



UNIVERSITÉ
DE GENÈVE

CENTRE UNIVERSITAIRE
D'INFORMATIQUE



INSTITUTE OF INFORMATION
SERVICE SCIENCE

Smart City – la Ville Intelligente

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iss.unige.ch



Presentation

- Institut de recherche inter-facultaire
 - Faculté des Sciences de la Société
 - Faculté Economie et Management
 - Centre Universitaire d'Informatique
 - Université de Genève



- Nombres clés:
 - 5 Professeurs, 60 personnes
 - 30 projets de recherche (FP7, AAL, SNF, CTI, COST)
 - 2.3MCHF/an (fonds externes)
 - 4 programmes d'enseignement (BSc, MSc, PhD, Executive)
 - ThinkTank



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Définitions ?

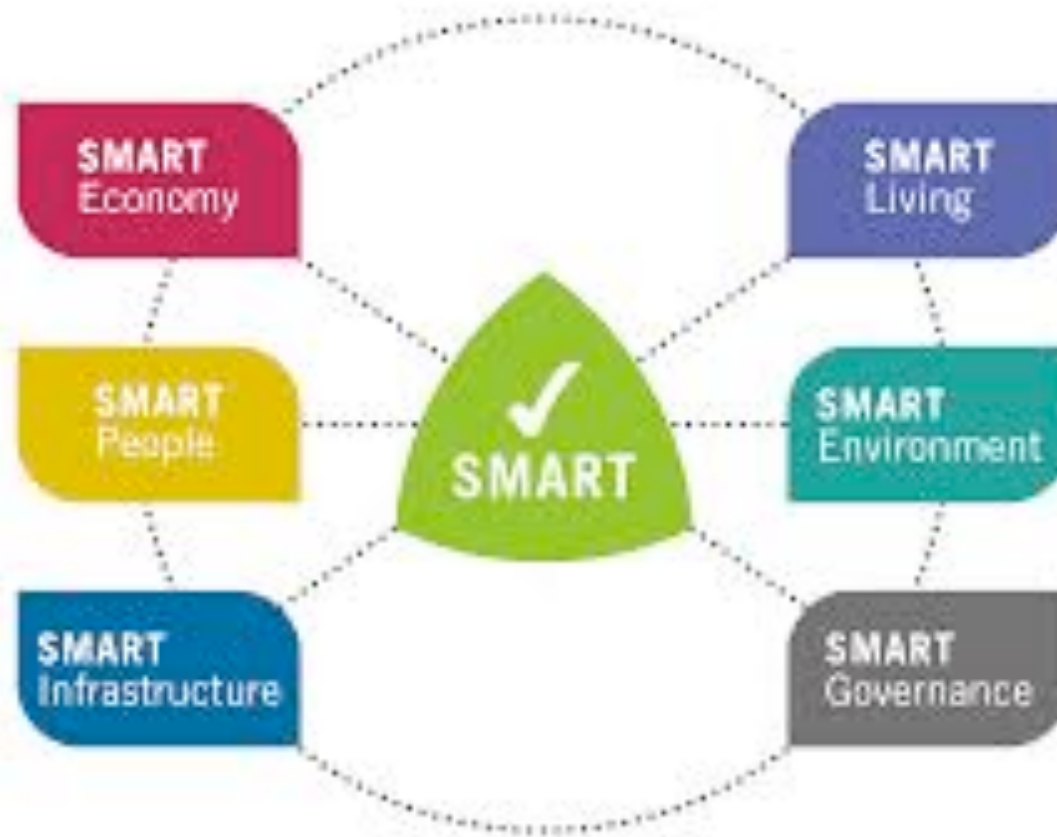
Définitions ?

You are probably familiar with the concept of the Smart City, a city **which uses digital technologies** to improve the **quality of public and private services**, while **reducing costs and resource consumption**.

The [Intelligent Community Forum](#) (ICF), a New York-based think tank, prefers to focus on Intelligent Communities, **defined as** “cities and regions that **use technology** not just to save money or make things work better, but also **to create high-quality employment, increase citizen participation and become great places to live and work.**”

<http://www.forbes.com/sites/federicoguerrini/2015/01/28/worlds-top-7-smartest-cities-of-2015-are-not-the-ones-you-d-expect/>

Smart city au sens large – Smart Society



Smart City



Technologies

Infrastructure (Internet, réseaux, appareils mobiles)

Capteurs, Actuateurs

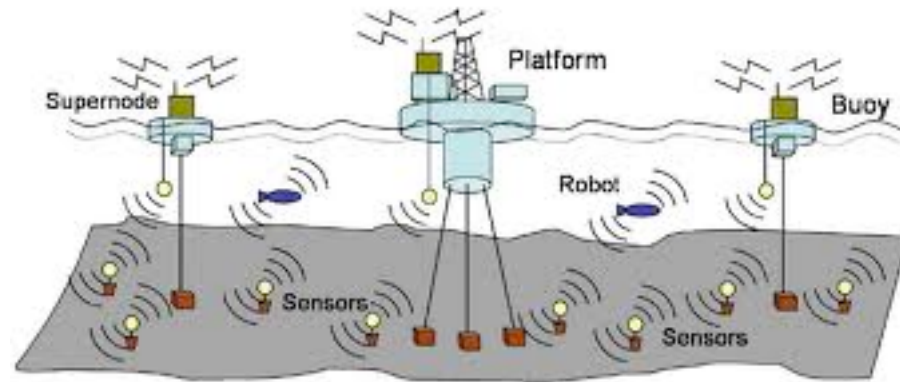
IoT

Open Data

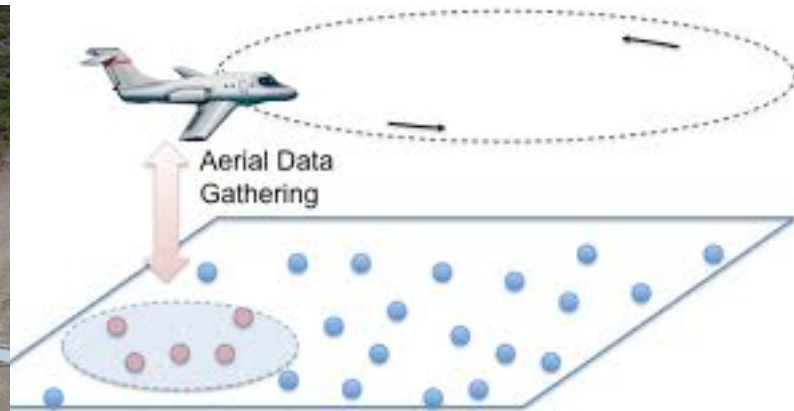
Big Data

Electricity Grid

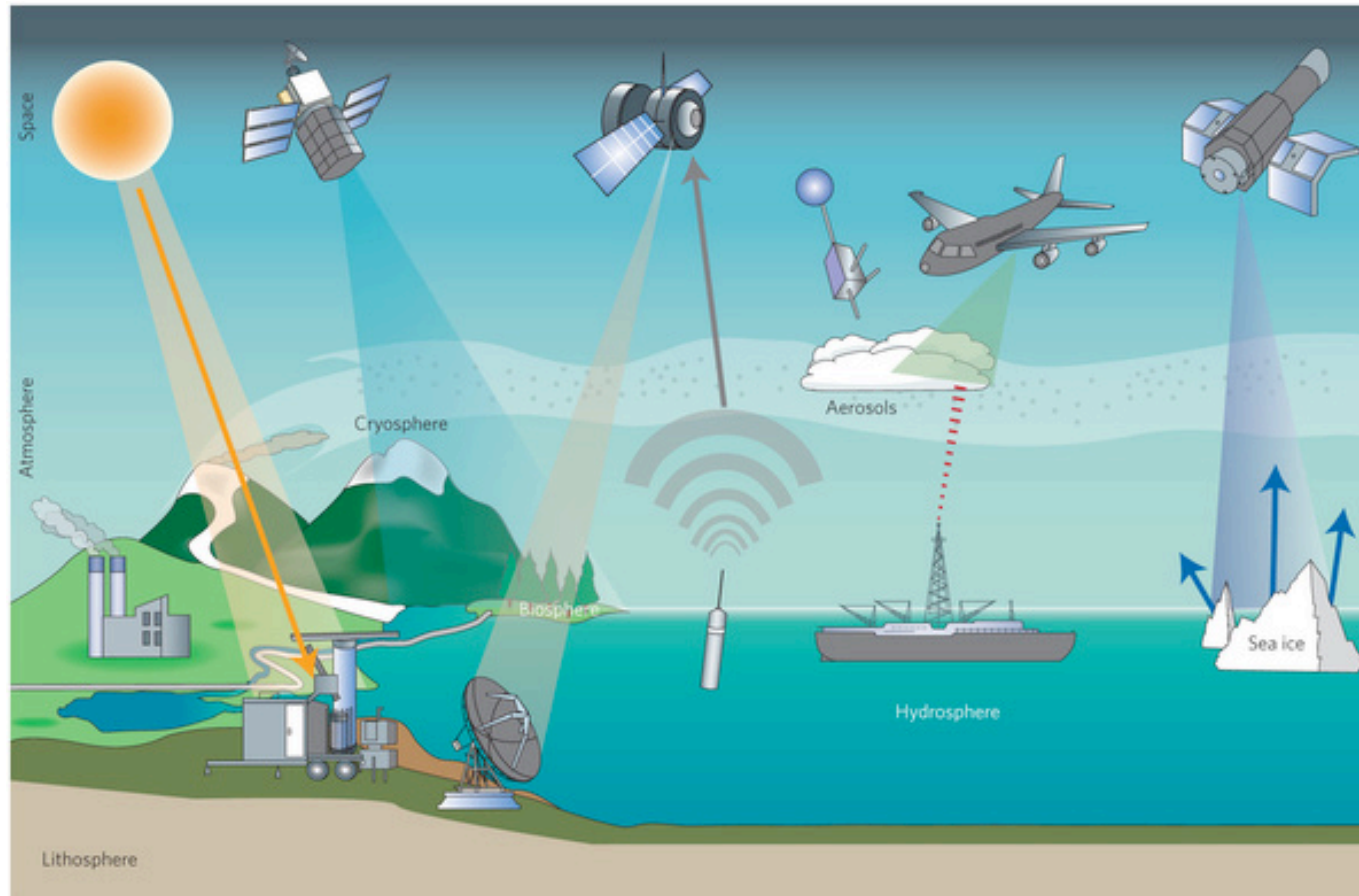
Capteurs physiques



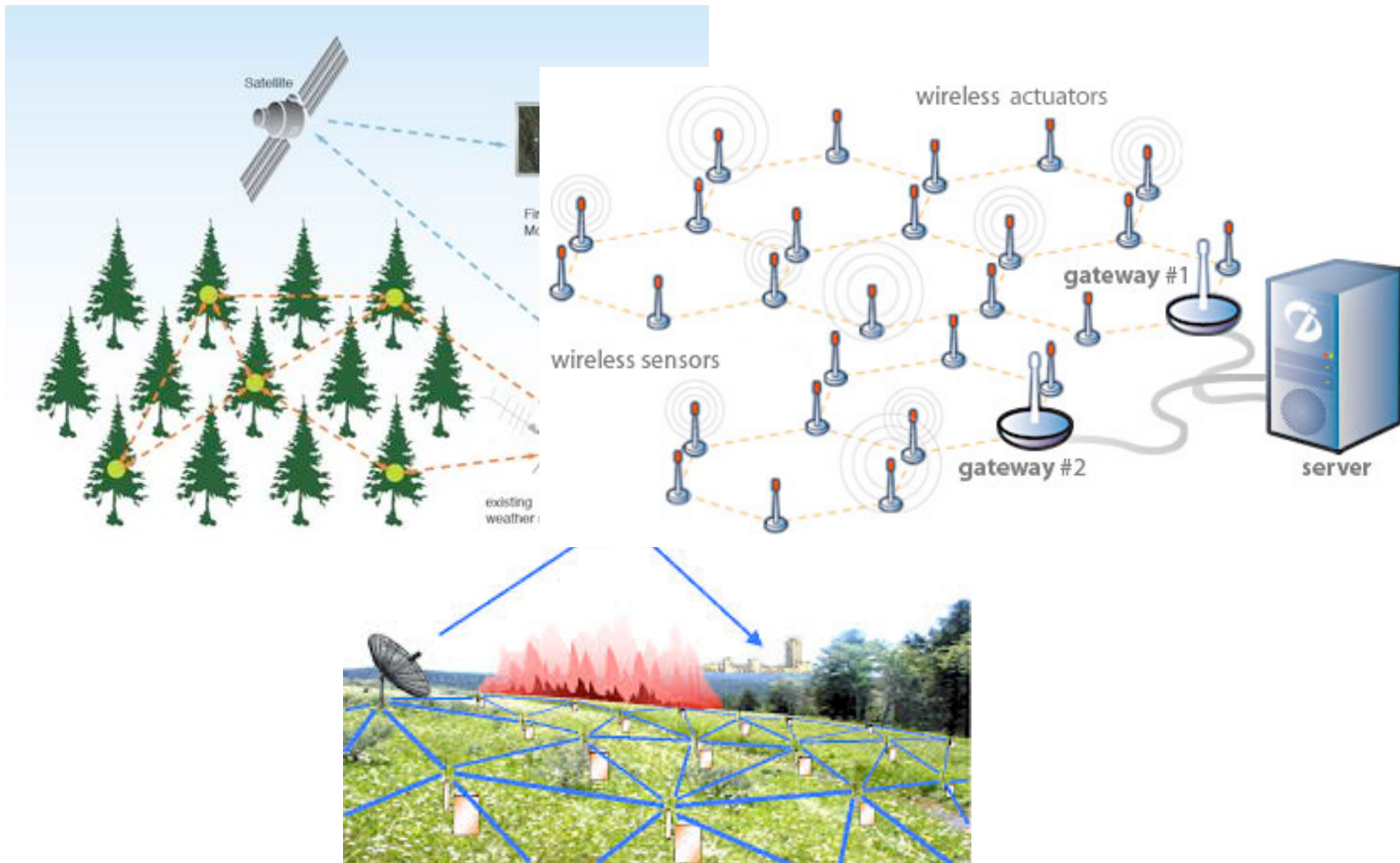
Terrestre
Sous-marin
Aérien



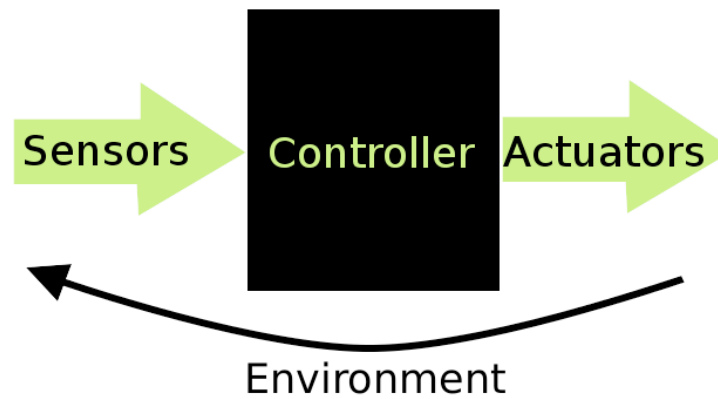
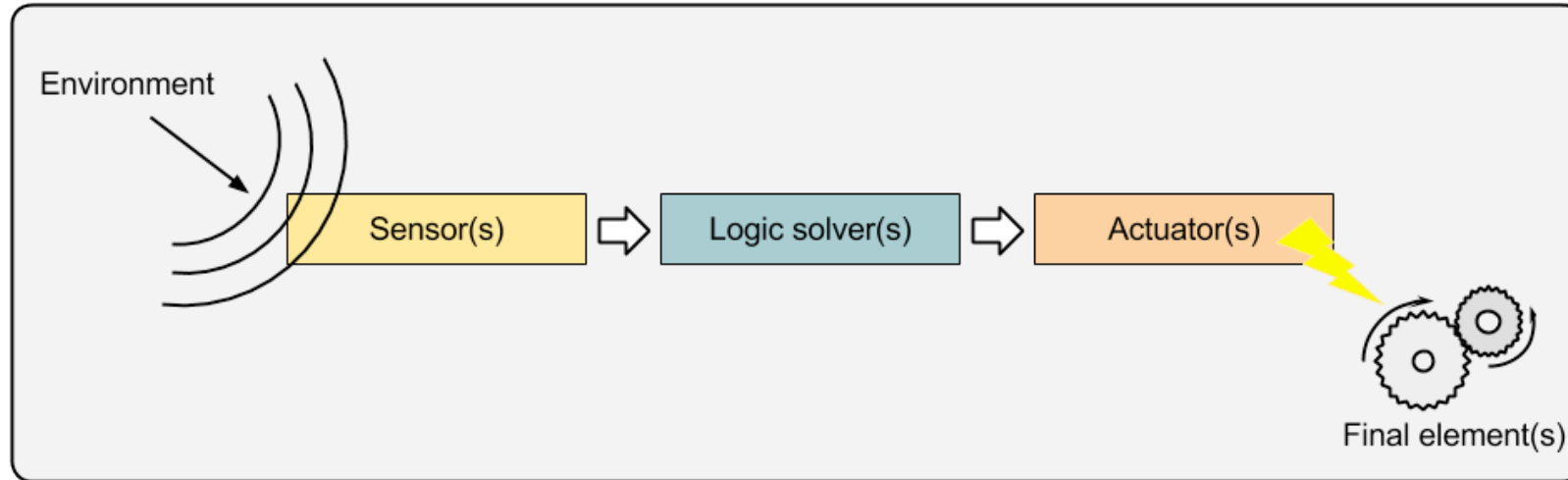
Capteurs physiques aériens



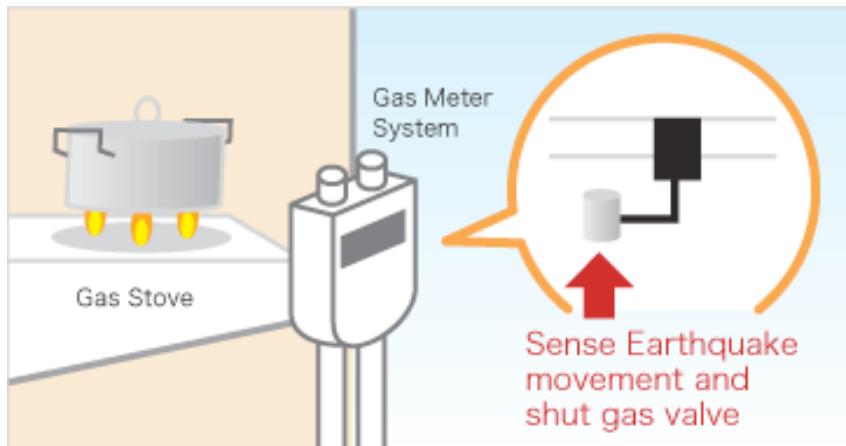
Réseaux de capteurs



Capteurs - Actuateurs



Capteurs - Actuateurs



<http://www.ubukata.co.jp/english/product02.html>

Capteurs virtuels



- Jeremiah Ouyang** @joooyang
Savvy Fishermen Fish where the Fish are. The distributed web strategy will involve widgets. Expect to see Widget advertising networks grow.
Expanded
- Erica OGrady** @ericaograd
@alsamko - I second that. In case you missed it she said: Social Media - Content isn't King, relationships are.
View conversation
- K.G. Schneider** @kgschneider
@bjackate I haven't had a job title my family has understood in about a decade!
View conversation
- Amy Gahrn** @amygahrn
Just told my Poynter readers how to do news podcasts smart. Can't wait to hear their excuses: <http://tinyurl.com/2bpu25>
Expanded
- Laura P Thomas** @laurapthomas
me: "No, I can't stay home again today, have some face-to-face mrgs to make" gin: "can't you do those in Second Life and stay home again?"
Expanded

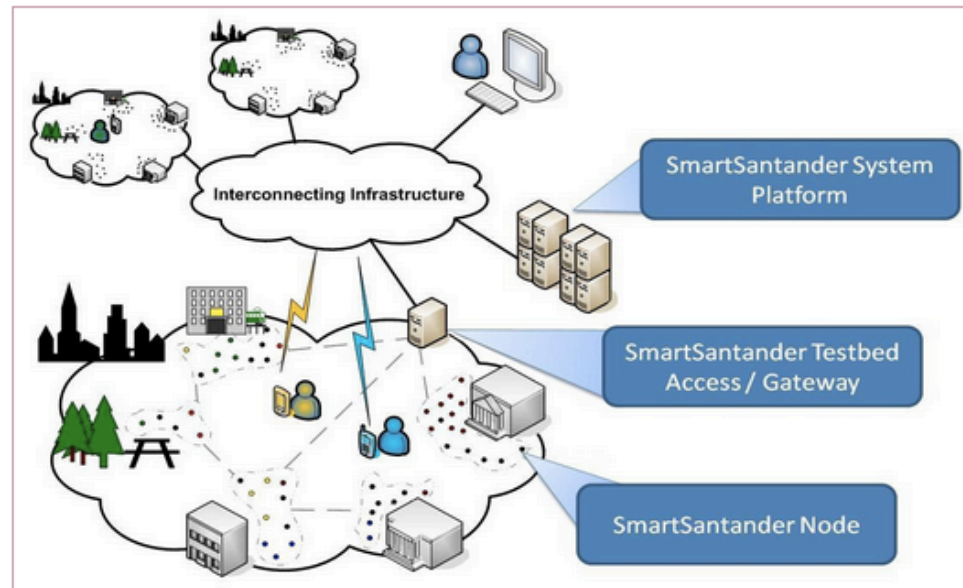




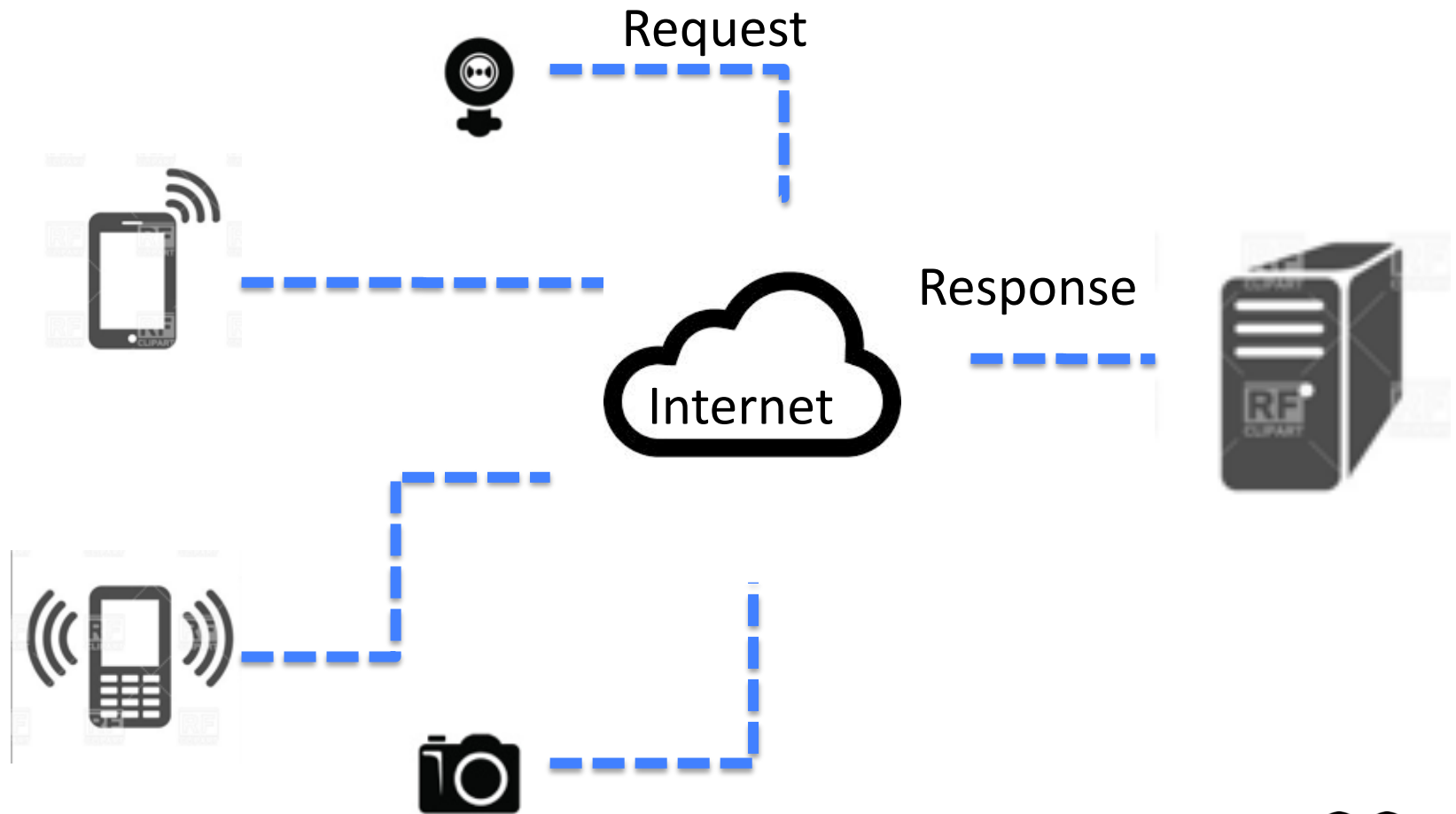
<http://www.smartsantander.eu/>

How does the infrastructure work?

A scalable, heterogeneous and trustable large-scale real-world experimental facility will be deployed. During the RWI sessions of the Future Internet Assembly in Prague in early 2009, the main requirements for a real-world IoT experimental platform were identified. SmartSantander will address all these requirements by specifying, designing, and implementing the necessary building blocks. An initial high-level architecture for the resulting new experimental facility has already been worked out, and is shown in Figure below. This architecture heavily relies on existing components which will be supplemented by the so far missing building blocks.



IoT Services



IoT – Robots sur Internet



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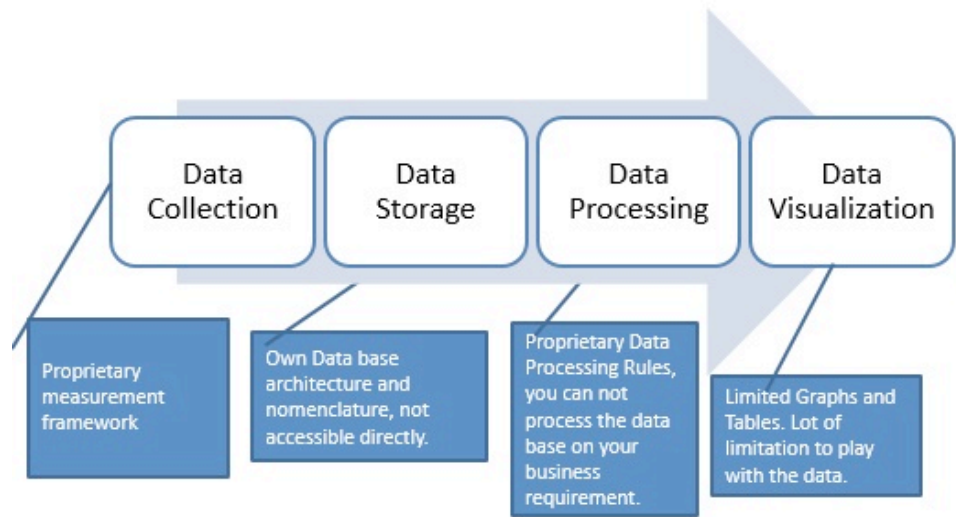
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Web robots

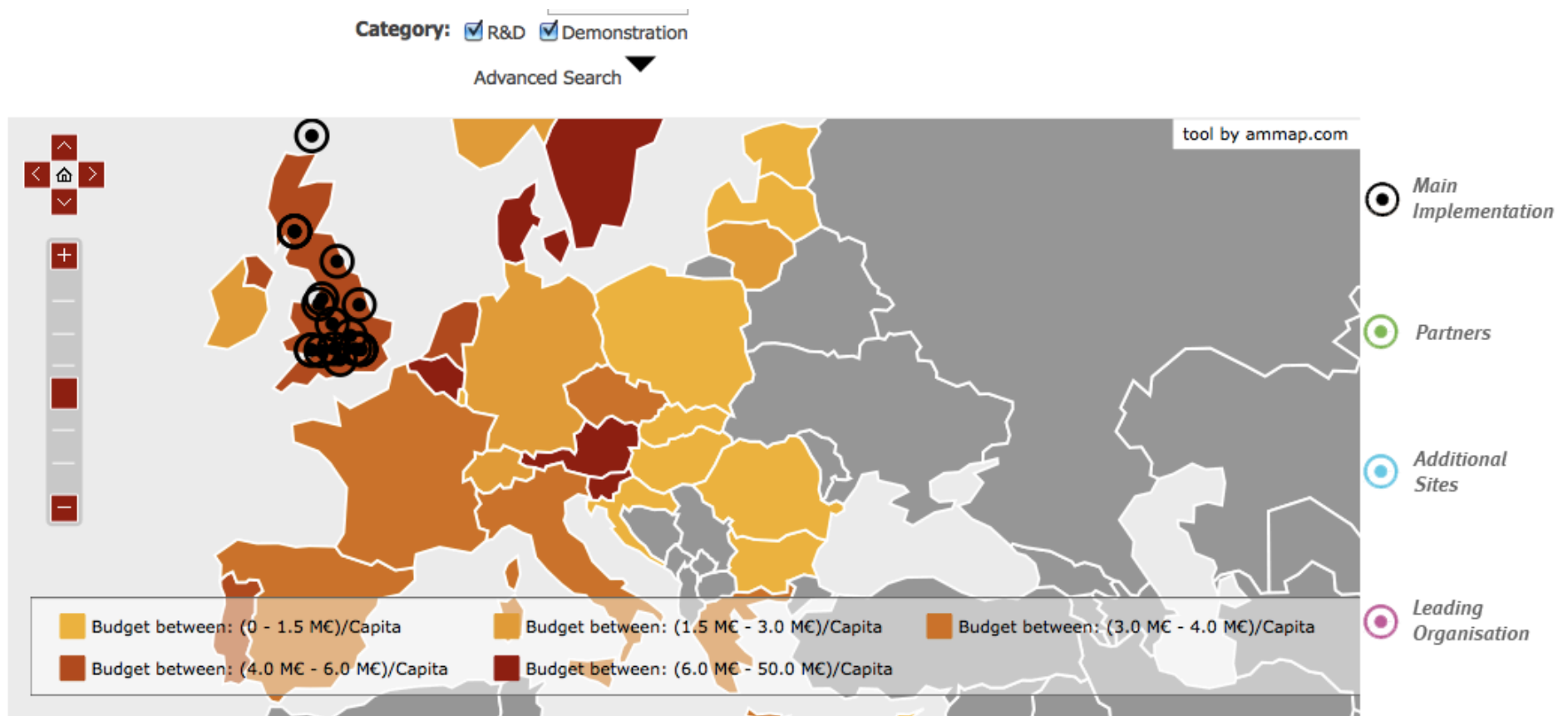
*Francesco De Angelis
Jose Luis Fernandez-Marquez
Jérôme Marchanoff
Giovanna Di Marzo Serugendo*

*francesco.deangelis@unige.ch
joseluis.fernandez@unige.ch
jerome.marchanoff@unige.ch
giovanna.dimarzo@unige.ch*





Smart Grid R&D Projects



<https://portal.smartgridprojects.eu/Pages/Map.aspx>

Services

“Brad” – IoT

Services spatiaux

Gestion de foule

Maison du futur

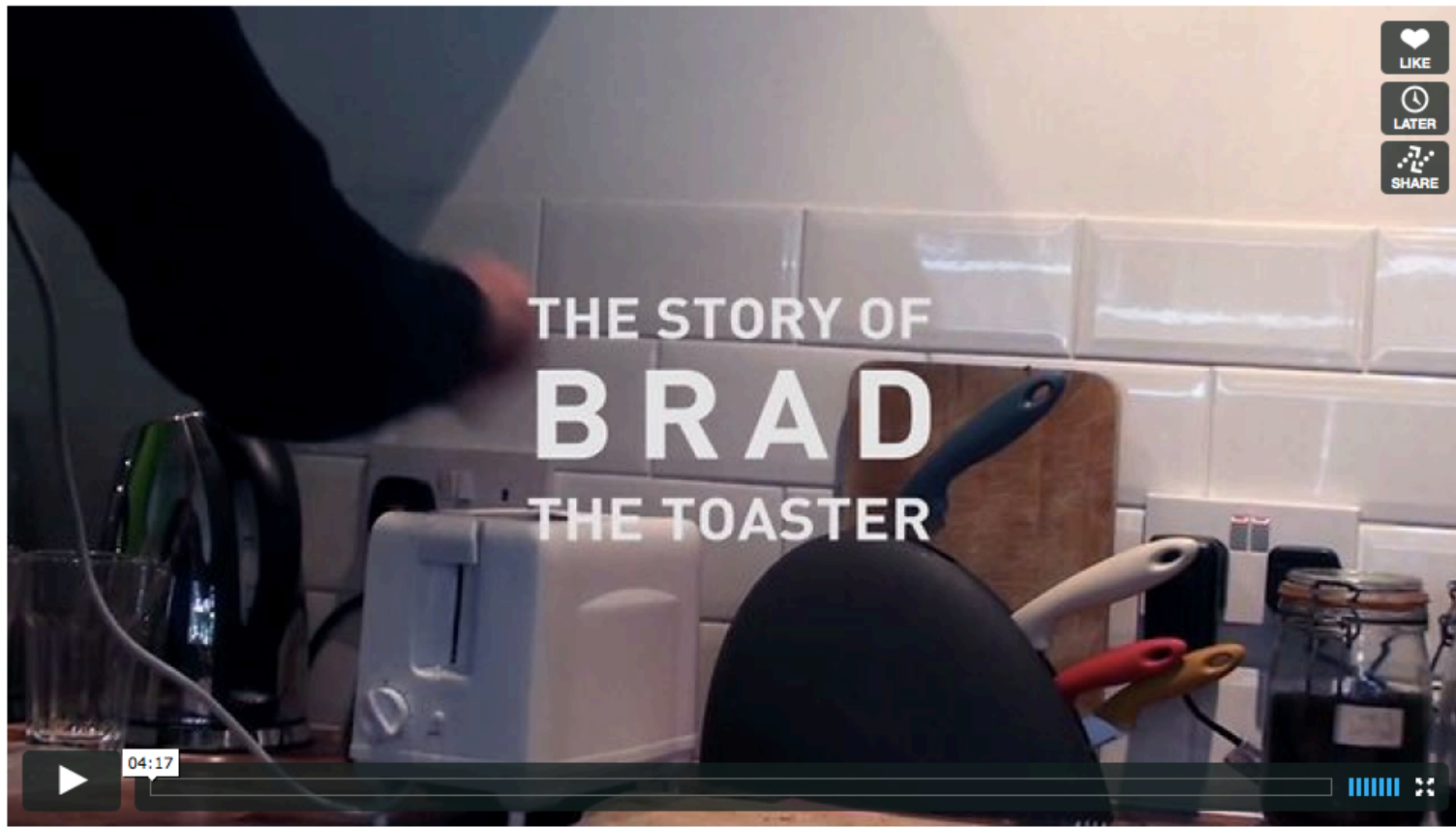
Gestion de l'eau

Gestion des déchets

Smart parking

Transports Intelligents

Services



<http://vimeo.com/41363473>

Services “dans l’espace géographique”

Crowd Steering

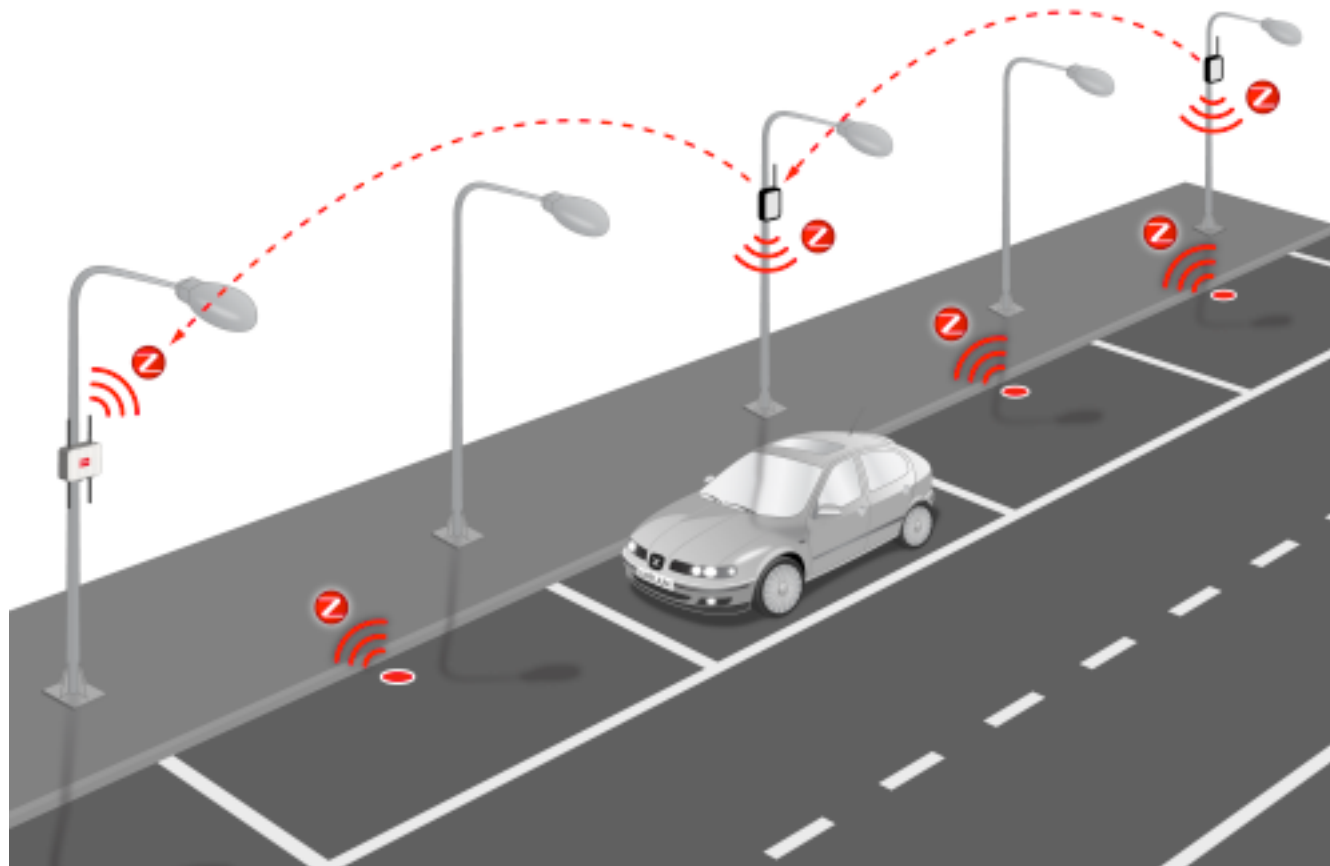
Chemotaxis

Gradient

Spreading



Services “dans l’espace géographique”



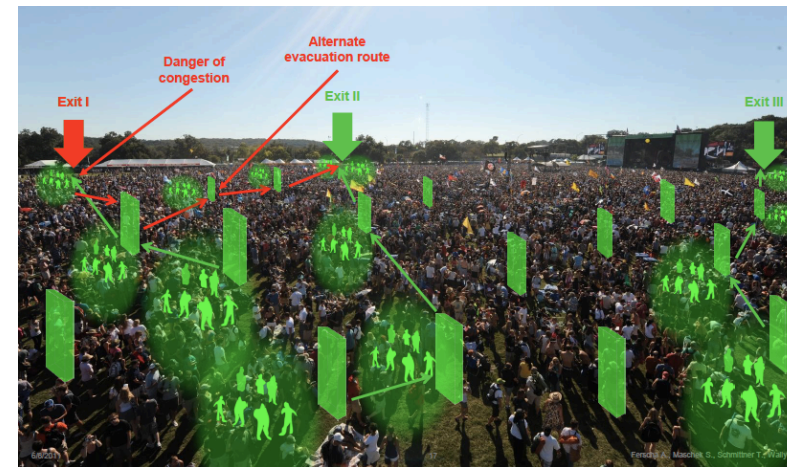
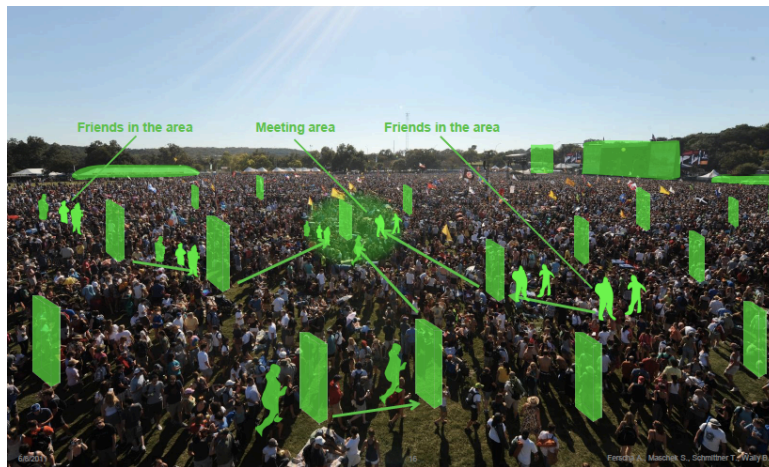
Services “dans l’espace géographique”



Gestion de foule

Crowd Steering through Public/Private Displays

- Single user
- Multiple user
- Emergency



Maisons du futur



<http://www.youtube.com/watch?v=9DJr8QwgLEA>



Water management for a Smarter Planet



Miami-Dade county saves USD1 million using water conservation

▶ Watch the video (00:03:22)



Fixing the future

📄 Register for the whitepaper (874KB)



Water management solutions

- ➔ IBM Intelligent Water
- ➔ IBM Enterprise Asset Management for water utilities

Smart = ?

Quelle intelligence?

Context-aware, Adaptatifs

Swarm intelligence

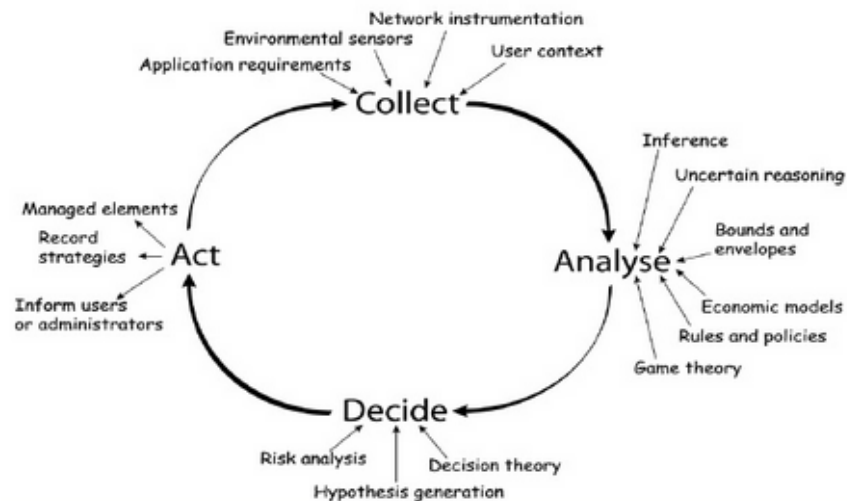
Systemes adaptatifs contextuels



The day and night interfaces in the [GARMIN Zumo 660](#) adapt the interface color so the user isn't blinded with a bright light.



Nest uses sensors to adapt the temperature to activity in the home.



Feedback Loop

Smart Services / Swarm Intelligence



<http://youtu.be/nSIPesWIDx8>

<http://www.sapere-project.eu>



Initiatives Smart Cities

IEEE Smart Cities Initiative / Challenge

IBM Smart Cities Challenge

IEEE Smart Cities

IEEE

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The First Annual
IEEE International Smart Cities Conference (ISC2-2015)
25-28 October 2015 | Guadalajara, Mexico


Full Paper Submissions Due June 15, 2015 – [Click Here For Details](#)

<http://smartcities.ieee.org/>




< **Smart City Example: Copenhagen** >

Copenhagen has committed to being carbon neutral by 2025, with 40% of its residents already commuting by bike.



< **Smart City Example: Tokyo** >

Tokyo's suburb of Fujisawa is currently being rebuilt with every house including solar panels and storage batteries.



< **Smart City Example: Toronto** >

Toronto uses natural gas captured from its landfills to power the city's garbage trucks. Fully closed-loop energy.

<http://www.secured-app.com/ieee/futurecom/?lang=en>



About the Smarter Cities Challenge



<http://smartercitieschallenge.org/about.html>

http://www.ibm.com/smarterplanet/us/en/smarter_cities/overview/

Genève = Smart City?

10 most connected cities in the world



Being a connected city doesn't just mean faster Internet speeds, it can also benefit innovation and tourism and support the local economy and civic aspirations. But some cities put more of an emphasis on their connectedness than others.

A new report from UBM's *Future Cities*, looks at the 10 best "Internet cities" in the world, based on five criteria: Internet speed; access to citywide Wi-Fi (fast and free being a plus); openness to innovation; support of public data; and security and data privacy.

Based on these factors, here are the world's 10 most connected cities (in no particular order):

- Seoul
- Hong Kong
- Tokyo
- Prague
- Amsterdam
- Montreal
- Seattle
- Geneva
- Stockholm
- Vienna



Europe has the most connected cities, followed by Asia, and North America. Only one city is in the United States -- hardly a surprise since the U.S. doesn't even crack the top 10 of countries with the fastest Internet .

http://www.ibm.com/smarterplanet/us/en/smarter_cities/overview/

<http://www.zdnet.com/article/10-most-connected-cities-in-the-world/>

... et le Smart City en Suisse?



IEM SA - Smart Parking



Orbiwise – Poubelle Intelligente

Emission du 21 janvier 2015



Les réseaux intelligents

 Tweeter 0

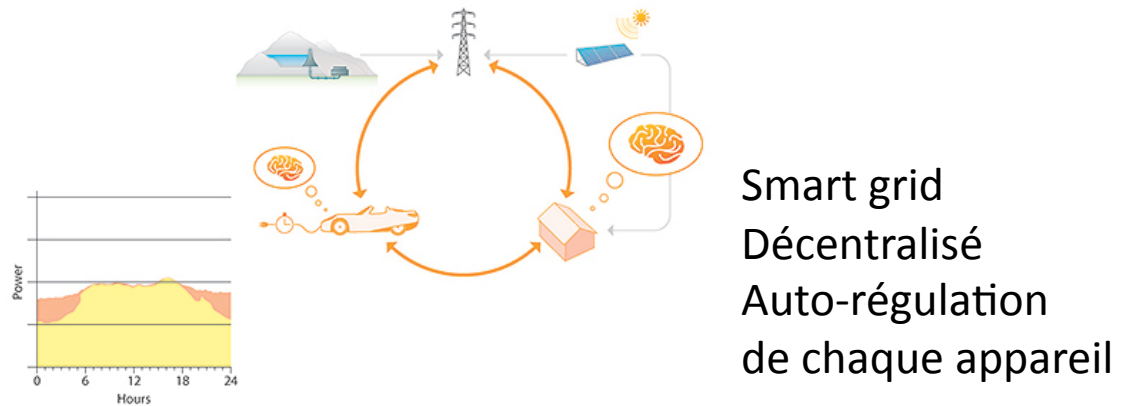
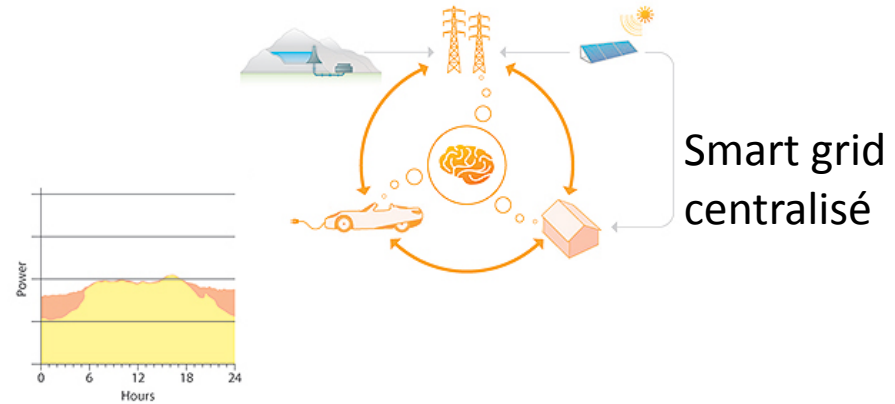
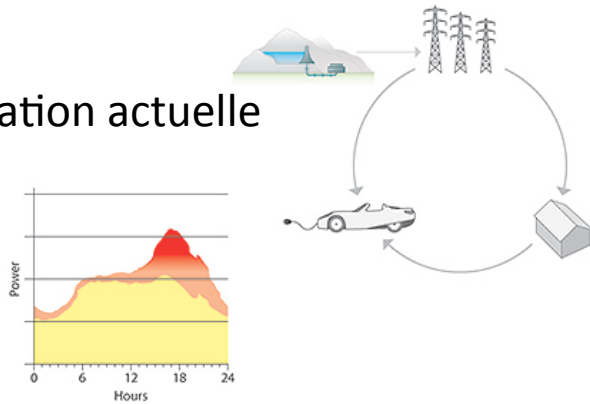
 Partager 0

Pouvoir vivre grâce aux seules énergies solaires et éoliennes est un rêve qui pourrait voir sa réalisation bien plus tôt que nous l'imaginons. Une équipe de l'EPFL travaille sur les réseaux de distribution électrique intelligents. Un système qui permettrait à chaque immeuble de devenir sa propre petite centrale électrique.

<http://www.rts.ch/emissions/court-du-jour/6367810-les-reseaux-intelligents.html>

Swiss2Grid – HES-Berne

Situation actuelle



<http://www.s2g.ch/>

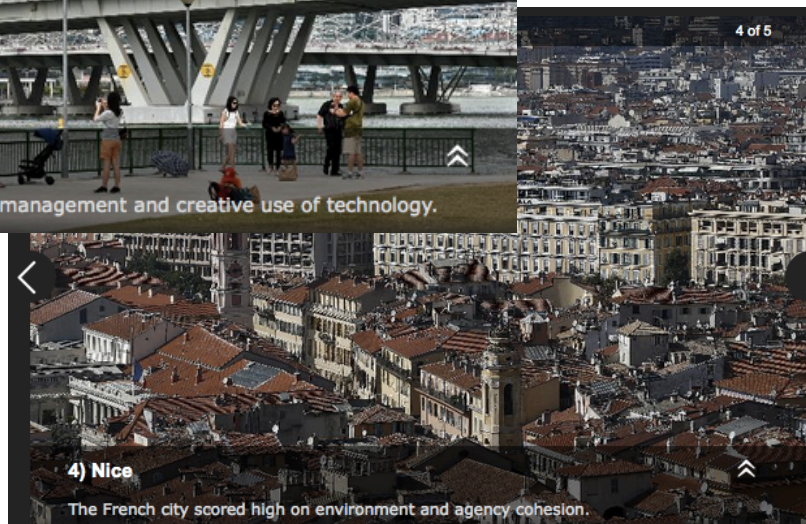
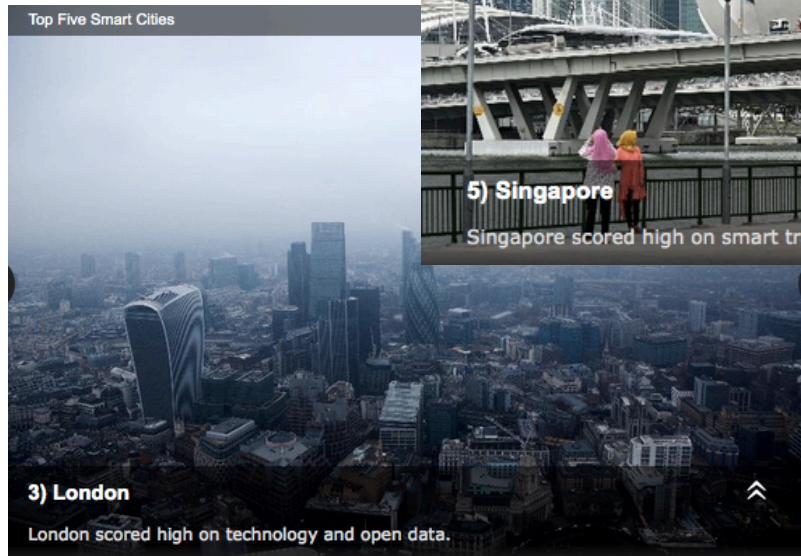
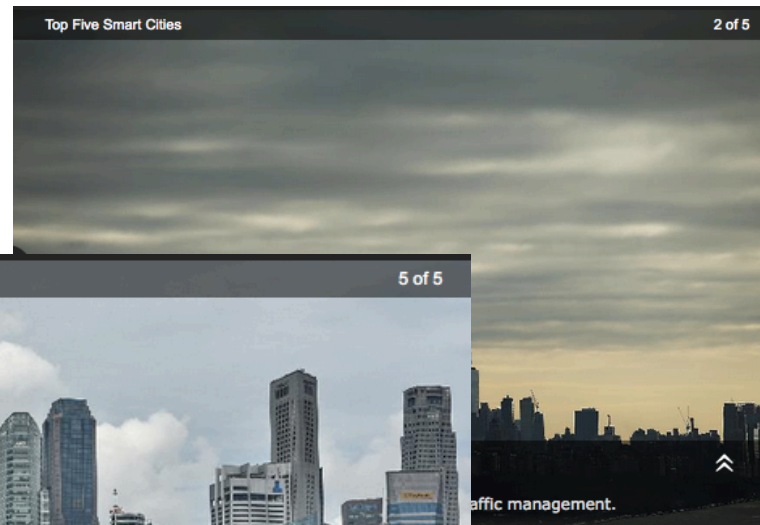
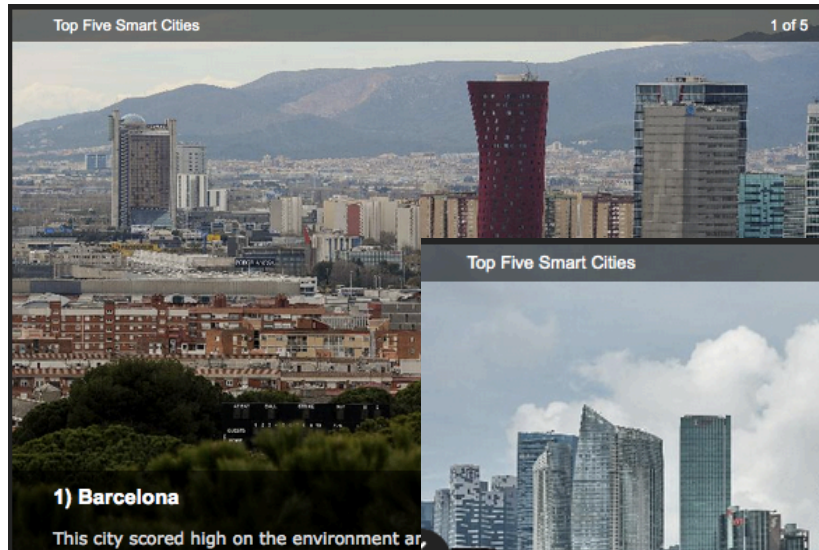
.. smart cities ailleurs?

Top 5 smart cities

<http://www.forbes.com/pictures/fgjd45ffdi/5-singapore/>

Top smart cities - benchmarking

<http://www.fastcoexist.com/3038818/the-smartest-cities-in-the-world-2015-methodology>



<http://www.forbes.com/pictures/fgjd45ffdi/5-singapore/>

Barcelone – Global Smart City 2015



Smart grids
Smart traffic management
Smart street lightning
Capacité technologique
Cohésion sociale
Projets durables

<https://eu-smartcities.eu/content/barcelona-world%E2%80%99s-smartest-city-2015>

Singapore – Smart Traffic Mgt

Prix adaptés sur l'autoroute
Feux de signalisation intelligents
(green wave)
Info trafic temps réel
Dissémination de l'info sur routes, apps

Singapore: Intelligent Transport System



<http://cityclimateleadershipawards.com/singapore-intelligent-transport-system/>

Nice

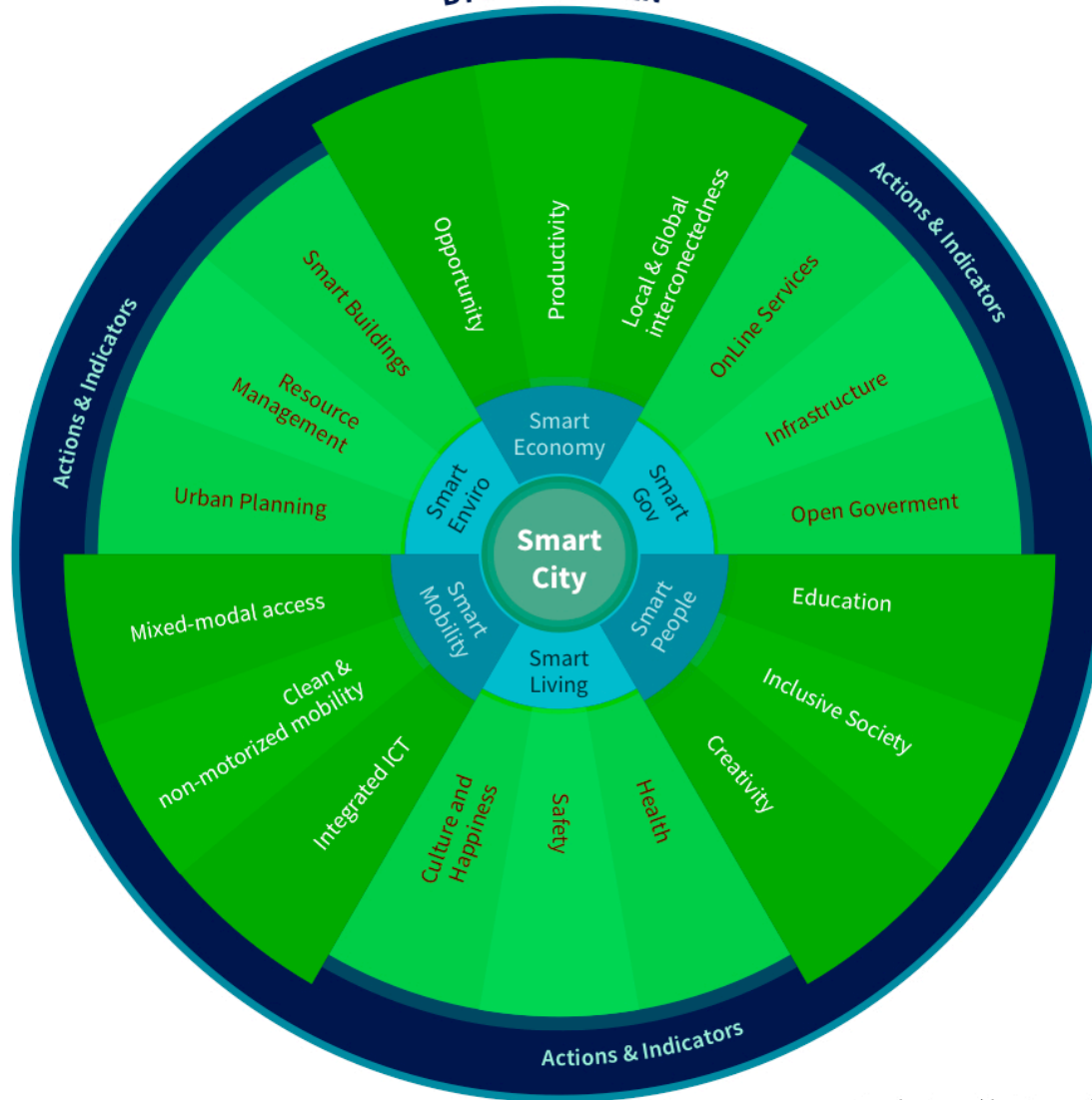


Villes intelligentes: 5 ans d'innovation sur la Côte d'Azur

- ① **1re expérimentation du « NFC sans contact » en Europe** avec la plateforme de services **Cityzy** et les services **Connecthings** déployés par **Véolia Transports** sur le réseau de bus (Nice, 2010). > [plus](#)
- ① **1re et seule ville française lauréate du « Smarter Cities Challenge » d'IBM (Nice, 2011)** > [plus](#)
- ① **L'un des 6 premiers smart grids français** dans le cadre des investissements d'avenir : **Réflexe**, piloté par **Veolia Environnement** avec **Alstom Grid, CEA-INES, Supélec et Sagemcom** (Nice 2011-2015) > [plus](#)
- ① **1er service d'auto-partage** déployé à grande échelle en France : **Auto-Bleue** (Nice, 2011) > [plus](#)
- ① **1er démonstrateur smart grid en France**, unique en Europe : le démonstrateur de quartier solaire intelligent **Nice Grid** à Carros avec **ERDF, EDF, Alstom, Saft**, etc. (Nice Eco-Vallée, depuis 2011) > [plus](#)
- ① **1er service de Mairie virtuelle « Spot mairie »** avec **Cisco** (Nice, 2012) > [plus](#)
- ① **1er système de parking intelligent en Europe** (Nice, 2012) > [plus](#)
- ① **1re charte territoriale smart grid en France** (charte des Alpes-Maritimes, 2013) > [plus](#)
- ① **1er boulevard connecté au monde** avec **Cisco** (Nice, 2013) > [plus](#)
- ① **1er bus électrique** à charge rapide et à autonomie illimitée au monde sans équipement lourd, avec **WATT system** (Aéroport Nice Côte d'Azur, 2014) > [plus](#)
- ① **4e smart city au monde** selon Juniper Research (Métropole Nice Côte d'Azur, 2015)

<http://www.investincotedazur.com/fr/info/news/nice-4e-smart-city-au-monde/>

BY BOYD COHEN



Re-designed by Manuchis.

<http://www.fastcoexist.com/3038818/the-smartest-cities-in-the-world-2015-methodology>

Participation citoyenne

Citizen as a scientist

... as a sensor

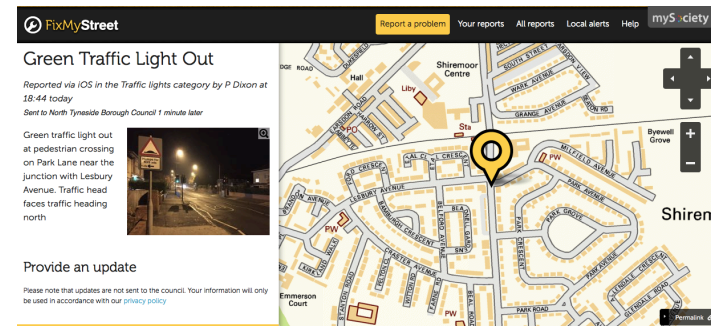
.. as a policy maker

Collaboration, participation, engagement

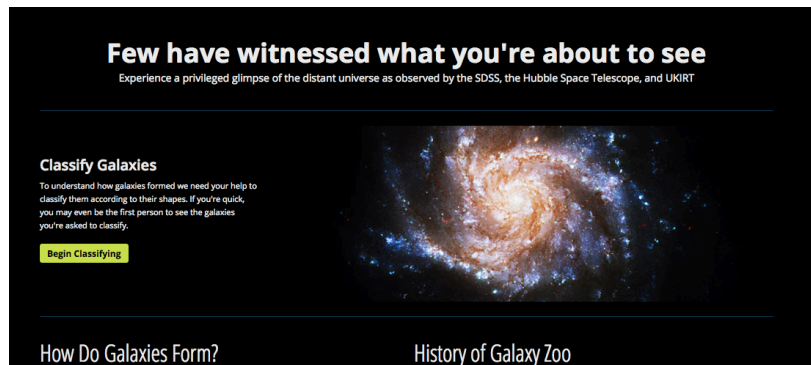
Information sharing



Citizen as a sensor



Citizen as a scientist



Democratic engagement



Technology tools

Web based platforms
Social Media



Crowdsourcing platforms



Mobile phones

Screenshot of the International Federation of Red Cross and Red Crescent Societies website showing the TERA (Trilogy Emergency Relief Application) and Beneficiary Communication page. The page includes a navigation menu, a search bar, and a main content area with a photo of a hand holding a mobile phone. The text on the page reads: "TERA (Trilogy Emergency Relief Application) and Beneficiary Communication". Below the photo, it says: "SMS messages are sent to communities across the country providing simple information on how to avoid cholera outbreaks." The page also features a sidebar with "Related documents" and "First hand information from beneficiaries".

Open Source Platforms /
Democracy

Screenshot of the Loomio website homepage. The page features a navigation menu with "LOG IN" and social media icons. The main content area has a globe icon and the text: "The world needs a better way to make decisions together." Below this, it states: "Loomio is free and open source software for anyone, anywhere, to participate in decisions that affect them."

Platforms for democracy and engagement

Voting tools / e-signature tools



Voting advice



Preferential Voting and Opinions

LiquidFeedback News · Developers area · Donate · [Full site](#)

LiquidFeedback is an *open-source software*, powering internet platforms for *proposition development and decision making*.

LiquidFeedback is an independent open source project published under MIT license by the Public Software Group of Berlin, Germany. The developers of LiquidFeedback have teamed up in the Association for Interactive Democracy to promote the use of electronic media for democratic processes.

LiquidFeedback is more than Liquid Democracy

Liquid Democracy

Collective Moderation

Fully Transparent Decision Process

Preferential Voting

Information, conversation, vote

PARTIDO DE LA RED - DEMOCRACIA 05 PARTIDO DE LA RED · INGRESAR

31 ABIERTOS 99+ CERRADOS

PRÓXIMOS A CERRAR

- Tarifa Social y Abonos para el Subte**
458 Participantes
- Protección de Nuestra Señora de Las Victorias
198 Participantes
- Basta de camiones con volquetes a cualquier hora
458 Participantes
- Extensión del horario del Subte
292 Participantes
- Una ley para los Museos Portefolios

Fecha de cierre desconocida

Tarifa Social y Abonos para el Subte

Despacho 3035 / 2013

Este proyecto apunta, por un lado, a la ampliación de la Tarifa Social del Subte y Premetro, destinada a usuarios en situación de "vulnerabilidad socioeconómica". Esta Tarifa equivale al 60% de la tarifa ordinaria.

Además, el proyecto establece la gratuidad del pasaje para alumnos de escuelas públicas, inicial, primaria y secundaria e incorpora 3 tipos de abonos del Subte: el "Abono por pago

Compétences?

Interdisciplinarité

ICT, Data Science, Technologie

Urbanisme, Environnement, Politique,...

Conclusion?

Adaptation

Centralisé vs décentralisé

Socio-technique