DATA-DRIVEN BASED URBAN POLICIES IN BRAZIL: THE ROLE OF A SUSTAINABLE CITY OBSERVATORY AND SOME EXAMPLES

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LEARNING MEETING 1 - SMART SOLUTIONS FOR URBAN SERVICES
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cgee | Centro de Gestão e Estudos Estratégicos
Ciência, Tecnologia e Inovação

Data-Driven Urban Policies

Data-driven systems

→ Generated mainly by the spread use of internet and mobile devices and the declining costs of data collection, storage and processing

→ A simple and effective way to conduct systems to their targets, supported by the handling of large amounts of data

Evidence based policies (synonym)

→ Can provide a very fertile terrain over which cities can improve the quality of life of their population and enhance services delivery

To achieve best results, fulfillment of basic conditions are requiresneeded:

→ Open access to relevant data (degrees of openness);

→ Large ICT Infrastructure , particularly in mobile communications, computers and other devices and software

→ The use of inteligent tools and methodologies

DATA

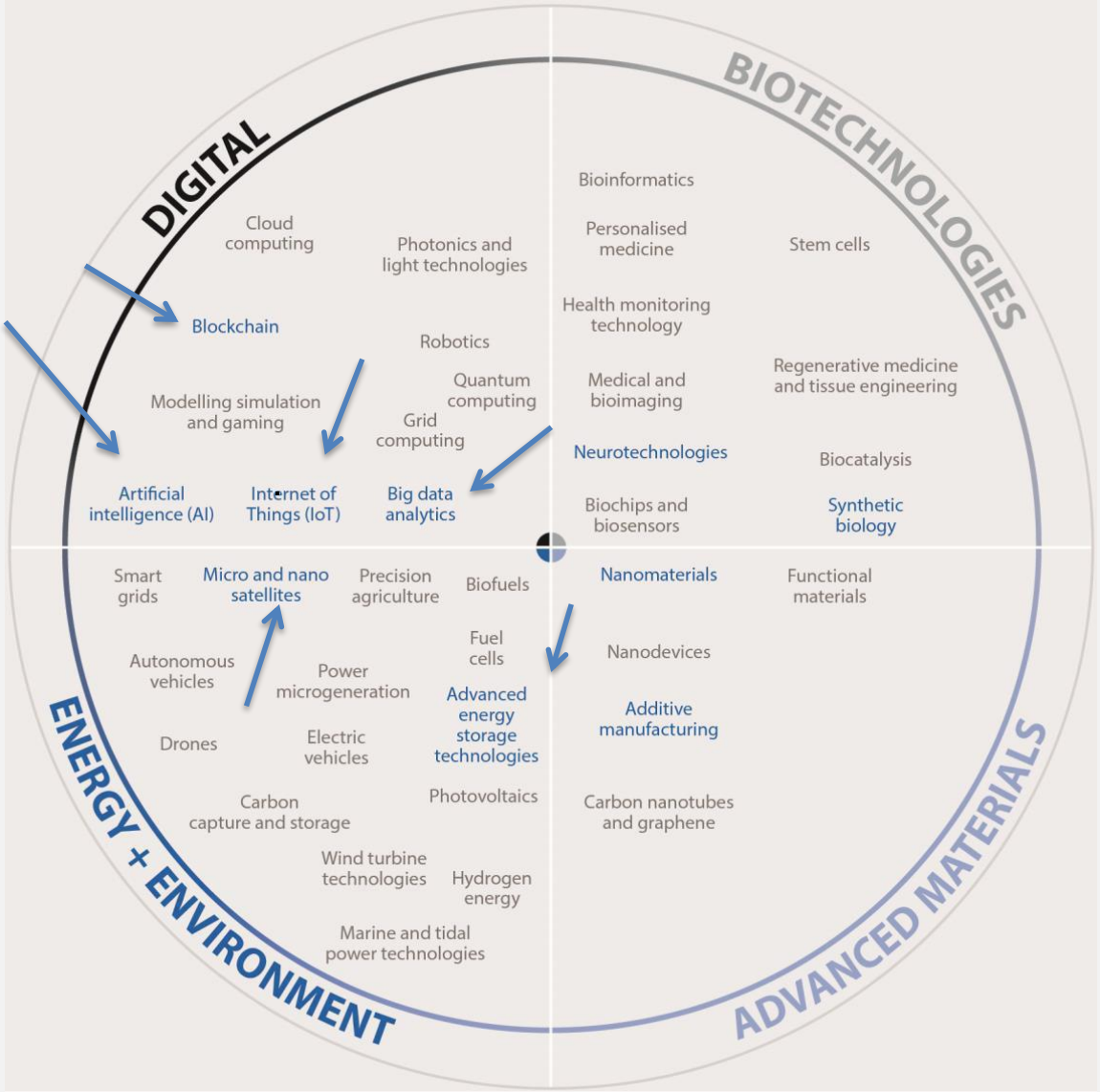
POLICIES

IMPROVED CITIES

Data-Driven related technologies

10 KEY TECHNOLOGY TRENDS FOR THE FUTURE

HIGHLIGHTS THE ROLE OF DIGITAL TECHNOLOGIES



OECD - SCIENCE, TECHNOLOGY AND INNOVATION OUTLOOK 2016

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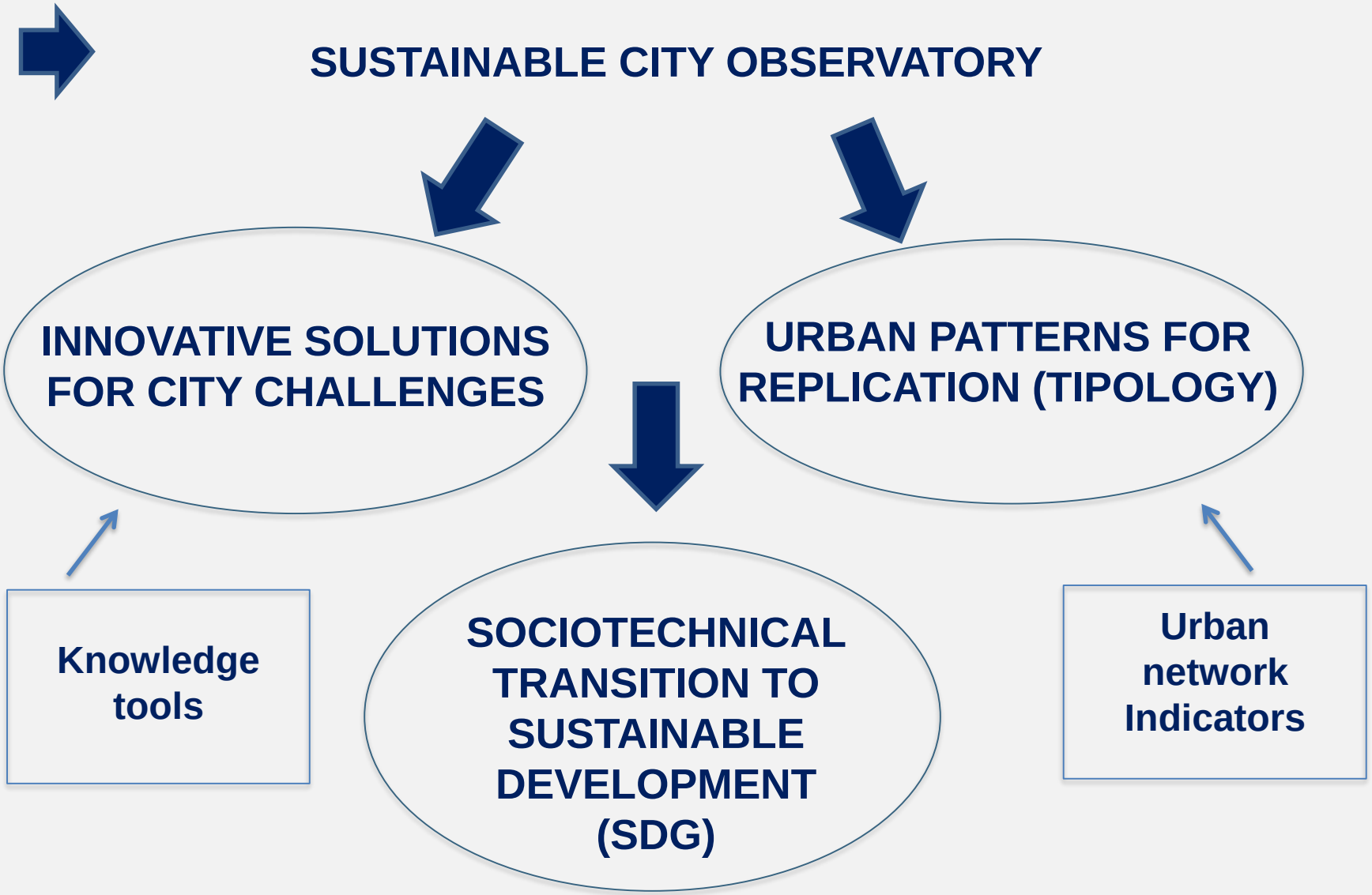

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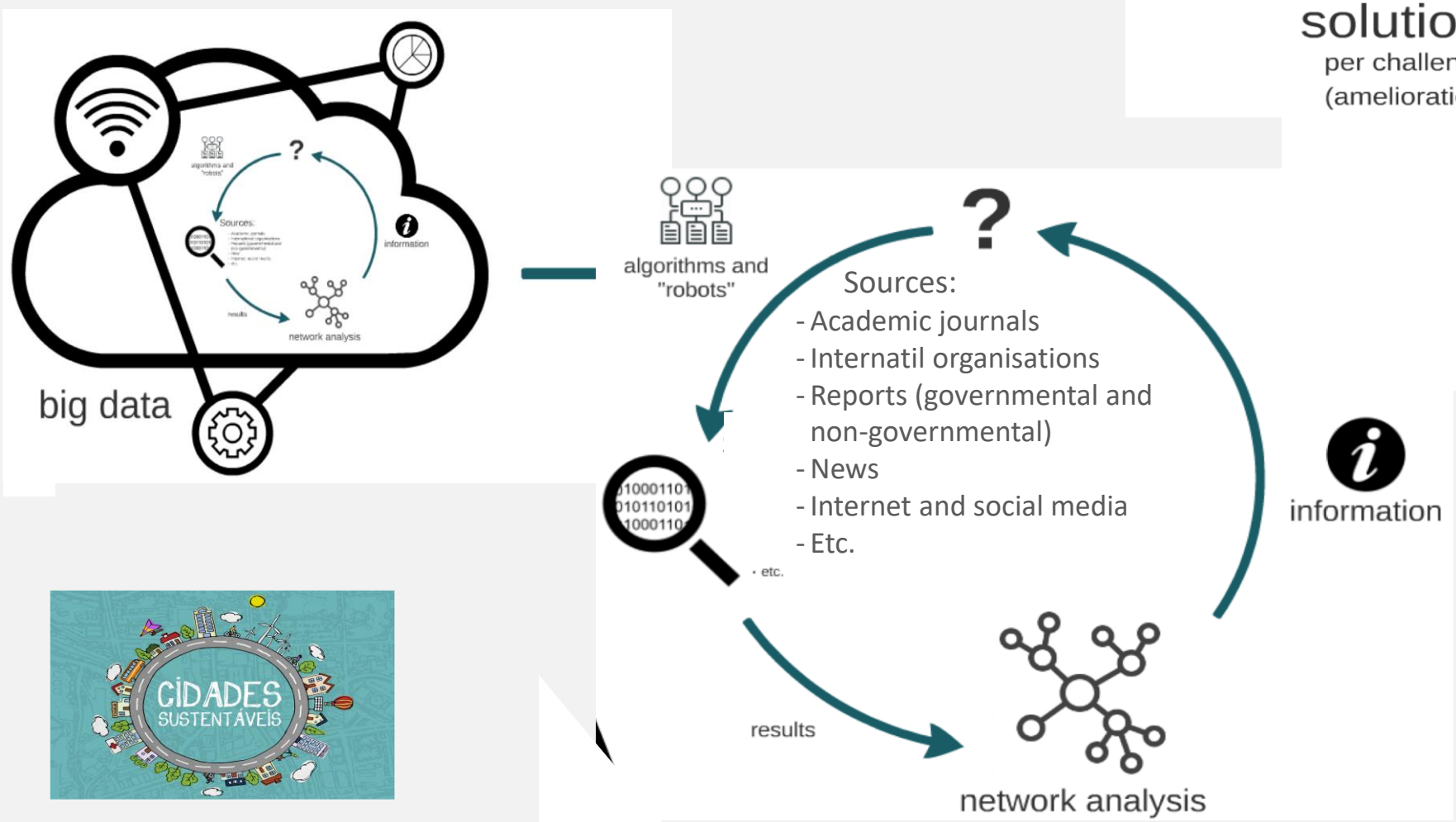
Scope

6 City Challenges

- Energy & (Mobility) — business and governance (i.e. net metering) models/arrangements for renewable and decentralised energy (i.e. production – solar) and mobility (e.g. solar boats) systems
- Built-in Environment — design options and technologies to make low income housing and the built-in environment climate resilient
- Natural Resources & Waste — nature-based solutions (e.g. phytoremediation and filtering gardens) solutions to recover and maintain water and ecosystem services, including in contaminated areas (e.g. dump site)
- Integrated Planning — automated GIS data collection technologies for long-term integrated planning and management software for mobility and zoning
- Visioning — best practices for long-term planning integrated with a collective and inclusive city visioning as well as climate scenarios
- Innovation Policy — options for improving innovation policies based on urban metabolism (resource flows) and reverse logistics

Possible solutions



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	**Education**	To enable the acquisition of required knowledge and skills for future jobs, and access to knowledge able to catalyse transformative processes
	**Energy**	To ensure energy security, reduce greenhouse gas emissions (decarbonise energy systems) and increase energy efficiency in cities
	**Innovation and competitiveness**	To promote a dynamic job market, connectivity and sustainable consumption patterns, strengthening the role of science and education in the urban transformation
	**Health**	To offer an inclusive, accessible and quality healthcare system to all as well as promote an increasing quality of life to overall citizens'
	**Food**	To provide safe, healthy, sufficient and nutritious food for all, ensuring food security and a balanced diet to citizens', and increasing the amount of locally grown and distributed food
	**Security**	To enable citizens' to use and move within public and private spaces freely and without risk, reducing the sense of insecurity in cities
	**Inclusion**	To ensure the end of poverty and socio-economic disparities, and provide universal access to basic infrastructure and services

	**Built-in environment**	To provide access to adequate housing, develop long lasting and less resource and carbon intensive infrastructure, in alignment to an appropriate land use
	Water	To ensure drinking water and adequate sanitation, stimulate an urban design sensitive to the water natural cycle and promote responsible water consumption
	**Solid waste**	To minimise waste generation in cities and manage effectively its collection, treatment and recovery or disposal, fostering its reduction, reuse and recycle
	**Resilience**	To prepare cities to anticipate, prevent, mitigate, respond and adapt to climate change and socio-environmental disasters, including new design features for urban development in transition
	**Natural resources and biodiversity**	To restore and conserve natural life- support systems and ecosystem services, including clean air and both surface and underground land and water
	**Mobility and resource flows**	To guarantee accessible cities, zero emission and non-motorised mobility, road safety, and affordable, low-carbon and quality public transport options to all, with a reduced urban metabolism
	**Governance and citizenship**	To embed sustainability in the planning of the city and ensure citizens actively shape urban development and the improvement of their living conditions

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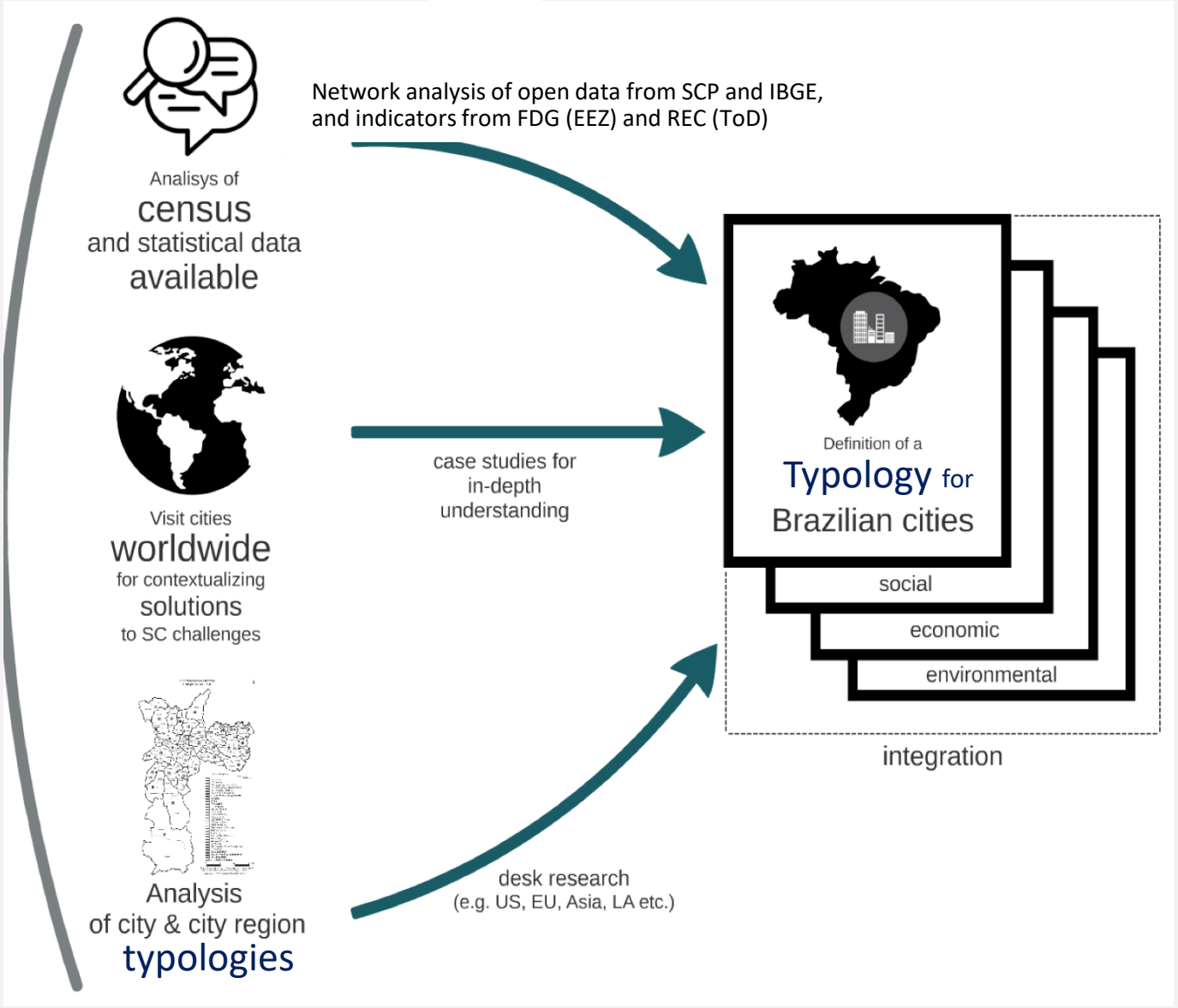
Analysis



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Services

Future evolving vision of a sustainable city

Refined solutions per City Typology and methodological guidelines

Solutions to contextualized challenges & city typology and their applicability

Validated solutions per challenge and city typology

Database of contextualised solutions per City Typology and of associated experts

app tool

Social media and consultations

+

Investigative and validation workshops

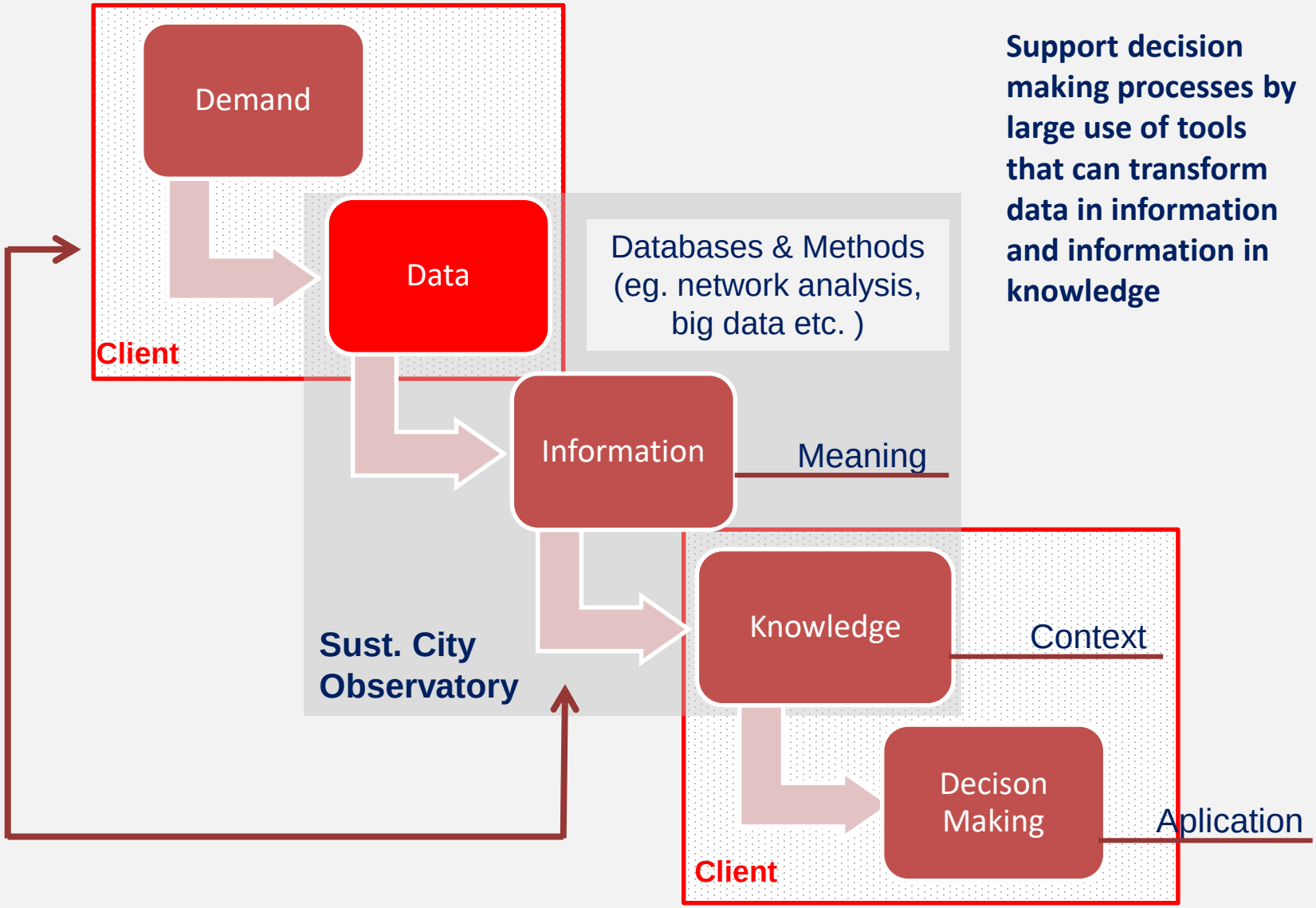
Enable **cities and stakeholders** to check for individual applicability of **solutions** and for an experts' database as well as define a **vision for the future** of a city's sustainability

Analyse Implications for Innovation Policy

Development of an Applicability Tool per challenge and/or solution

Adaptability and replicability requirements

Scheme for an intelligent process

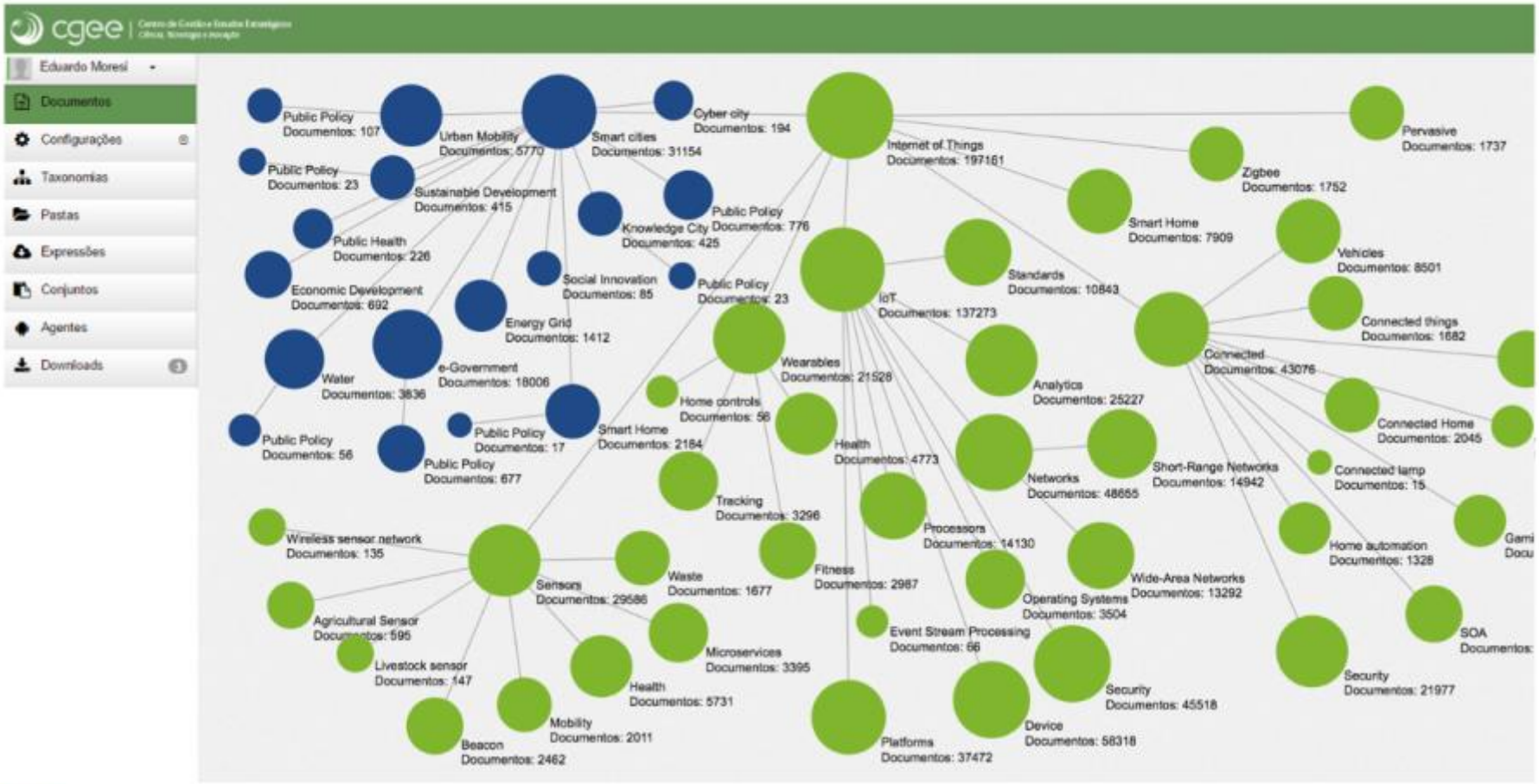


Support decision making processes by large use of tools that can transform data in information and information in knowledge

Data bases, sources and tools

The "big data" and "network analysis" tools can help on the identification of the relevant solutions and on the experts suited to explore and validate them for each area

Article Mapping: Internet of Things

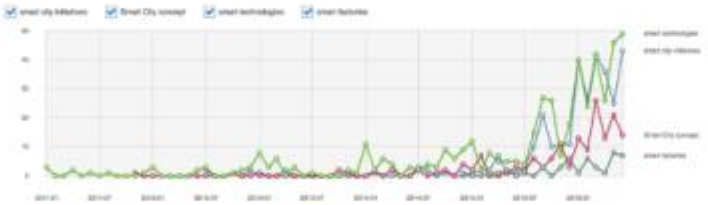


insightData

Trend analysis

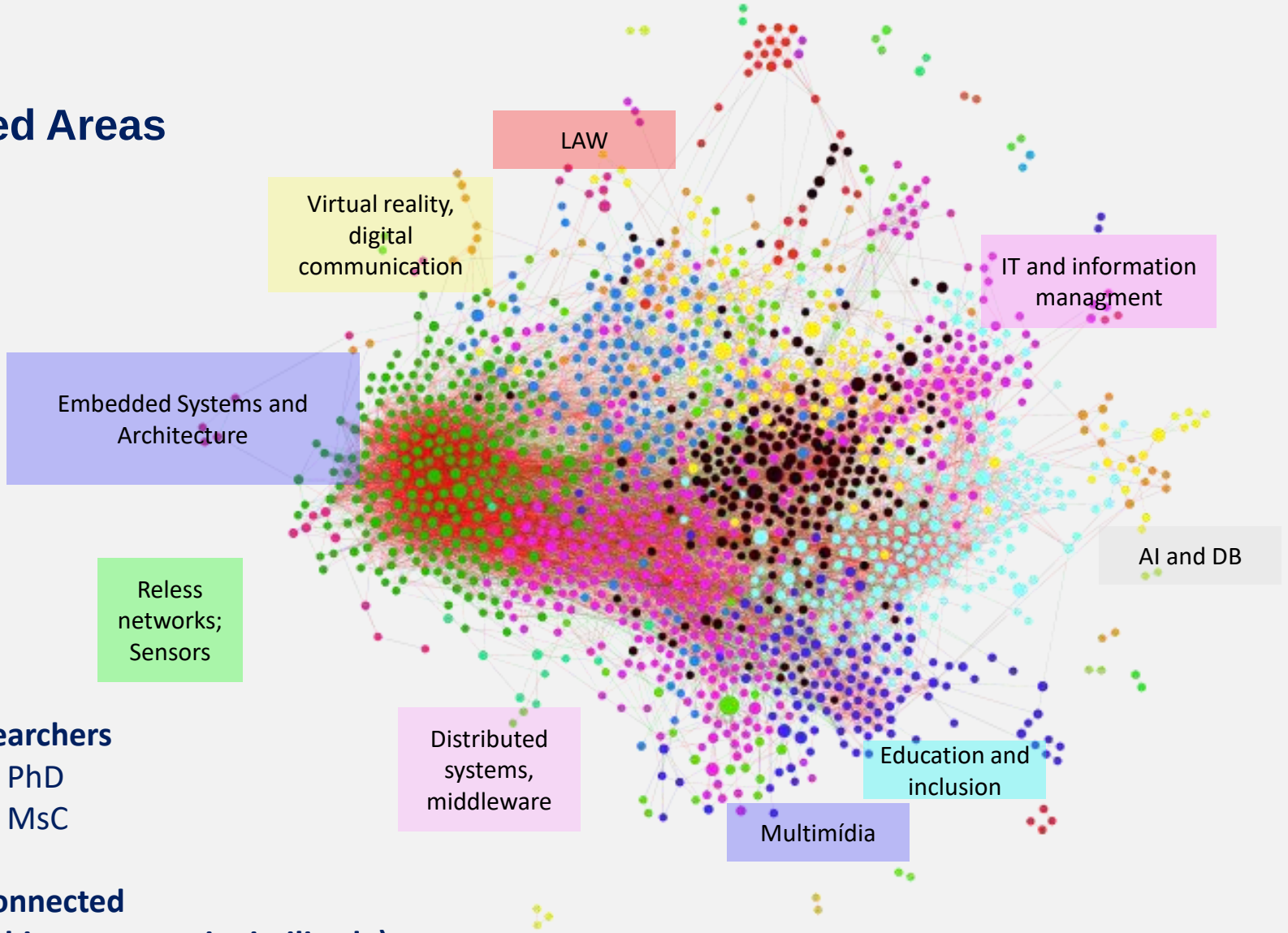
Monitoring

- Scientific production
- Market trends (from news contents)
- Technological production and intellectual property



Brazilian Researchers in IoT (CV's keyword)

Identified Areas



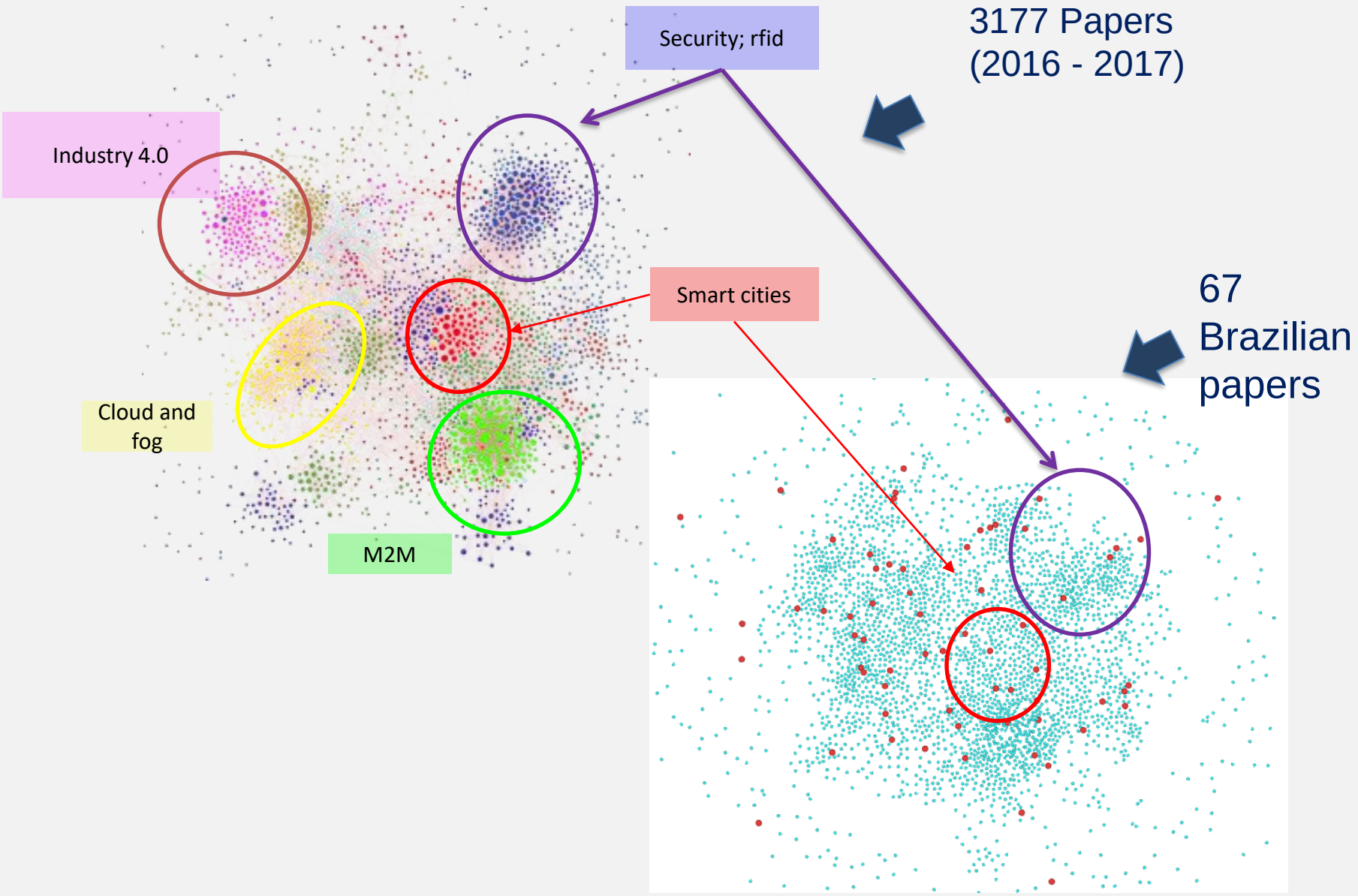
2133 - Researchers

962 – PhD

668 – MsC

1558 are connected
(coauthorship or semantic similitude)

IoT main published areas – Papers (Total & Brazil)



Example 1: Rio de Janeiro

- ✓ 2nd largest city in Brazil and one of the most violent;
- ✓ Poverty and opulence living side by side with huge inequalities that perpass urban fabric;
- ✓ ICT technologies had potential to evolve upon the vast number of mobile phones in the population hands..

- ✓ Following the 2014 World Cup and the 2016 Olympics, investiments were made to enable smart solutions;
- ✓ Integrated big data tools were set up
- ✓ Rio Operation Centre was established;
- ✓ Rio win a “World Smart City Award” in 2013 (Smart City Expo World)

Example 1: Rio de Janeiro

Rio Resilience Strategy

Chose 10 major risks areas:

1. Heavy rainfall;
2. Strong winds;
3. The urban heat island effect;
4. Rising sea levels;
5. Local and pandemic outbreaks;
6. Prolonged droughts;
7. Accidents involving the urban infrastructure
8. Congestion of the road network;
9. Influx of people impacting on the normality;
10. The incidence of crime in the urban area.

Major well succeded experiences:

- Communities warning system (especially for landslides);
- Traffic management initiatives (integration of data and operations with different apps; BRT, BRS and Rio Bike Capital

Example 2: Salvador

- ✓ City has evolved fast – from 31 to 17th position - in the Connected Smart Cities ranking (Urban Systems Consultancy);
- ✓ Also present poverty and opulence living side by side with these huge inequalities that perpass urban fabric;
- ✓ ICT technologies applied to urban management and the citizen's accessibility to them are the main novelty, again with the contribution of the spreading use of mobile phones.

- ✓ Apps – e. g. CittaMobi - deliver on line information about the time the buses will arrive at a stop;
- ✓ The city has invested in an optic fiber network that can and is supporting services like:
  - Intelligent traffic lights,
  - Transit monitoring centers
  - warning systems for natural disasters
  - reduction in the electricity company response time for lack of energy.

Some final remarks

1. **Smart solutions dialogue mainly with the wealthiest sections of the town**
   → There is room for solutions that effectively reach the poorest (justifying the use of a typology in SC Observatory);
2. **Smart city initiatives were based on short-term projects** (data storaged was discharged after 90 days of use at Rio's Operation Centre) → It will be desirable to retrieve data for longer and increase their use for planning and action;
3. **Operation's Centres should be more openned to the public in general**
   → Centre and similar institutions must interact in depht with city's citizens;
4. **There is a lot to improve in greening our cities** → We should stimulate a diversified offer of new and updated technological sustainable solutions;
5. **Sociotechnical transition should be promoted and people oriented on how to choose the best solution to each problem** → Technological solutions offer can be hierarchically organized to permit an adequate evaluation of their advantages
6. **Smart cities technology by itself isn't the solution to urban challenges**
   → inequalities should be directly confronted by initiatives being implemented.

Thank you!

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