

Smart Cities

Governing, modelling and analysing the transition

Edited by
Mark Deakin

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First published 2014
by Routledge
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

Simultaneously published in the USA and Canada
by Routledge
711 Third Avenue, New York, NY 10017

Routledge is an imprint of the Taylor & Francis Group, an informa business

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British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

Library of Congress Cataloguing in Publication Data

Smart cities : governing, modelling, and analysing the transition / [edited by] Mark Deakin.

pages cm

1. City planning. 2. City planning – Technological innovations. 3. Cities and towns – Growth. 4. Sustainable development. I. Deakin, Mark editor of compilation.

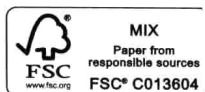
HT166.S5877 2013

307.1'216 – dc23 2013002744

ISBN: 978-0-415-65819-5 (hbk)

ISBN: 978-0-203-07622-4 (ebk)

Typeset in Times New Roman
by Out of House Publishing



Printed and bound in Great Britain by
CPI Group (UK) Ltd, Croydon, CR0 4YY

Smart Cities

Smart city development has emerged as a major issue over the past five years. Since the launch of IBM's Smart Planet and Cisco's Smart Cities and Communities programmes, their potential to deliver on global sustainable development targets has captured the public's attention. However, despite this growing interest in the development of smart cities, little has as yet been published that either sets out the state-of-the-art, or which offers a less than subjective, arm's length and dispassionate account of their potential contribution.

This book brings together cutting-edge research and the findings of technical development projects from leading authorities within the field to capture the transition to smart cities. It explores what is understood about smart cities, paying particular attention to the governance, modelling and analysis of the transition that smart cities seek to represent. In paving the way for such a representation, the book starts to account for the social capital of smart communities and begins the task of modelling their embedded intelligence through an analysis of what the 'embedded intelligence of smart cities' contributes to the sustainability of urban development.

This innovative book offers an interdisciplinary perspective and shall be of interest to researchers, policy analysts and technical experts involved in and responsible for the planning, development and design of smart cities. It will also be of particular value to final year undergraduate and postgraduate students interested in Geography, Architecture and Planning.

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1 Introduction (to smart cities)

Mark Deakin

In a recent article, Hollands (2008) asks the question: ‘Will the real smart city stand up?’ For according to Hollands, cities all too often claim to be smart, but do so without defining what this means, or offering any evidence to support such proclamations. The all too often ‘self-congratulatory’ tone cities strike when making such claims does not seem to sit well with Hollands (2008). For while images of the digital city, intelligent city, high-tech district and neighbourhoods of smart communities abound, they all fail to convey what it means to be smart and why it is important for cities to be defined in such terms.

In Hollands’ (2008) opinion, the validity of any city’s claim to be smart has to be based on something more than their use of information and communication technologies (ICTs). Hollands asks this question because cities all over the world are beginning to do just this and use such technologies as a means of branding themselves smart. Such smart city forerunners as San Diego, San Francisco, Ottawa, Brisbane, Amsterdam, Kyoto and Bangalore are all now setting a trend for others to follow. The other cities keen to follow in their wake and become smart include: Southampton, Manchester, Newcastle, Edinburgh, Edmonton, Vancouver and Montreal. It appears the rush to become a smart city has begun to gather apace and, as a consequence, pressure is now growing for cities to become even smarter.

Taking Hollands’ (2008) paper on the transition from intelligent to smart cities as its point of departure, this book takes the opportunity to reflect upon the anxieties currently surrounding the governance, models and analysis of such developments.

In this aim, Chapter 2 reflects upon some of the anxieties surrounding the transition from intelligent to smart cities drawn attention to by Hollands (2008). In particular, the anxiety that it has more to do with cities meeting the needs of the market than the intelligence that is required for them to be smart. Working on the assumption that any attempt to overcome such an anxiety means shifting attention away from the needs of the market and towards the intelligence which is required for cities to be smart, this chapter begins to set out a less presumptuous, more critically aware and insightful understanding of the transition from intelligent to smart cities. For the

representation of smart cities this chapter advances is founded on the realisation that it is the legacy of work undertaken on the informational basis of communications embedded in the very notion of intelligence, which is critical to understanding what it means for cities to be smart.

What follows goes on to capture the information-rich and highly communicative qualities of the technical, social, wider environmental and cultural intelligence currently surrounding the transition to smart cities. In particular the acute methodological issues they pose and critically insightful role which the networks of innovation and creative partnerships underlying these developments play in the learning, knowledge transfer and capacity-building exercises that service the transition to smart cities. This is what the chapter suggests Hollands' (2008) account of smart cities misses and goes some way to explain why he asks 'the real smart city to please stand up!' For in cutting across the legacy of the transition from the informational, to the intelligent and now smart city, Hollands' (2008) account of this transformation is not as well grounded in the informational and communicative qualities of the embedded intelligence they are built on and stand for.

This, the chapter suggests, is a critical insight of some note, for only in giving such a well-grounded account of the embedded intelligence drawn attention to, is it possible to do what Hollands (2008) asks of the transition. That is, 'under-gird' the social capital, which is not only critical in underpinning the informational and communicative qualities of the embedded intelligence that smart cities stand on, but pivotal in gaining a fuller insight into their wider environmental and cultural significance. In particular, in gaining a fuller insight into the wider environmental and cultural significance their networks of innovation and creative partnerships take on in embedding the intelligence of such an informatics-based and community-led transition to smart cities.

The chapter goes on to suggest this insight is equally significant for the reason it takes Hollands' (2008) thinking full circle. That is to say, by offering an alternative to the very 'top-down' entrepreneurial based business logic which is called for. Something which this chapter in turn realises by turning the top-down entrepreneurial based business logic of existing accounts on their head and grounding the information-rich and highly communicative qualities of such environmental and cultural developments on the community-led logic that is emerging to support the transition. That logic which in real time is aligned with, not against, the cybernetics of the social capital underlying the environmental and cultural significance of smart communities and what their founding networks of innovation and creative partnerships embed as the intelligence of this transition. Those developments in the cybernetics of social capital whose emergent environmental and cultural qualities are currently in the process of being institutionalised in the learning, knowledge transfer and capacity-building exercises which are intelligent in embedding the informatics of this community-led transition to smart cities.

Chapter 3 examines how electronic governance (e-governance) can assist in helping cities make better decisions and become more competitive, as well as

engage with citizens in democratic activities and decision-making processes. This chapter suggests that e-governance may provide a new vehicle for the emerging smart city. It assesses the conceptual landscape for city e-governance, and focuses on how cities can foster collaborative digital environments to enable local competitiveness and prosperity through knowledge networks and partnerships, integrated e-services and e-participation. Drawing from the literature and the results of a comprehensive survey study in 12 European cities, it puts forward a series of propositions on the future of e-city governance in Europe and the implications for strategic policy innovations to foster smart cities.

While Chapters 2 and 3 review the debate on governing the transition to smart cities, Chapters 4, 5, 6 and 7 examine the transition from intelligent cities to smart cities. In this respect, Chapter 4 develops the notion of an intelligent city as the provider of electronically enhanced services. It identifies how this growing interest in the notion of intelligent cities has led universities to explore the possibilities of using communities of practice (CoPs) as a means of drawing upon the industrial knowledge base such organisations offer to develop integrated models of e-government (eGov) services. It reports on the attempts made by a consortium of leading European cities (led by Manchester) to use the intelligence that CoPs generate as the environmental and cultural means by which to work smarter in developing integrated models of eGov service provision.

Made up of researchers, computer engineers, informational managers and public sector service providers, the IntelCities CoP has worked to develop an integrated model of eGov services and support the actions taken by cities to host them on platforms with sufficient intelligence to meet the e-learning needs, knowledge transfer requirements and capacity building commitments of their socially inclusive and participatory urban regeneration programmes.

As an exercise in CoP development, this organisation is particularly successful for the reason the intelligence it has sought to embed in cities and integrate within their platforms of eGov services is inter-organisational, networked, virtual and managed as part of a highly distributed web-based learning environment. Made up of both open source software groups, experts and lay people, the CoP is culturally unique in the sense its network provides an example of a virtual organisation set up to manage the learning needs and knowledge requirements of a technological platform. As such it:

- offers the means to meet the learning needs, knowledge transfer requirements and capacity building commitments of the organisation;
- co-designs them as a set of services that are socially inclusive and participatory and which allow users to learn about the availability of such services, how to access them and the opportunities they offer everyone to become engaged with and get involved in meeting the knowledge transfer requirements and capacity building commitments of their urban regeneration programmes;
- allows for the monitoring and evaluation of such actions.

As the chapter establishes, it is the e-learning platform that makes it possible for the online services under development to be integrated with the knowledge transfer and capacity-building technologies which are needed for this CoP to work as a shared enterprise. That is as an enterprise which allows such organisations to collaborate and build consensus on the competencies, skills and training that are needed to service the required online developments.

Together, the networks, innovation and creativity of the partnerships responsible for organising the development of these technologies, skills and training exercises make it possible to engage citizens and show how the active participation of communities is not only intelligent, but smart. This turns attention to what is termed the eTopia demonstrator, developed to illustrate the functionality of the semantically rich eGov services in question. This term is borrowed from the account of intelligent cities as e-topias and as organisations that are SMART, lean, mean, green software systems, driven by networked communities which are virtual. Organisational characteristics that are themselves built on the learning needs, knowledge management requirements and digital libraries of the electronically enhanced services that are made available on the eCity platform as a pool of integrated eGov services.

Chapter 5 goes on to examine the spatial intelligence of cities, the use of digital technologies and the institutional settings of those innovation systems seen as smart enough to radically transform cities. The starting point for this chapter are two related observations about the increased use of terms like intelligent and smart in contemporary urban planning and development. The first concerns the somewhat over-simplistic way cities tend to use the terms 'intelligent' or 'smart'. The second relates to the diverse range of strategies cities are currently assembling in laying claim to such a status. The observation here being that such a diverse range of strategies tends to say more about the ambiguity of the relationship digital technologies have to the developments under examination, than what it means for them to be either intelligent or smart. This is because for Komninos, the strategies in question are seen as being insufficiently developed for their digital technologies to embed the intelligence cities need to be smart and therefore require to claim such a status.

As a counterpoise to these observations, this chapter lays down some of the 'fundamentals of spatial intelligence', whose strategies and applications can be seen as being smart. It argues that despite the great diversity of strategies and applications, the logistics of spatial intelligence teach us that smart cities rest on a few knowledge-based trajectories. In particular, those knowledge-based trajectories that are embedded in the transitions of Bletchley Park, Hong Kong and Amsterdam and which the paper suggests are still only partially understood.

Taking Komninos' idea that cities are still stuck in the digital, rather than embedded in the intelligence of what is smart, as the 'third' observation on the transition, Chapter 6 examines the thesis on the 'embedded intelligence of smart cities'. For, as the chapter points out, while Mitchell (1995) sets out

a vision of urban life literally done to bits, left fragmented and in danger of coming unstuck, 'e-topia' offers a counter-point to this and image of the city no longer left in bits, but a place 'where it all comes together'.

Dwelling on the reconciliatory nature of these symbolic statements, this chapter suggests that while this thesis on the 'coming together' of the virtual and physical and dissolution of the boundaries between 'cyber and meat space' is compelling, there are a number of concerns surrounding the technical, social and environmental status of the embedded intelligence that is currently available for urban planners and developers to make cities smart. While problematic in itself, the chapter also suggests that if the difficulties experienced over the transition from intelligent to smart cities were only methodological they may perhaps be manageable, but the problem is they run deeper than this and relate to more substantive issues which surround the cultural trajectory of the thesis.

This, the chapter suggests, is a critical insight of social and environmental significance because if the cultural trajectory of the thesis is not in the direction of either the embedded intelligence of smart cities, or the ICTs of what is referred to as 'digitally inclusive regeneration platforms', then the question arises as to whether the whole notion of e-topia can be seen as a progressive force for change, or merely a way for the embedded intelligence of smart cities to reproduce the status quo.

This unfortunate scenario is what Graham and Marvin (2001) refer to not as e-topia but as splintering urbanism, because, under this thesis, the citizenship underlying the informatics of these communities is no longer able to carry the sheer weight of the material that such a cybernetic-based networking of intelligence is supposed to support. This, the chapter suggests, is important because such a representation of the transition offers what can only be referred to as the antithesis to e-topia. An antithesis that, it might well be added, goes some length to search out, uncover and expose the other side of this cybernetic-based intelligence and reveal what currently lies hidden in the debate that is currently taking place about the transition to smart cities.

From this perspective, the chapter suggests that it is evident that the problems with e-topia are as much substantive as methodological, the former holding the key to the latter. In substantive terms the chapter offers another twist on the question of what the transition from intelligent to smart cities means and in doing so goes very much against the grain, arguing that our current understanding of embedded intelligence, smart cities and the ICTs of digitally inclusive regeneration puts us on the verge of a new environmental determinism. An environmental determinism that this time around is cybernetic, in that it is founded on the embedded intelligence of knowledge-based agents underpinning the networking of smart cities and the digitally inclusive regeneration platforms they support.

To avoid repeating this mistake (yet) again, attention is drawn to the spaces that their radical democratic, i.e. egalitarian and ecologically integral, account of the transition opens up for a much more emancipatory view of the

intelligence embedded in those knowledge-based agents understood as being smart enough to meet these requirements. Those knowledge-based agents, it should perhaps be added, understood as being smart enough to meet these requirements by way of and through their exploitation of the social capital that underlies the very communities that give rise to the environmental and cultural norms, rules and values of such developments. In particular, the social capital that underlies the embedded intelligence of smart cities and that their communities of knowledge-based agents (architects, planners, engineers and surveyors) in turn support by hosting them as environmental and cultural services found on digitally inclusive regeneration platforms.

This chapter suggests that in ignoring these warnings and being unable to learn the lessons that such a critical reworking of the thesis offers, the strategy previously adopted must be seen as suspect. Not only because the vision and scenarios it advances have a tendency to side-step the social significance of digital technologies, but for the reason that in doing so, they end up replacing the agonies of equality and ecological integrity with little more than the ‘gnostics’ of ‘new age’ environmental and cultural storylines centred around the quality of life. The strategy advocated for adoption by this chapter is not grounded in such rhetoric.

The vision of e-topia this chapter builds instead rests on the messages others advance by turning the tables and agreeing that, while words offer the possibility of ‘bringing what it all means back together’, actually turning things around lies not so much in the words as with the semantics of the syntax and vocabulary governing the digitally inclusive nature of the regenerative storylines emerging from this discourse and, perhaps even more importantly, the degree to which they overcome the divided antagonisms of the excluded. This way, the chapter suggests, it becomes possible for the multiplied memory and infinite mind of the ‘cyborg civics’ and environments of their ‘tribe-like culture’, not to so much bemoan the ‘nomadicity of wireless bi-peds’, but actively celebrate the creativity of the virtual communities emerging from the digital-inclusive nature of such regenerative storylines.

In particular, it is added, celebrate the opportunity that this in turn creates for virtual communities to use the collective memory, wikis and blogs of their electronically enhanced services as a means for such platforms to bridge social divisions. Bridge them – it is important to note – by drawing upon the political subjectivities of cyborg-civics, their environment, tribe-like culture and nomadicity, as wireless bi-peds with the embedded intelligence smart enough for the citizens of this community to span them. In particular, span them with bridges that are not merely symbolic, but real in the sense that the semantic web of this knowledge base serves to be the agent of something more than a prop. Something more than a prop and stronger in the sense which the embedding of such intelligence allows the wikis and blogs of the web-based services that supports all of this to begin doing the job asked of them. That is the job of building a stage which is large enough for the analytic, synthetic and symbolic components of the transition to be smart in

playing out the possibilities there are for urban planning to be both equitable and ecologically integral.

Chapter 7 suggests that over the course of the past decade, the smart cities agenda is an issue that has gained real momentum in the Europe. The significance of this being reinforced further by other international organisations, such as the OECD, which suggests that smart cities offer society the prospect of not only being environmentally sustainable, but sufficiently competitive and cohesive for their emerging culture to meet their pressing quality of life agenda. As the chapter points out, as a result of such high-ranking institutional support, many cities have now adopted this socially cohesive, environmentally sound and economically competitive reading of what it means to be smart as a way to profile themselves as forward-looking, prosperous and well-endowed cultures. For instance:

- the Amsterdam smart city initiative emphasises the importance of collaboration between the citizens, government and businesses to develop smart projects that will ‘change the world’ by saving energy;
- Southampton City Council uses smart cards to stress the importance of integrated e-services;
- the City of Edinburgh Council has formed a smart city vision around an action plan for government transformation;
- the Malta smart city strategy promotes a business park to achieve more economic growth;
- IBM, Siemens and ORACLE have formed their visions of the smart planet;
- a number of EU research projects have also to deal with various issues of the smart city. A recently concluded pan-European research project, IntelCities, for example, concluded that governance, as a process and outcome of joint decision-making, has a leading role to play in building the smart city, and that cities should develop collaborative digital environments to boost local competitiveness and prosperity by using knowledge networks and partnerships, integrated e-services and governance.¹
- the INTERREG project Smart Cities is using an innovation network between university, industrial and governmental partners to develop the triple helix of e-services in the North Sea Region by cultivating a novel customisation process.

It is this view of smart-er cities as people-based, human, socially inclusive, environmentally sensitive and culturally aware that the chapter advocates. Adopting this ‘digitally inclusive’ vision of cities, the chapter reflects upon the current trends and understanding of what it means for urban administrations, policy makers and businesses in Europe to be smart. In developing this vision, the chapter pays particular attention to the role of the smart city as a nexus for open innovation and how the strategic significance of this development