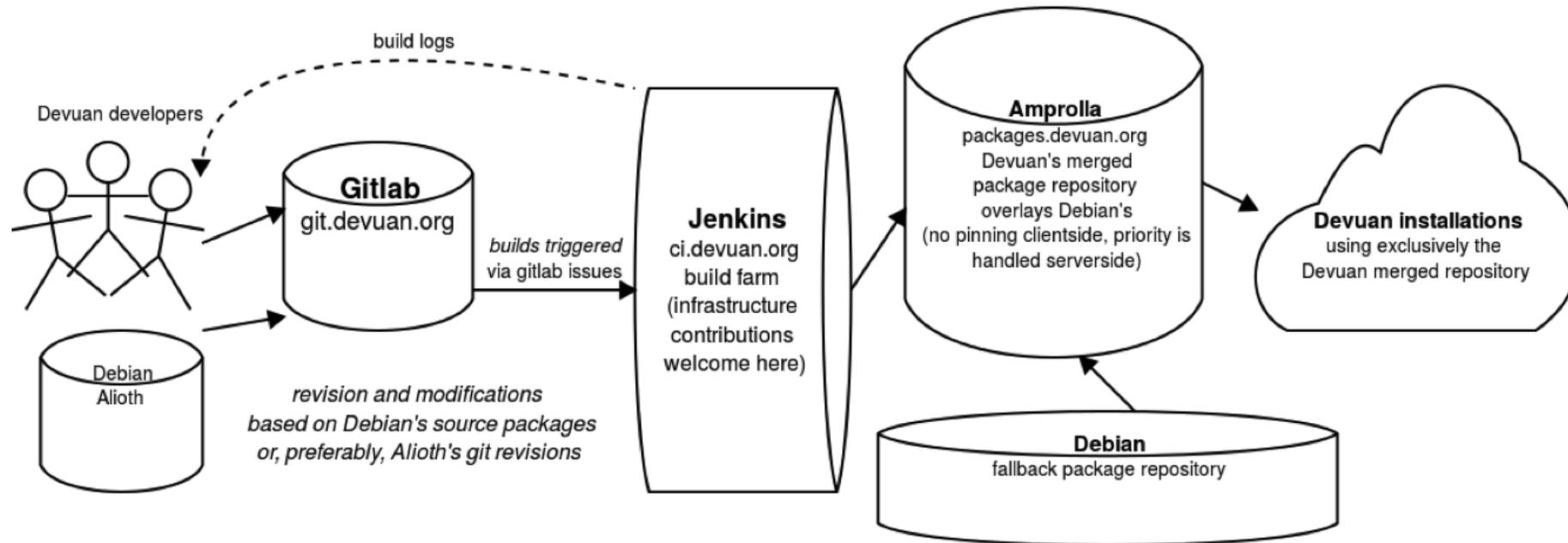
# DECODE OS

A GNU/Linux operating system for smart rule applications



# DEVUAN

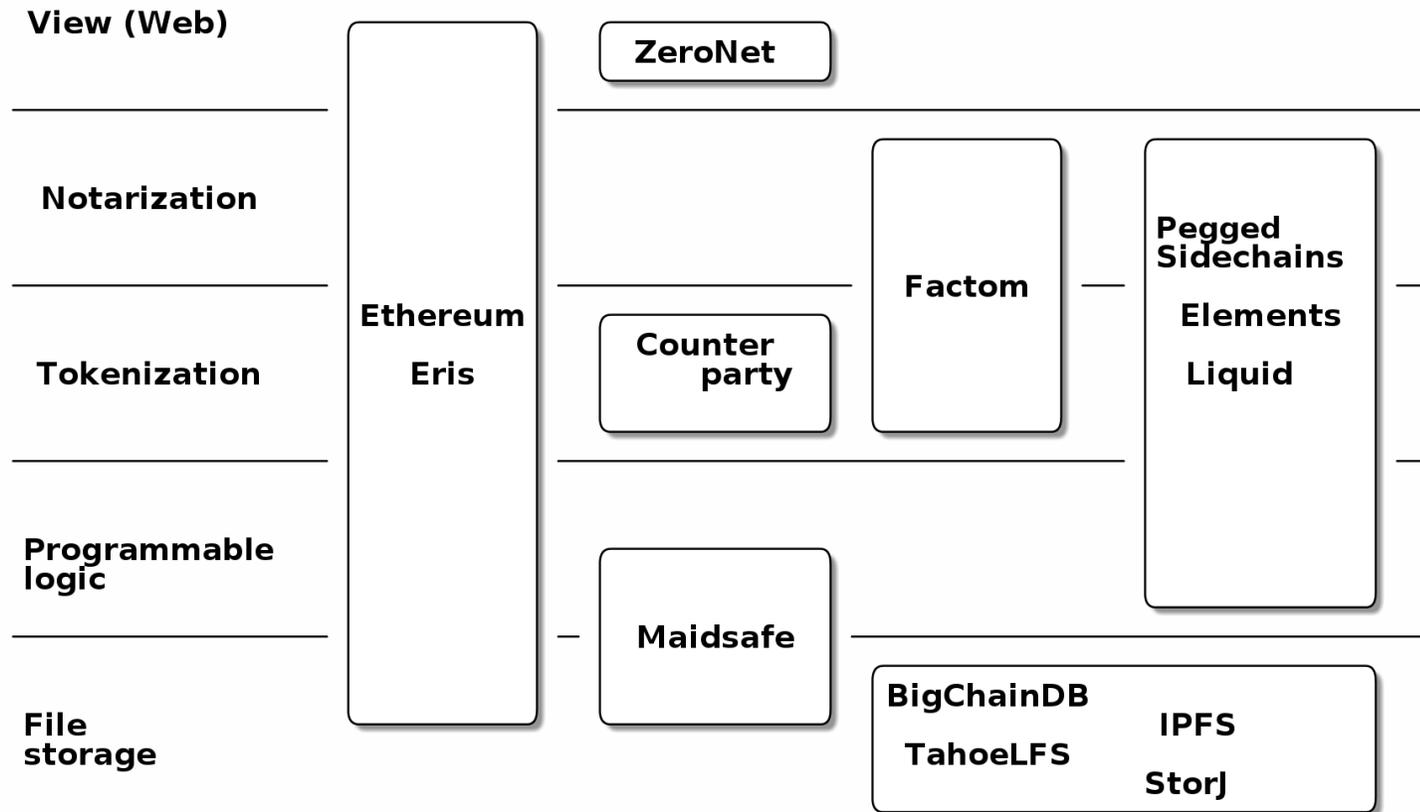
Continuous Integration for Devuan



# DECODE Neutral distributed ledger



Blockchain based tech, functionality graph



# DECODE

## Main Goals

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- Allow *participants* to manage access to their *private data*, by granting and revoke access to parts
- Allow *operators* to write *smart contracts* sign them and get the authorisation to run them on DECODE
- Allow *smart contracts* to access *private data* based on *entitlements* and *matched attributes*
- Allow everyone to record *entitlements* on a *distributed ledger* whose integrity is resilient and verifiable



# A New Social Pact on Data

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# 3 main challenges of DECODE

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## Technical

- Distributed data storage architecture
- Fully transparent and secure
- Portable / open standard
- Free & Open source



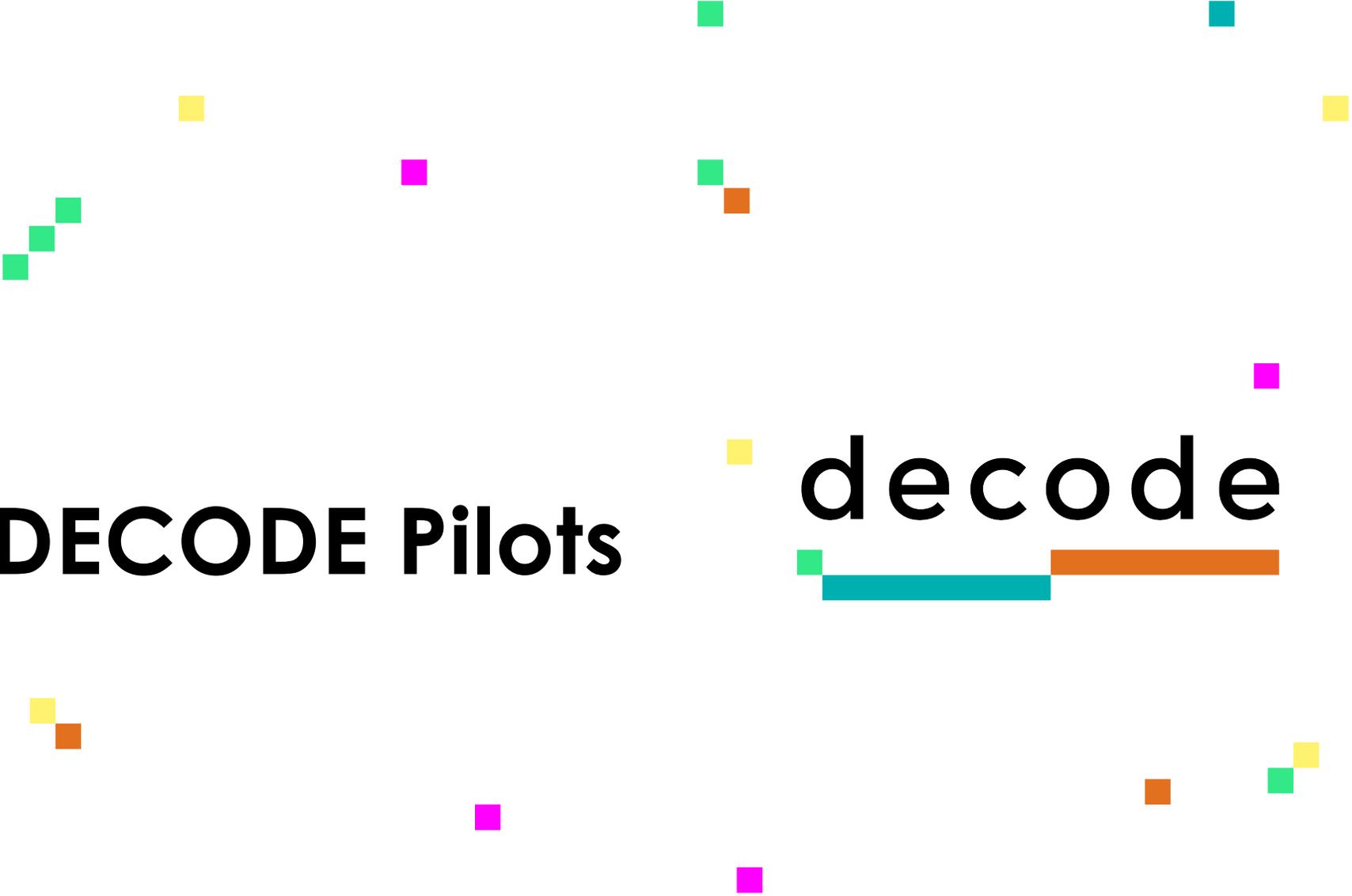
## Socio-economic & political

- New paradigm: Incentives
- Legal & economic implications of sharing data
- Who does the data belong to/ Governance
- Social & political awareness
- Fair non –predatory economic models



## Mass adoption

- Good use cases
- UX
- Make it work & scale
- Will communities find it relevant & adopt it?



# DECODE Pilots

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# DECODE Pilots

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## 4 pilots

### ■ 2 AMSTERDAM:

Localized social networks + FairBnB

### ■ 2 BARCELONA:

Participatory democracy + IoT citizen sensing

# Methodology (I)



## ■ “Discovery”: AGILE INCEPTIONS -CO-CREATION WORKSHOPS

... provide a practical example that shows how the new proposed technological architecture, legal framework and smart sharing rules can be used to solve an existing problem, while raising awareness on the general problem of data exploitation/privacy/ownership and proposing a (genuinely) different type of approach that the already existing ones.

Community  
engagement  
+ Real Needs  
+ Feasibility



# Methodology (II)



- “Inception”:  
Co-design  
with  
community



Elevator pitch + Personas + User journeys + Tech sessions + RAID analysis

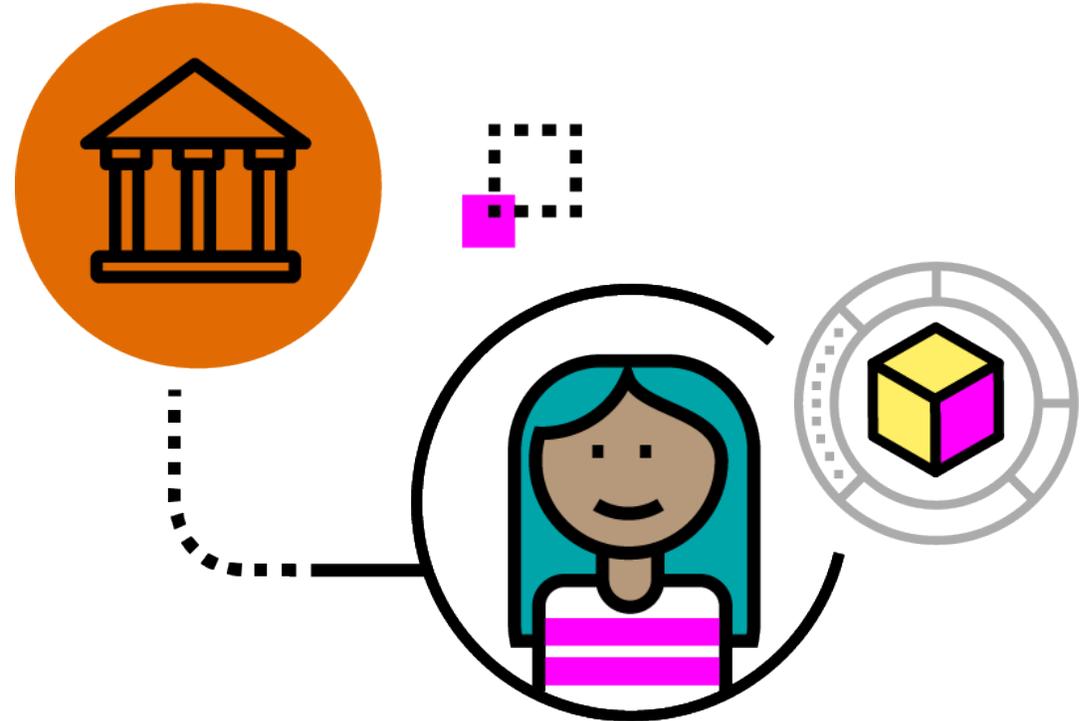
# BCN data-driven participatory democracy: Digital + BCNow!



**decidim.barcelona**

- Accountability on signing petitions & online voting, yet privacy on political beliefs
- Detection of city problems
- Provide tools to users with similar interests to interact
- Participatory budgeting

- Open source platform for participatory democracy  
+30k users



# Personalised data commons dashboard



Visualize personalized & relevant citizen interests

merging public data + data from the commons + personal interests to find/be found by similar profiles while ensuring privacy



# BCN: IoT/citizen sensing Data community rights

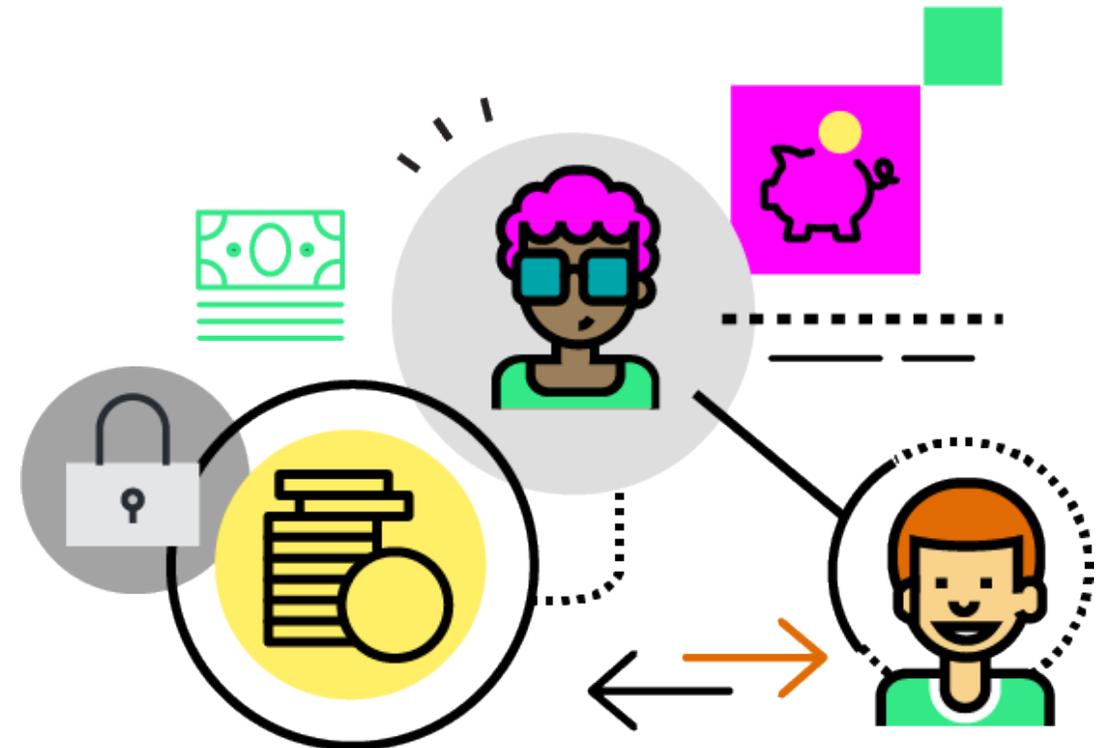


[smartcitizen.me/makingsense](http://smartcitizen.me/makingsense)

- IoT data might be privacy-sensitive
- Crowd sensing of a problem with IoT in a community
- Users can decide to whom and under which conditions they share data



**Making Sense**  
Advances and experiments  
in participatory sensing



# AMS: Local and social networks



 **Nextdoor** The private social network for your neighborhood.

[Sign in](#)

Discover your neighborhood.

Over 146,000 neighborhoods across the country use Nextdoor

Enter your street address

Apt

Enter your email address

[Find your neighborhood](#)

# AMS: Local social networks



## gebiedonline.nl

- Crowd certification that someone is a neighbor
- P2P Trust system transparent and auditable

Allow for neighborhood interaction platform that doesn't exploit data for the economic interest of the few:  
**shared value for the many**

- One platform per neighborhood (~20k distributed users)



# Cooperative & fair hospitality platform

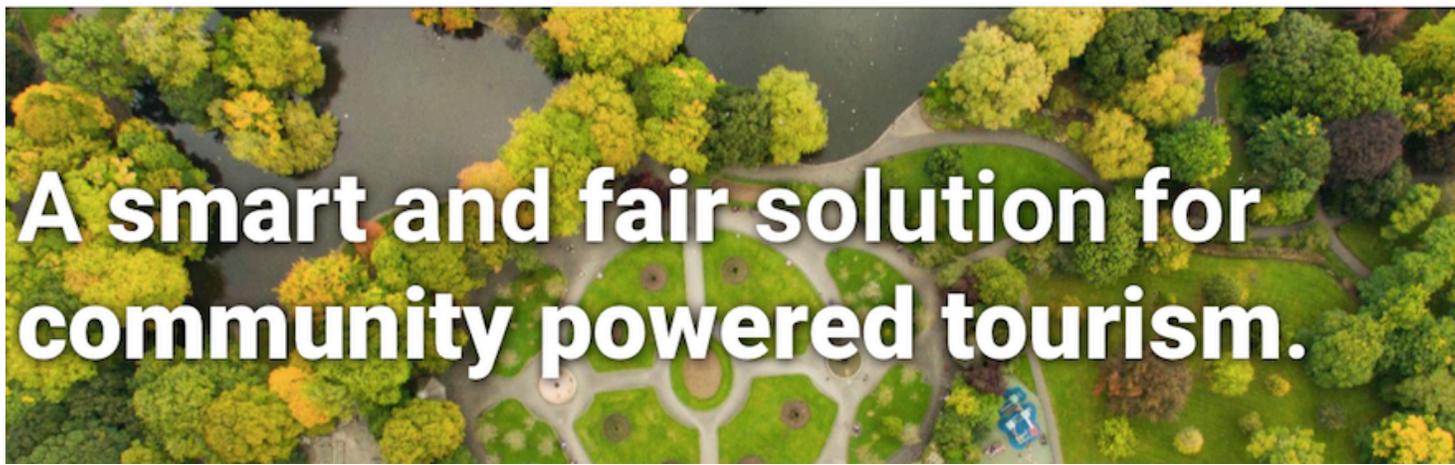


A verified, anonymous short-stay rental register. By only revealing the relevant attributes: (1) I live in the house that I let (2) I have not rented it out for more than 60 days.

Return benefits to community to mitigate effects of tourism.



[read our manifesto](#) [our network](#) [keep updated](#) [get in touch](#) [English](#) ▾



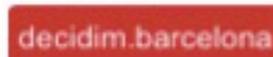
**A smart and fair solution for  
community powered tourism.**

# DECODE implementation strategy

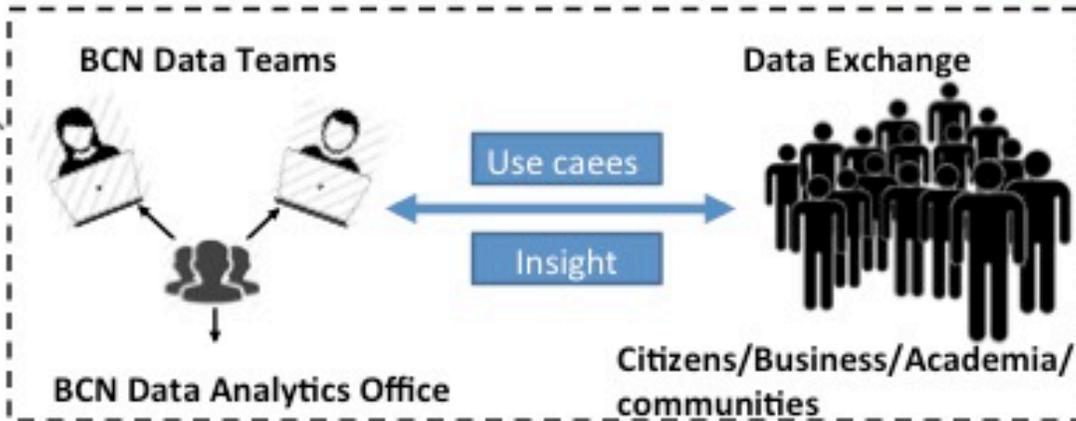
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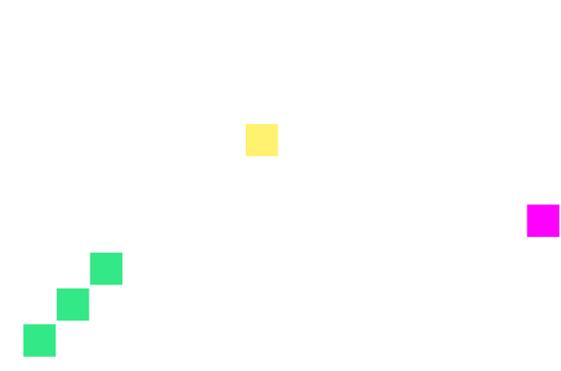
## BCN DATA COMMONS

BCN Agencies



## Barcelona Data Driven City

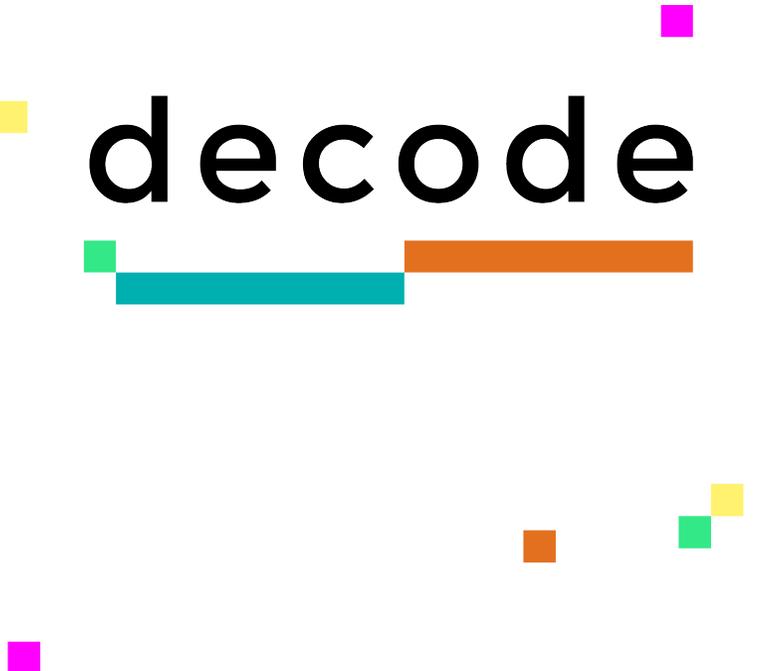




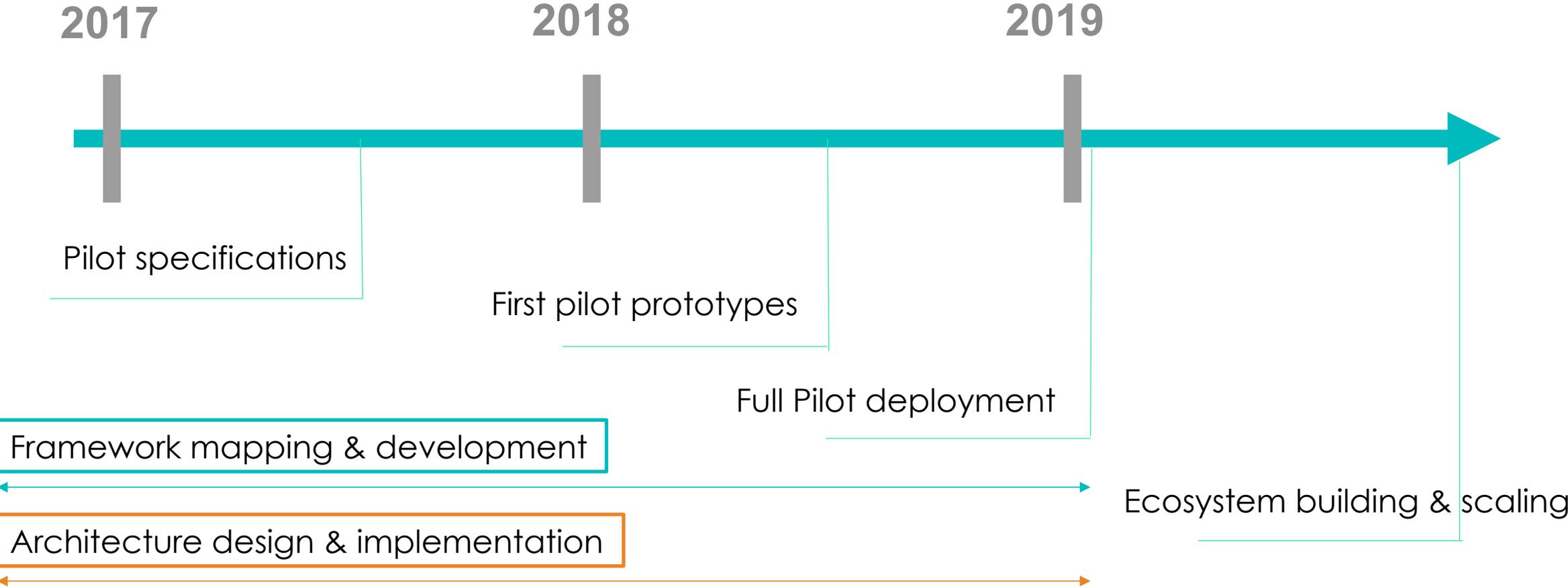
**What's next?**



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# Calendar: Join decode!



Contact us!

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[www.decodeproject.eu](http://www.decodeproject.eu)

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