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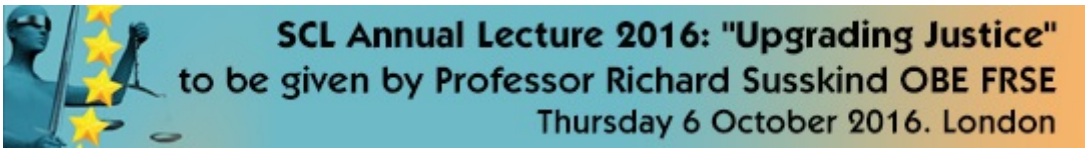

The Promise and Perils of Smart Cities

In the first of a series of articles on the Smart Cities theme, Rob Kitchin introduces some of the key concepts and issues. This article will be featured in the June/July issue of Computers & Law, which will focus on Smart Cities from a range of perspectives, with a view to giving technology lawyers a wider understanding of one of the most important developments of this decade and the decades to come.

As with many technology-related buzz phrases, 'smart city' lacks a well delineated and agreed upon definition. A review of the academic, stakeholder and corporate literature, however, reveals that a smart city is comprehended in three broad ways.

First, there is a constituency that understands a smart city to be principally about the changing nature of urban regulation and governance through instrumentation and data-driven systems. In this vision, the city is increasingly composed of what Adam Greenfield (2006) calls 'everyware' - networked ICT and digitally enabled devices directly embedded into the fabric of urban cities (eg security cameras, software enabled elevators, automatic toll booths, reactive lighting, sensor networks, etc) – that produce continuous streams of data that dynamically feed into management systems and control rooms. Through such technologies cities become knowable and controllable in new, dynamic, reactive ways (Kitchin 2014). Further, the data generated can be used to improve models and simulations for future development.

Second, there are some who conceive of the smart city as an initiative principally concerned with improving urban policy, development and governance by using advances in ICT to reconfigure human capital, creativity, innovation, education, sustainability, and management (Caragliu *et al*., 2009). Here, it is envisioned that the strategic use of ICT produces smarter citizens, workers and public servants that in turn can enact smarter policy and programmes, produce better products, and foster indigenous entrepreneurship and attract inward investment.

These first two visions are largely underpinned by a neoliberal ethos of market-led and technocratic solutions to city governance and development. In contrast, a third conception of a smart city is forwarded by some either as a counter-weight to the first two or as an alternative. Here, ICT is used to promote a citizen-centric model of development that fosters social innovation and social justice, civic engagement and hactivism, and transparent and accountable governance (Townsend 2013). A smart city in this vision is one that promotes a smart society that provides equal opportunities and reduces inequalities.

For many stakeholders, these three understandings are not mutually exclusive, with smart city strategies seeking to blend elements of them in varying proportions and emphases. Indeed, it is important to recognize that there are varieties of smart cities with their underlying drivers varying between places. For example, in Europe and the USA, the development of smart cities is principally concerned with improving efficiency, creating resilience and sustainability, strengthening security and control, and fostering economic development. In Africa and India, smart city initiatives are promoted as a way of enabling modernisation and national development, responding to population growth/migration, and managing economic and urban transitions.

Promise of smart cities

The promise of the smart city is that digital, networked technology can be deployed to reconfigure how aspects of daily life are performed and to tackle pressing urban issues, producing:

· a smart economy by fostering entrepreneurship, innovation, productivity, and competiveness;

· smart government by enabling new forms of e-government, new modes of operational governance, improved models and simulations to guide future development, evidence-informed decision making, better service delivery, and making government more transparent, participatory and accountable;

· smart mobility by creating intelligent transport systems and efficient, inter-operable multi-modal public transport;

· smart environments by promoting sustainability and resilience and the development of green energy;

· smart living by improving quality of life, increasing safety and security, and reducing risk; and

· smart people by creating a more informed citizenry and fostering creativity, inclusivity, empowerment and participation (Cohen 2012; Hollands 2008; Townsend 2013).

In short, the smart city promises to solve a fundamental conundrum of cities – how to reduce costs and create economic growth and resilience at the same time as producing sustainability and improving services, participation and quality of life – and to do so in commonsensical, pragmatic, neutral and apolitical ways. Not unsurprisingly then, transitioning to smartness has become the ambition for many cities around the world, seduced by the promise that by using networked digital technologies they can have their cake and eat it too.

Perils of smart cities

If the smart city vision sounds too good to be true, then its critics contend that is because it is. Some of the rhetoric they suggest consists of empty promises and some may partially deliver on its promise but with a whole set of pernicious political, social and legal side effects. The smart city vision has been critiqued in seven distinct ways.

First, the smart city approach as it is expressed within the smart city discourse, especially the marketing material of corporations selling city solutions, is ahistorical, aspatial and homogenizing in its orientation and intent (Greenfield 2013). Generally, smart city solutions take a 'one size fits all' approach, treating cities as generic markets and solutions as being straightforwardly scalable and movable. In so doing, they fail to recognize three things that necessitate solutions are contingent and relational to each locale: context such as history, culture and local sense of place; power and its manifestation through politics, governance, and competing interests; and embedded technological and infrastructural path dependencies.

Second, the technology, data and algorithms underpinning smart city initiatives are portrayed as being objective and non-ideological, grounded in either science or commonsense. This presents an image of smart cities as being neutral and politically benign. However, technical systems do not exist independently of the ideas, techniques, technical components, people and contexts that conceive and produce them (Kitchin et al., 2015). Smart technologies are thoroughly social and political and reflect the conscious and unconscious aims and biases of their designers.

Third, the emphasis on creating technical rather than political/social solutions overtly promotes technocratic forms of governance and what Evgeny Morozov (2013) terms 'solutionism': the belief that complex issues can be disassembled into neatly defined technical problems that can be adequately solved through technology. In other words, all that is required to understand, manage and fix the issues a city faces - in rational, logical and impartial ways - is suitable technical kit, sufficient data and clever algorithms. Such thinking is underpinned by a strong 'instrumental rationality' that privileges certain ways of thinking and doing over other forms of knowledge and action (Mattern 2014). As such, it works to marginalize other forms modes of governance and promotes a top-down rather than citizen-centric approach.

Fourth, smart city technologies are a vehicle to push an ideological agenda designed to further hollow out the state and privatise city service provision and elements of policy-making and governance (Hollands 2008). The smart city agenda, it is argued, is overly driven by corporate interests who are using it to capture government functions as new market opportunities. Beyond leading to corporatisation of governance, it also potentially creates technological lock-ins to certain proprietary technologies or corporate path dependencies that beholden cities to particular technological platforms and vendors over a long period of time, creating monopoly positions (Hill 2013).

Fifth, instrumenting cities with everyware potentially creates buggy, brittle, and hackable urban systems (Kitchin and Dodge 2011; Townsend 2013). In effect, smart cities initiatives takes two open, highly complex and contingent systems - cities and digital systems - and binds them together to create environments which are inherently prone to viruses, glitches, crashes, and security hacks. As systems become ever more complicated, interconnected and dependent on software, producing stable, robust and secure devices and infrastructures will become more of a challenge.

Sixth, smart city initiatives are far from being emancipatory and have profound social, political, ethical effects. Smart city technologies generate big data, processed by black-boxed algorithms, and even if they are not principally concerned with exerting new forms of control and regulation, the data can be parsed, reworked and commodified to produce extended forms of dataveillance (Kitchin 2014). As such, networked urbanism is ushering in a new era of pervasive dataveillance that erodes privacy in its diverse forms (eg surveillance, interrogation, identification, secondary use, insecurity, disclosure, exposure, appropriation, blackmail, distortion, intrusion, interference: Solove 2006). Moreover, it enables practices of algorithmic social sorting (whether people get a loan, a tenancy, a job, etc), dynamic pricing (whereby different people pay varying prices depending on their perceived customer value) and anticipatory governance using predictive profiling (wherein data precedes how a person is policed and governed) (Kitchin and Dodge 2011).

And lastly, the project of creating smart cities reinforces existing power geometries and social and spatial inequalities rather than eroding or reconfiguring them (Datta 2015). Smart cities are the vision of certain vested interests and they serve the interests of those constituencies, both through enacting their sensibilities and politics, and by advancing their economic concerns and material desires. Smart city technologies serve the interests of the wealthy and control and regulate populations, particularly those in the margins and informal economies, and actively marginalize and dispossess some citizens through, for example, land dispossession for development and differential investment across social classes.

Conclusion

The smart city is not simply the vision of a future city; networked urbanism already exists in practice in a multitude of forms in cities around the world. As such, we are already living with their promise and their perils as smart city technologies and initiatives are deployed. How they are unfolding in different places, however, varies in line with local

politics and social and economic contexts. In all cases, there is little doubt amongst many key stakeholders that networked urbanism holds much promise for tackling urban issues, improving city services and operational governance, fostering economic development and increasing citizen participation. However, the realities of implementation are messier and more complex than the marketing hype of corporations or city managers portrays and there are a number of social, political, ethical and legal concerns with respect to the kind of society smart city initiatives seek to create. As such, whilst networked urbanism has benefits, it also poses challenges and risks that are often little explored or legislated for ahead of implementation. Indeed, the pace of development and rollout of smart city technologies is proceeding well ahead of wider reflection, critique and regulation. Consequently, there is an urgent need to interrogate the vision and implementation of smart cities in different locales, and to re-imagine their ethos and ethics to ensure we favour the positives over the negatives.

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