

Big Data, Government & Wicked Problems: Shifting Knowledge Politics in Smart Cities

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Abstract

As Big Data Analytics is introduced into government, previously stable knowledge orders and regimes will change, entailing power shifts, especially for 'wicked problems' where defining the problem also means defining the solution. I want to examine this effect of Big Data on knowledge politics in global metropolitan Smart Cities, where Urban Analytics are most advanced and wicked problems assumedly most prevalent.

Problem domain & relevance

If you believe the current hype (Gartner 2013), Big Data, the next generation in data analytics, is set out to revolutionize the way we work with information. “Big Data: A Revolution That Will Transform How We Live, Work, and Think” (Mayer-Schönberger & Cukier 2013) is just one of many book titles spelling out this promise. Since government is a knowledge-based business, the ‘revolutionary’ effect of Big Data in the public sector could be substantial. With regard to ‘wicked problems’, the promise of Big Data analytics is to cut through complexity and unravel their wickedness (Satell 2013). Further, Big Data promises to reduce uncertainty by providing foresight, e.g. through predictive analytics.

As a novel means of producing meaningful knowledge for policy decisions, Big Data stands to change existing knowledge orders (Jung et al. 2014) and knowledge regimes (Pestre 2003), i.e. institutions that determine which knowledge is considered legitimate and robust in policy discussions. As knowledge and power are mutually dependent (Foucault 1980), changes in knowledge regimes also result in power shifts among the actors of a policy issue. This is well illustrated by the special case of ‘wicked problems’ where the problem definition is highly ambiguous and even arbitrary, and thus defining the problem means pre-defining the solution (Rittel & Webber 1973). Whoever is able to establish his definition of the policy problem as the dominant definition gains ‘problem ownership’ (Rocheffort & Cobb 1994) and can strongly determine the course of action to tackle the problem.

Possible effects of these shifts in knowledge regimes include the monopolization of ‘epistemic authority’ (Straßheim 2013) through Big Data Analytics by central government, the depoliticization of policy issues analyzed by Big Data (Rüb & Straßheim 2012), the marginalization of local perspectives (Scott 1998), and the devaluation of expertise and experience in public administration in comparison to analytics results, just to name a few.

As Big Data Analytics forcefully enters the sphere of government, its effects for knowledge politics could be highly consequential, even if more obvious matters of privacy and surveillance are currently more hotly debated.

Related work

Research on the effects of Big Data in the public sector is scarce. The existing literature usually offers prognoses rather than findings. Here, two major streams can be identified: The ‘incrementalist’ stream portrays Big Data as an improved tool for monitoring and evaluation but assumes that the political-administrative system will remain unchanged. In contrast, the ‘holistic’ stream speculates how Big Data may change structures and processes of the political-administrative system.

The 'incrementalist' view often focuses on individual aspects of Big Data. For example, the McKinsey Global Institute and the Deloitte Analytics Institute view Big Data mostly as a business analytics tool for more efficient resource allocation (Brown et al. 2011; Deloitte 2011). The Aspen Institute focusses on the aspect of real-time monitoring („nowcasting“) and consequently portrays Big Data as a way to provide more up-to-date data for decision-making (Bollier 2010). A study by the Australian Government acknowledges all aspects of Big Data, but does not derive any implications for the structure and processes of public policy from these (Australian Government Information Management Office 2013). Common to the 'incrementalist' stream is to recognize how Big Data can improve the input to the policy process, but to treat the political-administrative system as a black box which remains unaltered.

In contrast, the 'holistic' stream stresses possible changes in the structure and processes of political-administrative system due to Big Data. Policy papers by the London-based think tank Policy Exchange, the United Nations' Global Pulse program, and the World Economic Forum propose fundamental changes to the way policymakers and public managers conduct business (Yiu 2012; UN Global Pulse 2012; World Economic Forum 2012). Central to their argument is the idea of 'agile public policy', which replaces the classic policy sequence of 'planning – implementation – evaluation' with a more responsive, iterative and data-driven process (Parcell & Holden 2013). Borrowing terminology from software development (Beck et al. 2001), this is likened to the 'waterfall model' versus 'agile development'. While these are mere thought experiments, it is striking they are neither discussed in the light of 'wicked problems' nor that the proposed shift from deliberative to more managerial policy processes is problematized (Bogumil 1997).

Theoretical framework

My theoretical perspective is framed by the knowledge politics approach (Nullmeier 2013; Stehr 2003a), and therefore rooted both in the sociology of knowledge and related strands of research in political science. Based on the Foucauldian idea of a power/knowledge nexus, the research program of knowledge politics is interested in the use of knowledge in political contexts, the institutions regulating this usage and the transformation processes of these institutions (Stehr 2003b). In concrete political settings, these institutions regulating what is considered 'legitimate' knowledge establish themselves as knowledge orders and more locally, e.g. concerning specific policy fields, as knowledge regimes. Thus, knowledge regimes regulate whose perspectives matter and whose voices are heard. As new modes and places of knowledge production emerge, e.g. Big Data Analytics, changes in existing knowledge regimes are inevitable, thus entailing shifts in power and access.

While the paradigm of rationalist, evidence-based policymaking was already criticized by Rittel and Webber in their seminal paper on 'wicked problems' (Rittel & Webber 1973), the literature on post-positivist policy analysis and the argumentative turn in policy analysis further highlighted and examined the preference for centralized, assumedly rational policymaking (Fischer & Forester 1993). While successful in reducing uncertainty and providing additional legitimacy for decision makers, traditional evidence-based policy analysis privileges certain types of knowledge and thus tightly controls access to the policy arena.

A third theoretical foundation is found in the sociology of statistics (Camargo 2009) which examines the use and effects of statistics as political technologies. Further, this research field deals with the inherent argumentative power lent by quantitative evidence (Desrosières & Naish 2010; Porter 1996).

The research questions and methodological approach

My overarching research interest are the knowledge politics, i.e. the effects on knowledge orders and regimes, of Big Data Analytics in the public sector. Thus, relevant questions read: How do knowledge regimes change with the introduction of Big Data Analytics in government? What are factors moderating the effect of Big Data on knowledge regimes? How do different knowledge regimes react to the introduction of Big Data? What are the resulting power shifts of the knowledge politics of Big Data?

Methodologically, I will rely on a comparative case study design with different Smart Cities as cases and possibly different policy issues as sub-cases. Knowledge politics are best examined through the sociology of knowledge approach to discourse analysis (Keller 2011), which I will apply both to media and publications to examine public policy discourses as well as interviews with politicians and civil servants to analyze the discourse within the government.

Empirical setting

I chose global Smart Cities as case studies because they are a) most advanced in the implementation of Big Data and Urban Analytics and b) wicked problems are most prevalent in metropolitan areas with a high density of different interest groups. Current case candidates are:

- 1) London, which is quite advanced in the use of Urban Analytics and, as the home country of evidence-based policymaking, offers a potentially interesting knowledge order.
- 2) Singapore, being the possibly most advanced Smart City in terms of Urban Analytics in the world. With an essentially technocratic government, it is also most interesting in terms of knowledge regimes and depoliticization dynamics.

I am currently in the process of identifying one to two additional Smart Cities, e.g. in North America and preferably a continental European one.

Discussion of intellectual and practical challenges

While there is still a lot of work to be done in terms of theory and literature review, the true challenge lies in the empirics. Everybody is talking about Big Data, but it is very hard to find out who is actually practicing it. Further, most of the applications I found so far in the public sector are not sufficiently 'political' enough for the scope of my dissertation. Thus, 'empirical exploration' and the possible danger of the practice of Big Data in the public sector not being advanced enough to test my hypotheses are my main concerns.

The next steps or future direction of the research

Achieving an overview and understanding of the state of Big Data Analytics in Smart Cities around the world is the top priority at the moment. Further, I am working on an analysis of the global discourse on Big Data in government, especially in terms of promises and expectations associated with it. The goal of this analysis is to deconstruct the black box of Big Data in government to render it digestible for further analysis in my dissertation.

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