Notes from the Frontier of the Sensor City

As you walk out of Lime Street Station in Liverpool, you are immediately reminded of the city’s mercantile past with its Grade I and II listed buildings now juxtaposed with new urban developments. If you walk up Copperas Hill, you will notice at the junction of Russell Street a building that is more in keeping with modern urban architecture and design than some of the late Georgian buildings and Victorian terrace houses . One feature that will strike passers-by is the building’s unusual looking exterior of circuit boards. You are looking at a £15m technology hub known as “The Sensor City”.[[1]](#footnote-1) The Sensor City, which is the moniker of the joint venture project between the University of Liverpool and Liverpool John Moores University, is set to provide the gateway to a smart city comprising a consortium made up of public sector health suppliers, the NHS, university researchers, local SMEs and a leading UK 5G technology vendor. The ambitious vision of the future underlines a not dissimilar resurgence in national and international interest in creating dynamic urban spaces by leveraging the opportunities presented by ubiquitous computing, cheap and inexpensive cloud storage and sensors. Private and public sector interest in utilising data driven management to deliver services and promote civic engagement is a common feature of policy developments in Liverpool and other major cities in the UK. There is no doubt that as we see more urban spaces being transformed by technological infrastructures profound questions about the vision and the instrumental goals pursued by data driven processes will become a major focus of “local” policymaking. The four articles chosen for the first of the two-part Special Issue paves the way for an assessment of some of the opportunities and challenges facing urban infrastructures layered with software analytics, sensors and data driven processes. Specifically, the four articles emphasise two aspects of the transformation being ushered in by emerging technologies: one is structural and the other the evolution of norms governing mediated urban spaces. Structurally, urban technological infrastructures introduce new processes for participation, decision making and delivery of services. Infrastructures also raise questions about norms relating to transparency, accountability and legitimacy, central to embedding democratic values in civic spaces.

In *Contesting the decision: living in (and living with) the smart city* Martin Jewell maps the landscape which has been the focal point of legal scholarship. The transition from analogue to mediated space he suggests is not a panacea. He investigates the significance of unresolved conflicts and tensions and argues that mediated infrastructures merely shift the opportunities and contradictions to a new context framed by algorithmic and data driven processes. His thesis is compelling: a ‘place-sensitive’ approach is necessary to ensure that conceptual debates are grounded and confront some of the challenges faced by people. His concerns are consistent with questions raised by the socio-technical imaginaries of urban spaces being constructed by the grammar of algorithmic processes. The ‘smart’ urban space, he argues, must not create barriers or hurdles in contesting machine decision-making provided for in Article 22(3) of the General Data Protection Regulation 2016.

The call for caution is not merely a response to the structural transformation of urban spaces but a desire to ensure that democratic commitments are preserved and respected. The multi-authored article, *Right engineering? The redesign of privacy and personal data protection* best illustrates how the pursuit of this goal is to be approached. van Dijk, Tanas, Rommetveit & Raab acknowledge that even though urban smart spaces are not being constructed from ground zero physical environments, any regulatory toolkit must embrace what they describe as a techno-epistemic network. The authors use the General Data Protection Regulation 2016 with its emphasis on the principle of accountability as a focal point of analysis. ‘Data Protection by Design’ the authors argue enables safeguards to citizens fundamental rights and freedoms to be protected and promoted. The techno-epistemic network described in the article is founded on the findings of an ‘extended peer consultation’ with representatives of the emerging network: policy-makers, regulators, entrepreneurs and ICT developers, but also with jurists and publics that seem instead to remain outside its scope. The empirical foundations and the insights generated should serve as a litmus test for the development of standard setting initiatives which can, crucially, be scaled up through engineering and design solutions across multiple platform infrastructures and services. ‘Privacy by network’, they conclude, can be operationalised in a way that balances responsible innovation with privacy values. There is a broader aspect that should not be overlooked. The insights generated by the findings are important not only in terms of identifying structural and normative tensions and limits within design-based approaches but offer a deeper explanation of the lessons to be learnt, so that opportunities for protecting fundamental rights and freedoms are not missed.

Mediated spaces raise important questions about civic engagement, participation and the values that define the pursuit of public interest goals. Some of these questions are the focus of Anna Berti Suman’s article, *The smart transition: an opportunity for a sensor-based public-health risk governance?* Suman’s article underscores the significance of the structural and normative shift transition from physical to ‘smart’ spaces in urban contexts. Drawing on empirical work on public-health risks, the analysis draws attention to an important challenge that must be grasped. ‘Top-down’ models of governance that characterise public-health risk management, Suman observes, may seem not to harbour any democratic deficit until we recall that the public sphere in mediated spaces also reduce opportunities and scope for engagement, discourse and reflection. The central question addressed in this article is important: How could the potential of a city’s network of sensors and of data infrastructures contribute to smartly realizing healthier cities, free from environmental risk? Top-down governance, Suman asserts, undermines the public sphere for deliberation. Suman argues that what is needed to reduce the democratic deficit is a hybrid conception of the public sphere. A taxonomy is provided as a basis for promoting citizen sensing practices.

The disruptive feature of smart urban infrastructures and what this might imply for the ‘living environment’ and its inhabitants is a theme explored by Dagmar Schiek & Andrea Gideon. Like Suman, *Outsmarting the gig-economy through collective bargaining – EU competition law as a barrier to smart cities?*is alert to the dominant imperatives driving the narrative for change and the contested nature of proposed solutions seen as appropriate to the transformation taking place in urban environments and activities. The contribution can be viewed as a sobering reminder that the urbanisation of spaces and activities cannot be reduced to a mere question of economics or just another choice architecture. The article forcefully brings the points home by drawing attention to a very human activity encountered in cities: individuals delivering meals to offices in cities using mobile forms of transportation. Platform infrastructures operationalise the ‘gig-economy’ and as a consequence transform human labour. However, this is transformation is not a simple reiteration of Schumpeter’s vision of capitalism where the invisible hand approximates choices and values. Schiek and Gideon unravel the problems with an uncritical acceptance of the casualty of labour as nothing more than a collateral outcome of innovation, choice and preferences. As the authors rightly claim, the ‘gig-economy’, though arguably contributing to ‘smart cities’, may not always constitute the smartest solution for those serving within it. The article not only dismantles Silicon Valley’s appropriation of ‘move fast and break things’ but also provides some powerful arguments on why the perception that collective industrial action is far from structurally impossible for workers in the ‘gig-economy’ cannot be taken at face value: collective organisation, they observe may seem the smartest solution for upgrading the gig-economy for its workers.

The four articles not only take care to avoid claims to ‘solutionism’ but they pave the way towards enhancing our understanding of how and why the mediation of urban spaces for living matters. The Sensor City project undoubtedly brings with it promises of change. As sensor technologies and data driven management become mainstream so too is there a need to acknowledge that not every aspect of the complexity of life can be computed.

1. Sensor City is supported through the UK Government’s Department of Business, Innovation and Skills (now Business, Energy and Industrial Strategy, BEIS) with a £5 million University Enterprise Zone status capital investment award in 2014. http://www.sensorcity.co.uk/ [↑](#footnote-ref-1)