How do we understand Smart City? An Evolutionary Perspective

Prof. Dr. Nathalie Crutzen

Dr. Rama Kummitha

Smart City Institute, HEC Liège (Belgium)

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CONTEXT

Ongoing research developed by the **Smart City Institute** @ HEC Liège (Belgiu

Academic institute dedicated to the Management of Smart Cities & Regions

4 missions

Research
fundamental and
applied scientific
research (with an
international
perspective)

Teaching

Entrepreneurship
(via our incubator,
the City Venture
Lab)

supported by a transversal pillar of **awareness, visibility and network.**

NTRODUCTION

Smart Cities have gained tremendous popularity in the recent years

The phenomenon has been analysed under the angle of various disciplines (Ricciardi and Za, 2015)

No clear conceptualisation of the concept (many labels, approaches, perspectives)

- Due to the lack of a proper defined method or credentials for smart cities (Angelidou 2015, Richter et al. 2015, Caragliu et al. 2011, Nam and Pardo 2011), cities across the geographical spectrum claim themselves 'smart' with self-congratulatory note (Hollands 2008, Cocchia 2014, Caragliu et al. 2011)
- Hollands (2008) raised basic concern about the way how the word 'smart' has been used in the smart city terminology

No clear view on the literature (Ricciardi and Za, 2015; Letaifa, 2015)
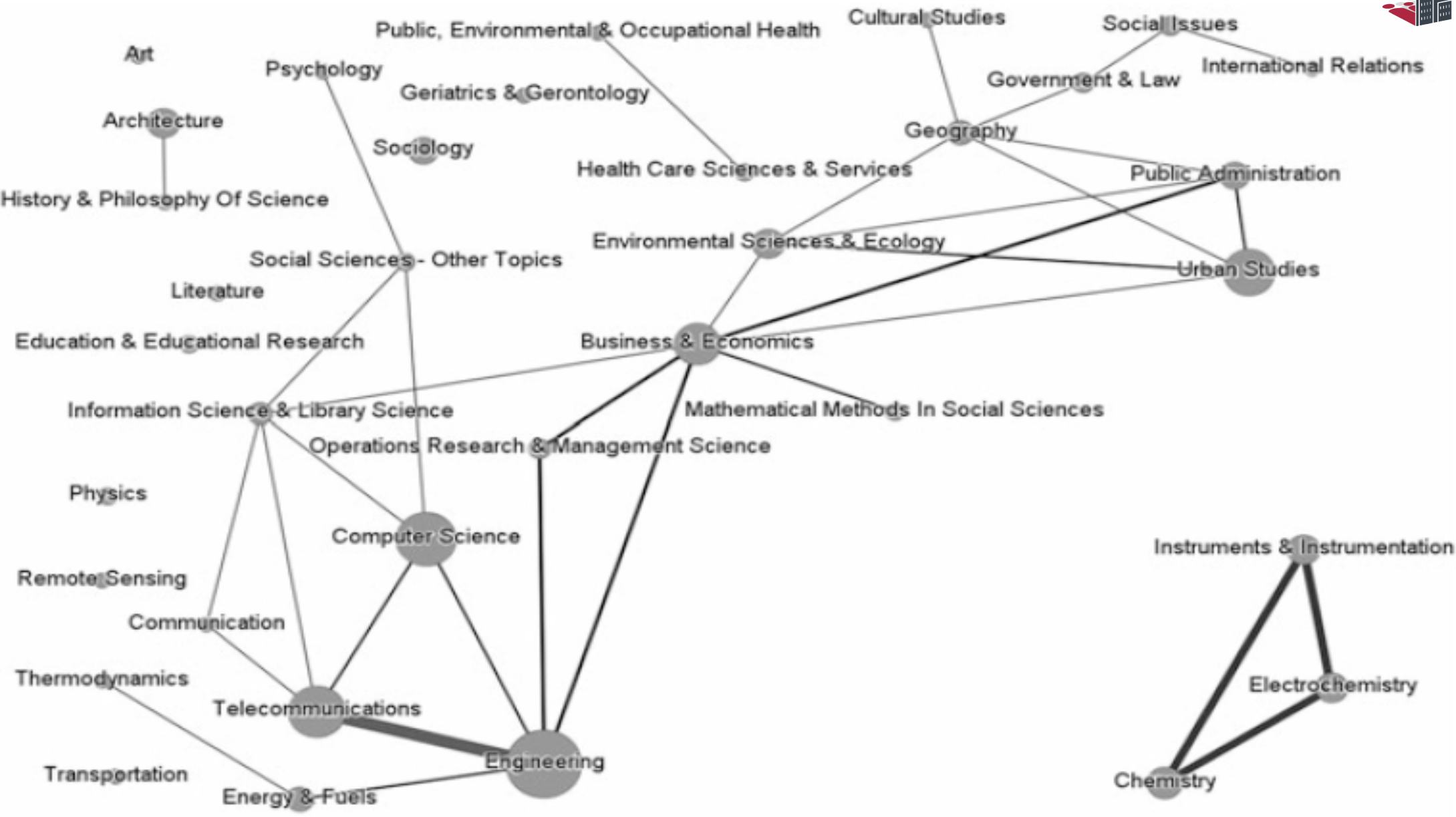
Source : Ricciardi and Za (2015)

RESEARCH OBJECTIVE

Review of the literature dedicated to Smart Cities in order to understand better how this literature has evolved over the last decades and extract a series of perspectives (3RC Framework)

METHODOLOGY

Initial searches in two data bases
- ➢ EBSCO
- ➢ ABI/Inform

Based on specific keywords : 'smart cities', 'smart city research', 'smart city management' and 'smart city planning'

Completed by manual searches through popular platforms such as Wiley online library, Oxford Journals database, Taylor and Francis, Springer Link, Scopus Sage and Elsevier – Science Direct

211 articles dedicated to Smart City/ies (from various disciplines)

METHODOLOGY

nalysis

➢ Systematic review by the researchers

➢ Coding based on
  ➢ Disciplines (journal, affiliations of the authors)
  ➢ Nationality of the authors
  ➢ Techno VS human centric approach (Letaifa, 2015)
  ➢ Research questions
  ➢ Dimensions investigated (Smart Mobility, Smart Environment, Smart People Smart Economy, Smart Governance, Smart Living) (Giffinger et al, 2007)
  ➢ Methodology
  ➢ Research object (geography, theme, sectors)
  ➢ etc

DEFINITION OF THE CONCEPT

Lack of consensus on how to define or classify smart cities

Indeed, « smart city » is a relatively new concept that is highly context dependent (country, government, natural resources, IT knowledge, and capacities + authors' background) (Weisi & Ping, 2014).

It has been more and more accepted that a Smart City should include three components: **technology, people and institutions** (Nam and Pardo, 2011; Colldahl, Frey & Kelemen, 2013).

Nevertheless, according to Letaifa (2015), the literature usually focuses on **technology**'s dominant role.

Number of papers published / year

1999	2006	2008	2009	2010	2011	2012	2013	2014	2015	2016 (may)	TOTA
1	2	1	1	2	13	10	20	44	79	38	21

As expected, **exponential growth** in the publication of papers on Smart City ies

It is become a specific field of scientific research, internationally reknown, b publications from all over the world and from various disciplines

PRELIMINARY OBSERVATIONS

Papers per **year** and **geography**

Country	1999	2006	2008	2009	2010	2011	2012	2013	2014	2015	2016	TOTAL
Asia	1				2		1	8	6	12	9	39
Europe		1	1			9	9	11	34	52	26	143
Africa												0
North America		1		1		3		1	4	11	1	22
South America										1		1
Australia						1				3	2	6

Most of the publications come from **Europe** (real boom over the last thre
years)

PRELIMINARY OBSERVATIONS

Disciplines

s mentioned by Ricciardi and Za (2015):

Engineering and related disciplines (energy, computer sciences
telecommunications)
Urban Studies
Public administration
Management, business and economics
Environmental Sciences

PRELIMINARY OBSERVATIONS

Papers using rather a techno or a human centric approach are observe (Letaifa, 2015)

➢ Contrary to the statement made by Letaifa (2015), papers using a **huma centric approach** are more and more common (119 papers)

Most of the papers do not have any empirical part

➢ Only 39 papers collect field data and have an empirical contributio (qualitative or quantitative)

➢ A lot of (too much??) conceptual and normative papers

PRELIMINARY CONTRIBUTION

4 perspectives emerge from our analysis – the **3RC framework**

➢ **R**estrictive perspective (28)
➢ **R**eflective perspective (31)   **SUPPORT** THE DEVELOPMENT OF SMART CITIES
➢ **R**ationalistic perspective (78)

➢ **C**ritical perspective (74)   **DENOUNCE** THE RISKS OF SMART CITIES

The definition of the concept, the disciplines involved and the approache chosen (techno VS human) vary a lot in function of the perspective in which th paper is anchored

Restrictive Perspective

- **Pure techno-centric approach → ICT based integrative development methods** which hav[e] largely focused on **connectivity and data**

- **ICTs is projected as an end in itself.** They result in enhanced lifestyle for citizens in a smart city environment Calzada and Cobo (2015)

- While focusing more on the technologies, proponents go on arguing that smart cities are "*intelligent, efficient, accommodating, reliable, and secure, all while reducing global warming and featuring automatic system maintenance with a consumer focus that aims at energy usag[e] customized towards individual needs*" (Richter 2015 et al.).

- Some examples:
  - Mitton et al (2012) Combining cloud and sensors in a smart city environment
  - Nuaimi et al (2015); Lepri et al (2015) or Deren et al (2015) focus on the application of big data to smart cities

- This perspective gravely ignores to answer questions such as whether 'being connected' reflects being smart. Does it guaranty inclusion in the mainstream? Or how technologies and open data could alone contribute to enhance participation and social inclusion? (Brynskov et [al] 2014)

Reflective Perspective

- Despite the advancements in justifying the existence of smart cities, the techno centric appro[ach] makes it worrisome (Waart et al. 2015, Bunnell 2015)

- In reaction to the restrictive perspective, the reflective perspective **starts to ask how and wh[y] ICTs are required and whether ICTs would be able to achieve larger social principles su[ch] as social justice, participation and inclusion**

- It is proposed that technology will develop human capital, and further enhances the capaciti[es] citizens to innovate and participate in mainstream and then to solve major problems to crate collective common good (Angelidou 2015)

- As more cities start gathering more data, they will be able to share it within and among themselves making the larger systems efficient (IBM 2010, Neirotti et al. 2014, Waart et al. 20[15] Bunnell 2015)

- Some examples:
  - Cimminio et al (2014), The role of small cell technology in future smart city application
  - Monfaredzadeh and Berardi (2015), Beneath the smart city: dichotomy between sustainability and competitiven[ess]

Rationalistic Perspective

- Scholars such as Neirotti et al. (2014) opinion that ICTs should not be identified in connection smart cities as smart initiatives **do not restrict themselves to technology alone** based interactions, but largely related to investments in human capital and transform the way how p live and interact in cities.

- Thus, investments in communities and their learning capabilities would yield in better innovat and entrepreneurship (Neirotti et al. 2014, Toppeta 2010, Giffinger et al. 2007).

- The humanistic element related to smart communities including education, social learning, so capital is considered as crucial for smart city creation (Eger 2003b)

- Building up on Jacobs (1970) and Geddes (2003), Calzada and Cobo (2015) emphasise that citizens should play a leading role in conceiving, designing, building and maintaning their citie

- Some examples
  - Giffinger et al (2007) (2010) discuss Smart City ranking in Europe
  - Neirotti et al (2014), Current trends in smart city initiatives: Some stylished facts

Critical Perspective

This perspective denounces the **risks linked to the Smart City phenomenon**

Examples

- Some scholars compared how the smart cities which have already been developed **have significant proportion of the populations in the crossroads** (Hollands 2015, Jazeel 201 Datta 2015).

- **Privatisation of urban space** (Hogan et al. 2012).

- The literature argues that while the top down approaches thrive in the wake of smart city growth, there is no evidence that proves that the bottom-up, user driven innovations get boosted (Sauer 2012).

- Some scholars denounce the predominance of **corporates' interests over Society**

  - The national and city budgets will be transferred away from the urgent needs of urban dwellers including basic sanitation, water and shelter etc. Such transfer aims to promote corporate inter which would further enhance inequalities in urban context (Begg 2002, Hollands 2008, Moser 2 Datta 2015).

  - Datta (2015) argues that smart cities are a business model

  - Corporations and governments gain by markets and lobbying respectively, whereas people los right to city in which they live (Moser 2015, Datta 2015, Bunnell 2015)

NEXT STEPS & LIMITATIONS

Next steps

1. Finalize the review & refine the 3RC framework
   ➢ Chronology pf the 4 perspectives?
   ➢ Detailed explanations & examples
2. Focus on the publications in Management Sciences (+/- 30 papers) t
   highlight paths for future research on the Management of Smart Cities

Limitations

➢ Databases used?
➢ Review and coding by two researchers

Thank you for your attention !

Suggestions?
Questions?

SRC FRAMEWORK