Here is a strategist, a decision maker, an innovator, a world changer: Napoleon Bonaparte.

"Un bon croquis vaut mieux qu'un long discours."

Napolean changed the world and particularly Europe. Among many things he is famous for this quote "Un bon croquis vaut mieux qu'un long discours."

"A good sketch is better than a long speech."

which - if your French is a bit rusty translates into "A good sketch is better than a long speech."

In this talk I would like to make a long speech to convince you about the value of sketching.

STRATA CONFERENCE

SKETCHING WITH DATA

FABIEN GIRARDIN, 29.02.2012, SANTA CLARA

Hi! my name is Fabien Girardin. I am a researcher, engineer and entrepreneur active in the domains of user experience and data science.

I practice my passion as a Partner at the Near Future Laboratory a think/make-tank strategically located in Europe and California. We combine insight and analysis with design and research with rapid prototyping to create potent provocative sometimes preposterous ideas into material form. Among many other lines of investigations, we are fascinated by the interplay between people and data. What do data tell us about ourselves and the places (cities, streets, buildings) we live in.
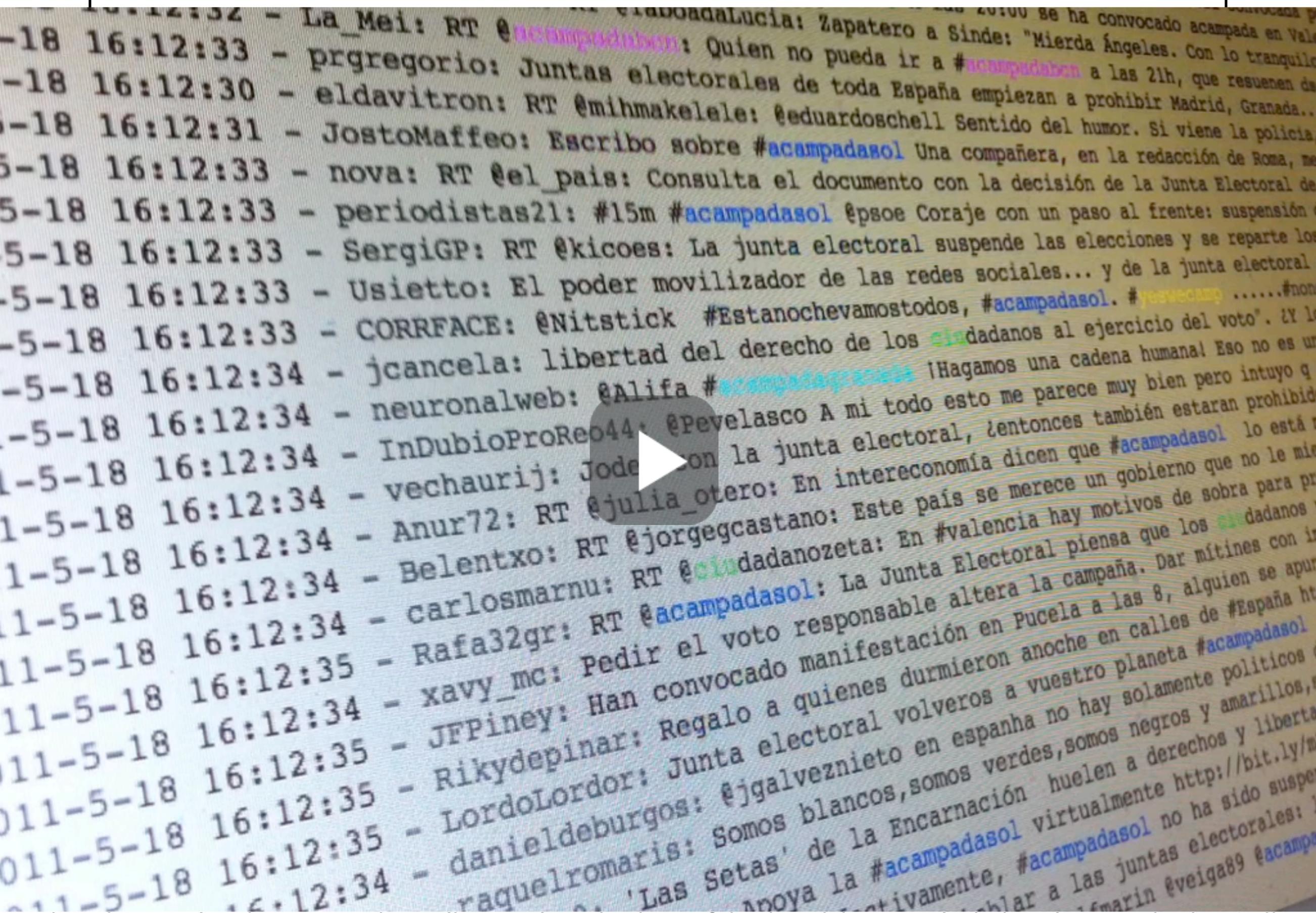
PART I   **The data**
PART II   **The process**
PART III   **The tools**
PART IV   **Conclusions**

We'll be approx. 40min together. So I divided my presentation into 4 different parts. First I will talk about the data we like to investigate, then about the process we apply with our clients to materialize information from data and the values we experienced in sketching with data. I will present you the tools we use to make that happen. Finally, I will conclude with some insights

We have been active observers and contributors since the dawn of the data deluge, particularly trying to make data 'talk' and 'work'.

Timo Arnall: Wireless in the World

We have been focusing on specific types of data, we call 'network data'. Network data are the byproducts of our interactions with digital infrastructures as nicely animated here by our friend Timo Arnall in his project 'Wireless in the world' http://www.nearfield.org/2010/06/new-film-wireless-in-the-world-2. Practically, we have materializing information from pretty much anything that is networked in our cities: cellphones, cars, shared bikes, digital cameras, credit cards, ...

Ville Vivante (2012). In collaboration with Lift and Interactive Things

This materialization can take the form of public installations we call 'urban demos' that reveals how the city lives through its data. Here Geneva though is cellular network activity. Project: http://villevivante.ch/

The World's Eyes
Where are the Britons?

The World's Eyes (2009). In collaboration with MIT SENSEable City Lab

Current Week in 2007
28
45

Or here in Barcelona through the photos people share online. Project: http://senseable.mit.edu/worldseyes/

These visualizations are the tip of the iceberg of our activity with data. Like many of you in this room we got our hands dirty manipulating this new 'oil' we call 'big data'.

Locate untapped sources

We have been hired to help locate untapped sources.

Refine data rather than only selling it

Refine data rather than just selling it. For instance, the analysis georeferenced photos you have seen previously as led to the production of new layer of information for navigation systems.

Materialize data into new services

We also been active helping materialize data into new services, or into new 'data products'.

PART I   **The data**
PART II   **The process**
PART III   **The tools**
PART IV   **Conclusions**

So you may ask: how do you make that happen? How do you help innovating with data?
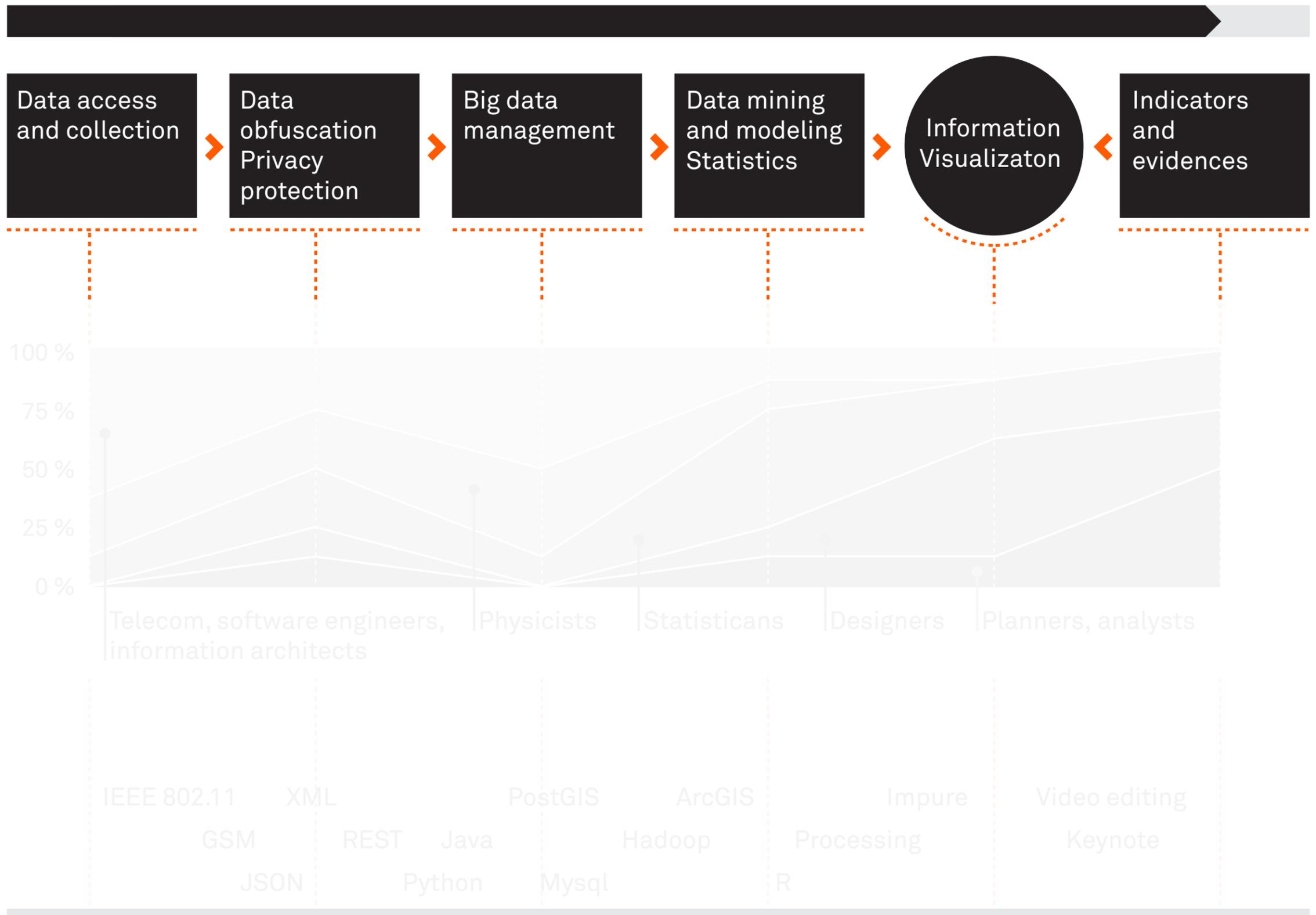
The process of innovating with (network) data demands several clear steps, each with their own set of questions and answers: From the data access and collection techniques, that feed data to obfuscations algorithms and big data management systems that are interrogated by basic data mining operation or advanced statistical inquiries. Information visualization techniques are then used to build evidences and indicators used to interrogate further the data.
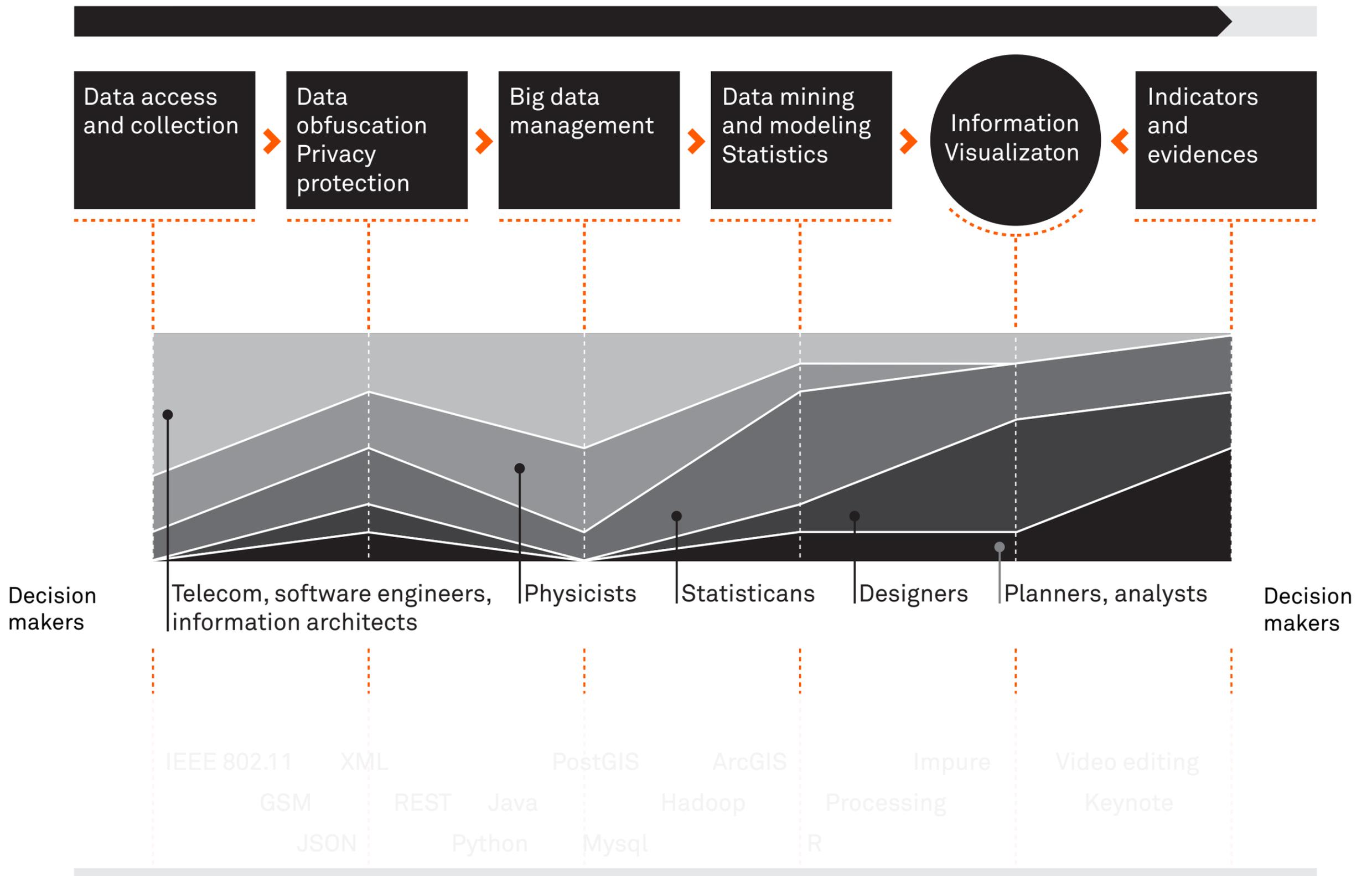
The process involves multiple practices and skills from engineering, to statistics, design, strategy planning, product management and law.
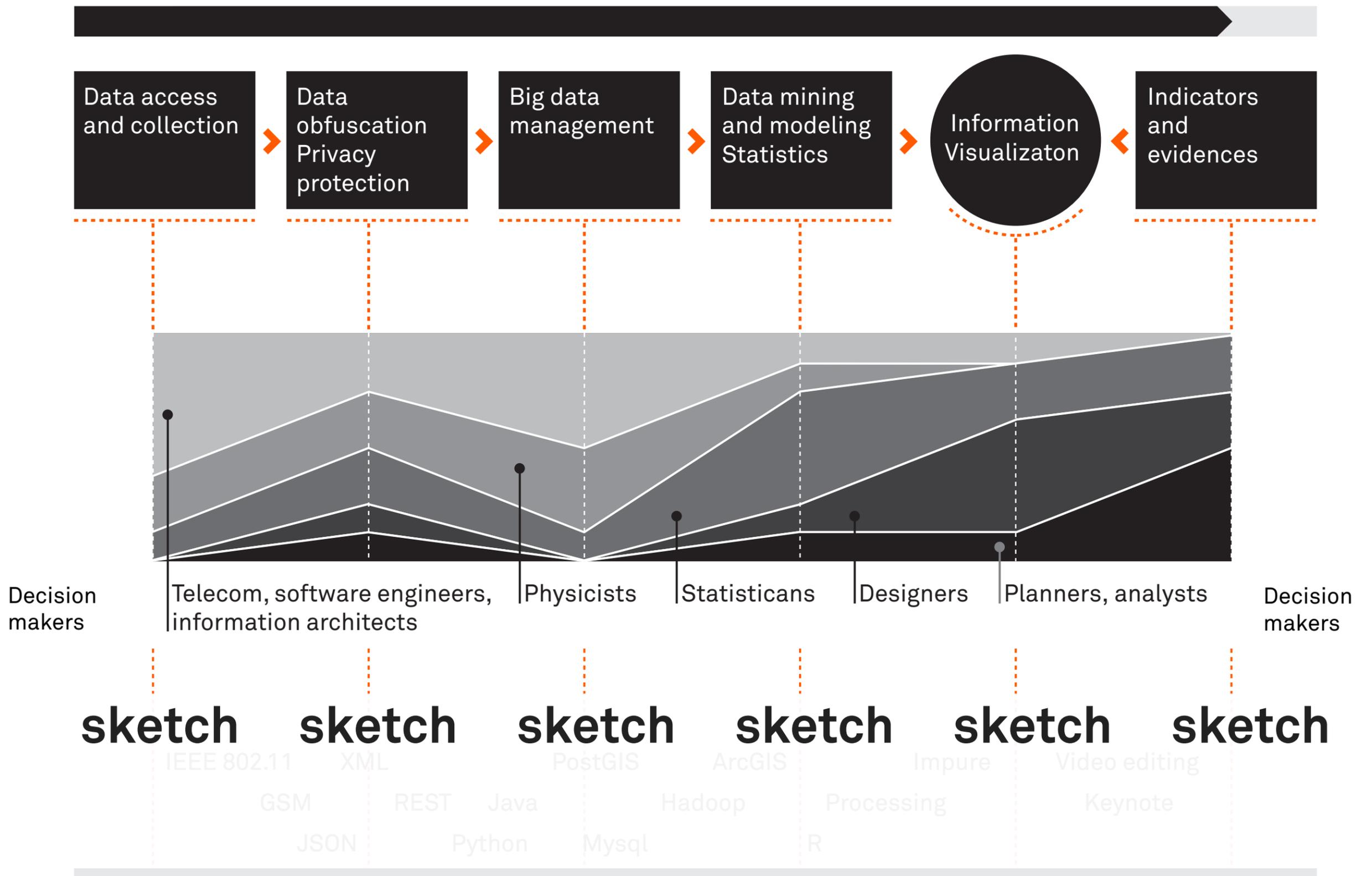
We have accompanied clients (and ourselves) along that often uncertain innovation process. Our experience has led us to use sketches with the data at hand at each steps. We use this sketches to answered some questions that generate new interrogations for the next phase.

a rough version of a creative work, made to assist in reaching a coherent result

Sketching is not a new practice as part of a creative activity. Sketching has been widely used to innovate in drawing, painting and architecture all domains related to visualization and communication. For instance Le Corbusier who changed the face of architecture was famous to sketch while presenting his projects and ideas:

"Through visual artifacts, architects can transform, manipulate, and develop architectural concepts in anticipation of future construction. It may, in fact, be through this alteration that architectural ideas find form"

Reference: Architect's Drawings: A selection of sketches by world famous architects through history by Kendra Schank.

Like the many other individuals who changed the world, Le Corbusier used sketching to think.

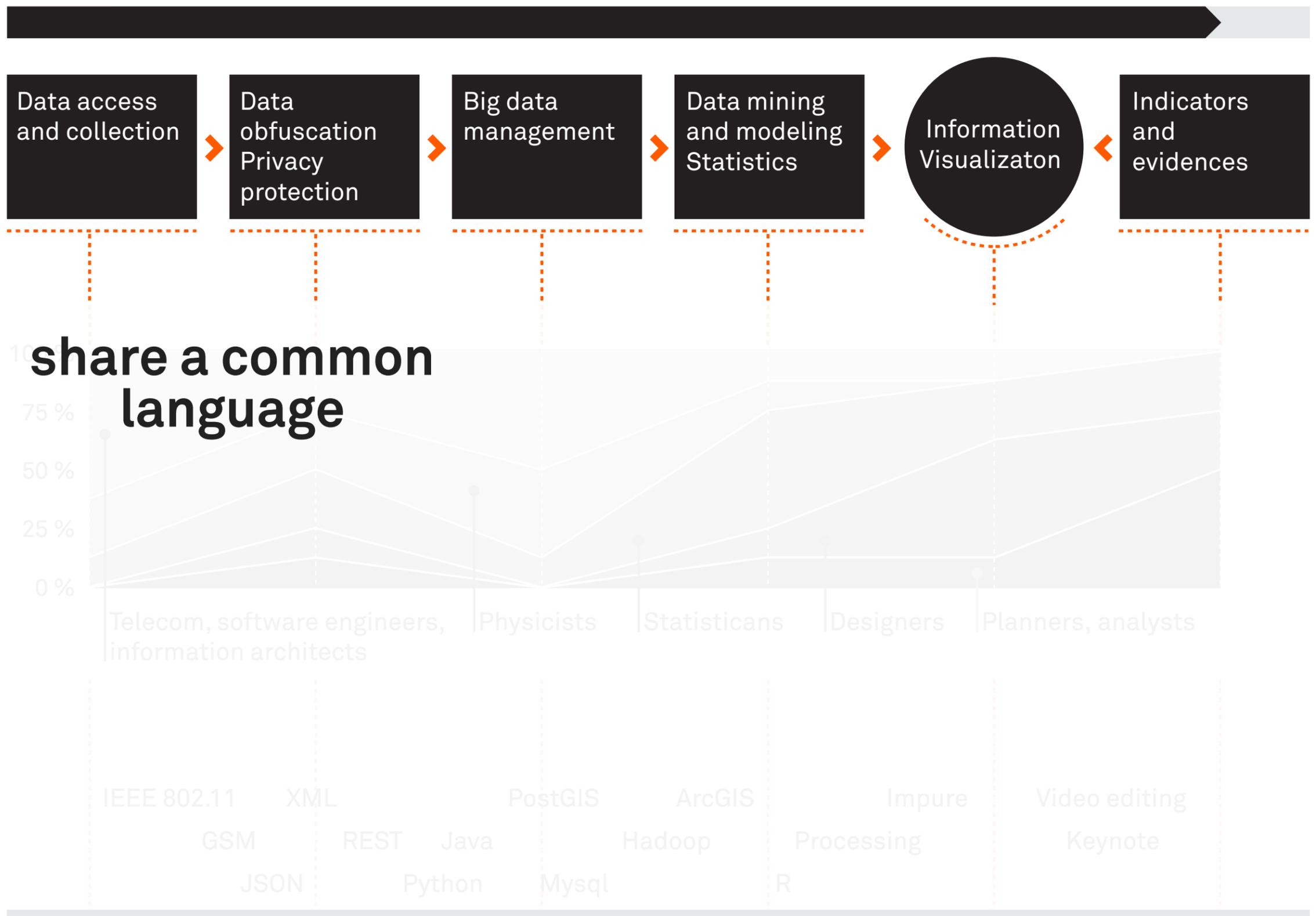To make an idea tangible and observer its different dimensions and implications.

And to tell stories, to share his discoveries.

When translated to the world of data, sketching has a lot to do with practices in a workshop. it consists in crafting rough early results and insights manipulating queries, blending with connectors, sculpting with algorithms, extracting with filters or drawing with libraries.

share a common language

Data access and collection	Data obfuscation Privacy protection	Big data management	Data mining and modeling Statistics	Information Visualizaton	Indicators and evidences

Telecom, software engineers, information architects | Physicists | Statisticans | Designers | Planners, analysts

IEEE 802.11 | XML | PostGIS | ArcGIS | Impure | Video editing
GSM | REST | Java | Hadoop | Processing | Keynote
JSON | Python | Mysql | R

From our multiple experiences, we extracted some key values of sketching. Today, I would like to highlight three of them. Sketching is helpful to set a common language among the different actors of the project on what the data really is and how it can be used.

For instance, in a project for a mobile phone operators, we were asked to help them explore novel services from aggregated cellular network activity. The project gathered multiple practices from a Network Engineer to help access the data to a Product manager that had to transform insights scenarios of product.
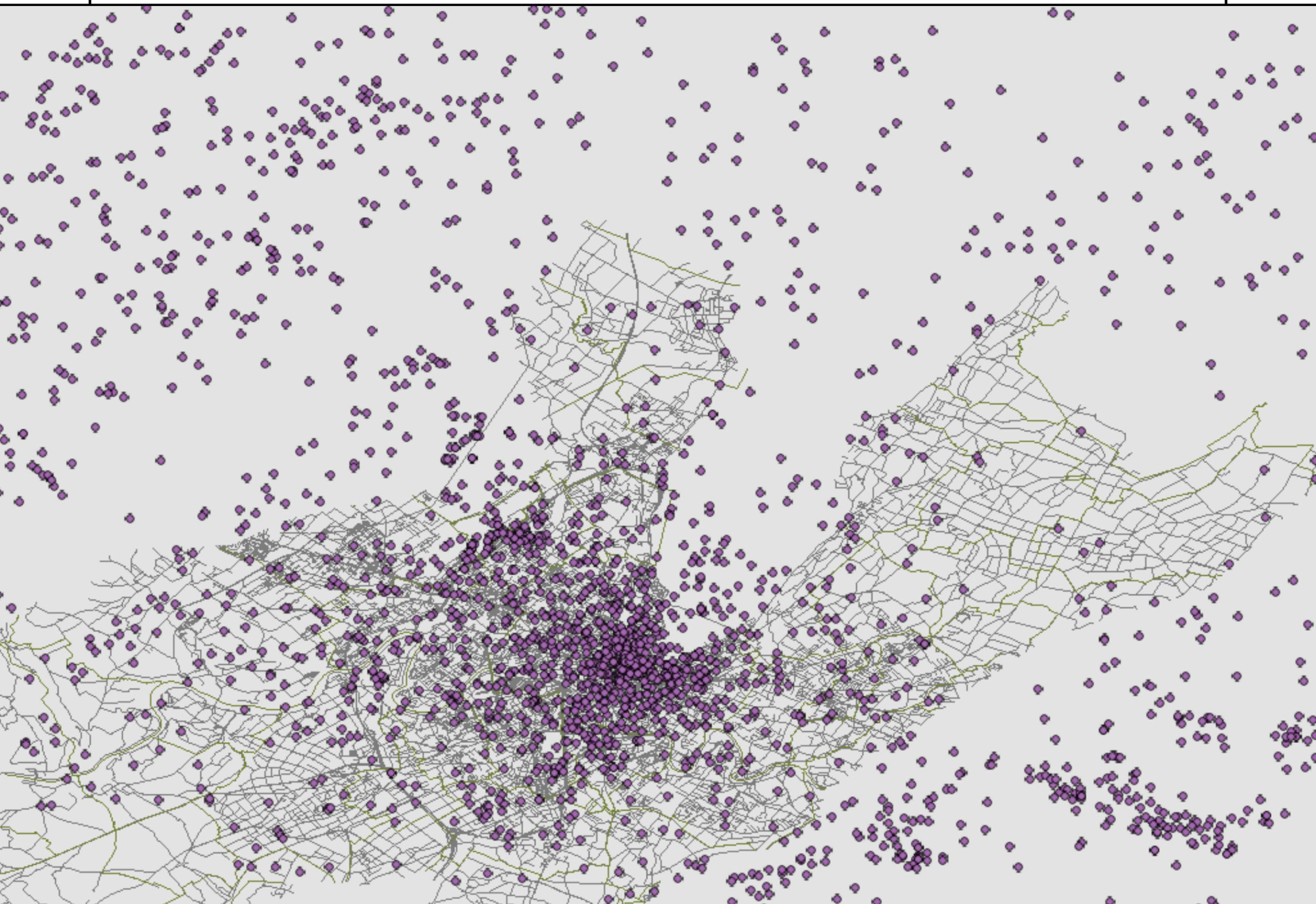
A main issue with this project involving and heterogeneous team is for everybody to understand the material (the data) we are actually trying to refine. For instance, here is the network engineer's view of the data (a network of cells that distribute the phone conversations)

Timo Arnall: Wireless in the World

and the Product manager who actually sees that data trough the customers and their interactions.

Swisscom 2011

So very early in the project we produced a sketch to showed the data we were trying to transform, for instance revealing the quality of the data to measure mobility and the type of information that could be extracted (here mobility and density of activity on the network).

Data access and collection	Data obfuscation Privacy protection	Big data management	Data mining and modeling Statistics	Information Visualizaton	Indicators and evidences

qualify results

100 %

75 %

50 %

25 %

0 %

Telecom, software engineers, information architects · Physicists · Statisticans · Designers · Planners, analysts

IEEE 802.11 · XML · PostGIS · ArcGIS · Impure · Video editing

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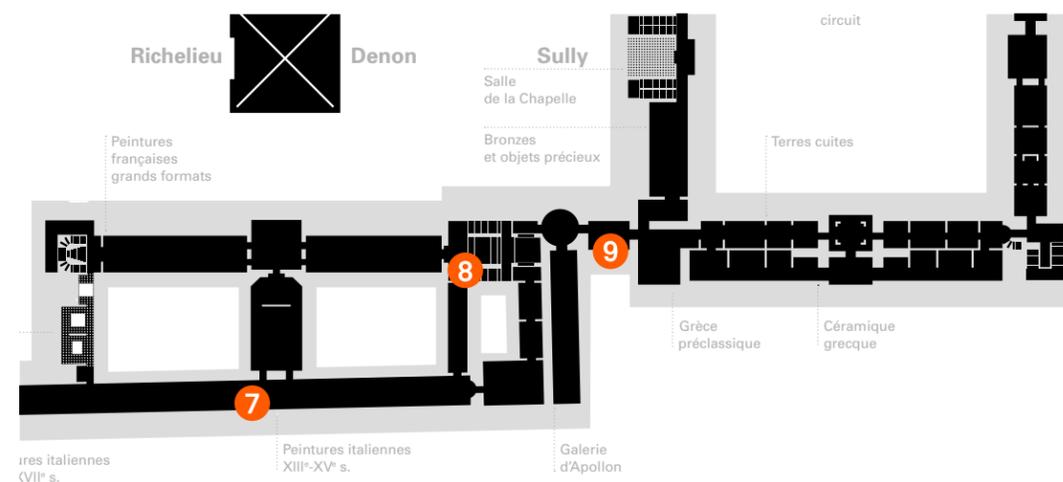JSON · Python · Mysql · R

Sketching is useful to qualify results

The Louvre Museum 2010 (in collaboration with BitCarrier)

For instance, in this project the Louvre Museum asked us to help them solving their problems of hyper-congestion. Hyper-congestion refers to the situation in which the quantity of visitors in a space influences negatively the quality of their visiting experience. So far, administrators of the museum only had a partial understanding of the problem based on observations and surveys.
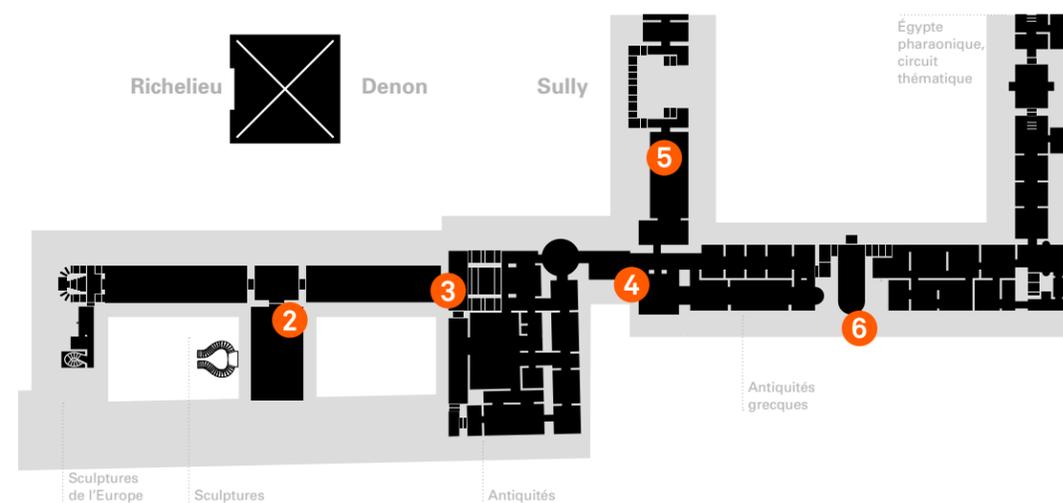
1ER ÉTAGE

9 Salle des verres ou salle 34 entre la Galerie d'Apollon et la salle des Sept cheminées, dite « Salle des verres »

8 Palier de la Victoire de Samothrace, côté comptoir audioguide Antenna-Audio, dit « Palier Samothrace »
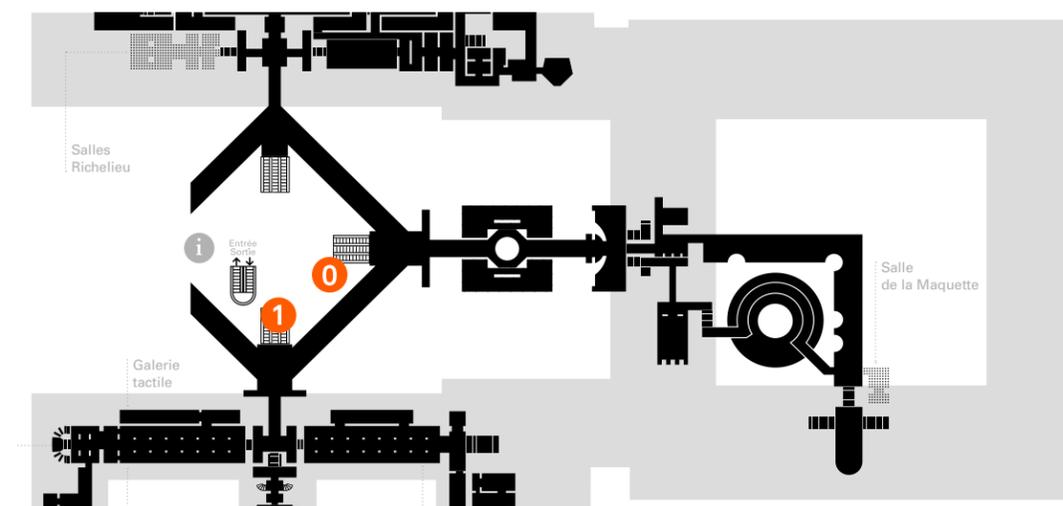
7 Grande Galerie

Richelieu Denon Sully

circuit

Salle
de la Chapelle

Peintures
françaises
grands formats

Bronzes
et objets précieux

Terres cuites

8 **9**

Grèce
préclassique

Céramique
grecque

7

res italiennes
(VIIᵉ s.

Peintures italiennes
XIIIᵉ-XVᵉ s.

Galerie
d'Apollon

0 REZ-DE-CHAUSSÉE

6 Crypte du sphinx

5 Salle des caryatides

4 Venus de Milo

3 Pied de l'escalier de la Victoire de Samothrace dit « Pied Samothrace »

**2** Palier Denon ou « rez-de-chaussée Denon », galerie Daru

Richelieu Denon Sully

Égypte
pharaonique,
circuit
thématique

5

2 **3** **4**

6

Antiquités
grecques

Sculptures
de l'Europe

Sculptures

Antiquités

-1 ENTRESOL

1 Accès Denon

0 Hall Napoléon

Salles
Richelieu

Entrée
Tactile

0

1

Salle
de la Maquette

Galerie
tactile

We worked on a the collection of empirical quantitative evidences of visitors mobility in the museum. For this investigation we used sensors that detect the presence of Bluetooth-enabled mobile phones (provided by http://www.bitcarrier.com) and deployed them in key rooms of the museum.
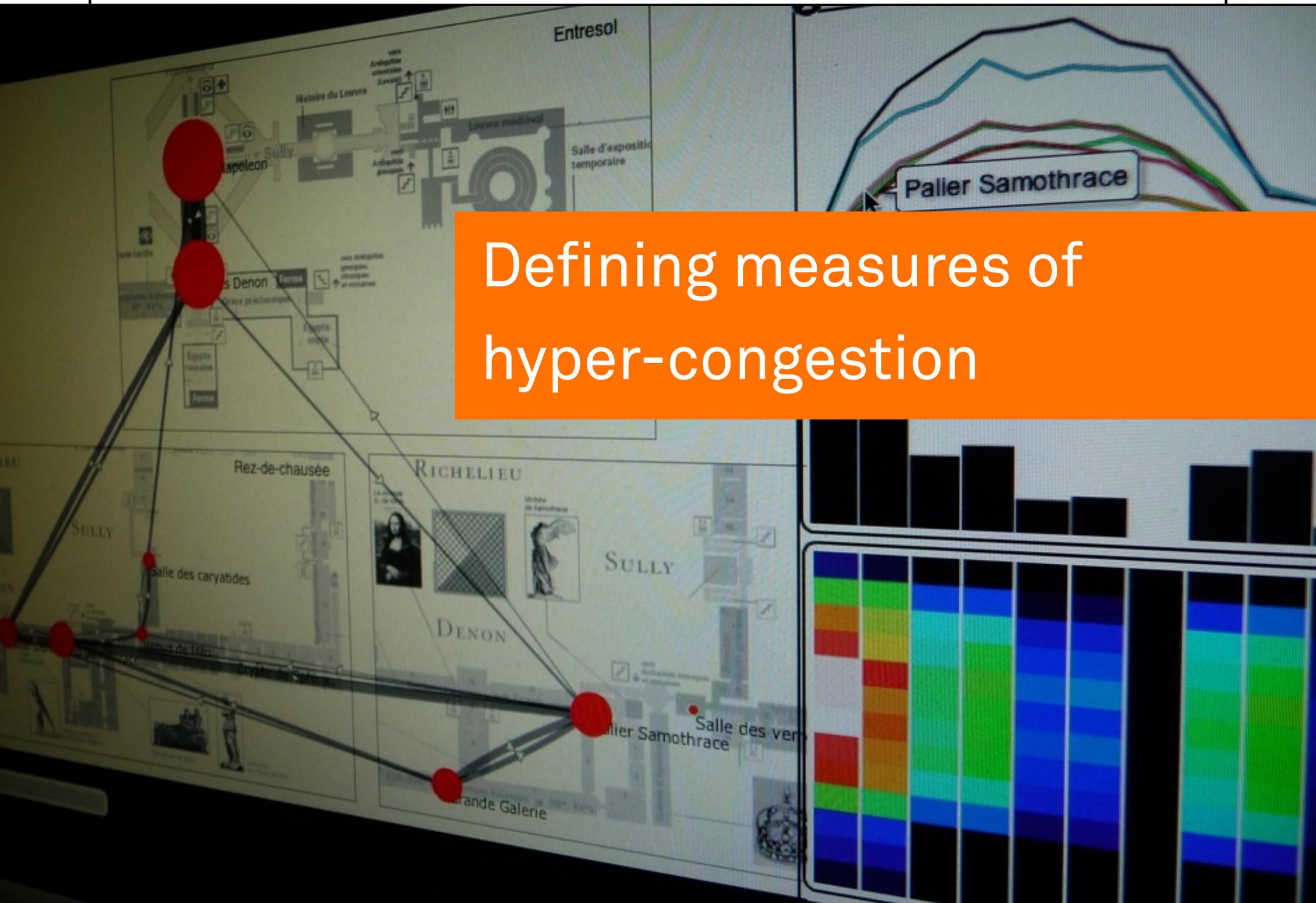
Defining measures of hyper-congestion

Each audit (data collection period) was immediately followed by meetings to present intermediary findings. These meeting were crucial to detected the symptoms of hyper-congestion. The sketches of results we produced were not particularly polished, but they carried out the necessary measures on visiting sequences, travel times and staying times.
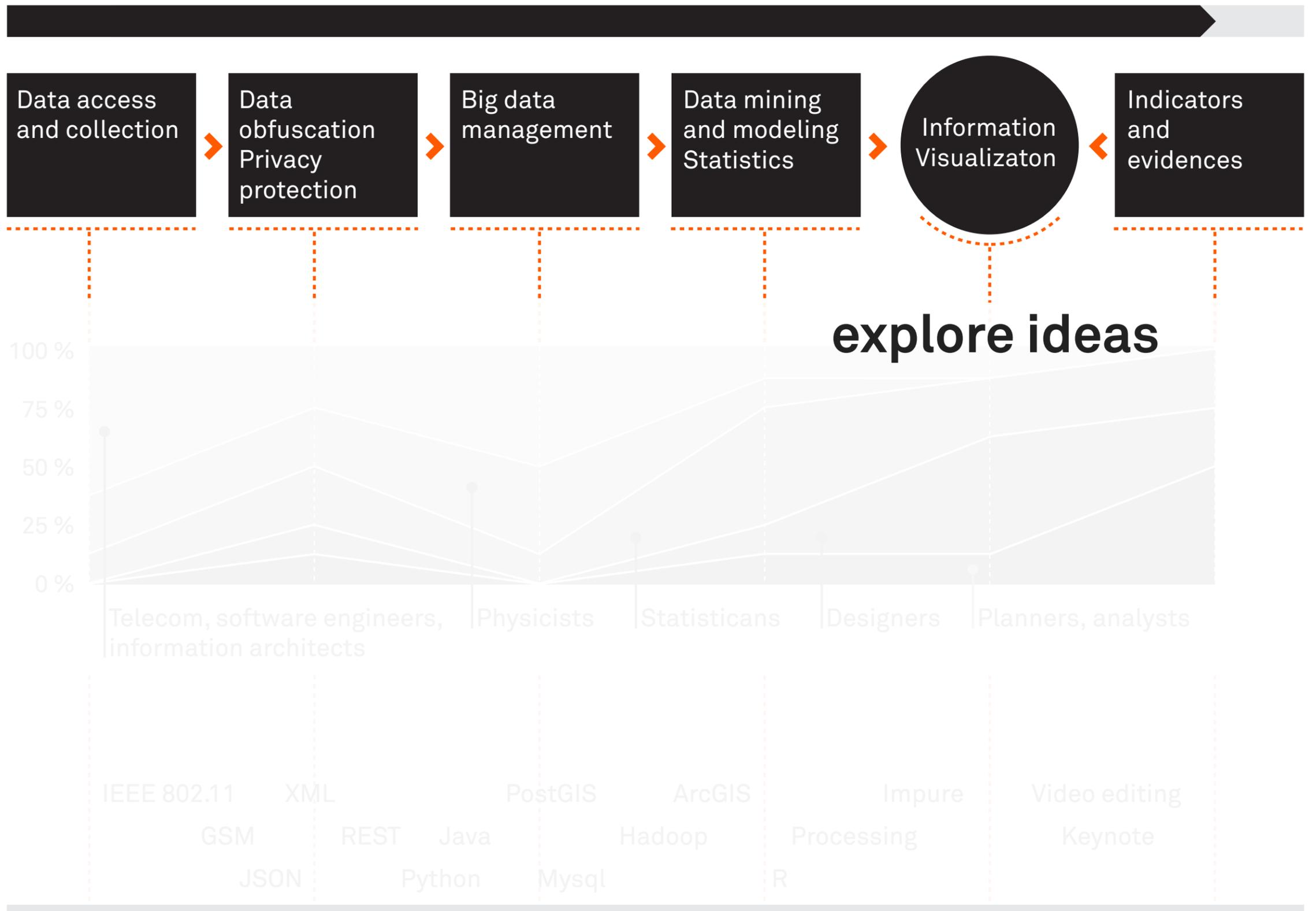
Our measures provided unprecedented insights and revealed the symptoms of hyper-congestion, but were insufficient to describe the reasons of the issue.

People on the field have the experience to help contextualize the data and early results

The Louvre Museum 2010

So we used our sketches to confront our measures and indicators with people on the field. Their *qualitative evidences* helped contextualize and qualify the early results as well as explain the detected irregularities. This qualitative view reinforced the quantitative observations and consolidated the overall knowledge on hyper-congestion. In other words, network data tell a story, not THE story.

Data access and collection › Data obfuscation Privacy protection › Big data management › Data mining and modeling Statistics › Information Visualizaton ‹ Indicators and evidences

explore ideas

100 %
75 %
50 %
25 %
0 %

Telecom, software engineers, information architects   Physicists   Statisticans   Designers   Planners, analysts

IEEE 802.11   XML   PostGIS   ArcGIS   Impure   Video editing
GSM   REST   Java   Hadoop   Processing   Keynote
JSON   Python   Mysql   R

As in painting and drawing, sketching is used to explore ideas.

For instance we have been exploring of the new roles of banks in the smart cities of the near future. We were approach by one of the world leading retail bank BBVA which had fairly good ideas of their potential contributions to a world that needs real-time data exchange platform. This is the kind of service a bank is extremely familiar with. However, they had limited knowledge the the type of information that could feed and emerge from this kind of platform.
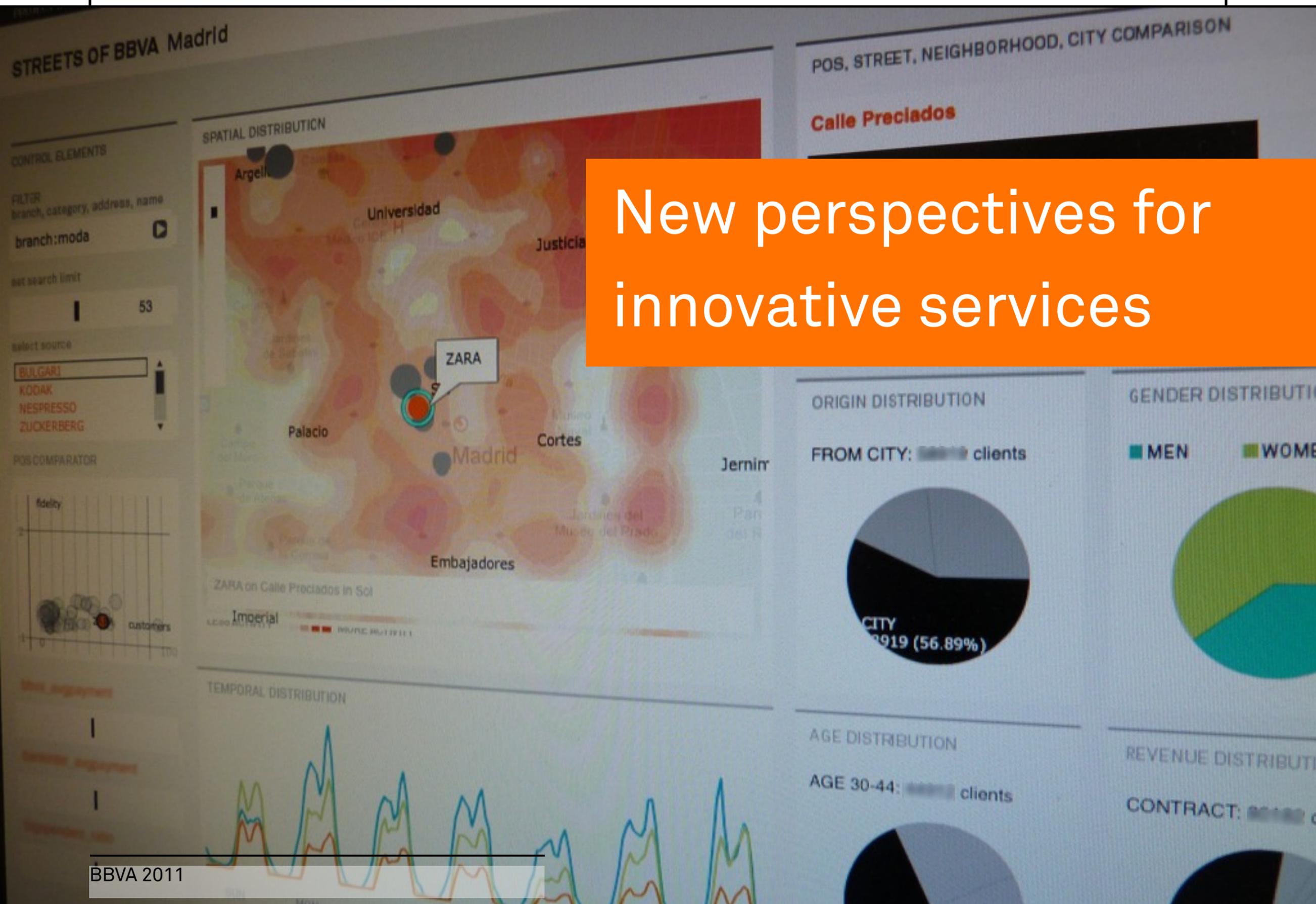
New perspectives for innovative services

BBVA 2011

As part of our consulting work, we sketched a pretty advanced dashboard for participants of the project to explore and interrogate their data with fresh perspectives. (Here a mix of social network and credit card activity in Madrid).

The use of the dashboard helped the participants craft and tune indicators that qualify the space (e.g. the streets of a city) based on its business activity. This experience was used to develop specific scenarios involving services and products that exploit a bank could take advantage of.

So we have seen that sketching is part of the process to innovate with data. But this process cannot take place without proper tools.

Sketching is about tools

As exemplified by Picasso, another innovator who changed his field of practices, the capacity to sketch is strongly related to the tools used. For instance, Picasso used the light.
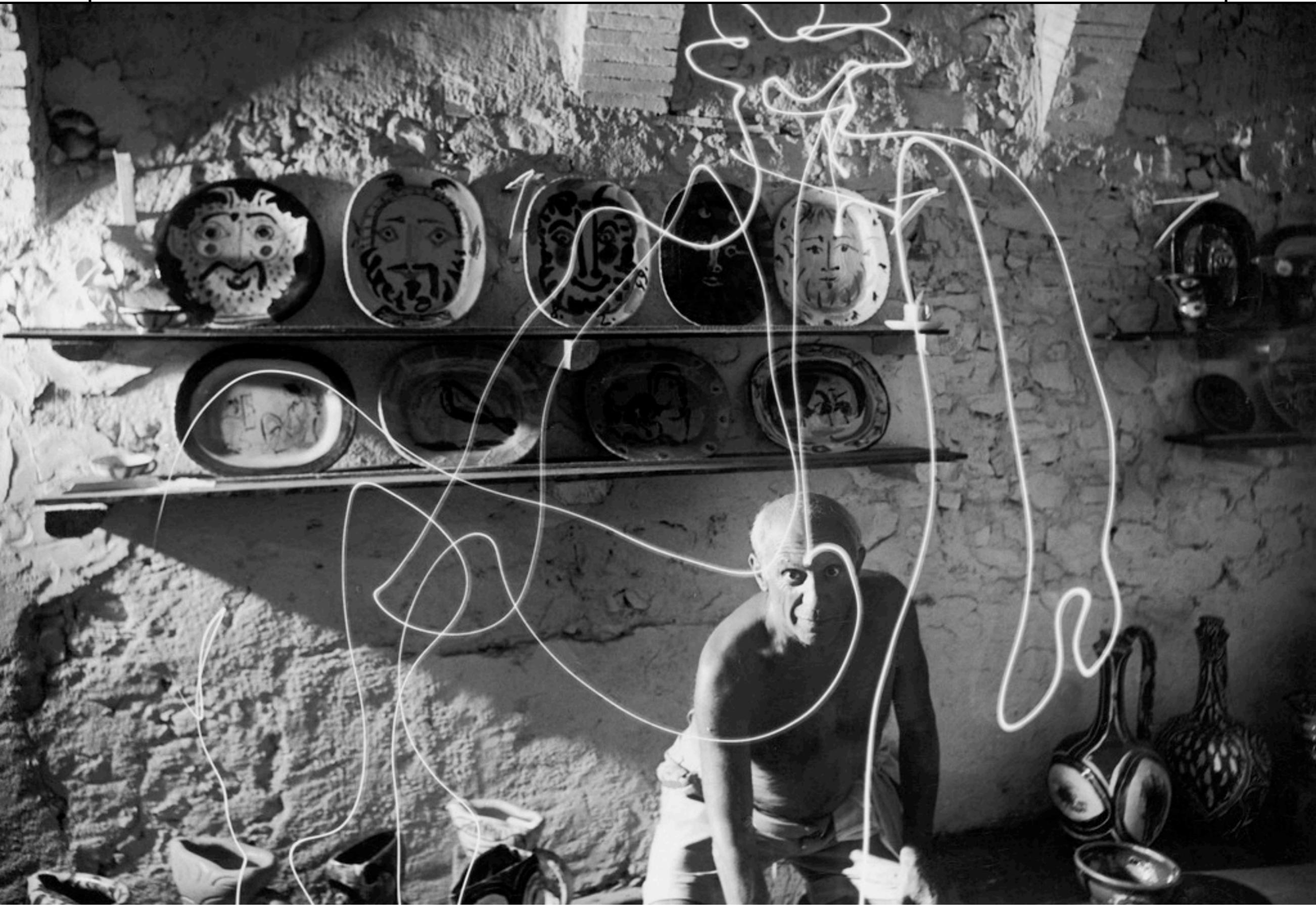
The light to free himself from the limits of a frame and the limits of 2D.
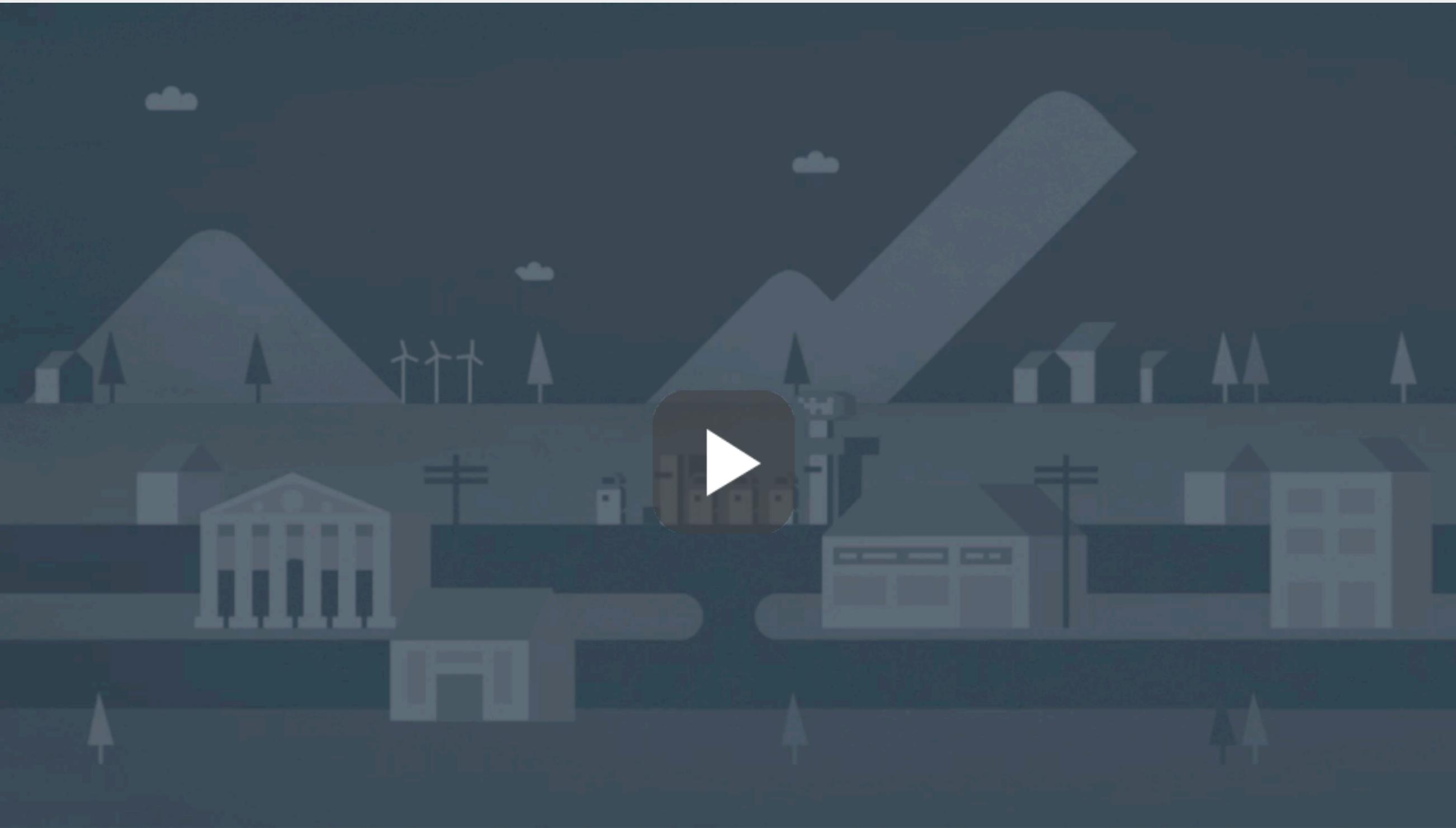
We have been working on these tools to innovate freely with data. With the information visualization consulting firm Bestiario, I co-created Quadrigram. Let me show you our teaser video and you will understand where our heart is : http://vimeo.com/36689579
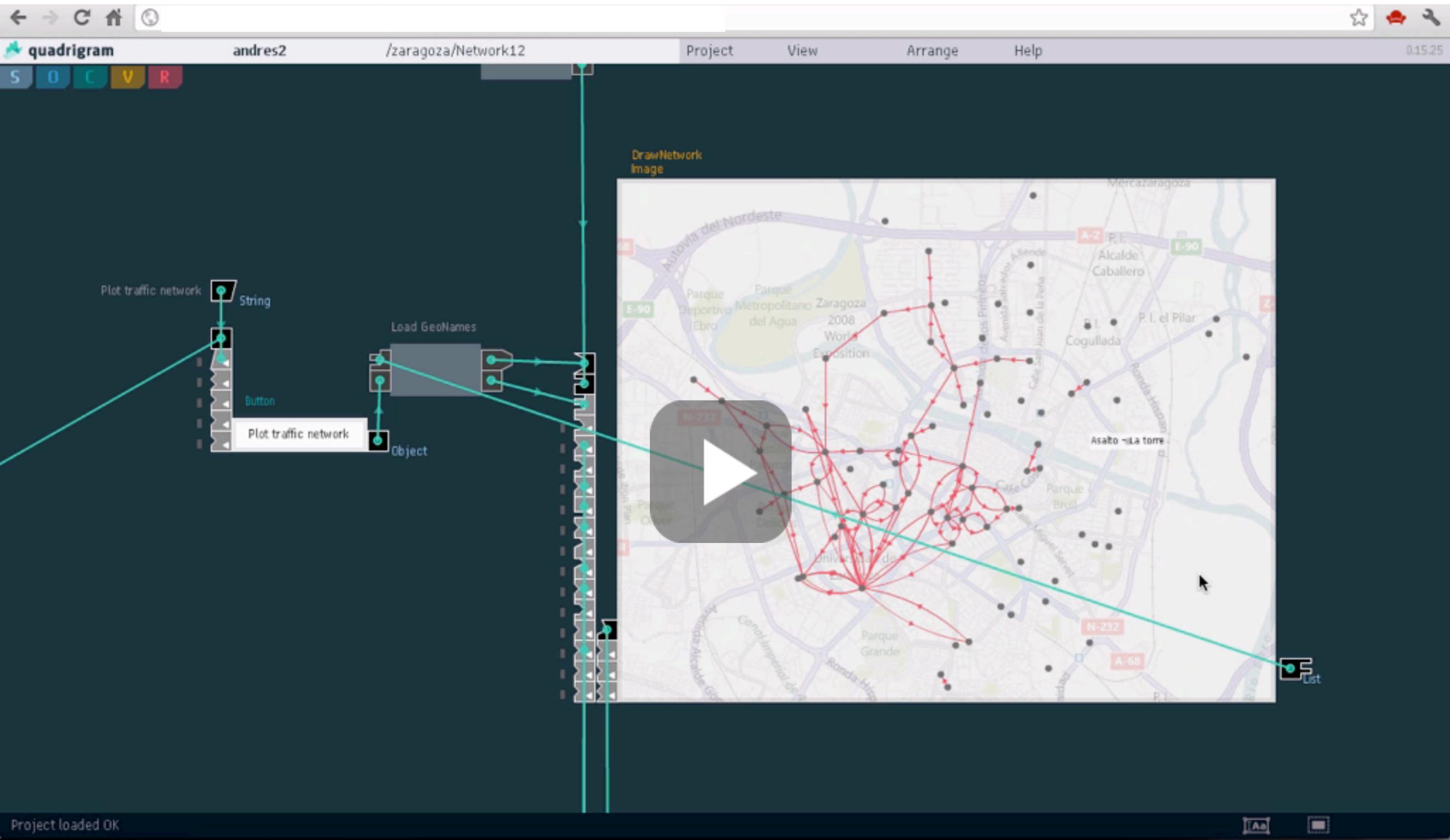
Access   Manipulate   Analyze   Visualize

Quadrigram uses a visual programming language based on modules pre-programmed for you. These modules form a data flow when you link them together. Each time you modify a modules, the update is propagated throughout the flow. Quadrigram is meant to facilitate your work with data along the 4 main domains of visual intelligence: access, manipulate, analyze, visualize. At the end of the creation process, you can publish your solution on the web.

Time-lapse courtesy of David Marchuet http://vimeo.com/23691424

Let me show you an example of how in Quadrigram you can freely explore the multiple dimension of a single dataset, each time generating a set of questions and answers.

Let's use the kind of real-time traffic information our friends at BitCarrier provide. Their sensor networks measures the quantity and speed of the traffic in key areas of a city.

Watch the demo:
http://vimeo.com/37366960

PART I   **The data**

PART II   **The process**

**PART III**   **The tools**

PART IV   **Conclusions**

So, we have seen that our world produces new type of data - network data - that is now treated is a material. There are both processes and tools that help innovate with this evolution. From our experience, there are values to sketching with data, in the same ways as strategists, innovators and world changers have been using sketches in the past.

Cannot afford long processes.
Need to succeed or fail early.

Great strategists, innovators and world changers have used sketching to cut long processes (speeches), because they need to succeed or fail early.
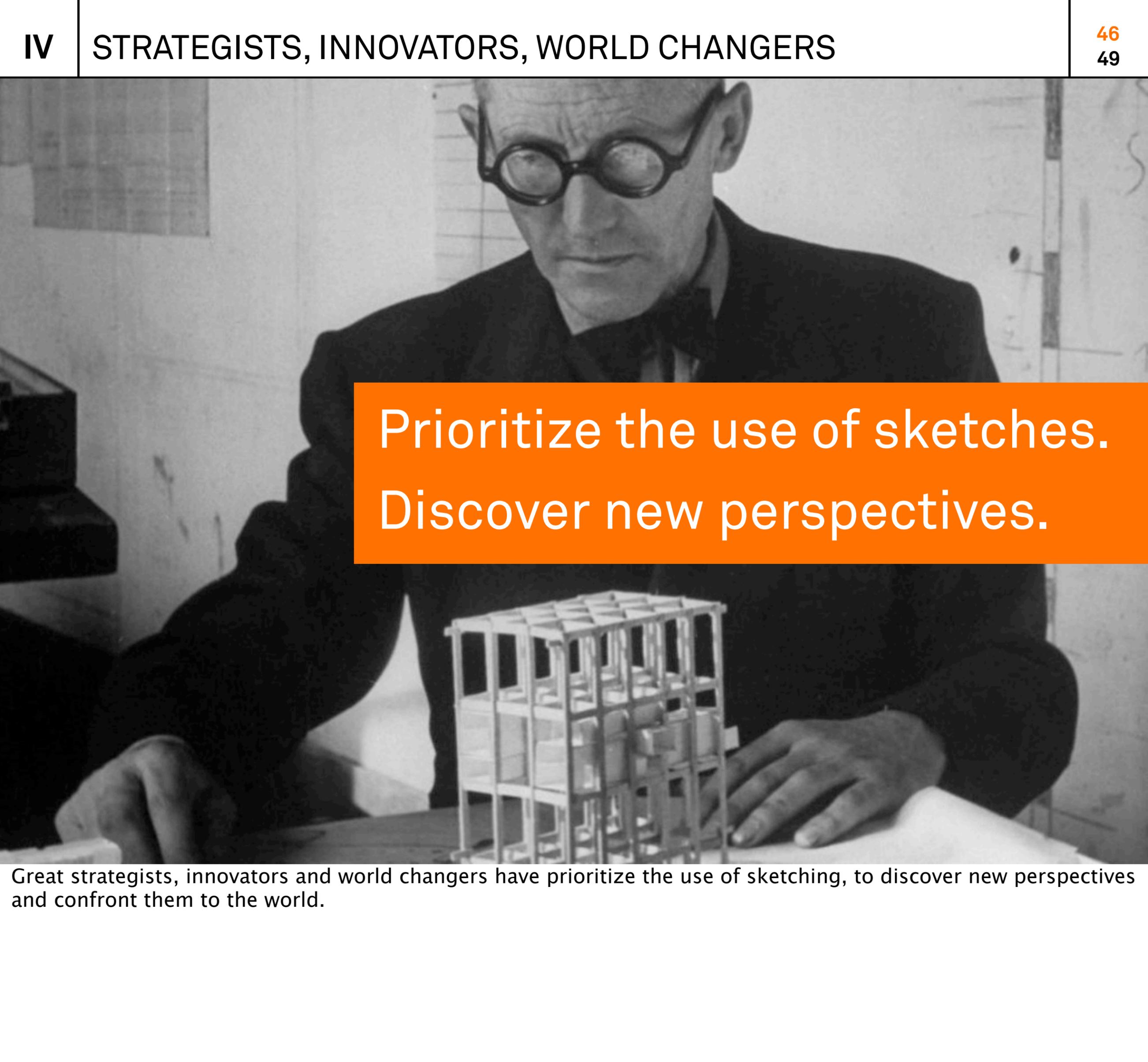
Prioritize the use of sketches.
Discover new perspectives.

Great strategists, innovators and world changers have prioritize the use of sketching, to discover new perspectives and confront them to the world.

Exploit the proper tools. Create with freedom.

Great strategists, innovators and world changers have used sketching to think freely without unnecessary constraints. They exploited the proper tools, sometimes they hijacked them.
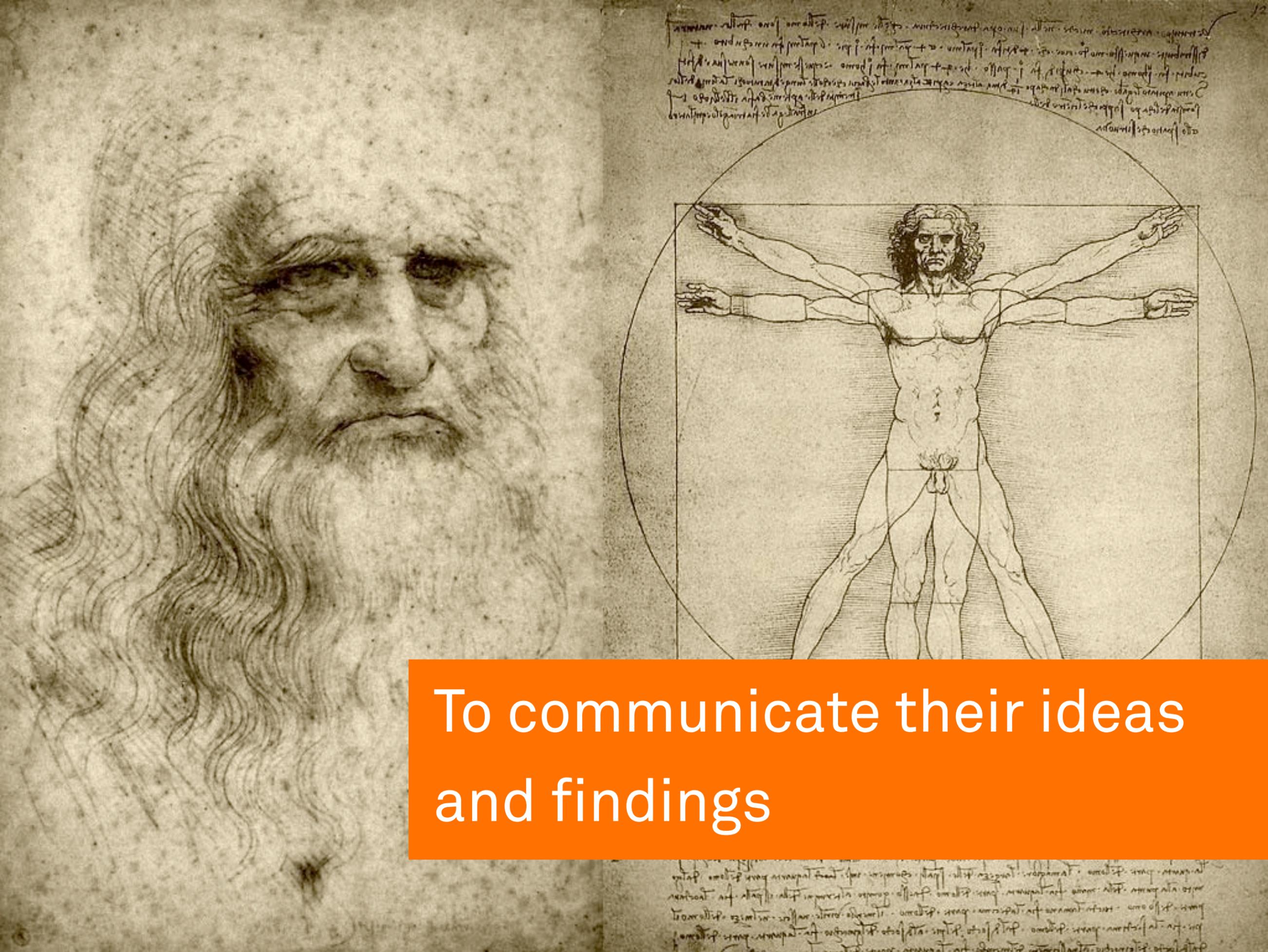
To communicate their ideas and findings

Great strategists, innovators and world changers have used sketching to communicate their ideas and findings

That leaves me wondering. In this room, how many of you will be the Michelangelos of the data era?

MERCI GRACIAS THANK YOU DANKE GRAZIE

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Thank you! @fabiengirardin