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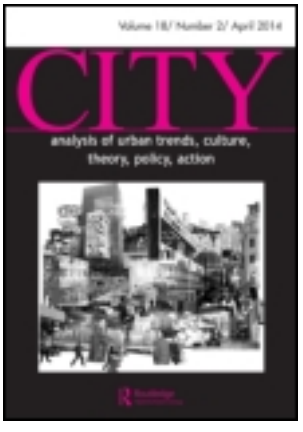

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Smart cities as corporate storytelling

Ola Söderström, Till Paasche and Francisco Klauser

On 4 November 2011, the trademark 'smarter cities' was officially registered as belonging to IBM. This was an important milestone in a struggle between IT companies over visibility and legitimacy in the smart city market. Drawing on actor-network theory and critical planning theory, the paper analyzes IBM's smarter city campaign and finds it to be storytelling, aimed at making the company an 'obligatory passage point' in the implementation of urban technologies. Our argument unfolds in three parts. We first trace the emergence of the term 'smart city' in the public sphere. Secondly, we show that IBM's influential story about smart cities is far from novel but rather mobilizes and revisits two long-standing tropes: systems thinking and utopianism. Finally, we conclude, first by addressing two critical questions raised by this discourse: technocratic reductionism and the introduction of new moral imperatives in urban management; and second, by calling for the crafting of alternative smart city stories.

Key words: urban studies, technology, smart cities, actor-network theory, storytelling, geography, planning

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Introduction

Smart cities, like creative cities, sustainable cities or livable cities are part of contemporary language games around urban management and development. These games involve experts, marketing specialists, consultants, corporations, city officials, etc. and frame how cities are understood, conceptualized and planned. Although we might consider this discursive activity with some skepticism, it often makes a difference. It is performative, because it shapes the imaginaries and practices of a myriad of actors concretely building the city through particular case studies or pilot projects, decisions and everyday action, like creating a new electricity system for a neighborhood. We therefore take discourse seriously in this paper and focus on two important aspects of contemporary 'smart city talk': we first look at how the term smart city has been popularized in the discourse of municipalities, media and especially private firms and then, at more length, how it has been given a specific content in IBM's global and massive 'smarter cities' campaign: the most developed attempt by a private company to define a smart model of urban management.[1] In doing this, we analyze key episodes in the struggle over the definition of what smart cities are about, claiming that this struggle is an important element in the competition between private companies over authorship, authority and profit in the smart city business.

Drawing on critical planning theory, we conceptualize IBM's smarter city campaign as a specific form of storytelling in the world of planning (Mandelbaum 1991;

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Sandercock 2003; Throgmorton 1996, 2003; Van Hulst 2012) and show that it mobilizes and recycles two long-standing tropes: the city conceived as a system of systems, and a utopian discourse exposing urban pathologies and their cure. On this basis, we develop three main arguments related to the purpose, content and effects of the dominant smart city story. The first is that this story is to a large extent propelled by attempts to create an 'obligatory passage point' (Callon 1986; Latour 1987) in the transformation of cities into 'smart' ones. In other words, it is conceived to channel urban development strategies through the technological solutions of IT companies. Second, we argue that this discourse promotes a conception of urban management that is a technocratic fiction: one where data and software seem to suffice and where, as a consequence, knowledge, interpretation and specific thematic expertise appear as superfluous. Third, we claim that this discourse prioritizes public investments in IT over other domains of spending and thereby introduces a new 'economy of worth' (Boltanski and Thévenot 2006) which is particularly problematic in resource-scarce cities.

The paper is embedded in a burgeoning literature on smart cities and which can be divided into two main categories: first, there are studies focusing on the technological side which is concerned with specific questions such as energy efficiency, carbon emissions, etc. (Bakıcı, Almirall, and Wareham 2013; Fischedick 2012; Paskaleva 2011; Rat-Fischer et al. 2012; Streitz 2011). This literature seeks to develop smart technologies for cities. There is then a second strand of literature approaching smart cities as an object of analysis and attempting to define the smart city as an assemblage of technologies such as advanced information and communications technology (ICT) infrastructure, smart cards in public transport, and e-governance functions aimed at increasing competitiveness, administrative efficiency and (in some cases) social inclusion (Allwinkle and Cruickshank 2011; Caragliu, Del Bo, and Nijkamp 2011; Deakin 2014; Deakin and Al Waer 2011; Kuk and Janssen 2011; Schaffers et al. 2011). However, little is actually known about the more fundamental principles and ideas underlying the smart city as a model—that is, as a generic solution to the problems of urban development and management[2]—beyond the self-advertisement of IT companies and municipalities. Until recently, the existing literature was also lacking in critical engagement with the exception of an early text by Hollands (2008). However, since 2011, a series of contributions has more critically scrutinized the phenomenon from different viewpoints: political economy, science and technology studies, governmentality studies and ideological critique, moving research away from the self-celebratory climate around smart cities. This critique can be briefly summarized as follows. In Hollands' (2008, 305) pioneering paper, the smart city model is interpreted as a contemporary high-tech clothing of urban entrepreneurialism, which 'plays down some of the negative effects the development of new technologies are having on cities' such as growing social polarization. Looking at smart cities as the places where the concentration and interconnection of 'big data' in cities lies, Kitchin (2014) raises questions of technocratic governance, corporatization of city governance or vulnerability and surveillance, while Wyly (2013) combines technology studies and political economy to argue that smart cities are to be interpreted in the context of the shift to 'cognitive–cultural capitalism' boosted by the takeoff of automated data generation and mining, notably through social networks. In a more Foucauldian perspective, Vanolo (2014) shifts the focus from data to citizens and discusses how the smart city model may be a powerful disciplinary tool to shape 'smart citizens', who are compelled to be technologically literate. Finally, different contributions have targeted smart cities as an ideological construct and as a simplistic model of the urban. For Bell (2011, 73), it is a vision of cities 'that frames all urban

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questions as essentially engineering problems to be analyzed and solved using empirical, preferably quantitative, methods' which give 'pre-eminence to urban phenomena that can be measured and are deemed important enough to measure'. In the same vein, Greenfield (2013, chap. 13) defines the dominant corporate discourse on smart cities as a return to the high modernism of the period 1880–1960: a Le Corbusier redux bound to repeat the worst planning disasters of the 20th century in the 21st century. Based on a more detailed argument, Townsend (2013) sees in IBM's smarter city discourse a resurrection of the urban cybernetics of the 1970s. These recent contributions have begun to provide answers to the agenda of critical questions identified by McFarlane, Marvin, and Luque (2013, 25): the why?, who?, what?, how?, where? and emerging consequences of smart urbanism.

Our paper connects some 'whys' and 'hows' of smart urbanism and pushes further the critical analysis of smart urbanism by focusing on the discourse of a central actor: IBM. It thus particularly relates to the critique of smart urbanism as an ideological construct focusing on the storytelling activity of the company as a means of securing and strengthening its market position. Thus, the aim of this paper is to describe the emergence of a prominent 'spokesperson' for the idea of smart cities in the public sphere and to analyze the constitutive elements and imaginaries in IBM's discourse on smarter cities. Our argument unfolds in three different steps corresponding to three aspects of this discourse. We first trace the origin and diffusion of the term 'smart cities' and examine how cities became problematized as smart and by whom. Then, we focus on IBM's smarter cities campaign to show how, on the one hand, the company translates different dimensions of the urban world into a unitary language and how, on the other hand, cities thus translated are inscribed in a narrative of positive transformation. The paper is based on three different methods and types of empirical material: the first is a media survey, using LexisNexis, to track down the moments and places of origin of the term *smart cities*; the second is a critical discourse analysis of the abundant online information of IBM's smarter city campaign; the third is a series of interviews in 2012 and 2013 with IBM and other specialists involved in projects using smart technologies in Switzerland.

Translating and narrating the smart city

In quite general terms, smart cities involve the creation of new relations between technology and society. According to this vision, as we show below, urban infrastructures and everyday life in cities are optimized through technologies provided by IT companies. These companies are the main producers of a discourse about (the benefits of) smart cities that they produce both to describe their activity in the domain and to stage themselves as central actors of this urban management model. This process is resonant with actor-network theory's (ANT) focus on the making of socio-technical networks and how certain actors try to create for their interests what Callon (1986, 183) calls in his seminal paper 'obligatory passage points' (OPPs hereafter). For Callon (1986, 180–185), the first and crucial step in the creation of socio-technical networks is the problematization of a situation in order to become indispensable actors in a network. It supposes of course the definition of the problem that needs to be solved, but also that of the actors involved and the creation of OPPs, through which these actors will be in a position to solve the problem. Concretely, an OPP is a place (a geographical one or an institution), or a procedure that becomes unavoidable: a vaccine developed by a pharmaceutical firm to avoid a disease, for instance. Here, the discourse about smart cities can be interpreted as a tool to make certain actors and technologies OPPs or key actors in the development and implementation of specific forms of urban

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management solutions. As we will show, IBM crafts a story that presents their smart technologies as the only solution for various urban problems and hence becomes an OPP. The use of mediations—from small talk to complex machines—to translate phenomena into a manageable language—is a powerful means of creating OPPs (Latour 1987). We will show here how the translation of the different dimensions of the urban world into the unitary language of urban systems is crucial in IBM's campaign. Finally, this discourse really gains momentum once cities and their problems thus translated are embedded in a narrative of positive transformation. Here, the smart city discourse becomes a story with a plot and can be fruitfully interpreted in the light of research on storytelling in planning.

Since the 1990s, there has been wide recognition within planning theory of the role of storytelling (Van Hulst 2012). Stories are important because they provide actors involved in planning with an understanding of what the problem they have to solve is (Van Hulst 2012, 314). More specifically, they play a central role in planning because they 'can be powerful agents or aids in the service of change, as shapers of a new imagination of alternatives' (Sandercock 2003, 18). For Throgmorton (1996, 2003), stories are the very stuff of planning, which, fundamentally, is persuasive and constitutive storytelling about the future. Seen in this perspective, planning is about 'emplotment, characterizations, descriptions of settings, and rhythm and imagery of language' (Throgmorton 2003, 126). It is also about power, as storytelling in planning calls for a critical analysis that asks 'who has the power to give meaning to things, to name others, to construct the character of collective identities, to shape the discussion of urban politics [. . .]?' (Throgmorton 2003, 132).

This is what this paper does: it looks at who has the power to define the smartness of cities and what the discussions around this theme should be concerned with. An important difference, as far as previous analyses of storytelling in planning are concerned, is that in our case the author of the story is not an individual planner or a planning office, but a private company, which addresses (mainly) municipalities to persuade them of the central role that IBM can play in a new era of (smart) planning. Our paper is therefore not based on interviews with planners, but studies the story that a large private company tells about smart cities in a worldwide marketing campaign. It considers the ingredients of this storytelling to be operators of power in an emergent field of thought and action. This will lead us to ask in our conclusion how other stories about smart cities might be told.

Emergence of the smart city discourse

Hollands (2008) and Vanolo (2014) have shown that the idea of the smart city is related to a double lineage in planning literature: the concept of Smart Growth as theorized by the New Urbanism movement in the USA of the 1980s and, on the other hand, the concept of the technology-based intelligent city. However, if we want to grasp the wider efficacy of the term we have to look at a broader public sphere by studying the media. Therefore, we focus here on the term smart city to show how it emerged in the media sphere. Our findings are based on LexisNexis, a large commercial newspaper database, and we have focused our research on international newspapers in English.[3]

This analysis shows that the term 'smart city' first appeared in the mid-1990s. It was mainly used in the 'self-congratulatory ways' Hollands (2008, 307) has criticized. The content of the newspaper articles using the term shows that in that period cities labeled themselves as 'smart' when they introduced functioning ICT infrastructure, e-governance or attracted high-tech industries to foster economic growth. However, there are two examples where the term smart city is used to describe a more complex discursive and technological

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phenomenon. In 1994, the Multifunction Polis (MFP), an autonomous smart city, was planned near Adelaide, Australia. In 1997, the two cities of Cyberjaya and Putrajaya, Malaysia, were re-planned as intelligent garden cities labeled as 'smart cities'. What made the Australian and Malaysian case smart was their vision to use ICT infrastructure not simply to attract business, but, as far as this was possible at the time, to let the ICT grid steer the functioning of the city in order to automatize and optimize its processes. While some of the key words used in the newspaper coverage where still 'high speed ICT', 'e-government' and 'attracting investment', they were extended by the reference to other terms: 'sustainability', 'eco and smart homes', 'environmental innovations' or 'public transport using GPS'. Premised on the idea of an optimization and automation of urban infrastructures, which has become central in the discourse and technology of smart cities, these two cases of the late 1990s can in retrospective be seen as pioneering ones for the more recent developments of the concept. Therefore, the term smart city first emerges in the media as a self-definition of a series of municipalities like Adelaide or Cyberjaya.[4]

Then, we have a second moment after 2008 characterized by the intervention of private companies in the IT sector, among which IBM. On 6 November 2008, in the midst of the financial crisis, Sam Palmisano (IBM's CEO at that time) gave a talk entitled 'A Smarter Planet: The Next Leadership Agenda' which had a large impact in the media.[5] In this speech, Palmisano argues that the world and its cities must become smarter to become more sustainable and economically efficient. Timely to this speech, IBM launched an extensive smarter planet advertisement—discussed below—which is running until the present day.

A few months later, on 25 September 2009, to position itself more firmly in the emerging smart city talk, the company officially files the term 'smarter cities' to be registered as a trademark: 'Mark: 79077782; Word Mark: SMARTER CITIES; Serial Number: 79077782; Registration Number: 4033245'.[6] The trademark was registered two years later on 4 October 2011. With Palmisano's speech and the trademark, we have a problematization of cities as smart cities, the first step in the creation of an OPP. Cities' problems are defined as the need to become smarter and the central actors of the process—IBM, municipalities—are identified. If IBM is far from being the unique contender in the business,[7] it has since 2008 acquired a very visible position. We now move on to show how the company's discourse unfolds in its very extensive smarter city campaign initiated in 2008 focusing on the campaign's website.[8]

Crafting the smarter city story

The 1990s and early 2000s were difficult times for IBM. Its annual losses reached 8 billion USD in 1993. This led to drastic strategic changes and the announcement in 2002 of the company's move away from hardware design and production to concentrate on consultancy and software. In 2004, the company sold its PC division to the Chinese company Lenovo. The aim of these changes was 'to "move up the value chain" into "more lucrative fields"' (McNeill 2013, 2). At the time, IBM had realized the importance for a global company like itself of the market presented by urban technologies. The 2008 launch of IBM's smarter planet campaign is to be interpreted within this context. Studies done by senior cadres of the company in the early 2000s had identified cities as a huge untapped market (Townsend 2013, 64). According to estimates, this market will represent: 39.5 billion[9] USD by 2016 or 20.2 billion[10] USD by 2020. In order to try and obtain the largest possible share in this market, IBM has developed a strategy involving two elements: first, a 'full-scale contracting for city governments' (McNeill 2013, 7) with flagship contracts such as those with Singapore and Rio; and second, its Smarter

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Cities Challenge where experts provide 100 municipalities over the world with pro bono consultancy in the hope that this initial investment will yield returns. It also allows the company to claim that its expertise is based on its involvement with 2000 cities worldwide. On the whole, as Hollands (2013, 9) notes, 'this strategy has clearly paid off, generating some 3 billion USD' of income and representing 'currently 25% of IBM's operations'. It makes IBM the market leader in the business of smart urban technologies in terms of sales and strategy.[11]

The smarter cities campaign, to which we now turn, has been designed to provide the company's strategy and services with a global visibility. It makes abundant use of video testimonies, pedagogical diagrams and case studies from around the world as its targets are not technological experts but an audience on the management level (municipalities, security, communication or transport companies) which, if convinced by the argument, is able to decide on the implementation of 'smart' urban technologies. Within this ambitious campaign, costing the company 100 million USD (Townsend 2013, 31), two aspects can be analytically distinguished: the translation of the city into a unitary language and its inscription into a transformative narrative. Making our way through these two aspects of the company's discursive strategy we will encounter two well-known topoi in urban planning history working as the main rhetorical devices of the campaign: the systems metaphor and utopianism.

IBM's urban theory rests on two main assumptions. First, the city is based on three main pillars:[12] planning and management services; infrastructure services; and human services. Each of these pillars is sub-divided into three sub-pillars: 'Planning and management services' into public safety, smarter buildings and urban planning, government and agency administration; 'Infrastructure services' into energy and water, environment and transportation; 'Human services' into social programs, health care and education. The sum of these nine pillars makes 'the city'.[13] Ideally, all nine systems would be monitored and regulated in IBM's 'Intelligent Operations Center', the 'central nerve system' of the city, first experienced in the city of Rio de Janeiro.[14] The city is thus seen from the point of view of a municipality: these pillars redefine the main administrative divisions of most cities around the world.

Second assumption, each of these pillars is an individual system and the city is a 'system of systems'. Systems thinking is not only used as a practical way to schematize a complex phenomenon—the city—but as a tool used in IBM's service provision to municipalities. Justin Cook, manager of IBM's Foundational Research Team, thus explains, referring to collaboration with the city of Portland, that 'we want to help these people become systems thinkers [. . .] to help them see relations'.[15] He goes on to a more general declaration: 'As systems thinkers we need to be thinking about the interconnections between these things and the ways to bring this all together so that the whole planet works in a better way.' Faith in systems thinking is also expressed at the very top of the company's hierarchy: Ginni Rometty, IBM's CEO since 2012, explaining smarter cities at a conference in Rio, thus presents data and systems analysis as the very core of how to make cities smarter.[16] Using an enlightenment rhetoric where data and systems theory are the means through which municipalities can move 'from gut-feeling and impressions to knowledge', the new CEO (probably unconsciously) situates herself in the lineage of the social reformists of the previous turn of the century: a Charles Booth, for instance, describing his survey and mapping of London poverty as bringing the light of science on the city (Söderström 1996).

Systems thinking is of course not a new perspective in urban theory and planning. There is a long genealogy of works within urban theory and planning defining the city as a system. Systems thinking about cities finds its roots in organicism and more precisely in visions of the city informed by

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William Harvey's theory of blood circulation in the early 17th century. Harvey's research on the functions of the heart, arteries and veins, was critical in secularizing the understanding of the body as a machinic system of circulations (Sennett 1994). This vision of the body, Sennett (1994, 263–264) argues, progressively informed urban planning of the Baroque period and the Enlightenment:

> 'Enlightened planners wanted the city in its very design to function like a healthy body [...] Thus were the words "arteries" and "veins" applied to city streets in the eighteenth century by designers who sought to model traffic systems on the blood system of the body.'

Thereby, organicism envisaging bodies like a set of (nervous, sanguine, etc.) systems of circulation provided urban design with an alternative to former rational geometric models of spatial organization (Friedmann, quoted by Mehmood 2010, 69).

The common denominator of organicist approaches in planning is a holistic view where cities are approached as composed of functionally related parts. Systems thinking in urban theory is a continuation of the organicist tradition in that respect but building on a different metaphor. If the body (and then more broadly living organisms) is the model of traditional organicism, systems theory builds on the computer metaphor. The urban totality is a large calculating system rather than a biological entity.

Systems theory has been one of the most influential and enduring approaches in urban thought since the 1960s, both in planning theory (Healey and Hillier 2010) and in urban geography (Mandelbaum 1985). Forty-four years before IBM launched its campaign, Brian Berry (1964) famously defined 'cities as systems within systems of cities' using the same Russian doll idea that is to be found in IBM's urban systems scheme. A few years later, Churchman (1968, quoted by Mehmood 2010) identified four different approaches in systems thinking: the efficiency, scientific, humanistic and anti-planning approach. IBM's systems rhetoric clearly prioritizes an efficiency approach 'which concentrates on reducing waste (of time, resources, materials, etc.)' (Mehmood 2010, 77).[17] More precisely, IBM's approach is indebted to Jay Forrester (1969), a computer engineer, and his work on urban dynamics in the late 1960s. Although applied with no success in Pittsburgh in the early 1960s and New York in the early 1970s, urban dynamics have been resurrected by Justin Cook, the IBM smart city strategist who is also a former graduate of MIT's Sloan School of Management where Forrester had been a professor (Townsend 2013, 83). There is something apparently odd in this resurrection as it gives the audience of the smarter cities campaign a sense of traveling back to the heroic times of post-war cybernetics. If we consider urban dynamics as a translation device used for the purpose of storytelling, this choice becomes less enigmatic. What urban systems theory provides, seen from this perspective, is primarily a powerful metaphor creating a surface of equivalence. It translates very different urban phenomena into data that can be related together according to a classical systemic approach which identifies elements, interconnections, purposes, feedback loops, delays, etc. Thus, the website is packed with schemes and flash animations showing how contemporary cities are constituted by functioning and measurable (but highly perfectible) urban systems and infrastructures. As millimeter paper is used as a surface of equivalence to translate and mathematize different living organisms observed through a microscope in biology (Lynch 1988), so urban dynamics translate the city into a single language. We have here, after problematization, a second important step in the constitution of an OPP: translation. The city is made to speak the language of IBM.

Two observations can be made on how urban systems are described in the campaign. First, it takes for granted that there are infrastructures: it never considers cities where the lack, breakdown, worsening, centrally

unmanaged urban systems and infrastructures is the norm, as it is in most cities of the Global South (Beall and Fox 2009; Gandy 2004). Bakker (2011, 63), for instance,

> 'suggests that the term "network", and the interconnectedness it evokes is a poor descriptor of water supply systems in many cities. Rather, the metaphor of the archipelago—spatially separated but linked "islands" of networked supply in the urban fabric—is more accurate than the term "network".'

In other words, this form of systems thinking presuming the existence of a set of urban systems is very largely North-centric. The second observation derives from systems theory as a surface of equivalence. In this approach, cities are no longer made of different—and to a large extent incommensurable—socio-technical worlds (education, business, safety and the like) but as data within systemic processes. This is of course one of the great advantages of data-based systemic analysis. However, the way the campaign presents the nine pillars and their relation tends to reduce the analysis of the city to a machinic vision of cities. As a result, the analysis of these 'urban themes' no longer seem to require thematic experts familiar with the specifics of a 'field' but only data mining, data interconnectedness and software-based analysis. This is particularly clear in IBM's three Is equation where the smarter city is the result of Instrumentation (the transformation of urban phenomena into data) + Interconnection of data + the Intelligence brought by software. Complexity, multipli-city is simplified, flattened into the uni-city of scaled systems and presents itself as IBM's *fiat lux* to its clients. This reduction of expertise has political consequences: as Marcuse (2005, 252) observes, the organic or systems metaphor also creates a fictitious entity 'the city' supporting 'a search for consensus politics, in which the claims of the minority or powerless or disenfranchized or non-mainstream groups are considered disturbing factors in the quest for policies benefiting "the whole"'.

This technocratic approach to cities is presented as the key to efficient urban management through a recurrent trope in the smarter city campaign: the 'if … then … ':

> 'If we think about it as a whole, if we integrate the system, we can keep the city's resources from getting trapped between locations.'[18]

Ontological transformation is in other words the source of the model's epistemological power. Moreover, in this version of systems thinking this transformation spares us the difficulties of interpretation: translated into data and systems, the city seems to speak by itself, to be self-explanatory. Therefore, at its core, this is what structures IBM's smarter city discourse: an engineering epistemology applied to humans and non-humans. Nature and culture reunited by the engineering mind. Systems thinking of course also transforms the nine pillars (or themes) in terms that can be addressed by the company's technologies and services. The nine pillars become combinable in one large system where all information is being brought together to be processed and then optimized to turn 'the city' into a 'smarter city'. This does not mean that in practice the company does not need or seek collaborations, but in its discourse it nurtures an imaginary of an urban management reduced to systems engineering.

Once defined in this way, the city can be embedded in a larger narrative about the city's past, present and future. This narrative, as we will see now in more detail, is a utopian one, in the strict sense of the genre, with its diagnosis of urban ills and its healing therapy.

Transforming the city

In its campaign, IBM constantly emphasizes the problems and shortcomings of the contemporary city. In general terms, the company argues that with 'rising urban populations, ageing infrastructures, and

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shrinking tax revenues today's cities demand more than traditional solutions'.[19] Across domains, cities, in IBM's urban theory, are facing the same issues: 'growing demands', 'tightening budgets', 'financial deficits', 'volatile markets', 'growing complexities', 'pollution', 'urban growth'. The city is in other words a 'sick city' permeated by a series of pathologies. To confront them, municipalities are hampered by 'inadequate systems to serve basic needs', 'obsolete' or 'broken technologies', 'litigation costs', 'benefit frauds' and 'wasted time'.[20] In short, the picture is grim and cities appear close to a fatal breakdown.

What this narrative conveys is the negative side of the 'utopian mirror image' (Choay 1997, 261–262). As planning historian Françoise Choay (1997) has argued, this is since Thomas More's *Utopia* (1516) a constitutive trope of the utopian tradition in urban planning.[21] Utopian urban planning is always conceived, she argues, as a therapeutic discourse starting off with a diagnosis of urban problems and pursuing with a set of universally valid solutions. She defines the utopian genre as: a single voice proposing—through a narrative distinguishing between a corrupted past and a perfect and immutable future—an ideal and universally valid model of society constituted by rational spatial form. IBM's smarter city discourse is in many respects in line with this tradition: its core is utopian storytelling.

First, the smarter cities story is a univocal one: nowhere in the campaign are other approaches or solutions to urban problems mentioned (Vodoz 2013, 52). Utopianism, like the smarter cities model of urban management, is not a collective project assembling different worldviews and interests, but a singular 'emancipatory' vision. Thus, the reply to Throgmorton's (1996) question 'who tells the story?' is simple: the corporation. Second, the smarter cities campaign hinges on a before–after demonstration closely related to the above mentioned 'if … (data-mining and systems thinking) then … (cities will become smarter)' argument. This is most vividly conveyed on their website by one of the first elements visitors encounter: an invitation to visit the museum of urban problems: 'Before the City got Smart, Exhibition'. The 'exhibition' proposes a travel in time where problems are portrayed as pictures hung on the line and where visitors learn about problems of the past, now—in the fictitious present of an accomplished smart city—resolved by smart technologies. 'With intelligence infused into the way cities worked, urban blights became history', the introduction to the exhibition proudly announces.[22] This before–after—or 'weightwatchers'—rhetoric is repeated throughout the exhibition as well as in the presentation of IBM's smart services and technologies. Throughout, technological solutions are presented as the *pharmakon* of contemporary urban pathologies through images and short stories.

One canvas for instance is entitled 'the queue' and explains that:

> 'Before the advent of smart information systems, people actually had to turn up in person to be seen by health centers, passport offices, post offices, embassies, the DVLA and the DMV. Long lines, known as "queues", quickly formed as people stood around aimlessly for hours. Finally in the early 21st century, electronic declarations cut queues and billions of euros in administration costs.'[23]

The third aspect of a utopian rhetoric, the smarter cities story, depicts a model of a perfectly functioning urban society but, in contrast with classical utopianism, it is governed by code rather than spatial form. Problems are specified as we have seen through 'a culture of analytics and systems' and thereby brought to a level where they can be addressed through code. This requires access to data and their interconnection through software. Data, it is argued, are trapped, 'unsmartly' organized in information silos, lost and not available when needed.[24] They are under-used and their potential should therefore be unleashed.

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When detailed information on all aspects of the nine systems is systematically collected and connected, IBM's algorithms can process the data and optimize each system. In case usable data do not exist, it has to be produced. Digital electricity meters with a connection to the Internet should, for instance, replace analogous ones to allow the implementation of smart electricity grids enabling a more efficient use of electricity. The solution is summarized in the marketing language of IBM as the three Is: to become smarter, the world (or the city) needs to be Instrumented, Interconnected and Intelligent. In other words, the core of 'smartness' lies in the algorithm.

Optimization through code is therefore the utopia promised by the company. As the vice president of the smarter infrastructure division puts it: 'The ultimate smart city, the Shangri La if you will, is one where all the systems communicate.'[25] This 'ultimate smart city' is a transparent one where all flows within the nine systems are quantified, connected and efficiently managed. Take public safety and traffic, for instance. Here the smarter cities program is not designed to suggest more police officers, police cars or roads, but information about them: where officers are, where accidents or traffic jams occur. Therefore, 'smarter cities' is a mild utopianism: it promises efficiency rather than paradise on earth. It is a utopian rhetoric tempered by market realism: it is easier to sell technologies and services than an *ad nihilo* urban structure, more convincing to tap on the faith in technology and progress than to promise a brave new city. As Vodoz (2013, 71) notes, the ideal of perfection is transposed from material space to virtual space. In other words, the smarter cities model does not suggest a revolution in urban morphology, such as Howard's garden city model, but a reformist optimization through data, monitoring, interconnectedness and automatic steering mechanisms. In contrast with other utopian models, smarter cities do not require the replacement of existing spaces, but its digital redoubling.

Finally, in the perfect future of classical utopias, historicity is abolished: the arrow of time is bent into a circular repetition. In the bright future promised by IBM's smarter cities, historicity is not abolished because optimization needs to be constantly renewed: novel technologies need to be constantly introduced for that purpose and codes constantly rewritten. If IBM's storytelling rests on a utopian rhetoric it constantly makes sure that the future it promotes is a realistic one.

In sum then, IBM's storytelling rests on two rhetoric pillars. The first is systems thinking which inscribes it in a techno-scientific imagination and provides it with the legitimacy of science. More concretely, it allows the translation of the city into a common language on which the company's technology can act. The second is a utopian story which recurs to an imaginary of progress, therapy and conversion (if not redemption). Each rhetoric pillar brings different elements to the persuasive power of the smarter cities campaign. They are building blocks of this discourse's authority. This discursive strategy is meant to persuade municipalities to think of the company as an OPP for an efficient and sustainable urban development.

Conclusion: the smarter city discourse as a framing device

On the surface, the dominant smart cities' storyline is about efficient and sustainable cities, but underneath it is primarily a strategic tool for gaining a dominant position in a huge market where, as Townsend (2013, 63) puts it, 'Siemens and Cisco aim to be the electrician and the plumber [. . .] [and IBM] their choreographer, superintendent, and oracle rolled into one'. Our paper looked at IBM's storytelling in its smarter city campaign in order to grasp some central specificities of the smart city model of urban development as it is usually presented in the public sphere. This story should not be taken at face value of course. What we have proposed is not a

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description of how smart cities work on the ground but a deconstruction of a communication strategy: what one of our IBM informants calls a market creation strategy.[26] The smarter city discourse is a framing device, as are other discourses on urban development: it makes us consider cities differently to promote new modes of urban management and development. It more specifically develops what Vanolo (2014, 893) calls a 'smartmentality' through which 'citizens are very subtly asked to participate in the construction of smart cities'. This mentality has of course positive aspects: it favors, for instance, efficient solutions to improve urban sustainability in sectors such as energy or transport. However, it also raises a series of critical questions. We briefly address two of them below.

The first is that this discourse promotes an informational and technocratic conception of urban management where data and software seem to suffice and where, as a consequence, knowledge, interpretation and specific thematic expertise appear as superfluous. This is a rather dangerous fiction. It leads us back to an epistemology dominant during the 1950s and 1960s, the heyday of spatial analysis and of the belief in the universal power of quantitative models in a discipline like human geography (Billinge, Gregory, and Martin 1984). We must admit that the plurality of approaches and languages developed in urban studies since the 1970s does not facilitate their fruitful use in urban management and development strategies. Nonetheless, a return to positivist dreamlands would hardly be progress as problems cannot be reduced to data problems but need to be interpreted in the light of longstanding political and scientific debates. Furthermore, we've been there before: municipalities in the 1960s and 1970s have already experienced the deleterious consequences of taking such stories about large-scale simulations being the ultimate planning solution at face value (Townsend 2013, 76–82).

The second and correlated point is that such a discourse promotes a mentality where urban affairs are framed as an apolitical matter. In the smarter cities campaign, causes of urban problems are associated with demographic trends, such as an estimated doubling of world urban population by 2050,[27] climate change and tight municipal budgets. Never with politics. The rhetorical means of the campaign also aspire to political neutrality. Systems thinking is neither progressive, nor conservative: it decomposes a phenomenon into related parts. There are of course left and right-wing utopias, but the horizon of a utopian structure of thinking is apolitical. As Choay (1997, 174) points out, political power in utopias is an 'epiphenomenon'. Similarly, smart technologies can optimize any system, from the surveillance of political opponents to waste management. It can be sold to democratic regimes such as Denmark as well as to much less democratic ones such as Syria. Very much like Le Corbusier saw functionalist urbanism as an apolitical model he was ready to propose to postcolonial India, fascist Rome or Stalinist Russia, smart urban technologies are an omnibus ready to stop wherever customers are to be found.

The apparent political neutrality of the dominant smart city story is reinforced by the production of evaluation criteria and rankings where cities are classified according to their degree of smartness[28] and by supranational funding programs such as the 2012 European Union (EU) program on 'Smart Cities and Communities'.[29] These initiatives introduce a new 'economy of worth' (Boltanski and Thévenot 2006)—a new way of evaluating the worth of people and things—urging cities at the bottom to climb up the smart city ladder. Such rankings and financial incentives fueled by smart talk can of course lead to necessary technological developments, but they might also obfuscate more urgent needs. Becoming a smarter city implies giving priority to investments in technology while technology-poor affordable housing or sewage systems are arguably more urgent in many of the world's cities. Priority-making is of course not an apolitical matter, but the very core of municipal politics. In other words, IBM's storytelling campaign

contributes to subtly introducing a new moral imperative where smartness becomes, like creativity, a new necessary asset of cities. The apparent apoliticism of the campaign naturalizes ubiquitous urban technology as an OPP for municipalities' development.

Recent critical work on smart cities has explored alternatives to this dominant corporate vision of urban futures (Townsend 2013; Hollands 2013; McFarlane et al. 2013). For Hollands (2013, 13), 'the real smart city has to begin to think with its collective social and political brain, rather than through its "technological tools"'. This alternative smart city exists. It is made up of myriads of initiatives where technology is used to empower community networks, to monitor equal access to urban infrastructures or scale up new forms of sustainable living. However, contrary to corporate storytelling, no straightforward narrative about the smart city emerges from these initiatives as they can be driven by very different and politically variegated motives. It is in this context that an alternative storytelling about smart cities is necessary. Storytelling in planning is not only a possible model *of* planning but also *for* planning (Van Hulst 2012) and should not only be used as an instrument of critique but also as an instrument to suggest progressive avenues for urban development (Sandercock 2003, 26). This is not an easy task because it requires generalization from initiatives that respond to local needs and are therefore usually local in scope. It also requires being explicit about normative and political positioning as smartness only makes sense within a system of values and aims. However, this effort in storytelling is necessary to move beyond critique, and beyond a mere contrast between corporate grand schemes and what easily might be perceived as anecdotal small-scale actions.

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Notes

1 In this paper, we alternatively use the terms 'smart cities' and 'smarter cities'. Both refer to the same idea and are often used interchangeably in the literature and online publications. The difference between the two is that 'smart city' is legally unprotected and can thus be used more freely or is interpreted and applied more widely while 'smarter cities', as we explain below, legally belongs to IBM and refers to the company's software and campaigns. We therefore use the term smart city to discuss existing literature and when tracing the origins of the smart city idea, while we use smarter cities when discussing IBM's campaign.

2 A 'model', etymologically, is a figure to be reproduced (Söderström and Paquot 2012, 41). See also developments below on urban models and the utopian planning genre.

3 As exact search parameters we used 'smart! city' allowing a search for all word combinations starting with smart and city (in newspapers only). There were 1952 matches, date of search: 5 September 2012.

4 The Adelaide project failed in 1997 due to a lack of investments leading to the fact that it eventually became an ordinary business park. For analyses of the Malaysian case, see: Bunnell (2002), Lepawsky (2005) and Brooker (2013).

5 http://www.youtube.com/watch?v=i_j4-Fm_Svs

6 http://www.trademarks411.com/marks/79077782-smarter-cities

7 In 2001, Cisco started, together with the developer Gale International, to build the smart city of Songdo in South Korea and in 2010 founded the 'Smart and Connected Communities Institute' and the 'Connected Urban Development Initiative' where the company's research on urban technologies is being conducted. In 2011, Siemens decided to invest on a huge scale in a new Infrastructure and Cities division and its own version of smart urbanism. Microsoft entered the game in 2013 with its City Next initiative.

8 The site analyzed is the US site of the smarter cities campaign which is richest in information (www.ibm.com/smarterplanet/us/en/smarter_cities/overview/index.html and www-03.ibm.com/innovation/us/thesmartercity/index_flash.html). Country-specific websites are slimmed down and translated versions of the US sites.

9 According to the market research company ABI (https://www.abiresearch.com/press/395-billion-will-be-spent-on-smart-city-technologi).

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10 According to the market research company Navigant (www.navigantresearch.com/research/navigant-research-leaderboard-report-smart-city-suppliers).
11 See, for instance, http://www.navigantresearch.com/research/navigant-research-leaderboard-report-smart-city-suppliers
12 In IBM's words: 'What makes a city? The answer, of course, is all three [pillars]' (http://www.ibm.com/smarterplanet/us/en/smarter_cities/overview/index.html).
13 On its interactive site, IBM does not use the hierarchy of main and sub-pillars but uses a list of 11 individual pillars, but there are only minor differences in content (cf. http://www-03.ibm.com/innovation/us/thesmartercity/index_flash.html).
14 The project started in 2010 (http://www-03.ibm.com/software/products/us/en/intelligent-operations-center/). Siemens's *City Cockpit*, first showcased in Singapore in 2009, is another variation of the same idea.
15 Speech given at USC Price, School of Policy Planning and Development in November 2011 (http://www.youtube.com/watch?v=IpFyQOW_ldQ).
16 http://www.forum48.org/portfolio/ginni-rometty/
17 Interestingly however, Cook (the company's above-mentioned systems thinker in chief) refers to Donella H. Meadows, lead author of *The Limits to Growth*, and author of a humanistic/environmentalist plea for systems thinking building on more elaborate complex systems theory (Meadows et al. 1972).
18 http://www.ibm.com/smarterplanet/global/files/us__en_us__cities__city_leaders_wsj.pdf
19 http://ibmtvdemo.edgesuite.net/software/industry/intelligent-oper-center/demo/3137_ControlRoom_Web.html
20 See, for instance: http://www.ibm.com/smarterplanet/us/en/smarter_cities/overview/index.html; http://www.ibm.com/smarterplanet/us/en/healthcare_solutions/ideas/index.html; http://www.ibm.com/smarterplanet/us/en/government/ideas/index.html
21 For Choay (1997) there are two main traditions, the utopian one, that she calls the model, and 'the rule' for which urban planning is based on a set of generative principles and which finds its origin in Leon Battista Alberti's *De re aedificatoria* (1485).
22 http://www-07.ibm.com/innovation/my/exhibit/index.html
23 http://www-07.ibm.com/innovation/my/exhibit/gallery_low.html#queue
24 See, for instance: http://www-03.ibm.com/innovation/us/thesmartercity/communications/chapter3.html#!/0; http://www-03.ibm.com/innovation/us/thesmartercity/traffic/index.html#!/1; http://www-03.ibm.com/innovation/us/thesmartercity/airports/index.html#!/3
25 http://www.ibm.com/smarterplanet/us/en/green_buildings/overview/index.html
26 IBM manager, interview 13 February 2013.
27 See www.ibm.com/smarterplanet/global/files/us__en_us__cities__city_leaders_wsj.pdf
28 For instance: http://www.smart-cities.eu/benchmarking.html
29 On the EU program, see: http://ec.europa.eu/eip/smartcities/

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