



Data-Driven Policymaking Week *#2 Urban policy making through analysis of crowdsourced data*

Marieke Willems (Trust-IT)

27 April 2021





Policy Cloud
Cloud for Data-Driven Policy Management

Urban Environment



Speakers



Marieke Willems

Project Manager Trust-IT Services



Ana D. Georgieva

Innovative Sofia, Sofia Municipality



Petya Bozhkova

Operative Director, OKYS



Liliana Carrillo

Founding Director at CollectiveUP and
Co-founding Director at the European
Digital Development Alliance (EDDA)

Policy Cloud

// The European Cloud for data-driven policy management will provide integrated reusable models and analytical tools, turning raw data into valuable and actionable knowledge towards efficient policymaking.



Duration: 36 months

Jan 2020 - Dec 2022



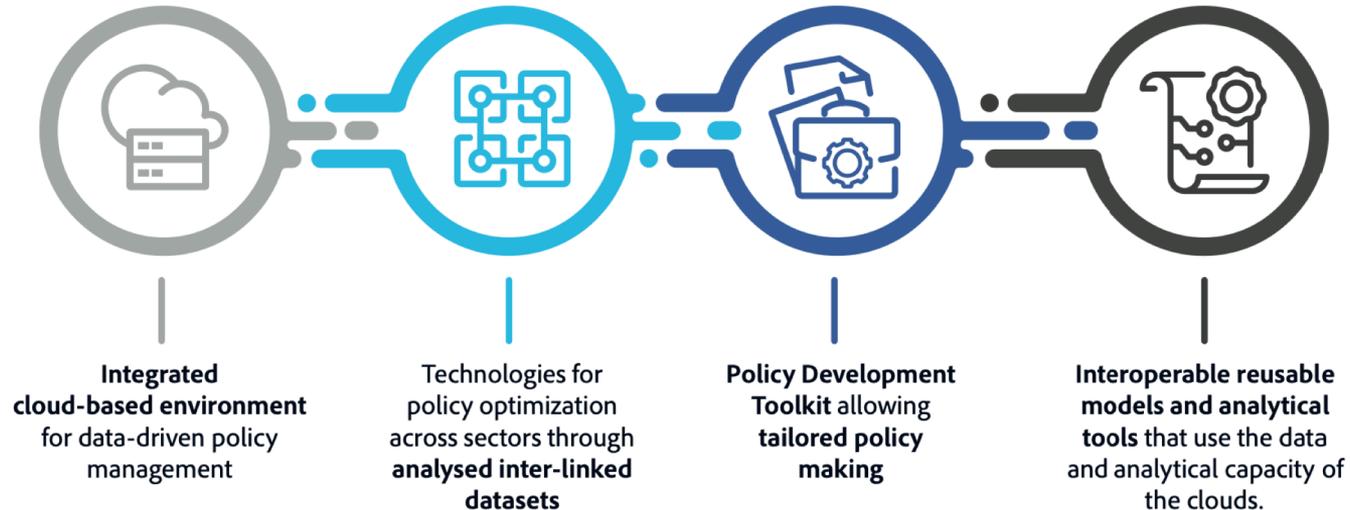
Budget: € 5.140.590



Partners: 15



Policy Cloud will deliver



Pilot Cases covering different societal challenges



URBAN POLICY MAKING

Facilitating urban policy making and monitoring through the analysis of crowdsourced data.

BULGARIA



INTELLIGENT POLICIES FOR THE FOOD VALUE CHAIN

Implementing environmental policies to boost the growth and development of the agri-food industry.

SPAIN



OPEN DATA POLICIES FOR CITIZENS

Predicting unemployment and associated risks to guide social services policy planning.

UK



POLICIES AGAINST RADICALISATION

Collecting and analysing social media data to enable policy makers to address radicalisation effectively.

ITALY

Policies Against Radicalisation



📅 26/04
🕒 14.00-15.00

Urban Policy Making Through Analysis of Crowdsourced Data



📅 27/04
🕒 14.00-15.00

Intelligent Policies for the Food Value Chain



📅 28/04
🕒 14.00-15.00

Open Data Policies for Citizens



📅 29/04
🕒 14.00-15.00



Policy Cloud
Cloud for Data-Driven Policy Management

Webinar

 27/04  14.00-15.00



 Data Driven
Policymaking:
**Urban Policy Making
Through Analysis of
Crowdsourced Data**

Agenda

- // Introduction & poll – **Marieke Willems** (Trust-IT)
- // The policy challenge: Urban policy making through analysis of crowdsourced data – **Ana D. Georgieva** (Sofia Municipality)
- // The Policy Cloud solution - **Petya Bozhkova** (OKYS)
- // The bigger picture – **Liliana Carrillo** (Founding Director at CollectiveUP, Co-founding Director at the European Digital Development Alliance (EDDA) and Policy Cloud ICB member)
- // Q&A





Sofia's Pilot Use Case:

Urban Policy Making Through Analysis of Crowdsourced Data

Ana D. Georgieva
Innovative Sofia, Sofia Municipality



The Context: Sofia Municipality

- ⚡ Sofia is the **capital** of Bulgaria and the biggest political, tech, administrative, cultural and educational centre in the country
- ⚡ **14th** largest city in the EU
- ⚡ Population: **≈1,8 million** inhabitants
- ⚡ Sofia Municipality is constantly working to **improve the urban environment** and meet the challenges that the city is facing
- ⚡ **Evidence-based policy making** is crucial for addressing urban challenges in a cost-efficient way



Scope

- ⚡ Through its involvement in PolicyCloud, Sofia Municipality will address **urban policy** as a **critical success factor** in improving the overall urban environment of the city.
- ⚡ Policy design will be adapted through assessment and validation of policies and initiatives, based on big data analysis related to:
 - ⚡ a) road infrastructure
 - ⚡ b) environment and air quality
 - ⚡ c) waste collection and waste disposal
 - ⚡ d) transport and parking
 - ⚡ e) cleanliness of public spaces;
 - ⚡ f) violation of public order, and others, of importance to citizens



What is the Purpose?

- ⚡ Support Sofia Municipality's policy making in important areas
- ⚡ Improve operational efficiency, transparency, decision-making
- ⚡ Utilize visualization to support policy makers to identify issues, trends, and policy effects and interactions
- ⚡ Validate existing policies and assess potential policies and initiatives in focus areas
- ⚡ More effective and efficient use of resources



Data

In designing policy, we will combine the data from both existing sources and from new open data sets that become available. The existing data sources are:

// Sofia Municipality's Citizens' Contact Centre

- // operational since 2014
- // facilitating direct communication from citizens, industry and institutions wanting to signal non-urgent deviations from normal practice within the urban environment

// Sofia Municipality's Air Things Platform

- // air quality monitoring system
- // fostering resource efficiency and climate change resilience through community based Air Quality IoT



Data

- ⚡ All scenarios will use data from SofiaCall, with **SC b)** Environment and air quality also using data from Airthings
- ⚡ Scenarios a), c), d), e), f) utilize data with similar attributes, variables and KPIs and will have similar end-to-end structure
 - ⚡ **SC b)** would add an additional type and source of data, and can include cross analysis of data sources
- ⚡ Analysing the data by category, type, territory and time will enable municipal and district administrations to identify problems, issues, and behaviour trends



Main Challenges and Success Indicators

⚡ Main challenges the project addresses:

- ⚡ Evidence-based policy making
- ⚡ Providing meaningful structured results from unstructured data
- ⚡ Ethical approach to data use

⚡ Success indicators:

- ⚡ # of policies tested
- ⚡ Results taken in consideration in city planning



Scenario 1: Road Infrastructure

- ⚡ **Road infrastructure** (with adjacent urban environment) is among the key and most budget consuming elements affecting citizens' everyday life.
- ⚡ Sofia Municipality will be able to carry out a **detailed analysis** of the territorial distribution of the signals by categories / types, areas, districts, major transport roads, etc.
- ⚡ **The results of the analysis will allow the municipal and district administrations to:**
 - ⚡ identify the problems in the road infrastructure and adjacent urban environment
 - ⚡ adopt or modify adequate policy making decisions, incl. on budget planning and effective use of budget and public resources
 - ⚡ facilitate better control, monitoring and prevention
 - ⚡ identify tendencies



Scenario 2: Air Quality and Environment

- ⚡ **Air quality**, as part of the overall focus on environment and quality of life in Sofia, is also among the key urban topics affecting citizens' everyday life
- ⚡ Sofia Municipality will be able to carry out a **detailed analysis** based on signals from Call Sofia and Airthings on the air quality in different parts of Sofia
- ⚡ **The results of the analysis will allow the municipal and district administrations**
 - ⚡ identify problems related to air quality
 - ⚡ adopt/modify adequate policy making decisions and measures for the long-term improvement in the area of air quality
 - ⚡ facilitate better control, monitoring and prevention
 - ⚡ validate existing policies and investigate if there is a need to update/modify them or create new one based on the retrieved information



Urban Policy Making – an Ongoing Co-Creation Process





Sofia use-case: Urban policy making through analysis of crowdsourced data – technological aspects

Petya Bozhkova OKYS Ltd.



Sources of information –crowdsourced data- Contact centre

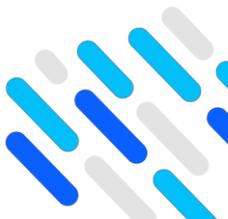
Many signals for irregularities in the urban environment and other spheres of public life are received daily by various departments of Sofia Municipality. In order to facilitate citizens and guests of Sofia, a single-entry point was successfully developed – the Contact centre – accessible by phone and website, where these signals can be received, processed, distributed to the relevant departments of the municipal administration, and as a result - answered to the sender.

In operation since the end of 2014 - <https://call.sofia.bg/>

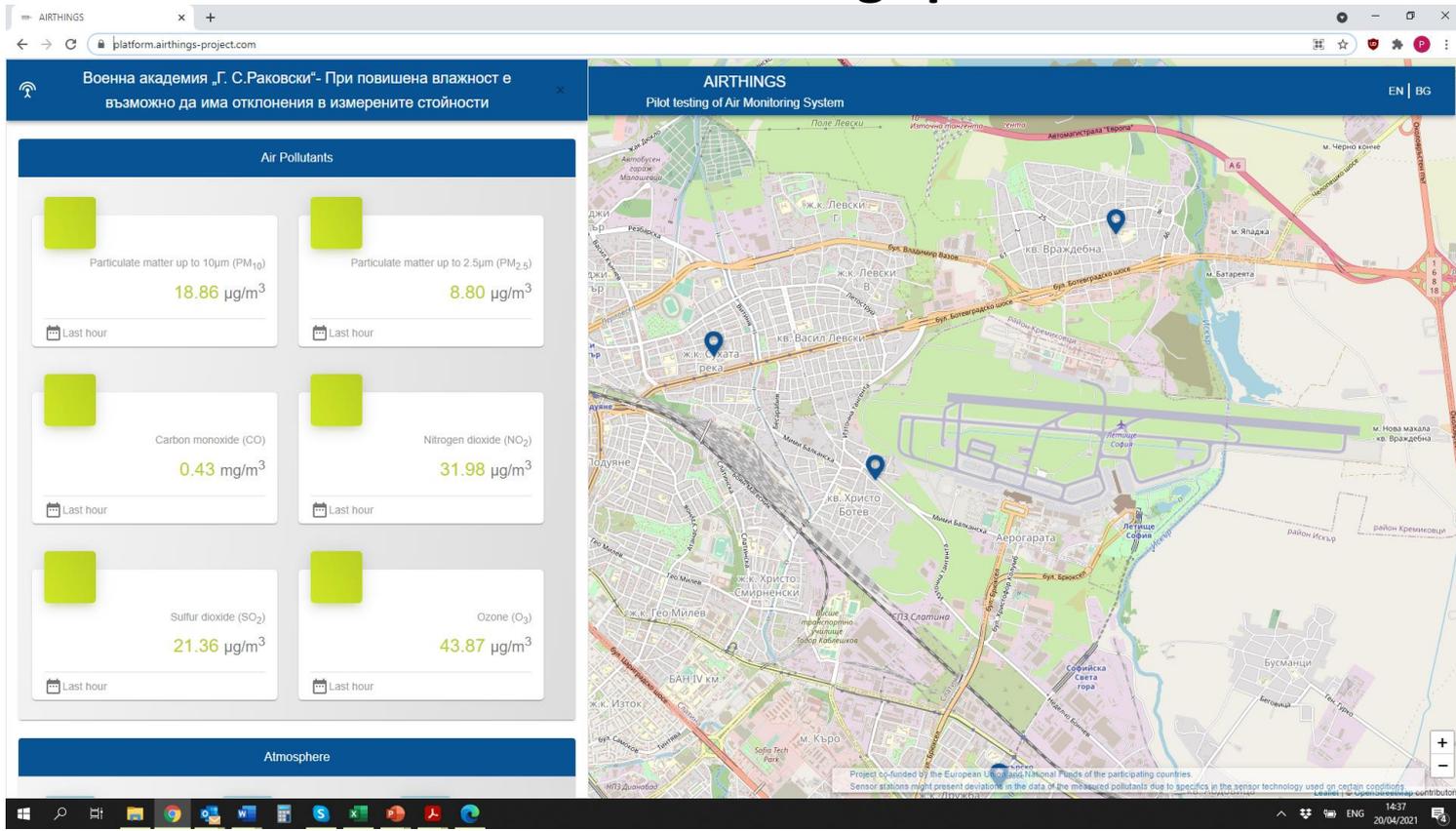
Above 300 000 signals in about 90 categories have been registered since the Contact centre is operational.

70 000 signals were registered for 2019.

Each signal is manually processed by the responsible officer.

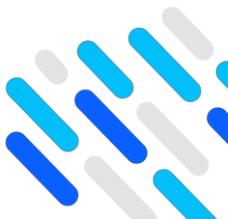


Sources of information –Airthings platform



Objectives of Sofia Municipality pilot

- ⚡ Use of crowdsourced data to find out repetitive problems and patterns
- ⚡ Extract, analyse and classify the data based on defined ontologies to create longstanding and sustainable solutions.
- ⚡ Design new policies/update existing ones to address problems, related to the urban environment
- ⚡ Create measurable KPIs and evaluate the impact of the (new) implemented policies



What are the benefits for Sofia Municipality?

- Powerful tool for policy modelling, simulation and improvement/re-modelling of existing policies
- Accurate analytical tool
- Large array of visualisations, giving the clear picture



Policy development toolkit

Automated tools enabling data manipulation, modelling, and visualisation



Reusable models & analytical tools

Technologies enabling opinion mining, and sentiment, social dynamics, and behavioral data analysis



Policies management framework

Decision tool enabling the integration of data collection, modelling and simulation technologies



Data marketplace

Repository of exploitable data and knowledge for policy making scenarios



Sofia use-case analyses

At the moment we are in the process of developing two of the scenarios:

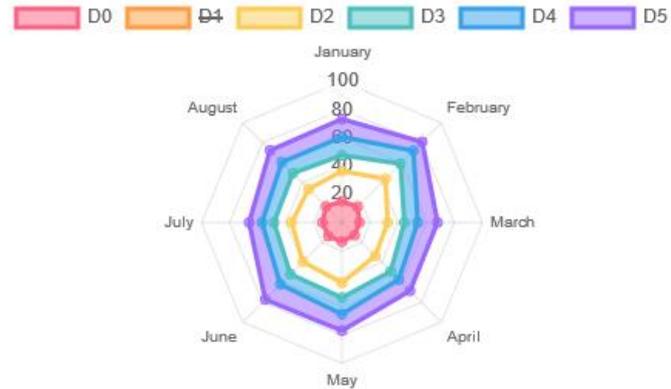
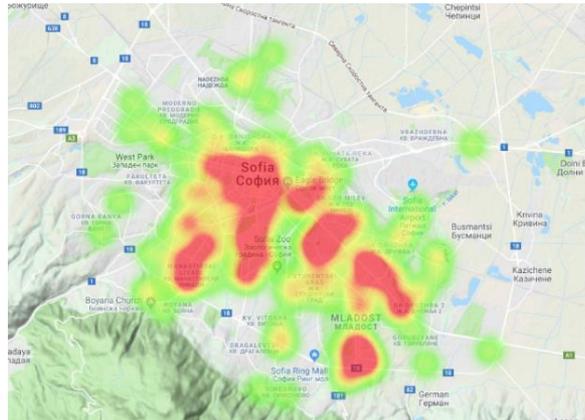
- ⚡ Road infrastructure
- ⚡ Air quality and environment

What will be analysed:

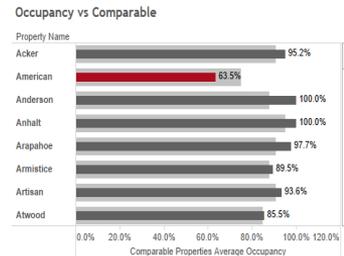
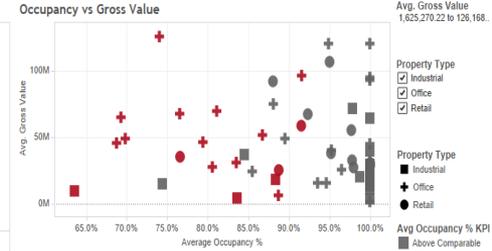
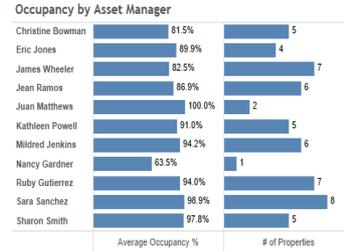
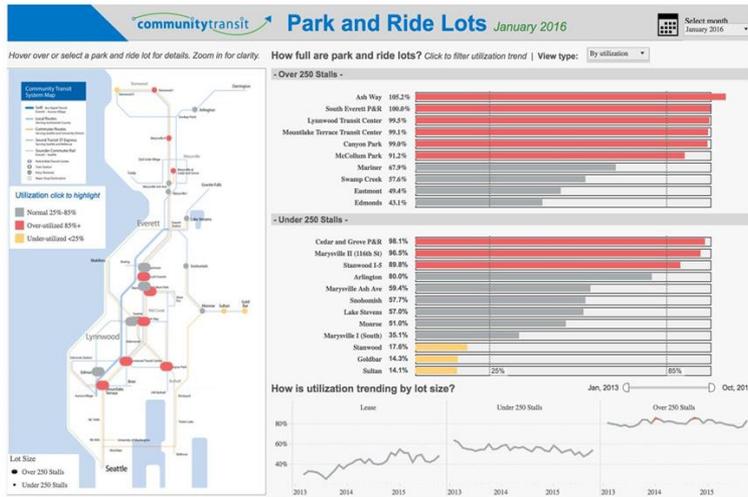
number of incidents/problems reported	change in frequency over the years
number of incidents/problems per year	annual percentage increase/decrease in number
number of incidents/problems per geographical location	cross-analysis of several criteria– e.g. per type and district and year;
number of incidents/problems per category per location	increase / decrease per type/ year/ district/ month
percent per type of incidents/problems	geographical spread per district/ per geo location
percent per month; percent per year	share of incidents per type / per month / per year, etc



Visualisation (example)



Visualisation (example)

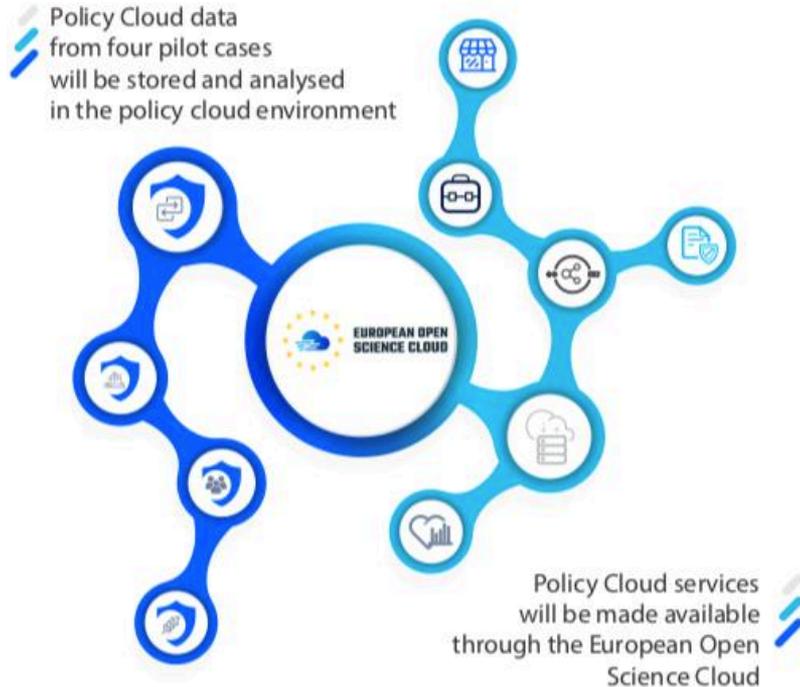


Property Details

Property Name	GLA Sq Ft	Occ. SqFt	Vacant Sq Ft	Occ. %	Comp. %
Acker	6,818	6,491	327	95.2%	91.0%
American	8,171	5,192	2,979	63.5%	75.0%
Anderson	36,192	36,192	0	100.0%	88.0%
Anhalt	15,998	15,998	0	100.0%	95.0%
Arapahoe	4,161	4,066	95	97.7%	91.0%
Armistice	2,351	2,104	247	89.5%	88.0%
Artisan	4,106	3,841	264	93.6%	91.0%
Atwood	6,699	5,727	972	85.5%	85.0%
Autumn Leaf	6,511	6,511	0	100.0%	91.0%
Bayside	3,653	3,050	603	83.5%	88.0%
Becker	6,935	6,352	582	91.6%	95.0%
Blaine	123,058	123,058	0	100.0%	90.0%



To sum up: what is Policy Cloud?



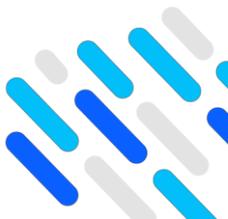
A cloud-based decision-support system that allows public authorities to model, implement, evaluate and adapt cross-border, evidence-based and data-driven policies, by using interoperable and reusable models and analytical tools, while preserving privacy and security according to EU and national laws and regulations.

Urban policy making through analysis of crowdsourced data



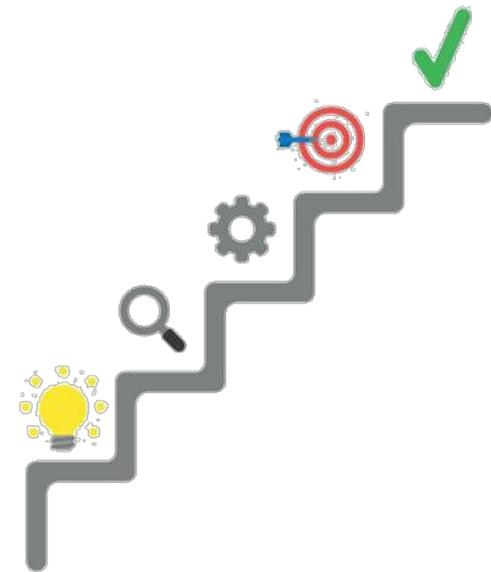
Achievements – what we've done so far

- // Definition of scenarios, policy modelling components, KPIs, analytical tools, visualisation requirements, database parameters
- // Co-creation workshop with stakeholders
 - // 22 participants: policy makers, digitalization experts and public administration representatives
- // Validated the technical tools and infrastructure to organise, filter, compare, visualise and analyse different data, as well as the need to create a regulatory and ethical framework for data usage and application.



Next steps

- // Second co-creation workshop
- // Further exploration and definition of additional analytical tools and/or visualisations for each scenario
- // Configuration and adaptation of the Policy Models





Policy Cloud
Cloud for Data-Driven Policy Management

Scaling up Sofia's Pilot Use Case

Urban Policy Making Through Analysis of Crowdsourced Data

European and Global perspectives

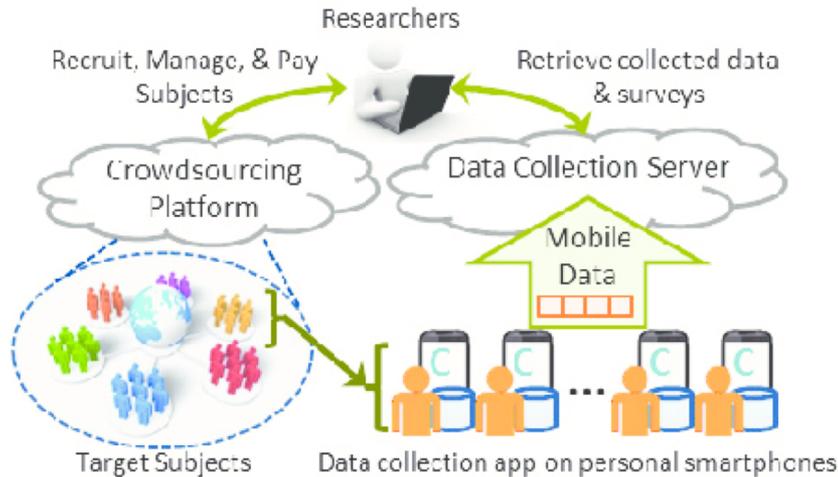


Liliana Carrillo

Collective Intelligence Researcher
Impact Creation Board at PolicyCloud
Founding Director at CollectiveUP
Co-founder at the European Digital Development Alliance



From Sofia's Data to Digital Twins



A digital twin is a virtual representation that serves as the real-time digital counterpart of a physical object or process.

https://en.wikipedia.org/wiki/Digital_twin

“A **digital twin** is a **virtual** representation of an object or system that spans its lifecycle, is updated from real-time data, and uses simulation, machine learning and reasoning to help decision-making.”

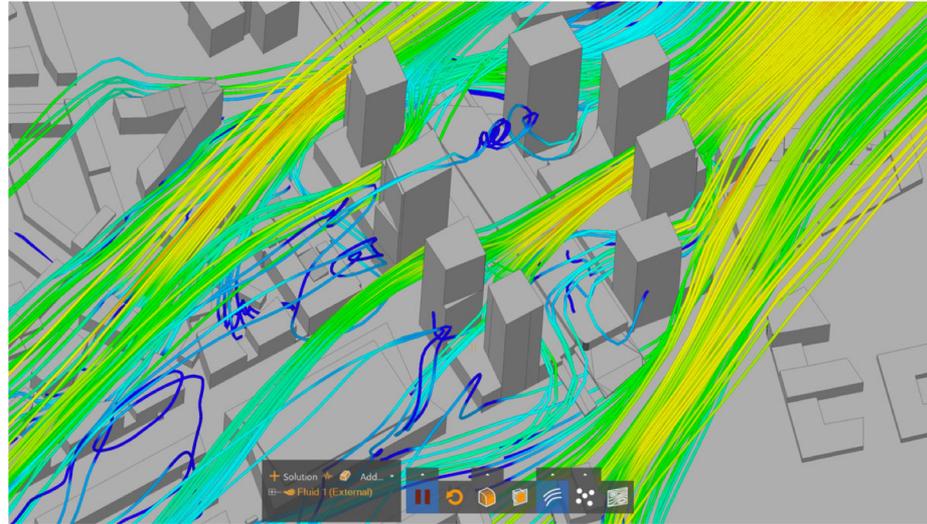
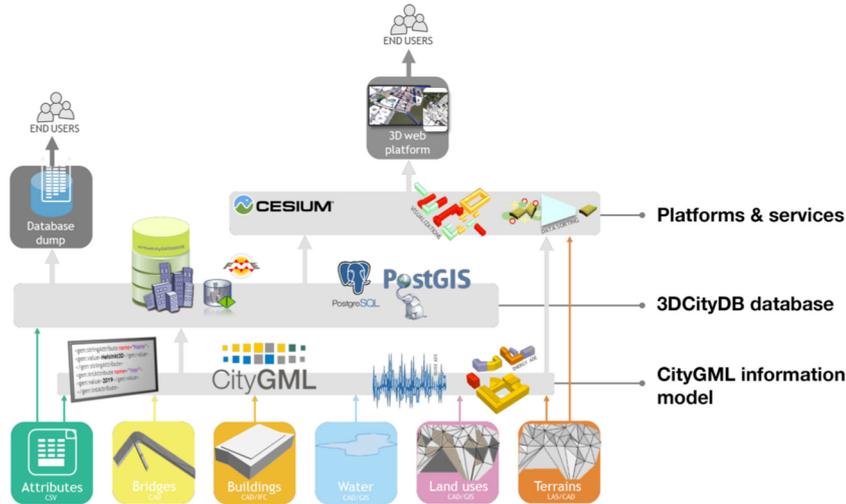
<https://www.ibm.com/blogs/internet-of-things/iot-cheat-sheet-digital-twin/>

<https://dl.acm.org/doi/10.1145/2565585.2565608>



Helsinki's Digital Twin

Kalastama CityGML Architecture



<https://aec-business.com/helsinki-is-building-a-digital-twin-of-the-city/>
https://www.hel.fi/static/liitteet-2019/Kaupunginkanslia/Helsinki3D_Kalastama_Digital_Twins.pdf



Complementary EU projects: NGI, DUET, LEAD...

NEXT GENERATION INTERNET

INTERNET OF HUMANS

The Next Generation Internet initiative by the **Digital Single Market** of the **European Commission**.



<https://www.ngi.eu/>



THE CHALLENGES IN BUILDING DIGITAL TWINS

DATA AVAILABILITY	DATA QUALITY	DATA INTEROP
<ul style="list-style-type: none"> Insufficient adequate data sources <ul style="list-style-type: none"> Real-time Reliably captured Available Not everything can be easily measured 	<ul style="list-style-type: none"> How do we assess and document data quality? Can we deal with sensor drift and other deviations? How to calibrate? 	<ul style="list-style-type: none"> How can we ensure interoperability s.t. different data sets can be combined? Can we prevent 'messy' integrations? Can we combine data sets and discover relations?

<https://www.digitalurbantwins.com/>



<https://www.leadproject.eu/>

European Data Strategy and Data Common Spaces

https://ec.europa.eu/info/sites/default/files/communication-european-strategy-data-19feb2020_en.pdf

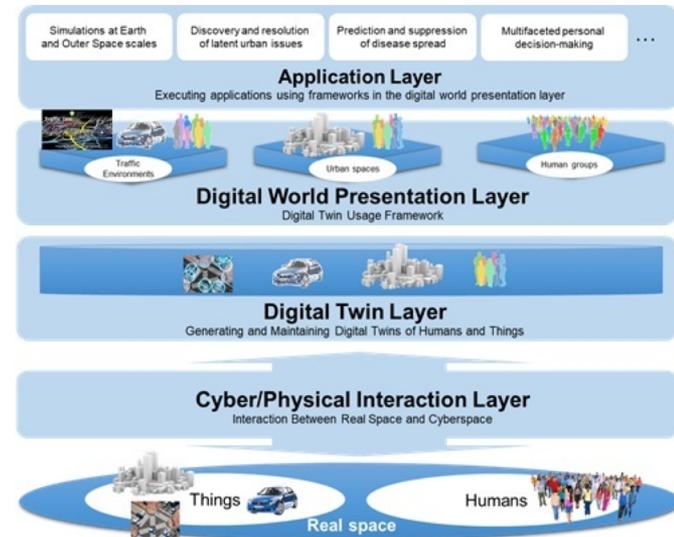
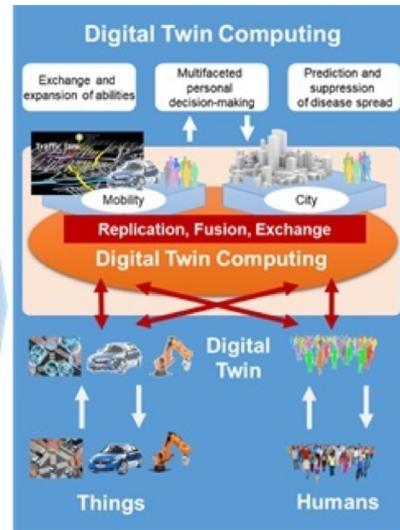
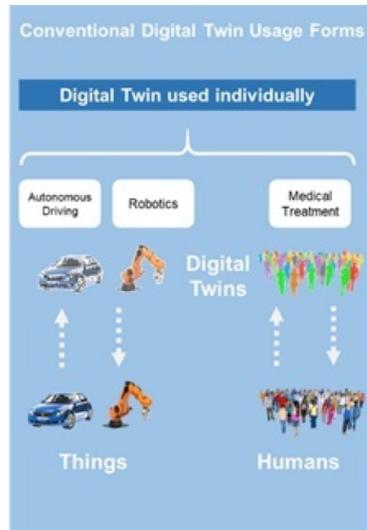
Building on the ongoing experience with the research community with the European Open Science Cloud, the Commission will also support the establishment of the following nine common European data spaces:

1. A Common European industrial (manufacturing) data space
2. **A Common European Green Deal data space**, to use the major potential of data in support of the Green Deal priority actions on climate change, circular economy, zeropollution, biodiversity, deforestation and compliance assurance. The “GreenData4All” and ‘**Destination Earth**’ (**digital twin of the Earth**) initiatives will cover concrete actions.
3. A Common European mobility data space.
4. A Common European health data space
5. A Common European financial data space
6. A Common European energy data space
7. A Common European agriculture data space
8. Common European data spaces for public administration, to improve transparency and accountability of public spending and spending quality, fighting corruption, both at EU and national level, and to address law enforcement needs and support the effective application of EU law and enable innovative ‘gov tech’, ‘reg tech’ and ‘legaltech’ applications supporting practitioners as well as other services of public interest.
9. A Common European skills data space



Japan's perspective: Collaboration between Urban Digital Twins

Digital Twin Computing system - Reference Model of Nippon Telegraph and Telephone Corporation https://www.rd.ntt/assets/pdf/iown/reference-model_en_2_0.pdf

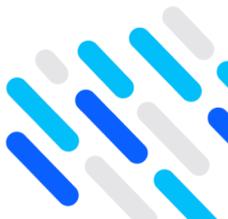


European Digital Development Strategy

My personal opinion:

By building an Open Cloud and Open Knowledge culture related to Urban/Rural Digital Twin systems, the most developed areas can support underdeveloped areas by:

- Sharing the policies and strategies that have worked in their regions, underdeveloped regions can learn easily, and potentially even test some of the strategies that have worked out, and implement them...
- Sharing the failures and learned lessons, underdeveloped regions can potentially avoid falling in similar mistakes and therefore save time, energy and money that can be channeled in better ways
- ... Thank you!



Thanks for your attention

Liliana Carrillo

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<https://europeandigital.org/>





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Webinar



28/04



14.00-15.00



Data Driven
Policymaking:
**Intelligent Policies
for the Food Value
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 [PolicyCloud EU](https://www.linkedin.com/company/policycloud-eu)



PolicyCloud has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 870675.