BUILDINGS & CITIES

Data politics in the built environment

SPECIAL COLLECTION: DATA POLITICS IN THE BUILT ENVIRONMENT

EDITORIAL

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HIGHLIGHTS

Buildings and cities are increasingly being reconfigured and re-imagined by flows of data. Smart homes and cities, digitally networked infrastructure services, shared mobility programmes and autonomous vehicles, surveillance and security systems, and urban control centres are a few of the many examples of how data are emerging as an influential driver of urban development processes. The aim of this special issue is to enhance our collective understanding of the practices, politics and power implications of data-driven buildings and cities. How are data generated, metabolised and gathered in the built environment? Who designs and governs these data flows, and to what end? Who and what are enrolled in the datafication of buildings and cities? What forms and types of data are collected, and what is ignored in data flows at and across different scales? What are the broader implications for social justice and equity? This editorial overviews the main issues of data politics for buildings and cities, summarises the four articles that comprise this special issue, and concludes with recommendations for policy, design and future research. While the contributors identify multiple negative aspects of datafication, they also suggest pathways to inform more progressive and emancipatory futures.

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1. INTRODUCTION

Buildings and cities are increasingly being reconfigured and reimagined by flows of data (Barns 2019; Hodson *et al.* 2020; Kitchin *et al.* 2017). Smart homes and cities, digitally networked infrastructure services, shared mobility programmes and autonomous vehicles, surveillance and security systems, and urban control centres are just a few of the many examples of how data cut across multiple scales to reconfigure buildings, neighbourhoods, cities and regions in fundamental ways (Degen & Rose 2022; Luque-Ayala & Marvin 2020; Marvin *et al.* 2015). The rapid and comprehensive datafication of buildings and cities is intended to produce a seamless built environment that connects providers and users, facilitates information provision and financial transactions, and informs and improves decision-making processes (Hodson *et al.* 2020).

However, there are growing concerns that the benefits of a datafied built environment are uneven and result in detrimental impacts to some individuals and groups at the expense of others (Bigo *et al.* 2019; Graham & Dittus 2022, Mackinnon *et al.* 2023). There is a need to interrogate how data are generated, metabolised and gathered by whom and for what ends. Equally, there is a need to understand who is enrolled in these datafication processes (both willingly and unwillingly) and how it impacts their lives. As Bigo *et al.* (2019: 4) note:

> data politics is concerned with not only political struggles over data production and its deployments, but how data is generative of new forms of power relations and politics at different and interconnected scales.

This has important implications for democratic norms and ideals, social equity and fairness, and the lived conditions of urban residents. The aim of this special issue is to shine a critical spotlight on the motivations, methods and consequences of data-driven buildings and cities. The four articles that comprise this special issue provide multiple insights into these issues and frame the datafication of the built environment as inherently political.

This editorial is structured as follows. A brief introduction to the data politics of the built environment is provided and the four articles in the special issue are then summarised. Three themes shared by the contributors are highlighted, and then recommendations for policy, design and future research are made. Data-driven buildings and cities will become commonplace in the coming decades and the articles provide inspiration to steer data politics towards progressive and emancipatory ends.

2. DATAFICATION OF THE BUILT ENVIRONMENT

> The emergent civic structures and spatial arrangements of the digital era will profoundly affect our access to economic opportunities and public services, the character and content of public discourse, the forms of cultural activity, the enaction of power, and the experiences that give shape and texture to our daily routines.
>
> (Mitchell 1996: 5)

Almost three decades ago, William Mitchell's ground-breaking book *City of Bits: Space, Place, and the Infobahn* (1996) speculated on the fundamental implications of datafying the built environment. Mitchell predicted that the proliferation of dataflows would produce a new topology of cities that is simultaneously digital and virtual, connected and fragmented. Today, urban residents are experiencing the fundamental reconstitution of work life, home life, infrastructure networks, financial institutions, manufacturing processes, consumption practices and entertainment in real time (Kitchin 2023; Mattern 2021). Data have emerged as the lifeblood of urban processes and are fed into software programs, algorithms, platforms, monitoring systems and city brains to streamline and automate functions and processes on a large scale. For proponents of smart cities and digitalisation, this is the realisation of computational power writ large. It is through the rollout of multiple overlapping and integrated digital networks that society can flourish, and humans can realise their full potential.

However, there are growing concerns that datafication processes are far from neutral and benign. In many cases, the datafication of the built environment is performed through 'an information architecture

that is invisible to users' (Shapiro 2020: 199). This has democratic implications, with the opacity of data flows serving to protect private interests while restricting vital forms of public engagement (Sadowski 2020). Critics of data-driven environments note that the collection, management, integration, analysis and application of data produces specific lived conditions that are beneficial to some but not all (Bigo *et al.* 2019; Graham & Dittus 2022). Decisions about what data are collected and what are ignored are unavoidably political processes that privilege some while neglecting others. Ostensibly objective datasets and algorithmic decision-making practices simultaneously mask and reinforce historic forms of prejudice, inequality and discrimination (Eubanks 2018; McElroy 2023; Safransky 2020). Likewise, data from 'smart' systems are being used to surveil and control people in their homes, workplaces and local communities (Nicholls *et al.* 2020; Shapiro 2020).

Taken together, these critiques of datafication raise important questions about social equity and justice while also encouraging us to consider how data flows in the built environment might be reconceived and remade for more sustainable and inclusive ends. As Olmsted & Spicer (2023: 167) note, 'data-based technologies tend to reflect and reproduce existing inequalities'. Developing a progressive and emancipatory data politics requires close scrutiny of how data-driven processes are reconfiguring buildings and cities today. This shifts our focus away from the optimisation of technological systems and towards the social, cultural and political implications of datafication processes and their influence on democratic norms, social equity and quality of life for all.

3. CONTRIBUTIONS TO THE SPECIAL ISSUE

This special issue is the outcome of a call for papers that attracted 22 abstracts and 11 manuscripts. The four published articles situate global digitalisation processes within local historical, social and political contexts (Table 1). The special issue includes a diverse range of topics, from energy, transport and smart homes to urban planning, democratic engagement and smart city agendas. The contributors engage with different geographical contexts and scales, albeit with a strong focus on mid-sized European cities. The special issue also showcases a range of different methodological approaches while emphasising the utility of qualitative data in revealing the politics of urban datafication.

Table 1: Overview of the papers in this special issue

AUTHORS	TITLE	DOI
N. Sharma, T. Hargreaves & H. Pallett	Social justice implications of smart urban technologies: an intersectional approach	10.5334/bc.290
F. Mello Rose & J. Chang	Urban data: harnessing subjective sociocultural data from local newspapers	10.5334/bc.300
S. Sareen, A. Smith, S. Gantioler, J. Balest, M. C. Brisbois, S. Tomasi, B. Sovacool, G. A. Torres Contreras, N. Dellavalle & H. Haarstad	Social implications of energy infrastructure digitalisation and decarbonisation	10.5334/bc.292
J. White & S. Larsson	Disruptive data: historicising the platformisation of Dublin's taxi industry	10.5334/bc.293

Sharma *et al.* employ an intersectional approach to position social justice at the heart of smart urbanism. Their analysis of 70 cases of 'troubles' in smart city activities engages with the multiple errors and glitches, alternative visions, and forms of opposition and resistance. They argue that while there is growing attention to social justice concerns in relation to smart technologies, intersectional approaches that emphasise how different inequalities interact and compound to produce unequal power dynamics are rare. The few cases where intersectional concerns have been identified often call for the increased involvement of underrepresented users in existing urban planning processes rather than more fundamental institutional reforms to directly challenge the multiple compounding oppressive systems of racism, sexism, colonialism, *etc.* The authors argue that it is necessary to decentre technologies and their users and instead focus on bringing about more comprehensive transformations of institutions and power systems.

Mello Rose & Chang expose the narrow scope of datasets typically used in data-based planning and governance. They propose a research methodology to produce subjective sociocultural datasets

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derived from articles in local newspapers. This involves the application of natural language processing to identify topics and places in Hamburg, Germany, that complement and extend conventional quantitative datasets. These new datasets reveal the intangible and unquantifiable aspects of urban life and can be used to support urban planning decisions. Data politics here is framed as an opportunity to enlarge the landscape of urban data beyond the objective and quantifiable to create a more nuanced and richer portrait of urban processes and experiences. The research points towards the untapped potential of urban data to enrich our understanding of the built environment and to inform governance processes.

Sareen *et al.* examine the twin transition of decarbonisation and digitalisation by focusing on urban energy services in three mid-sized European cities: Bergen, Norway; Brighton & Hove, UK; and Trento, Italy. Their study of renewable energy systems, electric mobility and smart metering reveals multiple forms of data politics that can be positioned on a continuum from 'commoning' to 'enclosure'. The findings illustrate the multifaceted influence of digitalisation on collective services that are simultaneously intended and unintended. The authors argue that there is a need for additional scrutiny of datafication processes to ensure that the use of smart-sustainable technologies to achieve decarbonisation goals does not come at the expense of social equity and justice. Furthermore, they see multiple opportunities for bottom-up modes of data-driven processes that promote the shared ownership and management of collective services.

White & Larsson examine the gradual emergence of a digital platform to manage the taxi industry in Dublin, Ireland. They situate digitalisation processes within the longer history of mobility services in the city and emphasise how the incumbent regulatory and economic conditions provide a base for disruptive actions by an entrepreneurial technology provider. The data politics in their story involve the replacement of a localised network of radio companies with a global app that serves as a digital intermediary between the taxi driver and the customer. The technology provider leverages uncertainty to create new conditions for service provision. Meanwhile, the new digital platform of ride-hailing creates opportunities for global investment while producing new dataflows for commodification by third parties. This produces new data subjects that are simultaneously globalised and individualised while sacrificing driver autonomy and existing networks of local social relations.

Table 2 compares and contrasts the articles with respect to their target of datafication, political lens and methodological approach. The contributions are diverse but they also share several common themes. The most dominant theme involves processes of societal exclusion that are commonplace in datafication. Mello Rose & Chang argue that datafication processes tend to ignore important sources of 'subjective socio-cultural data', while Sharma *et al.* highlight the underrepresentation of particular social groups and the perpetuation of existing structures of inequality. White & Larsson demonstrate how digital platforms produce social relations that are decontextualised and depersonalised to realise globalised and consumerist modes of life, while Sareen *et al.* show how digitalisation favours privatised and individualised structures rather than collective forms of management and ownership. The contributions raise key questions about how data-driven buildings and cities can be designed to be inclusive and democratic.

Table 2: The target of datafication, political lens and methodological approach of each paper in this special issue

AUTHORS	TARGET OF DATAFICATION	POLITICAL LENS	METHODOLOGICAL APPROACH
N. Sharma, T. Hargreaves & H. Pallett	Smart city technologies	Intersectionality	Comparative analysis of secondary data
F. Mello Rose & J. Chang	Sociocultural data from local newspaper articles	Subjective experience	Natural language processing
S. Sareen, A. Smith, S. Gantioler, J. Balest, M. C. Brisbois, S. Tomasi, B. Sovacool, G. A. Torres Contreras, N. Dellavalle & H. Haarstad	Collective energy services	Commoning and enclosure	Mixed qualitative methods
J. White & S. Larsson	Mobility platforms	Disruption and commodification	Historical case study

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A second theme of the special issue is the centrality of local geographies and histories to datafication processes. This is evident in White & Larsson's (p. 839) historical analysis of Dublin that includes an 'appreciation of the presence of the past in data's present'. Meanwhile, Mello Rose & Chang (p. 370) emphasise the 'intangible and unquantifiable aspects of urban life' in Hamburg while revealing the limitations of supposedly more 'objective' big data sources that are typically used to support data-driven governance. Sharma *et al*. demonstrate how the social injustices of datafication processes are aligned with historical processes of institutional oppression in multiple cities throughout the world, while Sareen *et al*. emphasise how the local contexts of Bergen, Brighton & Hove, and Trento are comprised of complex and variegated constellations of individuals and collectives. All the contributions emphasise the importance of qualitative methods and datasets to characterise local histories and geographies while providing a strong corrective to the universalising quantitative abstractions of most datafication processes.

Third, while the articles emphasise the negative aspects of the datafication of buildings and cities, they also provide pathways for more hopeful future conditions (Coutard & Guy 2007). For Mello Rose & Chang, hope resides in the potential use of multiple different sources of socio-cultural data to overcome the failings of poorly contextualised data-based governance and thus ward off at least some of its worst failures. For Sareen *et al*., hope can be found in alternative, civil society-led, commons-based visions of and approaches to decarbonisation and digitalisation. They see commoning as a means to normalise and institutionalise more progressive and inclusive forms of collective consumption. White & Larsson's analysis of the Dublin taxi industry highlights the contingent character of datafication processes. They emphasise that these processes are not inevitable but are the result of particular actions that could have turned out differently. Finally, Sharma *et al*. see opportunities to develop a more 'radical ethics' of data politics that can serve to renegotiate and re-evaluate interconnected urban crises. They call for data-driven processes that are founded in social justice to realise fundamental systemic changes. All the articles highlight the importance of including civil society in the development of new visions and alternatives that can dismantle existing unjust power structures.

4. IMPLICATIONS AND RECOMMENDATIONS: POLICY, DESIGN AND FUTURE RESEARCH

Data politics are not a recent phenomenon: there is a long history of compiling and using data to understand and steer human societies (Bigo *et al.* 2019; Hacking 2015). However, the digitalisation of information and proliferation of systems of monitoring and control over the last three decades is amplifying and extending the influence of data on society. As a whole, this special issue illustrates the diverse pathways through which digitalisation is making fundamental changes to how buildings and cities are designed and managed. There are concerns about the privatisation of public services and the surveillance and loss of privacy of individuals. At the same time, datafication opens up opportunities to know cities in new ways and to promote emancipatory processes that can support the public sector while enhancing the lives of underrepresented and vulnerable communities. Taken together, the contributions point towards several recommendations for policy, design and future research.

Much of the work on datafication focuses on the devices and systems that generate datasets and the companies that develop, implement and own these technologies. Equally important to these processes are public sector actors, specifically local and regional governments, that should be responsible for regulating and managing these emergent datafied environments (Karvonen *et al.* 2020). A key recommendation for policymakers is to contextualise and historicise data politics by recognising the importance of existing structures and systems and to examine how datafication is changing them (White & Larsson). As Mello Rose & Chang note, one step in this direction is to use existing socio-cultural datasets in data-based governance. Public sector actors can also experiment with new modes of governance and regulation to promote diverse and alternative models to organise and steer datafication processes (McGuirk *et al.* 2022). These governing activities can also extend beyond the public sector to involve civil society groups. Far from being unwitting

receivers of digital services, citizen and grassroots initiatives can both resist and repurpose data flows to redistribute costs and benefits and generate more inclusive and emancipatory forms of smart urbanism (Boni *et al.* 2019; Lee *et al.* 2020; Sareen *et al.*). Policymakers can benefit from the diverse alternatives being developed and implemented by civil society groups.

For designers of smart urban technologies and the apps and platforms that datafication feeds, the special issue reveals important implications for inclusivity. The contributors highlight the potential to include historically underrepresented groups in digitalisation processes and emphasise different sources of data and different ways of knowing urban environments (Karvonen 2020). There is a need for design processes to go beyond the mere inclusion of marginalised voices and instead to actively transform the exclusionary structures that rendered them marginalised in the first place. Local institutions need to be transformed so that underrepresented groups can be empowered to inform the governance of datafication processes.

The four articles in this issue also reveal some important gaps and omissions to be addressed in future research. There is a strong focus on the Global North and this needs to be complemented with empirical findings from the Global South to provide a broader palette of insights and implications (*e.g.* Alizadeh & Prasad 2023; Ghosh & Arora 2022). There is a strong bias towards the city scale, while datafication has implications that stretch from the individual to the global scale as well as across and between multiple scales. Likewise, there is a need to go beyond the use and application of data to focus on the data itself and how they are gathered and processed for use in apps, algorithms, software packages and platforms. Here, it is essential to develop multidisciplinary teams of scholars that include those who design and develop digitalisation processes as well as those who assess the positive and negative social implications. There is also limited focus on the detailed practices of those individuals who work with data in their daily lives and how datafication processes inform different ways of seeing and knowing urban environments. All these issues deserve more attention, especially with the rise of the next generation of datafication processes involving artificial intelligence and machine learning that have the potential to accelerate and deepen many of the issues identified herein (Cugurullo *et al.* 2024).

Data-driven buildings and cities are rapidly becoming the norm around the world. The contributions to this special issue provide multiple insights on the political implications of the datafication and provide inspiration for alternative approaches that are progressive and emancipatory.

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COMPETING INTERESTS

The authors have no competing interests to declare.

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