

ARTURO DI BELLA

SMART CITY AND GEOGRAPHIES OF CORPORATE MEDIATION

Introduction. – The paper intends to scrutinize the role of IBM and its socio-spatial relations in the smart city market-making and in the global promotion of the new paradigm of urban governance.

While most of the scholarly literature interested in the emergence of smart urbanism has focused mainly on the political dimension linked to the progressive neoliberalization of the urban governance, the smart city phenomenon represents also a market in construction, which can be interpreted as the product of specific corporate strategies.

In both the political and economic spheres, a key role is played by high-tech giant and its socio-spatial relations, in so far as it appears to be one of a small number of global firms showing the will and the capacity to significantly influence the transnational circuits of smart city technology and policy transfer in coming years. From an economic point of view, the role of the high-tech firm is associated with a reorganization of production aimed at strengthening the ability to extract knowledge from territory and to incorporate its economic values within the capitalist circuit of valorisation. From a political point of view, the role of IBM prompts us to think not so much about the asymmetrical relations of power between industry and urban governments – a concern often over-determined compared with the mechanisms defining local negotiation and its incorporation into institutional arrangements and local economies – as about the reconfiguration of the relation between space, power and knowledge promoted by the corporate logic of territorial organization and regulation.

For all this, the aim of the paper is to focus on the processes of mediation through which IBM has built its global leadership within the market of big data and smart technologies, although the most recent attention on «the actually existing smart city» has emphasized the hybrid and variegated nature of such a kind of urbanism, which is able to go beyond, at least in part, the diktat of the market and of big corporations (Shelton et al., 2014; Rossi, 2015).

The IBM case study is particularly interesting for two main reasons. First, within the field of smart cities' initiatives, IBM has been active over a far wider geographical spread than any of its competitors, embracing not only the cities in the global North, but also those of emerging economies. Second, Big Blue operates over a wider range of key urban sectors than many of its competitors, including finance, water, energy, education, transport and health.

The paper is structured in five sections. The first section presents the theoretical and methodological framework, within which to analyse the role of the corporation as well as of the city in the entrenchment of neoliberal rationalities, in the reinvention of the logics of accumulation, and in the revitalization of cognitive capitalism, in the aftermath of the global economic and financial crisis.

The second part analyses the processes of IBM reorganization, in response to the different crisis during last decades, from the advent of the new economy to the most recent global recession. At the beginning of the two thousands, the corporate turnaround involved its transformation into a very powerful service and consultancy firm, while the investment in knowledge based city services implied the reorganization of whole divisions and huge investments in analytics capabilities.

The third section debates the activities of discursive and spatial mediation accompanying the global launch of the IBM smart city model, and supporting the implementation of sophisticated mechanisms of city knowledge extraction, organization and valorisation, together with a constant balancing between global standardization and adaptation to local context.

The fourth section scrutinises the mechanisms of technological mediation promoted by the IBM smart city model, by analysing the relationship between the IBM techno-scientific vision, its spatio-temporal geographies of regulation, and the reduction of city and urban citizenship. In fact, the corporate territorial strategy has required a process of reducing the inherent complexity of client cities, both discursively and in terms of product, in order to develop globally scalable technological and consultancy solutions. The paper concludes by arguing the close interconnection between the smart city global paradigm and the competitive strategies of a small number of high-tech firms, which promote a profit-oriented logic of territorial organization that threatens to reinforce a post-political condition in policy-making and in urban governance.

Cognitive capitalism, urban neoliberalism, and the politics of the smart city. – Since the crisis of the Fordism, capitalism experienced a phase of structural change with a transformation of the mechanisms of capital accumulation, and of the organisation of production and labour. At the heart of this transformation, the processes of knowledge extraction and control become the main challenge of capitalist accumulation, while the social organisation of production tends to go beyond the industry boundaries and to embrace the whole of society (Thrift, 2005). Within this new system of accumulation, widely known as cognitive capitalism, the primary source of value is no longer the capital and the material labour but the general social knowledge and the ability to capture and mobilise the intellectual and cognitive potentials of the society as a whole (Lebert, Vercellone, 2006). The maximization of knowledge production appears to be increasingly disconnected from the traditional processes of intensification and closing, such as in the cases of clusters, incubators, scientific and technology parks,

and increasingly dependent on the extensive processes of diffusion and socialization, which feed on the appropriation of social knowledge and the exploitation of the «common» autonomously produced by the society.

Michael Hardt and Antonio Negri have interpreted this process as a shift from the «formal subsumption of labour» under capital, prevailing in fordist capitalism, to the «real subsumption» of labour and life itself, which entails the capitalist valorisation of knowledge, languages, feelings, and communicational and relational abilities, that is what has been differently called «mass intellectuality», «immaterial labour», and «general intellect» (Hardt, Negri, 2002, p. 43).

In *Commonwealth*, Hardt and Negri have also underlined the central role of metropolis as a key site of biopolitical production: «the space of the common, of people living together, sharing resources, communicating, exchanging goods and ideas», which generates forms of life that add value to knowledge intensive capitalism (Hardt, Negri, 2009, p. 250).

From this perspective, the recent global financial crisis can be understood as the first crisis of regulation of cognitive capitalism, while overcoming the economic crisis depends mostly on the reinvention of the logics of plus-value extraction and accumulation and on a constant appropriation of new cognitive spaces.

According to Jamie Peck, Nik Theodore and Neil Brenner, the most perverse legacy of the global crisis has been a further entrenchment of neoliberal rationalities and disciplines (Peck, Theodore, Brenner, 2013, p. 50). While the first responses to the financial crisis impose a direct enforcement of the neoliberal project by means of a new cycle of structural adjustment and shock therapy, in the next stage the extension of fast-policy regimes seeks to transmit the diktats of neoliberalism through more indirect means, such as the soft discipline of best practice (ibidem, p. 77). The critical analysis in this respect cannot be limited to the conventional concerns with what specific neoliberal policies achieve, but to consider also who and how move them, that is to take into account the processes and the instruments of mediation that public and private actors develop and implement at different scales and in different fields of action in order to extend its own sphere of influence.

Several urban studies have analysed the key role of guru (Peck, 2005), consultants (McCann, 2011; Prince, 2012), and travelling technocrats (Larner, Laurie, 2009) in influencing global imaginaries and urban policy agenda, by showing how cities represent social and political products, which cannot be understood outside the networked, multi-scalar and de-territorialized system of socio-spatial relations that characterizes the global circuits of policy knowledge.

Promoted by a multiplicity of public and private actor-networks, the smart city narratives indicate a new visionary city, where digital technology is the driving force for change and development (Giffinger et al., 2007; Holland, 2008).

In investigating how in an age of market triumphalism new imaginaries, discourses and models of urban development address a global post-recession context, scholars interrogate whether the aspirational discourses of smart city compete with, or are complementary to, neoliberal urban narratives (Gibbs, Krueger, MacLeod, 2013). In this context, most of the critical studies have argued that smart city representations, even if proposed as a panacea for many current urban problems, from climate change to democracy, seem to be tightly linked to the existing and dominant neoliberal urban doctrines (Vanolo, 2014), primarily focused on economic competitiveness and the linkages with city branding to attract new private sector interests (Holland, 2008; MacLeod, Jones, 2011).

Private IT companies and local authorities both play a key role in planning top-down and centralising approaches of smart urbanism. Governments are looking to the Internet and digital technologies as useful tools in order to provide new services and to enhance old ones, by creating new public-private partnerships with a strong emphasis on the expertise and technologies of private sector companies aimed at developing new technical system in city government, with the consequence that these private actors are increasingly playing an important part in planning this new model of urbanism (Luque, McFarlane, Marvin, 2014).

Many contributions have focused on the struggle between tech giants, such as IBM, Siemens, Cisco and so on, over visibility and legitimacy in the multi-trillion dollar smart city global market (Townsend, 2013; Holland, 2014; Parautis et al., 2014).

To analyse the smart city paradigm as the result of a high-tech company strategy entails the need to focus on the reconfiguration of corporate socio-spatial relations linked to those restructuring operations and territorial strategies aimed at a competitive advantage and at consolidating its own influence on the smart city market-making.

In the field of economic geography, an important contribution for understanding the role of corporate socio-spatial relations is that developed by Henry Yeung, who has conceptualized the «relational geometries» in order to indicate the heterogeneous configurations of power relations leading the process of economic transformation and competition of both firms and territories (Yeung, 2005).

In political geography, the geography of power of Claude Raffestin represents another important keystone. Through the development of a multidimensional approach to power relations, including all the social relations aimed at the control and the exercise of power over people and things, such as the activities of States, institutions, and firms, Raffestin has conceptualized a geography of power where every form of appropriation and transformation of reality is supported by abstract and material mediators, which play a key role in the processes of representations as well as in those of production (Raffestin, 1981; 2012). From this perspective, a theory of territoriality is primarily a theory of mediation, while the exercise of power, as a combination of energy and information, is strictly linked to

the ability of transforming the material and social environments through specific cognitive and practical boundary drawing activities, fully related to knowledge formation and circulation (Klauser, 2012).

Within this theoretical framework, the smart city model can be understood as a «policy product» of the competitive strategies of a small number of high-tech companies, including the internal reorganization of production and the external promotion of a profit-based logic of territorial organization, both oriented to neoliberal values of economic growth, and aimed at increasing the power of business in public domain and at reinventing the logic of capital accumulation.

Methodologically, the analysis is based on the review of critical studies about smart urbanism and of «grey literature», that is documents self-produced by the multinational corporation, such as annual reports, guidelines, keynote speeches, and press articles.

Big Blue and the challenge of the new economy. – Between the late nineties and the beginning of two thousands, many multinational corporations had to face the challenges associated with the growing competition of emerging economies and the commoditization of products and markets with a consequent erosion of profit margins. IBM is not an exception, so it has undergone a profound in-depth restructuring in order to reorient the production towards higher-value and more profitable markets, to transform the firm in a globally integrated corporation, and to guarantee higher levels of corporate efficiency and productivity (IBM, 2009). In this context, the new priorities become: the empowerment of R&D capabilities; the maintenance of a constant tendency towards innovation of both processes and products; the conversion of corporate governance toward a more flexible and integrated business model; and, a greater focus on emerging economies (Bramante et al., 2010).

The R&D division developed stronger collaborations with external clients and internal business unities, and spending roughly \$6 billion a year on research and development IBM has built a global capability with eight laboratories on three continents, in addition to partnerships with many top universities.

Samuel J. Palmisano becomes CEO in 2002, just when IBM bought the «PwC Consulting» to explore the software market and to strengthen those resources and skills necessary to provide business integrated solutions through a new division, the IBM «Business Consulting Services» (Kirkpatrick, 2004). Since 2000, IBM decided to divest a number of low-margin units, so it sold in 2002 its disk unit to Hitachi, in 2005 its personal computer business to the Chinese firm Levovo, and in 2007 the printer division to Ricoh.

This complex corporate reorganization – in great part revealed in the article of CEO Sam Palmisano «The globally integrated enterprise» published in 2006 in *Foreign Affairs* – implies a shift from hardware

business to software and services, with a special attention to intelligence and analytics, service-oriented architecture and cloud computing (Palmisano, 2006).

Data analytics is recognized as a strategic asset for the firm's competitive strategies and particularly important was the merger of IBM's Consulting Group into its Global Services group in the beginning of the two thousands. The advantages of investing in analytics capabilities are not limited to the urban services market, but it embraces other strategic sectors. In particular, IBM recognizes a wide range of action fields where to deliver value with big data: from sentiment analysis to the customer experience, from innovative healthcare solutions to weather predictive models, from optimization of risk decision based on real-time transactional data to crime prevention (German, 2012).

This new corporate philosophy has been encapsulated in IBM's Smarter Planet campaign, which insisted on the need for firms and governments to harness big data, and to use advanced analytics to guide their decision-making. The marketing campaign is under the responsibility of Ogilvy&Mather, the unique IBM's advertising agency since 1993, which is responsible to develop a creative theme common to all the clients, with the slogan «To build the change in a ever more intelligent world» (IBM, 2008). The next step was to implement and remix this macro vision in different fields of actions, such as transports, finance, and the city (IBM, 2012).

IBM Smart City: cognitive boundary drawing and spatial mediation. – The choice to invest in the smart city product is a direct consequence of the identification of urban services as a priority area of action. The global strategy of the high-tech giant is materialized in a reconfiguration of the corporate internal and external «relational geometries», which is aimed on one side at developing the skills and the technologies needed to define its smart city technological infrastructure, and on the other side to render transferable, through consultancy services and marketing campaign, its smart city ideas, practices and techniques.

First, IBM's credibility in terms of making generic knowledge about cities is build upon huge investments in terms of hardware, software, informatics and especially analytics resources. With regard to the latter, between 2008 and 2013, IBM invested \$17 billion in the acquisition of more than 30 high-tech start-ups specializing in big data analytics (IBM, 2013), in line with a selection strategy aimed at guaranteeing the optimization of 3Vs: «variety», which includes unstructured data, such as video, images, texts and audio; «velocity», time-sensitive streamed data, such as stock market behaviour; and «volume», from social media traces to GPS signals (Ferguson, 2012). As a whole these data can be processed through specific cognitive systems based on cloud, such as the IBM Watson System, which guarantees innovative services of data collection and processing. Besides acquisition, the firm has developed new programs of technological innovation, such as the IBM Global Entrepreneur Program

for Startup, it has built nine Analytics Solutions Centers acting as key nodes of a global analytical innovation ecosystem that also involves more than forty Innovation Centers and six thousands business partners, and more recently it has realised also important alliances, such as that with Twitter, which has guaranteed the access to data generated each day by more than five hundred million twitters. In 2004 alone, data analytics revenues have increased to 7%, reaching the record level of \$17 billion (IBM, 2014).

Second, the global diffusion of IBM's smart city goes hand in hand with a complex territorial strategy, in so far as the experimentation and valorisation of new mechanisms of urban knowledge extraction, organization and circulation necessitate of specific cognitive and spatial boundary drawing activities.

The success of this territorial strategy depends mostly on the ability to produce a narrative of positive transformation, which enables the global scalability of the IBM smart city's technological and consultancy solutions (Söderström, Paasche, Klauser, 2014). This discursive activity implies specific cognitive boundary drawing practices, mostly based upon the conceptualisation of the instrumented, interconnected, and intelligent city of the future. The instrumented city refers to sources of near-real-time real-world data from both physical and virtual sensors; interconnected means the integration of those data into an enterprise computing platform and the communication of such information among the various city services; intelligent refers to the inclusion of complex analytics, modelling, optimization, and visualization in the operational business processes to make better operational decisions (Harrison et al., 2010).

The city is translated in a unitary techno-scientific language that mediates its inscription into a transformative and normative discourse, which as a sort of corporate urban theory is based on three main pillars: a) planning and management; b) infrastructure; c) people. Each of these priority axes is then subdivided in three sub-systems: a) planning and management of public safety, government and agency administration, and city planning and operations; b) services and infrastructures in the fields of energy, water, and transportation; c) services for people in the fields of education, care, and social programs.

Thus, IBM approaches the city as a macro-system of nine sub-systems, by promoting itself as a producer of technology and IT services, and then as an enabler of a technocratic governance based on the monitoring, regulation, coordination, and integration of urban services through a spatially specific and temporally continuous process of data collecting, sharing and analysing. This analytical work is provided by specific infrastructures, such as the IBM's Intelligent Operations Center, where the convergence and the sharing of data provide an executive dashboard to depict the overall and real-time status of a city, which acts as a cognitive platform aimed at informing and guiding the action of policy-

makers, service providers, and local authorities toward a continuous adaptation and optimization of the urban system's functioning (IBM, 2011).

This territorial strategy is characterized by a constant balancing between global standardization and adaptation to local context in both discursive and spatial mediation. With regard to the latter, for instance, the launch of Smarter Planet campaign, in 2008, and of Smart City Challenge, in 2010, promote the circulation of IBM's smart city model within the transnational circuits of policy transfer. Meanwhile, the selection of specific key sites as strategic nodes of a wider transnational network, where to concentrate investments, resources and skills, serves to reach the maximum level of urban knowledge production and circulation, and travelling corporate experts and technocrats facilitate its territorialisation in a variety of cities around the world.

Indeed, a first key element of this corporate strategy is the Smarter City Challenge, which selected worldwide 100 municipalities between 2011-2013. A grant of \$400,000 is nominally ascribed and offered to the winning applicants in the form of consultancy services by a team of specially selected IBM experts who provide, in collaboration with city leaders, the context-specific analysis and recommendations to support a successful smart city strategy (IBM, s.d.). Through this initiative, IBM can extend the geographical reach of its marketing and consultancy activities and to experiment its techno-scientific model of urban governance in local contexts very different from each other, through which to develop competencies and technologies on a range of city-specific urban policy issues, then globally scalable: a key element for those scale economies necessary to ensure a return on investments, in terms of profits.

A second strategic element is the creation in Dublin of a dedicated Smarter City Technology Centre in 2011, where IBM intends to build a highly skilled and cross-disciplinary team of urban experts on IBM's technologies for intelligent urban and environmental systems, with a focus on creating analytics, optimizations, and systems for sustainable energy, urban water management, transportation, and basic infrastructures (IBM, 2010a).

A third element is the selection of Rio de Janeiro and Singapore, both of them sub-regional capitals distinguishing themselves as engines of development of fast-growing economic and high innovative areas, and as key laboratories of experimentation, which reveal the corporate interest in emerging economies and render globally visible its capabilities and technologies for a more intelligent Planet (Angelidou, 2014). In Singapore, the collaboration between local authorities and IBM has focused on transport, with the co-development of a simulation system based on traffic prediction in main urban nodes and aimed at preventing traffic congestion. In 2010, by adopting an infrastructure-oriented smart city approach, IBM employed its first integrated operations centre in Rio de Janeiro, functioning as an integrated system of data gathering and processing in order to respond to emergencies due to disasters,

as the city has recently experienced devastating landslides, and to face the forthcoming challenges in terms of efficiency and safety of hosting the World Cup in 2014 and the Olympics in 2016.

Techno-mediation and algorithmic governance. – By focusing on geographical dimensions of technological mediation of IBM smart city model, it is possible to appreciate the spatial and temporal reconfiguration of the mechanisms of urban governance promoted by the corporate logic of territorial organization and planning, which selects the priority axes and offers a unique solution to the many urban problems: «governing cities in real-time through code and data» (Kitchin, 2014).

The city is envisioned as a physical incarnation of an immense cloud of big data made available by the development of digital technologies and ubiquitous digital tools and by the diffusion and integration of fixed and mobile, material and human, sensors in public and private spaces. The real-time accumulation of empirical knowledge about various phenomena is central to provide previsions and recommendations about the future, which continually transform the perception of temporal relations, and imply a specific form of «anticipatory governmentality» (Klauser, Albrechtslund, 2014). The processing and the sharing of urban data through software, algorithms and statistics provide urban leaders with the information useful to the optimization of the limited resources available (IBM, 2010b).

Through the lens offered by this paradigm, which is based on big data analytics and interrelation, a major challenge of the urban governance becomes the real-time understanding and regulation of ever changing realities for a better and more intelligent comprehension of the city geared to systemic efficiency, environmental sustainability and economic growth (Kitchin, 2014).

This novel spatio-temporal geography of urban governance mostly depends on the building of a physical or virtual Centre of Excellence (CoE), which supports the processes and techniques of data gathering, processing and analysing, by making available automatic and informed knowledge (Batty, 2013), which will drive future actions.

This techno-mediated regulation-at-a-distance implies a new engineered, digitalized and technocratic model of urban system governance where big data represent the cognitive platform for an objective understanding of the reality.

The interconnection and the processing of huge flows of data within CoE enable a constant process of optimization, whereby the management of this knowledge about cities serves to create a more transparent, efficient and adaptable system of systems, whose targets and conditions are constantly readapted and redefined, depending not only on the ever changing parameters of reality itself, but also on specific priorities and normative conditions (Klauser, 2013). As incubator of a new form of artificial intelligence, the CoE mediates and supports the functioning of smart cities according to rules, techniques, codes and instruments aimed at limiting and/or removing inefficiency, disorder and

unpredictability by means of a model of governance based on data transparency and on a clear set of basic criteria.

The emphasis on an urban regulation mediated by the availability of objective and transparent data and by the use of software and algorithms, tends to overlook the non-neutral nature of both them. On one side, the mystification of data as basic element of an objective knowledge about cities does not take in account their relative nature, due to the arbitrary processes of data collection, selection and interpretation (Kitchin, 2014), nor the margins of errors linked to these activities (Batty, 2013). On the other side, the creation of specific software is based on the formulation of algorithms and implies predefined codes that are used to assess people's profiles, risks, and levels of access to a whole range of spaces and services, with the effect of enabling a model of governance, which continuously and invisibly classify, standardize, and demarcate rights and responsibilities, inclusions and exclusions (Klauser, 2013).

Within this process, citizens play a key role, as agents of knowledge production, regulation and utilization (Goodchild, 2007; Kelley, 2014; Gabrys, 2014). In fact, as human sensors, citizens voluntarily and involuntarily leave digital traces which, once the datasets are attached to physical space, transform landscapes into info-scapes, providing authorities with better knowledge and allowing them to make more informed decisions (Rabari, Storper, 2013). As a consequence, however, the smart citizen is instrumentalized, through a techno-political rhetoric that reduces the complex question of urban citizenship to a series of predictable and programmable performances focused on technology consumption and data production. The citizen is indeed reconceptualised as a good user of a rational system (Gordon, Walter, 2013), who acts in a disciplined way and within a prescribed framework, as responsible for continuing basic city processes. Furthermore, the access to data is represented as a prerequisite of transparency and democracy that enables the civic participation in the public sphere, so that citizens become key actors in the ever more profitable urban data market-making, where private companies such as IBM can experiment their innovative solutions, and thus in services to the basic continuation of the status quo of the city and its existing power structures. In fact, the civic engagement of smart citizen by means of technological interfaces and digital tools seems to give priority to those neoliberal values, such as centralized control, efficiency, predictability, short-termism, and individual citizen instrumentality, which mostly reduce the innovative and democratic potentials of civic action (Hill, 2013).

Conclusions. – The launch of the IBM smart city model has been contextualised between the crisis of global capitalism and the reproduction of neoliberalism in urban space, and then understood as a product of a high-tech company's competitive strategy and its socio-spatial relations.

First, the paper has shown the key role played by cities in the process of regeneration and reinvention of cognitive capitalism following the global economic-financial recession. Second, the focus on the IBM internal and external socio-spatial relations through the analysis of the reorganization of production and of the discursive, spatial, and technological mediation as key components of its territorial strategy has highlighted the interconnection between the economic dimension of industrial activity, linked to the implementation of sophisticated mechanisms of urban knowledge production, organization and valorisation within the capitalist circuits of the global economy, and its political dimension, linked to the promotion and territorialisation of its smart city model.

In this perspective, the reduction of the city and of the urban citizenship as key elements of the IBM smart city model is aimed at experimenting novel forms of surplus value extraction and accumulation from activities of knowledge production, organization and circulation, while its focus on sustainability and systemic efficiency seems to intensify the open-ended nature of neoliberal urbanism possibilities (Gibbs, Krueger, Mac Leod, 2013).

The paper has highlighted how a small number of high-tech corporations in the name of flexibility, velocity and efficiency, are currently increasing their influence as important actors in the making of this new paradigm of urban planning and management, while the innovation of urban governance is directly and exclusively connected to technological solutions. The creation of a public sphere characterized by an high level of informational asymmetry and technical complexity risks to further intensify the post-political and post-democratic conditions of policy making and of urban governance, while avoiding main concerns related to the reconfiguration of relation between space, power and knowledge linked to corporate smart city solutions.

REFERENCES

- ANGELIDOU M., *Smart city policies: A spatial approach*, in «Cities», 2014, 41, pp. 3-11.
- BATTY M., *Big data, smart cities and city planning*, in «Dialogues in Human Geography», 2013, 3, pp. 274-279.
- BRAMANTE J., R. FRANK e J. DOLAN, *IBM 2000 to 2010: continuously transforming the corporation while delivering performance*, in «Strategy & Leadership», 2010, 38 (3), pp. 35-43.
- FERGUSON M., *Architecting A Big Data Platform for Analytics*, White Paper for IBM Intelligent Business Strategies, 2012 (available on line: http://citia.co.uk/content/files/architecting-a-big-data-platform-for-analytics_24606569.pdf).
- GABRYS J., *Programming environments: environmentality and citizen sensing in the smart city*, in «Environment and Planning D: Society and Space», 2014, 32, pp. 30-48.

GERMAN R., *What is Big Data's role in helping companies achieve competitive advantage through analytics?*, IBM Information Management Foundation, 2012 (available on line: [https://www-950.ibm.com/events/wwv/grp/grp037.nsf/vLookupPDFs/Big%20Data_Ron_%20Edmonton%209-20/\\$file/Big%20Data_Ron_%20Edmonton%209-20.pdf](https://www-950.ibm.com/events/wwv/grp/grp037.nsf/vLookupPDFs/Big%20Data_Ron_%20Edmonton%209-20/$file/Big%20Data_Ron_%20Edmonton%209-20.pdf)).

GIBBS D., R. KRUEGER e G. MAC LEOD, *Grappling with Smart City Politics in an Era of Market Triumphalism*, in «Urban Studies», 13 June 2013, pp. 2151-2157.

GIFFINGER R. et al., *Smart Cities: ranking of European medium-sized cities*, 2007 (available on line: http://www.smart-cities.eu/download/smart_cities_final_report.pdf).

GOODCHILD M. F., *Citizens as sensors: the world of volunteered geography*, in «GeoJournal», 2007, 69, pp. 211-221.

GORDON E. e S. WALTER, *The Good User: Tech-Mediated Citizenship in the Contemporary American City*, 2013 (available on line: <http://www.chrono-synclastic-infundibulum.com/PDFs/GoodUser.pdf>).

HARRISON C. et al., *Foundations for smarter cities*, in «IBM Journal of Research and Development», 2010, 54 (4), pp. 1-16.

HARDT M., e A. NEGRI, *Impero. Il nuovo ordine della globalizzazione*, Milan, Rizzoli, 2002.

HARDT M. e A. NEGRI, *Commonwealth*, Cambridge, The Harvard University Press, 2009.

HILL D., *Essay: On the smart city; Or, a 'manifesto' for smart citizens instead*, in «City of Sound», 2013 (available on line: <http://www.cityofsound.com/blog/2013/02/on-the-smart-city-a-call-for-smart-citizens-instead.html>).

HOLLANDS R. G., *Will the real smart city please stand up? Intelligent, progressive or entrepreneurial?*, in «City», 2008, 12 (3), pp. 303-320.

ID., *Critical interventions into the corporate smart city*, in «Cambridge Journal of Regions, Economy and Society», 2014, DOI: 10.1093/cjres/rsu011.

IBM, *Smarter Cities Challenge*, n.d. (available on line: <http://smartercitieschallenge.org/smarter-cities.html>).

ID., *Costruire il cambiamento in un mondo più intelligente*, 2008 (available on line: http://www.ibm.com/smarterplanet/global/files/it_it_it__overview__overview_vision.pdf).

ID., *2Q 2009 earnings presentation*, 16 July 2009 (available on line: <http://www.ibm.com/investor/2q09/presentation/2q09.pdf>).

ID., *IBM Opens Smarter Cities Technology Centre in Ireland*, 2010a (available on line: <https://www-03.ibm.com/press/us/en/pressrelease/29745.wss>).

ID., *Smarter cities with IBM software solutions*, 2010b (available on line: <ftp://public.dhe.ibm.com/software/ch/de/multimedia/pdf/transcript-smarter-cities-with-ibm-software-solutions-eng.pdf>).

ID., *Smarter Cities Series: A Foundation for Understanding IBM Smarter Cities*, 2011 (available on line: <http://www.redbooks.ibm.com/redpapers/pdfs/redp4733.pdf>).

- ID., *Annual Report*, 2012 (available on line: http://www.ibm.com/annualreport/2012/bin/assets/2012_ibm_annual.pdf).
- ID., *Annual Report*, 2013 (available on line: <https://www.ibm.com/annualreport/2013/>).
- ID., *Annual Report*, 2014 (available on line: <http://www.ibm.com/annualreport/2014/>).
- LARNER W. e N. LAURIE, *Travelling technocrats, embodied knowledges*, in «Geoforum», 41, 2009, pp. 218-226.
- LEBERT D. e C. VERCELLONE, *Il ruolo della conoscenza nella dinamica di lungo periodo del capitalismo: l'ipotesi del capitalismo cognitivo*, in C. VERCELLONE (ed.), *Capitalismo cognitivo. Conoscenza e finanza nell'epoca postfordista*, Roma, Manifestolibri, 2006, pp. 19-37.
- LUQUE A., C. MC FARLANE e S. MARVIN, *Smart Urbanism. Cities, grids and alternatives?*, in M. HODSON e S. MARVIN (eds.), *After Sustainable Cities?*, London & New York, Routledge, 2014, pp. 129-142.
- KELLEY M. J., *Urban experience takes an informational turn*, in «GeoJournal», 2014, 79, pp. 15-29.
- KIRKPATRICK D., *Inside Sam's \$100 Billion Growth machine Sam Palmisano has to huge goals: to get this giant growing again – and return IBM to greatness*, in «Fortune magazine», 14 June 2004 (available on line: http://money.cnn.com/magazines/fortune/fortune_archive/2004/06/14/372637/).
- KITCHIN R., *The real time city? Big data and smart urbanism*, in «GeoJournal», 2014, 79, pp. 1-14.
- KLAUSER F., *Thinking through Territoriality: Introducing Claude Raffestin to Anglophone Sociospatial Theory*, in «Environment and Planning D: Society and Space», 2012, 30, pp. 106–120.
- ID., *Through Foucault to a political geography of mediation in the information Age*, in «Helvetica Geographica», 2013, 68, pp. 95-104.
- ID. e A. ALBRECHTSLUND, *From self-tracking to smart urban infrastructures: Towards an interdisciplinary research agenda on Big Data*, in «Surveillance & Society», 2014, 12, pp. 273-286.
- MAC LEOD G., *Urban politics reconsidered. Growth machine to Post-democratic City?*, in «Urban Studies», 2011, 48(12), pp. 2629-2660.
- MAC LEOD G. e M. JONES, *Renewing urban politics*, in «Urban Studies», 2011, 48, pp. 2443-2472.
- MC CANN E., *Urban policy mobilities and global circuits of knowledge*, in «Annals of the Association of American Geographers», 101, 2011, pp. 107-130.
- PALMISANO S. J., *The Globally Integrated Enterprise*, in «Foreign Affairs», 2006, 85 (3), pp. 127-136.
- PAROUTIS S. et al., *A strategic view on smart technology: The case of IBM Smarter Cities during a recession*, in «Technological Forecasting and Social Change», 2014, 89, pp. 262-272.
- PECK J., *Struggling with the creative class*, in «International Journal of Urban and Regional Research», 29, 2005, pp. 740-770.

PECK J., N. THEODORE e N. BRENNER, *Il Neoliberismo sta risorgendo? La supremazia del mercato in seguito alla Grande Recessione*, in M. POSTONE (ed.), *Prospettive della Crisi Globale*, Trieste, Asterios editore, 2013, pp. 50-81.

PRINCE R., *Policy transfer, consultants and the geographies of governance*, in «Progress in Human Geography», 2012, 36 (2), pp. 188-203.

RABARI C. e M. STORPER, *The Digital Skin of the City*, Working paper del Programma *Villes & territoires*, Paris, Sciences Po, 2013 (available on line: http://www.sciencespo.fr/chaire-developpement-durable/sites/sciencespo.fr.chaire-developpement-durable/files/61_2013_Cities_back_Storper_Rabari.pdf).

RAFFESTIN C., *Per una geografia del potere*, Milan, Unicopli, 1981.

ID., *Space, territory, and territoriality*, in «Environment and Planning D: Society and Space», 2012, 30 (1), pp. 121-141.

ROSSI U., *The variegated economics and the potential politics of the smart city*, in «Territory, Politics, Governance», 2015 DOI:10.1080/21622671.2015.1036913.

SHELTON T., M. ZOOK e A. WIIG, *The actually existing smart city*, in «Cambridge Journal of Regions, Economy and Society», 2014 (available on line: <http://www.spatialcomplexity.info/files/2014/09/SSRN-id2477482.pdf>).

SÖDERSTRÖM O., T. PAASCHE e F. KLAUSER, *Smart cities as corporate storytelling*, in «City», 2014, 18 (3), pp. 307-320.

SWYNGEDOUW E., *The Antinomies of the Postpolitical City*, in «International Journal of Urban and Regional Research», 2009, 33 (3), pp. 601-620.

THRIFT N., *Knowing Capitalism*, London, Sage, 2005.

TOWNSEND A. M., *Smart cities. Big data, civic hackers and the quest for a new utopia*, New York, Norton & company, 2013.

VANOLO A., *Smartmentality: The Smart City as Disciplinary Strategy*, in «Urban Studies», 2014, 51 (5), pp. 883-898.

YEUNG H. W., *Rethinking relational economic geography*, in «Transactions of the Institute of British Geographers», 30, 2005, pp. 37-51.

University of Catania, Dept. of Political and Social Science

arturo.dibella@unict.it