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Elaborating the urbanism in smart urbanism: distilling relevant dimensions for a comprehensive analysis of Smart City approaches

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ABSTRACT

Over the last decade, Smart City has increasingly become a popular urban policy approach of cities in both the Global North and Global South. Such approaches focus on digital and technology-driven urban innovation and are often considered to be a universal solution to varied urban issues in different cities. How Smart City policies operate in contemporary cities is being examined in the emerging, but still underdeveloped, academic field 'smart urbanism'. The considerable consequences of Smart City strategies call for critical engagement with the rationale, methods, target group and implications of Smart City approaches in different urban contexts. The aim of this paper is to further such critical engagement by distilling dimensions absent in current smart urbanism. We do so by exploring both the academic field of critical urbanism and smart urbanism and through that develop our contributions to the smart urbanism debate from existing theoretical and conceptual approaches within critical urbanism. We distilled three dimensions that require further development to facilitate a comprehensive analysis of what Smart City policies mean for contemporary urban life: (1) the acknowledgement that the urban is not confined to the administrative boundaries of a city; (2) the importance of local social-economic, cultural-political and environmental contingencies in analysing the development, implementation and effects of Smart City policies; and (3) the social-political construction of both the urban problems Smart City policies aim to solve and the considered solutions. As such, we argue that there is a lack of consideration for 'the urbanism' in smart urbanism.

Introduction

The past decade has shown increased attention for cities and urbanization, both in academic and in policy circles. These debates portray cities – worldwide – as a locus for innovation, an engine of economic growth and arena for social progress. This and the notion

that the majority of the global population lives in urban areas coined the slogan that the twenty-first century will be an urban century.

Nevertheless, as also recognized in contemporary scholarship, there are still existing or newly emerging urban issues such as poverty, inequality, insecurity, environmental vulnerabilities and a lack of (access to) different types of infrastructure. Just as in earlier urban development (such as housing projects), governments see these often as management problems that can be fixed by technological and technocratic solutions. The past decade has seen a number of policies to further urban development by drawing on city's capacities and addressing identified problems and needs. In line with neo-liberal governance approaches, such policies often address economic growth and innovation, see the government as a facilitator of processes and involve the private sector as a partner in the financialization and execution of processes (Gupta, Verrest, & Jaffe, 2015). Some of the better known policies, including the Creative City (Chatterton, 2000; Florida, 2003; Jessop, 1997; McCann, 2007), waterfront redevelopment (Davidson, 2013) and mega-project (Dupont, 2011) strategies, have travelled and through complex networks and processes have been implemented in cities around the world (McCann & Ward, 2012; Temenos & Mccann, 2013). Recently, we have seen the rise of the Smart City policy concept (Hajer & Dassen, 2014). While initially coined by Chatterton as an urban form required for the development of the Creative City (Chatterton, 2000), it was IBM's 2010 push that made the Smart City gain momentum. The concept now travels around the world, taking hold of governance processes in cities as diverse as Tel Aviv, Cape Town, Songdo, Amsterdam and Delhi. Promising tools for effective and efficient governance by means of state-of-the-art technologies, Smart City policies respond to urban governments' desire to improve governance processes and to be a state-of-the-art, 'world-class' city.

As an emerging academic field, *smart urbanism* examines how Smart City policies operate in contemporary cities. According to Luque-Ayala and Marvin (2015), due to the 'infancy' of the discipline, its disciplinary fragmentation and single case study approach, the work lacks 'theoretical insight and empirical evidence required to assess the implications of this potentially transformative phenomenon' (p. 2106). Furthermore, mainstream smart urbanism considers Smart City as a set of technocratic solutions for urgent urban problems and not as a political response to political conflicts that reflect discourses on what urban problems are, what appropriate solutions are and what desired urban development is. However, due to the considerable consequences of Smart City strategies, critical engagement with the rationale, methods, target group and implications of Smart City approaches in different urban contexts is required (Luque-Ayala & Marvin, 2015). The aim of this paper is to further such critical engagement by distilling dimensions absent in analyses of current Smart City approaches. Below, we address three aspects of current smart urbanism that require further development to facilitate a comprehensive analysis of what Smart City policies mean for contemporary urban life: (1) the acknowledgement that the urban is not confined to the administrative boundaries of a city; (2) the importance of local social-economic, cultural-political and environmental contingencies in analysing the development, implementation and effects of Smart City policies; and (3) the social-political construction of both the urban problems Smart City policies aim to solve and the considered solutions. As such, we argue that there is a lack of consideration for the 'urbanism' in smart urbanism.

Our understanding of urbanism is informed by *critical urbanism*, one of the social science approaches that unpack capitalist developments and neo-liberal policies through an understanding of the underlying discourses, power relations and the implications of their outcome in terms of equality or sustainability. We explore how we can connect the field of critical urbanism to smart urbanism. In order to do so and develop our contribution to the smart urbanism debate, we depart from existing theoretical and conceptual approaches within critical urbanism and relate these to the critical voices within smart urbanism. Below, we first discuss the rise of the concept of Smart City policies and the academic field of smart urbanism (both mainstream and critical). Subsequently, we discuss critical urbanism as a corresponding academic field that analyses current urbanization and the role of capitalism in it. A comparison of the two, drawing on relevant concepts and theoretical underpinnings, helps us to distil relevant dimensions for a comprehensive analysis of Smart City strategies.

The Smart City concept

Parallel to the increasing penetration of data, algorithms and social and mobile technologies into our daily lives and growing attention for urban sustainability pathways, the concept of Smart City is gaining traction in urban development and city governance around the globe. It became a global urban policy and development model (leitmotiv) which circulated, migrated and mutated through processes of policy mobility (Cook & Ward, 2011; McCann, 2011). Strongly shaped by large IT and technology actors such as IBM and Cisco (McNeill, 2016), it promises to achieve an 'efficient, technologically advanced, green and socially inclusive city' (Vanolo, 2014, p. 883). The Smart City concept is widely used by urban managers, political elites and leading business actors in framing and shaping urban development using utopian urban imageries (green-sustainable, technological-informational) and keywords, such as clean, green, intelligent and efficient, to attract investments, highly skilled workers and tourists. It is put forward as a strategy to address urban growth and social and environmental sustainability.

However, understandings of what a Smart City is vary; the label is imprecise and largely ideological lacking a well-defined core (Hollands, 2008; Vanolo, 2014), and Smart City projects and initiatives differ in their context, framings, goals, magnitude and complexity. Hence, analysing the effects of smart cities and Smart City initiatives requires specification of the type of Smart City or Smart City initiative that has been developed or evolved (for example, new smart cities or retrofitted). Recent uses of the term Smart City agree on the notion of the technological assemblage (mobile devices, digital data, algorithms, Internet, sensors, weirs, digital visualizations, etc.) being key to developing a Smart City. Given the strong visibility of technology developers, information and communication technology (ICT) market leaders and dominance of neo-liberal models, this assemblage is often grounded in the corporate world (Hollands, 2015; Kitchin, 2014b; Söderström, 2015).

More specifically, on the one hand, the concept of Smart City is rooted in the discourses of new urbanism, and in particular smart growth (e.g., Thorns, 2002), which aimed to address urban problems by drawing on ICT-based innovations, compact and integrated land use planning and architectural urban design, creative and cultural industries, and principles of social and environmental sustainability (Hollands, 2008). In this context, from a knowledge economy-based perspective, Smart City is seen as an entrepreneurial

development model to create a vibrant urban economy by stimulating innovation, creativity and entrepreneurship (Caragliu, Del Bo, & Nijkamp, 2011). The underlying assumptions are that cities are hubs of economic growth and production and that the knowledge economy drives economic development, generates wealth and makes cities more competitive. Nevertheless, although focusing on the knowledge economy, technology and ICT are seen as an enabling infrastructure, therefore in the literature also referred to as high-tech entrepreneurialism (Hollands, 2008 based on Jessop, 1997).

On the other hand, the Smart City concept is rooted in the discourse on intelligent cities (e.g., Komninos, 2002), emphasizing the relationship between technology and urban space. It is a narrow, normative and problem-solving interpretation reducing the Smart City to an ensemble of digital data (often real-time or near real-time), data analytics, networked and integrated technologies, and ubiquitous computing to capture, monitor, manage, and regulate city flows and processes (Kitchin, 2014b). This interpretation largely rests on the assumption that integrating and modelling of produced and derived data create a more comprehensive representation and understanding of the city which can make urban processes more efficient, enhance the performance of public service delivery, enable access to information and participation, address urban sustainability goals and help produce predictions of likely outcomes of future development. In this context, the Smart City can become a technology of the government at a distance, which Vanolo (2014) calls 'smartmentalisation'.

The widespread attention for and implementation of the Smart City concept has also led to the emergence of a scholarly field aiming to understand the effects and outcomes of Smart City strategies. The next section explores the mainstream and more critical notions within this field.

Smart urbanism

In contrast to Smart City as a policy concept, we understand smart urbanism as an emerging scholarly field, which analyses and reflects on the varieties and outcomes of Smart City development. Next to a substantial body of mainly applied studies that highlight the opportunities and benefits of Smart City tools and strategies, in this article labelled as mainstream smart urbanism, a more critical strand has emerged. These critical voices question the effectiveness of neo-liberal, corporate-led, top-down software and technology-mediated urban developments that promise to make cities more efficient, more environmentally sustainable, socially just, safe and secure, and economically prosperous (Marvin, Luque-Ayala, & McFarlane, 2016). Central to Smart City policies are digital technologies, (big) data and computer algorithms to monitor, control and manage urban infrastructure, resources, risks or even people, which for instance materialize as city dashboards, sensor networks or centralized control rooms (Marvin et al., 2016). As such, the majority of Smart City critiques (e.g., Marvin et al., 2016) discuss their potential implications and risks on urban society, or on how they have transformed the urban way of life, including social interactions, urban space, power relationships and urban regulations. While it signals a number of concerns, smart urbanism as a scholarly field lacks empirical evidence and theoretical embedding of these concerns.

A first concern highlighted in smart urbanism is the technocratic way of governing cities (Kitchin, 2014a; Kitchin, Lauriault, & McArdle, 2016). Data and code reduce

urban characteristics and processes to numbers, maps, graphs and pretty visualizations which are, if data are streamed real time or nearly real time, continuously updated (Klauser, Paasche, & Söderström, 2014). The underlying assumption is that a centralized, multi-faceted and dynamic evidence base provides an objective and non-idealistic account of urban processes and situations, by which city managers can identify and address 'all urban problems'. While evidence-based urban management is not a new phenomenon, the new possibilities of big data analytics, distributed sensor systems and ubiquitous computing have considerably sophisticated the process of data gathering, storage, manipulation and visualization, thereby promoting a (false) idea of value-free and objective knowledge. Moreover, insights produced through 'big data' approaches are often inductively produced and not based on existing urban knowledge. At the same, while being promoted as value free, there is always an underlying theoretical notion about how the world fits together and what is significant and what is not. Big data is thus only as good as the modelling underlying its use. This exacerbates technocratic reductionism (Söderström, Paasche, & Klauser, 2014) and masks those urban conflicts and issues that are not visible in the digital representations (e.g., the lack of basic services in informal settlements which are not in formal registries); ignores social, political, cultural, economic and historical contexts shaping urban life (Kitchin et al., 2016); and therefore leaves little room for a wider perspective beyond the data analytics. Moreover, despite its managerial and early-warning capacities in case of infrastructure-related problems or environmental hazards, surveillance, social sorting, predictive profiling and neglect of privacy are frequently mentioned undesired effects of this development. These effects may in particular harm weaker and marginalized groups who are neither aware that they are passive data producers through their Internet activities and location-enabled devices (Taylor, Richter, Jameson, & Perez de Pulgar, 2016), nor have the power and right to act against formal procedures and made decisions. The outcome of technocratic governance and reductionism may be highly unequal urban societies, characterized by unequal power relations, large gaps between those with access to information services or opportunities and those without, social exclusion and unequal distributions of costs and benefits (Datta, 2016; Kitchin et al., 2016; Luque-Ayala, McFarlane, & Marvin, 2016).

A second concern is the corporatization and neo-liberalization of urban governance (Kitchin et al., 2016; Söderström et al., 2014; Vanolo, 2014) where private sector firms and data scientists design and supply smart and digital solutions and embed them into the city fabric, offer public services and define urban vocabulary and categories. Through this process, they become powerful actors in framing the problem and in decision-making processes. This not only enhances technocratic governance, but can create technological lock-ins and dependence of city governments on provided platforms, software and binding contracts (Baud, Scott, Pfeffer, Sydenstricker-Neto, & Denis, 2015; Kitchin et al., 2016). Furthermore, it pronounces inequality in access to (digital) technologies. Moreover, although the Smart City concept is promoted to create more resilient cities, a highly data-, software- and technology-mediated urban governance system is also a system at risk (Kitchin et al., 2016); first, it is the preferred target of hackers; and second, if system components are not regularly updated and adapted to changes in other related system components, the system will become unstable. In the absence of backup strategies (as analogue systems are most likely removed), this can even lead to an entire system breakdown.

In response to understanding Smart City as a data-, software- and technology-mediated urban configuration, several scholars (e.g., Hollands, 2016; Neirotti, De Marco, Cagliano, Mangano, & Scorrano, 2014; Odendaal, 2016; Söderström, 2015) have emphasized the importance of non-technical and bottom-up social and political processes and initiatives in 'real' Smart City development. Such initiatives, also labelled as knowledge-intensive smart urbanism (Söderström, 2015), mobilize technology as enabler in the knowledge production process recognizing varieties of knowledge or operate without ICT at all, highlighting creativity, social learning or alternative ways to achieve transitions to low-carbon societies (Powells, Bulkeley, & McLean, 2016). Here, the government may function as a moderator to connect the different actors with common goals but complementary expertise (Cosgrave, Doody, & Walt, 2014). In addition, due to contingency, Smart City development needs to be related to the situated context including prevailing public values (Kitchin & McArdle, 2016; Marvin et al., 2016; Meijer, Gil-Garcia, & Rodriguez Bolivar, 2016; Odendaal, 2016) where attention is paid to strengthening urban capacities to cope with a diversity of issues instead of attempting to solve 'all' (Caragliu, Del Bo, Kourtit, & Nijkamp, 2016). This may shift Smart City development from a technological push and fix towards strategic vision development.

Drawing on (critical) smart urbanism literature, several gaps in our understanding of Smart City policies can be highlighted. First, there is a need to better understand the politics and implications of technocratic and corporate governance on different urban groups, and to address the tensions with and possibilities of normative and alternative agendas. 'Smart city projects require an attention to – and critique of – the ways of life that are generated and sustained in these proposals and developments' (Gabrys, 2014, p. 45). This also includes the need to critically unpack how data are collected, stored, processed and put at work. Second, there is a need to analyse and assess alternative ways of smart urbanism, such as the potential of open data platforms for creating alternative visualizations of and applications for the city, or bottom-up innovations that bring forward new ideas and practices towards smart urban development. Third, as smart urbanism largely engages with (critiquing) technocratic urban governance, it concentrates on what happens within city administrative boundaries and lacks attention on implications beyond these demarcations.

Through a lens of critical urbanism

Given the re-emphasis of cities as engines of economic growth, loci of technological innovation and mass consumption, and of their significance in global financial circuits, current urban growth and transformation is strongly shaped through capitalism. While much of policy and academic debates see these urban transformations as largely positive, and its possible negative outcomes as to be corrected, *critical urbanism* focuses on the (potential) negative consequences of urban change. Inspired by post-Marxist thought and thinkers such as Henri Lefebvre and David Harvey, scholars such as Brenner (2009), Christian Schmid (e.g., Brenner & Schmid, 2015), Roy (2015b), Robinson (2006) and McFarlane (2011a) question how current capitalist urbanization shapes processes of social, political, economic and environmental inequality and deconstruct the discourses underpinning these. Critical urbanism aims to unmask the 'myths, reifications and antimonies that

pervade bourgeois forms of knowledge about capitalism' (Brenner, 2009 in McFarlane, 2011a, p. 374).

Despite a shared critical vision on the relationship between capitalism and the city, critical urbanists show large heterogeneity and conduct fierce debates regarding the ideas, approaches and concepts that give direction to this critical urban thought. Epistemological and ontological debates on what makes up the urban and how we can know about it start from a shared 'Wirthian' understanding of urbanism, i.e., that the urban and cities are going beyond the physical entity of the city and beyond an arbitrary boundary line. It is built and building on complex social, economic, political and ecological relations with its environment and therefore stretches to and beyond the immediate surroundings of the physical city to other cities around the world and remote areas at far distance. Hence, the urban is a process rather than a place-based entity (Barnett & Parnell, 2016, p. 9). But where Brenner and Schmid (2015) argue that we have entered an age of 'planetary urbanism', emphasizing that urban processes of production, distribution and consumption have created extreme forms of urban concentration and extension such that every place, even the remotest village, is now integrated into the urban (Brenner & Schmid, 2015, p. 153), other authors argue that such an extreme move away from place-based connotations of the urban goes against everyday reality where boundaries and physical features are central to urban identities, governance and economies (Barnett & Parnell, 2016).

A second, fiercely debated issue is led by urban scholars such as Roy (2009a, 2015a, 2015b), Robinson (2006, 2015), Michael Storper (Scott & Storper, 2015), Neil Brenner and Christian Schmid (2015). It concerns the essence of the urban and how we should conceptualize and interpret urban diversity. Urban theory building on a narrow set of western cities has been condemned by several authors including Robinson (2006) and Roy (2015b) as giving a parochial vision on what the urban is, which concepts are useful to understand it and for creating a hierarchy of cities with Western cities at the top and cities in the Global South at the bottom in what is a universal process of urban development. Robinson's Ordinary City approach (2006) emphasizes the importance of considering each city as a space of transformation shaped through global processes of which the outcome is determined by local historical, economic, social and political contingencies. These visions are juxtaposed by authors claiming that the urban is defined by a few universal characteristics of cities and of urbanization (e.g., agglomeration and the urban land nexus (Scott & Storper, 2015), the spatial concentration of economic surplus, and the creation of a built environment or urban landscape (Walker, 2016), allowing for the building of a singular urban theory in which urban difference is understood as 'empirical diversity'. This again is disputed in Roy's essay 'Who is Afraid of post-colonial theory' where she promotes a post-colonial approach to understand that 'this "coherent concept of a city" is a story that the West tells itself about itself' (Roy, 2015b, p. 6).

A central theme in critical urbanism is social and economic inequality, their (re-)production through neo-liberal governance and capitalism, and how they co-produce urban space and its everyday life. This central concern comes about in much varied research including work on employment and gentrification, with a particular interest in how such processes are shaped through local institutional contexts (van Gent, 2013) and how it impacts on urban segregation, exclusion or more general the right to the city (Dupont, 2011; Shatkin, 2009). Work in the field of urban assemblages (Brenner, Madden, & Wachsmuth, 2011; McFarlane, 2011b) and policy mobilities (McCann & Ward, 2012)

focuses on how cities are being governed through assemblages of different types of actors whose interests and powers are joined to realize distinct goals. Policy mobilities in particular then look at how urban policies travel from one place to the next, at the role of powerful networks in this, and how such policies change local environments. Related to this is the work on (in)formality arguing that the informal is not the deviant and way of living of the poor but part and parcel of urban life across class (Roy, 2009b). Finally, critical urban approaches also focus on environment and ecology. This work, mostly in urban political ecology, includes a focus on the distribution of access and exposure to environmental services (such as water and clean air) and risks (flooding, pollution, etc.), both within urban areas and between urban areas and their surroundings, and questions how nature and urbanization are interrelated. The focus in particular is on the politics and discourses underpinning these processes (Heynen, Kaika, & Swyngedouw, 2006; Jaffe, 2016; Swyngedouw & Kaika, 2014). Subsequently, much recent attention is given to the politics of knowledge and how different types of knowledge are validated (Baud et al., 2015; Leitner & Sheppard, 2003; McFarlane, 2011a).

Methodologically speaking, critical urbanism seeks to extend knowledge through a focus on comparative approaches between cities or urban phenomena (Brenner, Marcuse, & Mayer, 2009; Robinson, 2006, 2015). Brenner, Marcuse, and Mayer (2012, p. 5) present a critical research agenda, focusing on the areas that are impacted by capitalist urbanization and that require a critical analysis. A first area of impact is the relationship between socio-spatial inequalities and politico-institutional arrangements; the second domain concentrates on the naturalization of urban inequality and injustices; a third area should focus on the 'deciphering of crisis, tendencies, contradiction and lines of conflict in contemporary cities and finally should provide prospects for socially progressive and sustainable alternative to contemporary urbanism. In conclusion, critical urbanism brings to the forefront three assumptions of urban life: (1) The urban is a relational concept, a process and not confined to city boundaries; (2) Cities are 'ordinary' and develop through complex interactions of global processes and local social-economic, political and environmental histories and features; and (3) Urban knowledge and related, what are considered urban problems and solutions, are not neutral or objective but produced through discourses and conflicts. The focus of critical urbanism is on inequalities, and it pushes a comparative approach to understanding urban realities globally.

Taking these points of consideration, the next section confronts critical urbanism to smart urbanism and distils those dimensions which are currently underdeveloped in smart urbanism but could contribute to the further development of (critical) smart urbanism.

Confronting smart urbanism to critical urbanism

To further the scholarly field of smart urbanism, we start with putting smart urbanism in dialogue with critical urbanism. The table below shows the similarities and differences between the two approaches in terms of their origin, main rational, object of study, conceptualization of the urban and how it is represented. First, the approaches share a focus on examining how certain policies or larger discourses (co-)produce urban space. Critical urbanism addresses in particular social-economic inequalities that are (re-)produced and normalized through such institutional politics, e.g., access to the city. Smart urbanism

Table 1. Comparing smart urbanism and critical urbanism.

	Smart urbanism		Critical urbanism
	Mainstream	Critical	
Origin	Developed from a policy, informed by Science of Technology Studies (STS)		Developed from scholarly debate
Main rational	Technology, algorithms and data can solve pressing urban problems	The city is shaped through technology, algorithms and data	The city is shaped through capitalism
Object of study	How technology, innovation and data can improve the urban way of life	How technology, innovation and data shape the urban way of life	How capitalism shapes the urban way of life
Urban ontology	The city as a node or bounded entity; technological innovation leads to progress	Not debated; questions the relationship between technology and urban change	The city as a process going beyond boundaries; the relationship between urban change and capitalism is problematic
Representation of the urban and urban issues	Objective, data-driven, utopian imaginaries	Subjective, not value free; calls for recognizing multiple realities	Socially constructed, space for multiple realities
Urban governance	Top-down, corporate entrepreneurialism	Calls for recognizing contributions from bottom-up initiatives; inclusive	Calls for recognizing contributions from bottom-up initiatives; inclusive
Diversity within cities	Not problematized	Acknowledges diversity and inequalities across groups	Acknowledges diversity and inequalities across groups
Global urban diversity	Universal and prescriptive	Recognizes importance of situated context; problematizes lack of diverse cases studies	'Ordinary cities'; recognizing diversity

considers how Smart City policies shape urban life, including urban security and environmental vulnerabilities (Table 1).

Second, they partially agree on the importance to deconstruct a progress discourse, on the one hand the capitalist development and on the other hand the technology innovation/data discourse. Specifically, critical urbanism questions the nexus between capitalism and urbanization and its implications for urban life, for example, in terms of inequality and access but also in terms of what is considered urban progress, an urban 'problem' or a 'good' city. With respect to smart urbanism, the idea that *smart* equals *innovative* equals *technological* is the normative relationship underpinning Smart City policies. While mainstream smart urbanism does not question this relationship, critical voices in smart urbanism see this technocratic reductionism as a concern and pose the question how the relationship between smart, innovative and technological is constructed and what this construction implies for things, people and relations not questioned and not studied. Hence, both critical urbanism and critical smart urbanism see definition of urban problems and urban solutions as constructed and not an object 'out there'.

Differences between the two concepts are multifold. Smart urbanism as an academic field is largely developing from a data technology and innovation-based policy. As a result, smart urbanism examines how data, algorithms and technological innovations can create urban change. Secondly, it analyses how the label Smart City is mobilized in broader economic development strategies. The nature of the policy and the important role of the urban government make that smart urbanism (both mainstream and critical) look at the city – or a part thereof – mostly as a bounded entity, concentrating on administrative and physical boundaries. Critical urbanism on the other hand has its root in theoretical debates. It

questions urbanization through the lens of capitalism and politics. Seeing the urban as a process, as relational and spreading beyond the bounded city means it analyses the city in relation to its wider environment. This wider environment can be as concrete as its immediate surroundings and as abstract as global networks and flows.

In terms of how the urban and its issues are represented, mainstream smart urbanism believes in an objective representation of the city through data and data-driven production of knowledge. Both critical urbanism and critical smart urbanism argue that urban representations and knowing are shaped through social constructions, as power loaded and subjective. As such, critical smart urbanism and critical urbanism also underscore the value of alternative definitions for urban problems and solutions. This is also reflected in positions on the dominant actors/producers in Smart City governance: top-down corporate governance versus bottom-up.

Finally, mainstream smart urbanism has little acknowledgement of urban diversity and what that means for Smart City policies. Many policies are based on or developed after a few 'best practices' (e.g., Songdo, Masdar City and Amsterdam) and explanations of their success and failure do not consider political, economic and social histories and characteristics. While this is acknowledged in critical scholarly writing, there is still little empirical evidence beyond experimental projects. In critical urbanism, this diversity is central, much historicized and core to much debate.

Based on the above, we argue that the differences between smart urbanism and critical urbanism pertain in particular to the mainstream strand in the former. In its approach towards, for example, urban representation, societal implication and the questioning of the underlying discourse, the critical strand in smart urbanism is similar to critical urbanism. However, we argue that critical smart urbanism can benefit from a more explicit pronunciation of urbanism in smart urbanism. With this, we mean that smart urbanism (1) lacks a solid epistemological and ontological understanding of the urban; (2) could benefit from more attention to local contingencies, i.e., acknowledgement of the importance of urban diversity; and (3) needs to be more aware of how urban problems and their proposed smart solution are socially constructed. While the second aspect is acknowledged but not fully developed by critical scholars in smart urbanism, the first dimension is absent in smart urbanism. Hence, to further the scholarly field of smart urbanism, the central notions and tensions in critical urbanism on what the urban is and how diversity needs to be understood are essential. This will help to better understand interlinkages between current digitalization, capitalism and urbanization, and how they shape Smart City approaches and their impacts on current urban life, focusing on social, economic, environmental and political risks and benefits, and the distribution of these across social groups and urban spaces.

Concluding remarks: where to go from here?

The aim of this paper was to further the critical analyses of Smart City policies. Smart City policies, pushed by a coalition of the private sector and (urban) state actors, are currently implemented globally. Based on the underlying seemingly positive relation between technology, innovation and smart, technological solutions are being implemented to solve identified urban problems and conflicts. The emerging academic field of smart urbanism addresses the implications of such policies to some extent. While we increasingly see

analyses that are critical of (the effects of) Smart City policies, a framework that allows for comprehensive critical policy analysis is lacking. Our main argument is that currently smart urbanism lacks a thorough consideration of *urbanism*. Hence, our strategy has been to bring urbanism into smart urbanism. We have done so using insights from the academic field of critical urbanism and have come to three core dimensions of urbanism in smart urbanism: the urban is relational; cities are ordinary; and urban knowledge, problems and solutions are constructed.

Highlighting urbanism in a smart urbanism framework urges a number of questions and considerations to be at the core of smart urbanism. Firstly, understanding the urban as relational means that analyses of how smart policies shape and are shaped by the urban need to go beyond the physical and administrative boundaries and categories of the city. They should address questions such as how smart metering of water shapes water availability in the urban fringes, how urban–rural mobility is impacted by new kinds of smart transport or how informal practices can contribute to smart urban development. Secondly, it requires an understanding of how cities are integrated in larger urban regions and urban networks and what this means for smart policies. For example, how do global economic relations shape the relations in one city between actors, and how do these impact the kinds of policies that are implemented.

Emphasizing local contingencies means that social, economic and political histories and characteristics are considered in understanding the emergence, implementation and implications of smart policies. It urges questions such as how smart policies strengthen, weaken or replicate existing patterns of inequality and exclusion. For example, how access to digital platforms is shaped by class and how privacy issues are more detrimental for some social groups than others. Furthermore, such understanding should question how smart policies are disturbing, facilitating or contradicting local formal and informal practices and who is benefitted or harmed by that. Think, for example, about informal access to land and services. Thirdly, bringing urbanism into smart urbanism means a concern with how urban problems and proposed (smart) solutions are constructed. It proposes analyses of the process (actors, practices, conflicts and discourses) that make that some urban issues become 'key problems' and others not. Similarly, it requires to understand why (specific) smart technologies become to be seen as the best solution for the constructed problem. Furthermore, smart urbanism then questions what this construction of problems and solutions mean for how other urban issues and solutions to them are being understood and valued.

Finally, methodologically smart urbanism has to go beyond single case studies to generate new urban theories on Smart City strategies. Following critical urbanism, such methodological work should include comparative cases, both with respect to new smart cities and retrofitted smart cities.

In conclusion, bringing urbanism in smart urbanism means that smart urbanism moves away from a field of policy analysis towards a more complex understanding of how technology, capitalism and urbanization enmesh in producing Smart City approaches and their impacts on contemporary urban life.

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