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Urban Complexity, Smart City and Governance : An Actor-Network Theory Approach

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SMART City Context

Since 2008, for the first time in the history of humanity, more people live in cities than in rural areas.

Population projections show an urban population of 6.3 billion in 2050, compared with 3.9 billion today (UN, 2014).

- The growth of urban populations is a real challenge: access to resources, services, housing, employment, health, education, leisure, air quality, mobility, etc.

Urban authorities around the world launch Smart City programs to face these new challenges

- Ojo, Curry, Janowsky et Dzhusupova (2015) ; Rodriguez Bolivar (2015) ; Breux et Diaz (2017) ; Foucault et Moulier Boutang (2017).

SMART City

According to European Commission (EIP-SCC, 2013, p. 5):

> *"Systems of people interacting with and using flows of energy, materials, services and financing to catalyze sustainable economic development, resilience, and high quality of life; these flows and interactions become smart through making strategic use of information and communication infrastructure and services in a process of transparent urban planning and management that is responsive to the social and economic needs of society".*

According to the *Smart Cities Council* (Our Vision, 2007, p.5):

> *"A city [that] gathers data from smart devices and sensors embedded in its roadways, power grids, buildings and other assets. It shares that data via a smart communications system that is typically a combination of wired and wireless. It then uses smart software to create valuable information and digitally enhanced services"*

Purpose of this research

- **An empirical observation:** «Which city, by definition, does not want to be smart?» (Hollands, 2008, p. 305).

- **Surveys on smart cities revealed that** the smart city paradigm tends to underestimate governance dilemmas.

- **A challenge:** Many challenges require a new, reticular and decentralized form of urban governance that can integrate both the interdependencies of actors at a given level and the interdependencies between levels (Kooiman, 1993 ; Bevir, 2013).
  - These cities develop productive interactions within and between networks of urban actors (Kourtit, Nijkamp & Arribas, 2012).

Research Question: What kind of governance for smart cities?

Literature Survey

The concept of smart governance forces city authorities to rethink, change and improve their governance routines, procedures and processes.

- **The literature on smart cities**
  - Highlights Interactions between different stakeholders in the City (Meijer et Rodriguez Bolivar, 2015).
  - Focuses primarily on the use of ICT to enhance stakeholder involvements, implement public policies or provide efficient and effective public sector services (Rodriquez-Bolivar, 2015).
  - Smart city governments have a user-centered vision in which citizens and other stakeholders are treated as key assets for the development and implementation of smart cities (Kourtit et al., 2012).

Literature Survey

SMART Governance

- Must be an intelligent administration (Meijer & Rodriguez Bolivar, 2015)
- Focuses on new electronic governance using ITC (Gil-Garcia, 2012).
- Requires human resource management to ensure, among other things, acceptance and understanding of new routines, of policy objectives, of new technologies and new coalitions.
- The focus on stakeholder networks, on complexity and on governance implies, above all, the recognition that not all actors are equal.

Theoretical foundations of this contribution

The Actor network Theory (Bruno Latour, 1987): According to Latour, each technology has a scenario, a potential, a function and a morality, which are the result of interactions between a network of individual, collective, symbolic and technical actors around the technology.

- Weight equal to each element of the network, human or non-human
- "Social shaping" of technology, which explains how processes, actions and social structures relate to technology.

Data determinism is ubiquitous. It fuels a modernist discourse on data as a solution for all urban challenges.

Theoretical foundations of this contribution

The Actor-Network Theory fits particularly well the understanding of cities as complex, adaptive and self-organized systems.

- Cities are thus made up of cellular automatons and competitive, cooperative and coexisting parameters. Together they explain how local land development rules can lead to the emergence of global models (Haken, 2012).
- The limited pilot capacity is emphasized, which is due to the autonomy of the actors and the inability of a single entity to control or supervise the dynamics resulting from certain interventions (Klijn & Snellen, 2009).
- Events, behaviors and changes are initiated at the actor level or react to external events rather than controlled or orchestrated by a central authority.

Governance of SMART City : proposals

Ideal types of governance according to the degree of adaptation of governance: smart city government, smart decision-making, smart administration, smart urban collaboration (Meijer et Rodriguez Bolivar, 2015).

- Urban authorities need to rethink how they manage urban infrastructure and the daily lives of stakeholders.
- Thinking about the governance of smart cities means thinking about the evolution that innovations will bring about in the socio-economic field**.**

The governance of smart cities involves:

- Self-assessment leading
- Marginalization of traditional urban governments
- A review of urban policies
- The place of the data in the smart city

Conclusion

This theoretical contribution aims essentially to define a framework for the future analysis of "smart" cities.

It helps to understand the complexity of smart cities.