

**GLOBALIZATION AND CITIES: EVOLUTION OF SMART CITIES STUDIES ON
MANAGEMENT KNOWLEDGE FIELD**

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ABSTRACT

From such an approach of the sustainable development, the focus is on the elaboration of policies and practices of economic, social and environmental scope, which allows the evolution of the quality of life of the generations to come. With the globalization phenomena, the emergence of innovations brought about at a given scenery, citizens begin to appropriate urban spaces, which fragments the view of the public thing as something of the other. In this direction, the process of rethinking this space begins, in order that the cities become more intelligent. Therefore, this study investigated the evolution of publication about smart cities on the Management knowledge field. As results, the study showed this subject is increasing recently and we believe that this manuscript is appropriate because it has data that can be used by researchers – as an organized analysis about smart cities evolution studies on Management field with most-researched subjects and growth rhythm – and managerial (public or particular) – as a reading to understand better how to contribute to build smarter cities.

Keywords: Smart Cities; Sustainable Development; Innovation.

INTRODUCTION

When we investigate the Management knowledge field, we face the tendency of an economic scope and context intra and extra organizational, that are in a process of adaptation to the factors of culture and society and of better use of the natural resources (Sampaio, 2010). The regional development itself must also be adapted to the scenario of using these conditions, by strategies that contemplate the three dimensions of sustainability, or triple bottom line: environmental (planet), economic (profit) and social (people) (Elkington, 2001). Elkington (2001) also points to the importance of a management revolution, among other factors, for sustainable development.

In territorial analysis, the search for a sustainable regional development, the leaderships of most of the spheres first create projects of, first, a local and after, global impact. In this sense, innovation environments are instruments of developed and developing countries that confer greater local competitive advantage by transforming content of knowledge into wealth (Steiner; Cassim; Robazzi, 2008; WCDE, 1987).

An example is innovation environments whose function is the endogenous development from the application of knowledge - the creation of innovation - and to contribute to local businesses and initiatives, as well as to provide strategic alliances of the region in question; for mutual benefit (Medeiros, 1993; Rodrigues, 2013). According to Barbieri (2000), organizations that seek to collaborate better with the environment in which they interact, - the model of innovation environments - tend to provide a governance policy that prioritizes aspects not only economic, but also social and environmental. Consequently, a position that will contribute to sustainable regional development.

Ideas and business deployed in the 1950s in the stagnant San Francisco Bay (State of California, USA) - a pioneer in the concept of technology parks. Be this use of electronic devices, software, social networks and other applications. Observation given to account of the state economy, although diversified, rely on the innovation environments The Cartesian approach, which is only cost-effective in the short term, remains a priority in many respects in the corporate world. A model that does not privilege strategic thinking about business continuity and its legacy for stakeholders (Mattos et al., 2005). In the case of innovation environments for sustainable regional development, the role of these initiatives as potential income generators is explained (Medeiros, 1993).

A posture of a sustainable innovation environment, in addition to a likely financial return, could create indirect feedback from the community; such as the public / private installation of education and training institutions for local inhabitants, as well as the improvement of access infrastructure, through the attraction of other businesses or properly government investments. The sense of collectivity for local progress begins to increase (Vedovello; Judice; Maculan, 2006). However, according to Melo (2011) and Etzkowitz (2012), even though such environments have the capacity to develop sustainable competitive advantages, they still do not contribute decisively to this, with the participation of other spheres - fundamental factor.

When analyzing the tripod of sustainability, or triple bottom line, the studies of the social and economic contributions are, by themselves, of wide discussion. Results indicates one of the principles of the academic institution, - disseminator of teaching, research and extension and cradle of innovation - development of being and community (Santos, 2011). According to Jara (1998), the economic dimension is only sustainable, at the point where the quality of life prevails over the concern with the amount of production. As the cradle of knowledge, universities have a considerable contribution to the establishment of these innovation environments. Such relevance is due to the development of research that takes them as an object of analysis, both for innovation and development studies, and for possible improvements and

experiments in the performance of their activities and policies. As a consequence of such practices for improvement in the processes of innovation environments. Vedovello (2000) states that these are treated as instruments of regional development policy, to make the cities more intelligent. In this context, how is the evolution of research about smart cities on the Management knowledge field?

Therefore, this study aims to investigate the evolution of publication about smart cities on the Management knowledge field. To do this: a) to analyze the publications about smart cities on the Management knowledge field and b) to present a characterization of the production, methodological aspects of research and the themes associated with the studies.

The relevance of the study is justified because the thematic of innovation and sustainable development is inherent to the development of a nation and with this, the creation of intelligent cities. One notes this subject as a remarkable field of knowledge for the area of management, not only public, but also to the academic, business interests and other existing organizations; to investigate the understanding of relationships and attitudes, at institutional levels, concerned with sustainable development.

2. INNOVATION AND SMART CITIES

The level of competitive advantage in the markets instigates companies to be attentive to what is happening in their macroenvironment (stakeholders) and to seek differentials based on innovations that hinder the benchmarking of their competitors. According to Schumpeter (1985), innovating means recombining existing forces and materials, producing the same or other things, from the use of new methods. Thus, these authors (1985) also listed five forms of innovation: a) the creation of a new product; (b) introduction of a new production method; (c) opening up of a new market; (d) the discovery or acquisition of a new source of raw materials or semi-finished products (new suppliers) and (e) the creation of a new industry or monopoly. When imagining the process of innovation as waves over time, it is increasing its amplitude and reducing its frequency. That is, access to new technologies has allowed society to innovate more in a shorter period of time (Schoppe 1985; Tidd; Bessant; Pavitt, 2005; Takahashi & Takahashi, 2007).

The current technological areas are the development of information and communication technologies. However, these areas are no longer new where they came from. According to Lundvall (1988), universities, which foster innovation, by joining high-tech companies in the Bay Area (California, USA) during the Second World War period, promote the debate on complementarity between science and technology, with additional exchanges. The beginning of this was still in the 1930s, on the initiative of Stanford University (Stanford, California, USA), with the creation of scholarships and accompaniments to students who wanted to open businesses. New businesses were coming in, and the old ones remained, resulting in increased facilities and the establishment of Stanford Industrial Park in 1950.

The rationale was that companies of the future would be increasingly linked to their alma mater, not losing their ties to the knowledge environment. In 1974, the park had about 70 companies, and in 2005, 150. Silicon Valley (Silicon Valley), as it became known worldwide for clustering cutting-edge innovative companies, was the first real model of an innovation environment: the largest agglomeration of high-tech industries. Along with him, Route 128 (Massachusetts, USA), sought to stimulate their stagnant economies by war. (Spolidoro & Audy, 2015). With the success of these two regions, the first European innovation environments emerged, with emphasis on the British (Massey, Quintas & Wield, 1992). Such characteristics make this technological pole a model for other projects around the world (Ganzert & Martinelli, 2009). The nations, institutionalized in the figure of the United Nations (UN), has been working

since the 1970s in encouraging the creation of business incubators and technology parks. Competent assignment to UNESCO, in the section Universities-Industries Partnerships (UNESCO, 2015). With this, it is noticed that amid so many devices and tactics in the race for competitive advantage, the innovation factor is always successful. Nations that have decided to invest in research and development (R&D) institutions, finance and labor market legislation, and industrial policies have progressed (Fritsch & Mueller, 2004).

This fact evidences the relation between technological progress and economic development, when investing in science and technology (Stopper, 1995). Although the presence of the academy generates greater numbers of innovations and patents, it can still negatively interfere in the business processes (Albahari et al., 2013). It remains to seek a balance on both sides, which according to many studies, prove successful when complemented. To this end, incentives from the public sector become necessary in order to make cities smarter. For Coffey and Polèse (2005) the development of a place refers to the capacity of a locality in the production and sale of its goods and services and, therefore, to involve the capacity of its inhabitants in the generation of income. Issues of characterization and interrelation between social, environmental and economic dimensions are in vogue (Jacobi, 2003).

Thus, Amaral Filho (1996) states that the term "development" has related variables such as: the use of competitiveness in an efficient way, social equity and the reduction of environmental impacts. With this, the sustainability tripod is necessary, in the concept of development of a given region, so that the progress of the region is sustained by policies and practices developed by a mutual articulation of its agents. Public management began to think globally, with a constant search for innovation, knowledge of the environment and its trends; but to act locally, favoring the territory in which the market of interest was concentrated. (Thompson & Strickland, Gamble, 2008).

The evolution of the concept of development occurred with the greater awareness of the future generations, the idea of sustainable regional development will emerge, to make cities more intelligent. This approach, which is based on the principles of sustainability, is described as practices and policies that respect three fundamental criteria: social relevance (social viability), ecological prudence (environmental viability) and economic viability (Sachs, 2002). Complementing these principles, the United Nations (UN) (2003) stresses that the construction of regional development from a sustainable standpoint reflects a series of discussions on the economic, social and environmental dimensions.

As Boisier (1996) argues, it is a process of social transformation, aiming at the permanent and sustained progress of the territory in question, with the direct participation of the actors who live there. As for its design and relationship, Coe et al. (2004) argue that in sustainable regional development, territories are shaped by occurrences in both the endogenous environment (internal relations) and exogenous (external relations - competitive environment and markets).

This is a process characterized by a strong interest of local societies in formulating regional policies. This is so that the main topics of the present day are debated and for the region to be the main driver of its own development process (Dallabrida, 2000). On this evolution of innovation environments, we can find the appropriability of the urban space by people in a more innovative and sustainable place, where information technology is combined a sustainable process (social, economic and environmental). (Townsend, 2013)

According to Kitchin (2014), they are cities that are increasingly composed of and monitored by technology and its economy and governance is driven by innovation, creativity and entrepreneurship, by smart people. Scholl and Al-Awadhi (2015) complements it brings innovation, attractiveness, competitiveness, sustainability, and livability of an urban space. It could be about smart governance; smart human capital; smart environment; smart living; and

smart economy. (Lombardi et al., 2012). By this way, we are introduce the research method to achieve our goals.

3 METHOD

A qualitative study, with an exploratory approach, since the theme of smart cities is not yet in the traditional domain of the management area, as in the cases of Social Sciences, Anthropology and Urbanism; and descriptive. According to Loiola and Bastos (2003), surveys of this nature are particularly important to encourage reflection by the researchers themselves on the challenges and limits that surround their practice. The search for data to achieve the objectives was carried out from the survey of thematic articles, via Scopus databases.

Thus, articles were analyzed from these periods, based on the systematic review of the literature. We selected the papers with the expression "smart cit *" in the title or on the set of keywords, with temporal limitation from the first study, in 1999, until 2017; document type "article", source type "journal". After this selection, 162 articles were identified that were read integrally for the analysis categories.

Thus, the categories gathered a set of items that evaluated each article in three dimensions, according to the one proposed by Hoppen, Lapointe and Moreau (1996) and in the adaptation of the classifications adopted by Hoppen and Meireles (2005) and Sampaio and Perin (2006), which classify the research methodologies in approach, type of research, nature and instrument of data collection. Also in this dimension, the category under analysis was included, aiming to identify the level of analysis used in the studies carried out (Figure 1). However, it was identified in some articles that the specification of some methodological aspects used was not described in a specific way, being necessary the interpretation and analysis of the researchers to carry out the classification.

Figure 1 – Script analysis of the papers

Classification of Analytical Categories		
1st Dimension Articles Characterization	Authorship	i) Authors; ii) Filiation (University/Country)
2nd Dimension Methodological Aspects	Methodological Approaches	i) Qualitative; ii) Quantitative; iii) Qualitative/quantitative
	Research Type	i) Survey; ii) Experimental; iii) Case Study; iv) Multiple Case Study; v) Action Research
	Research Nature	i) Exploratory; ii) Descriptive; iii) Exploratory-descriptive; iv) Causal
	Data Collection Instrument	i) Interview; ii) Questionnaire; iii) Primary e Secondary; iv) Secondary; v) Multimethod
	Object of Analysis	i) Individual; ii) Group; iii) Organization
3rd Dimension Correlations	Contextual Subjects	Associated Thematic

Source: Adapted of Hoppen, Lapointe & Moreau (1996); Hoppen & Meirelles (2005); Sampaio & Perin (2006).

As Hoppen, Lapointe, and Moreau (1996) argue, each researcher who has done the exercise of formally evaluating the content of a scientific article knows that much of the

published articles do not explicitly advertise the research methods used, neglecting certain essential details for the evaluation, which makes it difficult to assess the study. It should be emphasized that the four theoretical articles were analyzed only from the first and third dimensions, considering the specificity of the researches. As explained, we present the results on the next part.

4 RESULTS

In order to guarantee the depth in the analysis of these articles, it was decided to organize the results of the research in three parts. The first deals with the characterization of production and the authors, while the second presents aspects related to the methodology of the studies, involving the approach, the type and nature of the research, the data collection instrument and the object of analysis. The third one focuses on the analysis of research content, focusing on the themes associated with the subject.

4.1 First Dimension: Author and Papers

According to results, the 162 papers are distributed on 73 different journals, according to the Management, Business and Accounting are. Almost 50% (76 studies) from the studies are published on the top 10 most published journals identified (Figure 2).

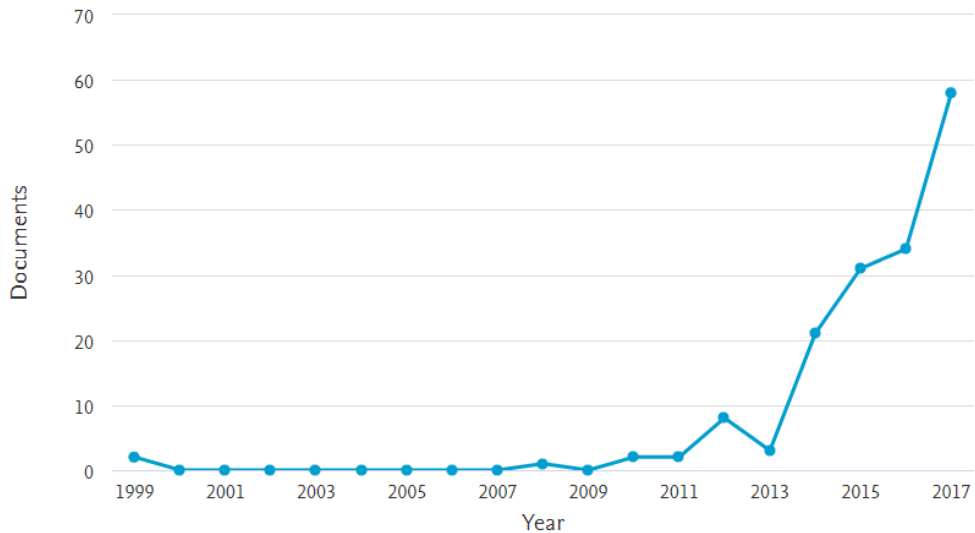
Figure 2: Top 10 most-published journals identified

Journal	1999 2001 (2)	2002 2004	2005 2007	2008 2010 (3)	2011 2013 (13)	2014 2016 (86)	2017 (58)	Total (162)
1. Cities	1	-	-	-	-	11	16	28
2. Knowledge Management and E-learning	-	-	-	-	-	10	1	11
3. Technological Forecasting and Social Change	-	-	-	-	1	4	2	7
4. International Journal of Services, Technology and Management	-	-	-	-	-	-	5	5
5. Journal of Cleaner Production	-	-	-	-	-	5	-	5
6. Journal of Theoretical and Applied Electronic Commerce Research	-	-	-	-	5	-	-	5
7. Production Planning and Control	-	-	-	-	-	5	-	5
8. Innovation	-	-	-	-	3	1	-	4
9. Eastern European Journal of Enterprise Technologies	-	-	-	-	-	1	2	3
10. International Journal of Applied Business and Economic Research	-	-	-	-	-	2	1	3

Source: Authors, 2019.

We can observe the interesting evolution about this knowledge subject that has presenting increases on your citations and studies published on recognized journals (Figure 3).

Figure 3 – Evolution of articles by year



Source: Scopus Databases searched by authors, 2019.

The number of publications about smart cities turned out from 3 in 2013, to 58 in 2017, increasing approximately 20 times. According to the affiliations which are responsible by studies, the University of Leed, in United Kingdom is on the first position. About country, Italy is the one that has a protagonism on that field, mainly by Universita degli Studi di Padova and Torino (Figure 4).

Figure 4 – Top 10 Ranking Country x University

	University		Country
1	University of Leeds (UK, 5)	1	Italy (28)
2	Università degli Studi di Padova (Italy, 4)	2	United Kingdom (22)
3	Vrije Universiteit Amsterdam (Netherlands, 4)	3	United States (17)
4	Università degli Studi di Torino (Italy, 4)	4	Spain (15)
5	University of Cambridge (UK, 4)	5	Finland (11)
6	VTT Technical Research Centre of Finland (Finland, 4)	6	Netherlands (11)
7	King Abdulaziz University (Saudi Arabia, 3)	7	France (10)
8	CNRS Centre National de la Recherche Scientifique (France, 3)	8	Germany (7)
9	Politecnico di Torino (Italy, 3)	9	India (7)
10	Lappeenranta Teknillinen Yliopisto (Finland, 3)	10	Belgium (6)

Source: Authors, 2019.

4.2 Second Dimension: Methodologic Analysis

4.2.1 Methodologic approach

The major part of the studies presented the quantitative (80) methodologic approach on its development, being on the second positions the qualitative (61). It can demonstrate there is a balance about the studies approach (Figure 5).

Figure 5 – Methodological Approach

Methodological Approach	1999 2001 (2)	2002 2004	2005 2007	2008 2010 (3)	2011 2013 (13)	2014 2016 (86)	2017 (58)	Total (162)
Qualitative	2	-	-	2	4	30	23	61
Quantitative	-	-	-	1	7	41	31	80
Qualitative-Quantitative	-	-	-	-	2	15	4	21

Source: Authors, 2019.

4.2.2 Research Type

About the research type most common on the studies, highlights the case study, which could bring the case of many cities that has experienced the opportunity of being smarter (Figure 6).

Figure 6 – Research Type

Research Type	1999 2001 (2)	2002 2004	2005 2007	2008 2010 (3)	2011 2013 (13)	2014 2016 (86)	2017 (58)	Total (162)
Survey	-	-	-	1	6	34	18	59
Experimental	-	-	-	-	-	4	7	11
Case Study	2	-	-	2	4	37	23	68
Multiple Case Study	-	-	-	-	3	11	10	24
Action Research	-	-	-	-	-	-	-	-

Source: Authors, 2019.

Referring to the case study, it was identified that the single case studies stand out in relation to the multiple case studies. According to Yin (2005), the case study is an empirical investigation that is adequate to apply in an attempt to explain causal connections in real life situations, because these are too complex for treatment by means of experimental strategies or data collection.

4.2.3 Research Nature

About the research nature, we could identify the supremacy of descriptive studies (93 studies) against just 29 exploratories. (Figure 7)

Figure 7 – Research Nature

Research Nature	1999 2001 (2)	2002 2004	2005 2007	2008 2010 (3)	2011 2013 (13)	2014 2016 (86)	2017 (58)	Total (162)
Exploratory	-	-	-	-	3	11	15	29
Descriptive	1	-	-	3	7	45	37	93
Exploratory and Descriptive	1	-	-	-	3	30	6	40

Source: Authors, 2019.

4.2.4 Data Collection Instrument

According to the main data collection instrument applied on the studies, it was more common the use of Questionnaire (59 studies) and Interview (40 studies). (Figure 8)

Figure 8 – Data Collection Instrument

Instruments	1999 2001 (2)	2002 2004	2005 2007	2008 2010 (3)	2011 2013 (13)	2014 2016 (86)	2017 (58)	Total (162)
Interview	-	-	-	1	3	22	14	40
Questionnaire	-	-	-	2	5	34	18	59
Primary and Secondary	2	-	-	-	2	14	11	29
Secondary	-	-	-	-	2	4	6	12
Multimethod	-	-	-	-	1	12	9	22

Source: Authors, 2019.

4.2.5 Object of Analysis

We identified that the leading object of analysis on studies was about Organizations, Politics and Systems, verifying the context and actuation of governments, corporations and other institutions reacting to improve our cities. (Figure 9).

Figure 9 – Object of Analysis

Research Nature	1999 2001 (2)	2002 2004	2005 2007	2008 2010 (3)	2011 2013 (13)	2014 2016 (86)	2017 (58)	Total (162)
Individual	-	-	-	-	3	16	9	28
Groups	-	-	-	1	4	27	18	50
Organizations, Politics or Systems	2	-	-	2	6	43	31	84

Source: Authors, 2019.

There is a lack of studies that address the perspective of the individual who, as addressed in the biases of sustainable development, is the fundamental part of cultural change, more specific in learning and relationships for this area.

4.3 Third Dimension: Correlating Subjects

The analyzed journals treat the theme in a broad way. The main themes involved are presented (Figure 10). It is possible to identify that many studies treat about Innovation and Information Technology, corroborating on what theory indicates about smart cities, as the same with Sustainability.

Figure 10 – Contextual Subjects

Research Nature	1999 2001 (2)	2002 2004	2005 2007	2008 2010 (3)	2011 2013 (13)	2014 2016 (86)	2017 (58)	Total (162)
Innovation and Information Technology	2	-	-	1	5	28	18	54
Sustainability	-	-	-	1	1	22	13	37
Governance	-	-	-	-	1	6	11	18
Urban/Regional Development	-	-	-	-	5	16	9	30
Globalization	-	-	-	1	1	14	7	23

Source: Authors, 2019.

Finally, based on the results discussed, it follows a summary with main findings (Figure 11) on the studies about Smart Cities, on the Management knowledge field.

Figure 11 – Research Highlights

Top Publisher University	University of Leeds (UK)
Methodologic Approach	Quantitative
Research Type	Case Study
Research Nature	Descriptive
Data Collect Instrument	Questionnaire
Object of Analysis	Organizations, Politics or Systems
Contextual Subjects	Innovation and Information Technology

Source: Authors, 2019.

5 FINAL REMARKS

The analysis of the articles published on the subject in the given period allowed to present an overview about the authors, methodological strategies and the thematic content of the identified researches. Through the analysis of the periodicals there is recognition of the importance of the theme, but a small number has been found.

From the articles analyzed, it is possible to note that emerging countries as a whole still remain far from policies and practices for the development of smarter cities, with the protagonism of public and private entities and universities. Factors such as large income and gentrification, resulting in significant social inequality; lack of basic infrastructure in many regions and the lack of a culture of belonging to the public seem to fortify walls to the best practices of governance and quality of life.

In approximately 20 years, 162 publications in periodicals of impact are still a small number because this is a subject that has been diffusing theoretically and taken as a means for sustainable development. It is notable that well-reputed journals are interested in studies in the area of intelligent cities, as analyzed.

We believe that this manuscript is appropriate because it has data that can be used by researchers – as an organized analysis about smart cities evolution studies on Management field with most-researched subjects and growth rhythm – and managerial (public or particular) – as a guide to understand better how to contribute to build smarter cities.

One of the limitations of the study was the use of only the Scopus database, due to the search for larger journals. Thus, in order to expand this study, it is suggested to carry out investigations in the interactions between the triple helix (Academy, State and Industry) for

sustainable development, to compare with cities already considered intelligent and also a possible systematic review of the literature.

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