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Smart City Visions and Human Rights: Do They Go Together?

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Understanding the impact of technology on urban life

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The Technology and Human Rights Fellowship is part of the Carr Center for Human Rights Policy's project to examine how technological advances over the next several decades will affect the future of human life, as well as the protections provided by the human rights framework.

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Introduction

Over half of the world's population lives in cities today. According to the latest predictions, more than two thirds of all people will inhabit an urban environment by 2050 (UNDESA 2016). The number and size of cities has increased over the last decades, with the highest projections for future growth in the Global South. As cities continue to expand, so does their impact on policy generation, as political players, as drivers of states' economies, and as hubs for social innovation and cultural exchange. Cities are important actors on the national and international stage, with mayors' conferences, city grassroots organizations, and urban citizens driving the search for today's most pressing problems, including climate change, inequity, migration, and human rights concerns. Many have expressed hope that "cities [will] deliver where nation states have failed" (Oomen 2016, 2).

Organizing this ever-growing, dynamic human space, enabling people from diverse backgrounds to live together, addressing the spatial and social challenges of urban life, and delivering services to inhabitants are challenges that cities have struggled with and that continue to dominate the urban policy agenda. The fast growth of cities and the increase in power has led city governments to look for new ways to make city administration, service delivery, and citizen involvement and management more efficient and cost-effective. Since the dawn of digital computing in the 1950s, technology and digitalization have been seen as a way to improve cities and to address these urban challenges. City growth and digitalization are therefore intertwined, and the trend to digitalization of cities has received extensive scholarly and practical attention, especially after the arrival of personal computers in the 1980s and 1990s and the rapid growth of the internet in the late 1990s and 2000s. The technology-infused city has received various names and different conceptualizations, ranging from "wired cities" (Dutton, Blumler, and Kraemer 1987), "computable cities" (Batty 1997), the "city of bits" (Mitchell 1995), "cyber cities" (Graham and Marvin 1999), and "digital cities" (Ishida and Isbister 2000) to "intelligent cities" (Komninos 2002), "sentient cities" (Crang and Graham 2007), and "real-time cities" (Kitchin 2014), showing the deepening and widening impact of technology and the transformation into an instrument with more and more autonomy, capacity, and power. Today, the most commonly used term is "smart city" and while no generally accepted definition exists, there is general agreement that smart cities use information and communication technologies (ICTs), the Internet of Things, cloud computing, and other technological applications as vehicles to transform the city to the benefit of their inhabitants and governments (Reuter 2019). Smart cities have revolutionized city government and administration (e.g., e-governance), digital city operating systems (e.g., urban dashboards, smart meters, online transactions, building management), sensor-driven service delivery (e.g., smart grids, dynamic waste collection routing), and automated interventions in the environment (e.g., sensor networks measuring pollution, noise, etc. and flood management with programmed responses to increases in water flow). They have opened new avenues for citizens to participate in decision-making processes (e.g., through e-governance) and get around (e.g., through intelligent transport systems and mobility apps, smart travel card, bikeshares, smart parking, or ride-share services) and changed the way urban residents live (e.g., smart meters, app-controlled appliances, digital personal assistants) and innovate (e.g., through crowdsourcing of ideas and entrepreneurship) (Kitchin 2016; Giffinger 2007; Deakin and Al Waer 2011; Mohanty, Choppali, and Kougianos 2016; Neirotti, DeMarco, Cagliano, Mangano, and Scorrano 2014; Aoun 2013; Mosannenzadeh and Vettorato 2014). What is happening in the city, how the city is evolving, and urban planning and development can now be monitored in real time using sensors, devices, and citizen-collected data (Komninos 2013). Smart city solutions promise to solve a fundamental challenge of cities: how to foster economic growth and decrease costs while increasing resilience, sustainability, service production, participation, and quality of life, and "to do so in commonsensical, pragmatic, neutral and apolitical ways through the use of data" (Kitchin 2016, 13). There is no doubt that the smart city agenda, digitalization, and technological changes have had a profound impact on city life.

The Impact of Smart City Initiatives on City Life

Traditionally, the discourse and scientific examination of urban digitalization and its impact has been dominated by computer science, data science, and engineering approaches. Software generation, engineering approaches, and technological innovation were at the front and center, with mathematical modeling, simulations, data mining, remote sensing, machine learning, and the analysis of masses of unstructured information and big data as key research objectives. The examination of the political, economic, cultural, and social implications of the digitalization of cities came later and began in earnest in the 1990s with the development of theories, theses, and predictions. Human geographers, sociologists, and urban studies experts started to infiltrate the STEM-driven smart cities discourse and developed a number of social critiques of smart cities (Reuter 2019; Green 2019; Cardullo, Feliciantonio, and Kitchin 2019; Coletta, Evans, Heaphy, and Kitchin 2019; Shelton and Lodato 2019; Morozov and Bria 2018; Datta 2018; Kitchin 2016; Vanolo 2014; Greenfield 2013; Marcuse 2012; among others).

These can be summarized into the following categories:

1. *Overemphasis on technical solutions*: Rather than focusing on addressing underlying political, economic, and social problems, smart city initiatives emphasize the creation of ahistorical and generalizable technical solutions that lack context and promote one-size-fits-all fixes. These technical solutions are seen as

objective, neutral, and politically benign, rather than driven by their developer and stakeholders' values, views, and preferences.

2. *Top-down implementation and technocratic governance:* The smart city agenda is implemented top-down and dominated by corporate–government alliances instead of citizen input, leading to technocratic governance rather than citizen-centered deliberative democracy.

3. *Corporatization and privatization*: Smart cities hand over an increasing number of public functions to private actors who compete for highest profit instead of pursuing the greater good.

4. *Reinforcing divides and inequities*: Smart cities reinforce digital divides, inequality, and power asymmetries by catering to political elites, prioritizing vested interests, and deepen existing socioeconomic divisions instead of producing societies that are more just, equal, and inclusive.

5. *Surveillance and privacy violations*: Smart cities rely on data gathered from and by citizens or services used by citizens, thereby supporting surveillance, introducing new forms of social regulation, eroding privacy, enabling predictive profiling, fostering social categorization, and influencing citizen behavior.

6. *Security concerns*: Smart city technologies produce urban systems that are potentially vulnerable to hacking and cyber-attacks affecting critical infrastructure and data security rather than producing a stable, reliable, resilient, and secure environment.

Let me shed some light on these critiques. First, traditional actors in smart city initiatives tend to see technology as a neutral solution to social, political, and economic urban problems and the primary driver of change – a perspective Green (2019) calls "tech goggles". Urban challenges relating to civic engagement, criminal justice, or city design are seen as inefficiencies in city government administration that technology and data-driven solutions can ameliorate. These solutions are argued to be apolitical and non-ideological because they are developed by engineers, computer scientists, and software developers who use mechanical objectivity and politically neutral approaches. Case in point: Sam Palmisano, then Chairman and CEO of IBM, proudly ended in a speech at the Royal Institute of Foreign Affairs in London with these words: "Building a smarter planet is realistic precisely because it is so refreshingly non-ideological" (Palmisano 2010). Engineers and scientists rarely question the underlying assumptions of their inventions, the ways in which their personal perspectives, biases, and values enter the development of technology, or the problematic ways in which technological innovations are being used. Technological solutions are developed on the presumption that everyone shares the same kind of smart city vision and are produced purely in response to market and city administrator demand. Technological innovation becomes a goal in itself without any reflection on impact and whether it truly addresses the social, economic, or political issue it is designed to solve. A good example is e-voting. Supporters of e-voting stress the benefits of electronic voting such as speed of counting ballots and faster results, cost-reduction, and remote accessibility, which can potentially increase voter turnout (see for example Civiciti, a company promoting e-voting; Willis and Aurigi 2017). They tend to underestimate the risks such as election fraud, security breaches, verification challenges, and software bugs and failures. Smart city advocates get caught up in technology-focused policymaking and smart city rhetoric, which leads to the failure to address the complexity and sociality of cities (Oliveira and Campolargo 2015). Urban problems such as changes in population patterns (urbanization and rural to urban migration) and ensuing resource shortages, climate change and disaster risk management, and the need to produce resilient cities require structural solutions, not simply technical band aids.

Smart cities hand over an increasing number of public functions to private actors who compete for highest profit instead of pursuing the greater good.

Second, smart cities are often produced top down, with initiatives driven by corporate-government bureaucracies as opposed to democratic governance. Citizens play a secondary role: at best, they are valued as consumers or data gatherers; at worst, they are seen as obstacles, incapable, and in need of clarification on the benefits of technology (Greenfield 2013; Hollands 2008, 2015; Sassen 2011; Willis 2016). Smart cities increase the likelihood that citizens are reduced to data points, consumers, users, testers, or investors instead of creators, leaders, and decision-makers. Technology is used to steer residents to fulfil the government-corporate developed urban vision and their adherence to this course is measured through surveillance and social sorting. This approach is bolstered by a culture of stewardship for citizens and civic paternalism, in which citizens are perceived as unable to decide what is best for them and take on a leadership role in urban politics (Shelton and Lodato 2019; Cardullo and Kitchin 2018). Residents become less and less involved and lose their status as active participants in the urban discourse.

The critique that smart city initiatives do not foster community participation has not gone completely unheard.

City governments and tech companies have hurried to create "citizen-focused" or "citizen-centric" initiatives and to give the appearance to be more citizen-friendly. However, as Kitchin et al. 2019 show, some of these initiatives give only lip service to citizen inclusion and are essentially rebrandings of current projects. They continue to focus on corporate capital accumulation and keep technocratic governance largely intact (Macgilchrist and Bohmig 2012). Smart city initiatives and tech companies have developed a number of apps and platforms to address challenges in civic engagement, community-building, and democracy (e.g., online dashboards like Proud City or Granicus; social networks such as Neighborland, a collective online urban planning platform, Nextdoor, a community-based social network, or Change by Us, where citizens can propose projects; idea-sharing and civic engagement tools like Mindmixer, a virtual town hall platform). None of these move beyond information sharing and administrative tasks or tackle underlying urban issues, empower citizens, or strengthen community ties.

The pushback against real citizen participation in smart city governance is based on the perception that including "non-experts" is "messy", time consuming, and costly and does not therefore align with the basic smart city tenets of efficiency and cost reduction. While examples of successful citizen-centric initiatives exist (e.g., Smart Cities for All, a project focused on eliminating the digital divide for persons with disabilities in smart cities worldwide (in Reuter 2019), Brickstarter in Helsinki, a site that focuses on crowdfunding urban renewal, architectural and public art projects (in Holland 2015), Dampbusters in Bristol, a project in which citizens co-designed sensor-based solutions to dampness (in Ignazio, Gordon, and Christoforetti 2019), or Face Your World in Amsterdam that encourages young people to become engaged in city renewal (in DeLange and De Waal 2012)) and smart cities that have increased citizen participation are highlighted (e.g., Seoul, Amsterdam, and Medellin (both in McLaren and Agyeman 2015) or Barcelona (in Cardullo and Kitchin 2018)), these examples are not representative of the vast majority of smart cities or initiatives. Many of the projects are very location-specific and might not easily be transferred to other cities, especially because most projects are focused in cities in the Global North with high economic prosperity. In addition, urban residents might still not have full ownership of the process. Even when smart city initiatives seek citizen involvement and empowerment through implementing measures like crowd-sourcing, citizen science, living labs, sharing platform, open source software, and data management, citizen participation is achieved through neoliberal imperatives that are concealed in citizen-focused language (Cardullo et al. 2018; Engelbert 2019).

In fact, smart cities create a paradox: on the one side, smart cities create new avenues for citizens to participate (e.g., through e-voting, online services and feedback, surveys, etc.). On the other side, they often lead to less meaningful and impactful citizen participation. Cardullo and Kitchin (2018) attribute this result mostly to a combination of technocratic and market-driven governance with the lack of understanding of what face-to-face communication, neighborly interaction, trust-building, capacity-building, and social forms of living together contribute to active, engaged communities and citizens. As studies show, software-based and computational forms of participation do not have the same implications on quality of life, community-building, and sense of belonging as face-to-face interactions (Lee et al. 2011). In addition, software can limit the creative spectrum of interaction as it establishes communication in a predetermined, specific path that does not allow for flexible reactions or changing circumstances. Online interactions can therefore not replace the established traditions of face-to-face community building.

Smart cities benefit rich elites, leaving large portions of the city

Third, because corporations and the technology industry have played such crucial roles in developing the smart city agenda and driving its implementation, an increasing number of public functions and services are privatized and handed over to private actors. Smart cities have shown to promote corporatization and privatization of public spaces, goods, and services. Large corporations like IBM, Google, General Electric, Cisco, Siemens, and Philips, among others, dominate the smart city agenda and often dictate the nature, timeline, and adoption of technological solutions by city governments. Capital and economic power drive smart city processes, which are determined by ideologies of neoliberalism, colonialism, and imperialism. Cities, services, and public goods become a way for corporations to enhance profit (Brenner, Marcuse, and Meyer 2012; Marcuse 2014) and increasingly function as markets in which corporations compete for highest profit. City policies benefitting private actors amplify the creation of neoliberal political economies that operate for the benefit of a small wealthy elite instead of pursuing the greater good. Cities with capitalist neoliberal policies reinforce inequalities and social and spatial divides (Harvey 1973; Sassen 1991; Rossi 2017). Smart cities amplifies these tendencies, which become an "attempt to reconfigure the city as an accumulation strategy, forming a tech-led version of entrepreneurial urbanism" (Kitchin et al. 2019; see also Hollands 2008, Shelton et al. 2015; Reuter 2019). In its strongest form, the public sector serves merely as an agent for corporations, while public good production and service provision is taken over entirely by private entities and companies. Citizens' needs and benefits are secondary to generating highest profit margins, establishing long-term investments, and minimizing maintenance (Morozov and Bria 2018). We see

Smart cities reinforce digital divides, inequality, and power asymmetries by catering to political elites, prioritizing vested interests, and deepening existing socioeconomic divisions.

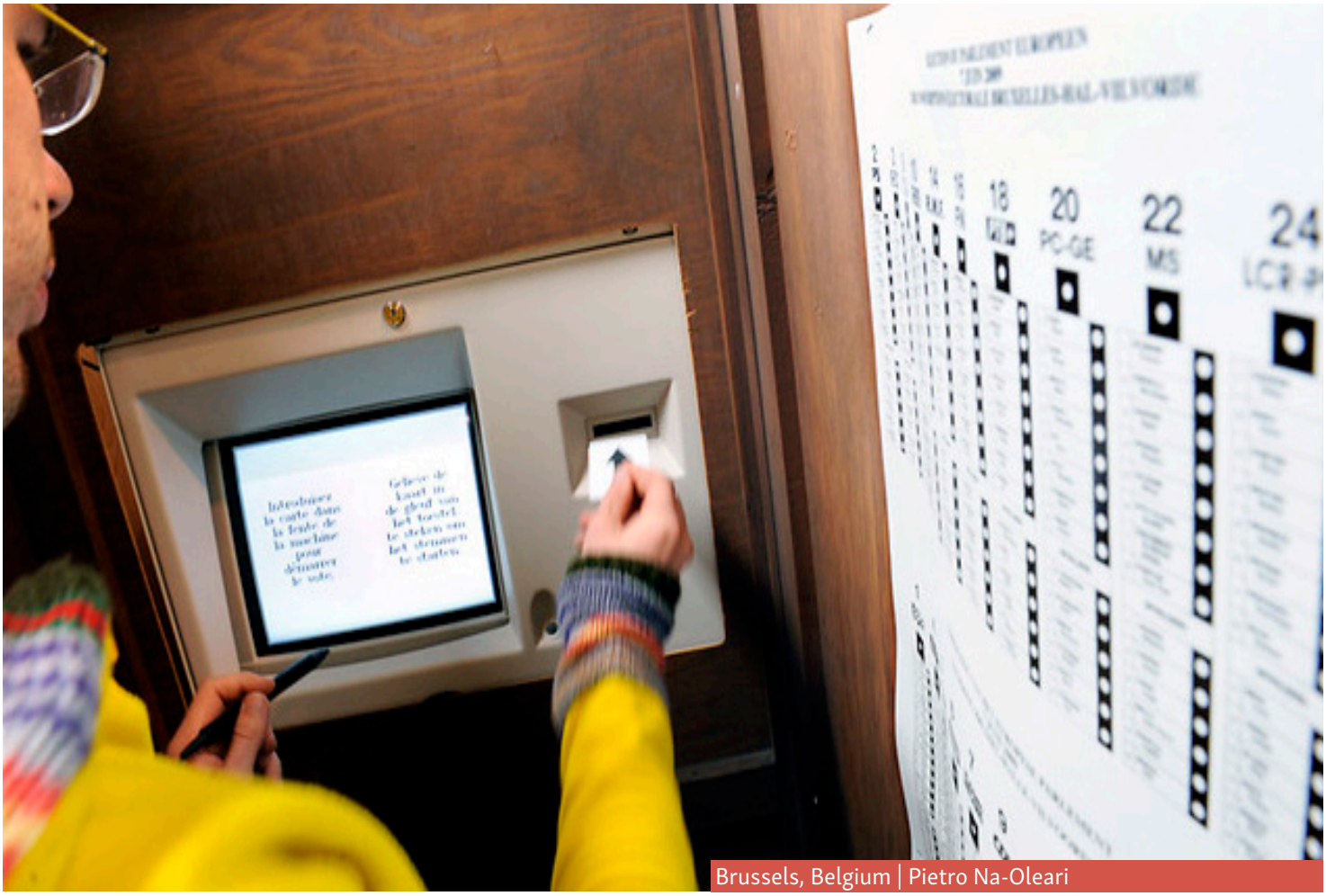
some of the effects of these developments in our cities. Corporate driven products have disrupted established public and private services through technological advancement. For example, Uber has completely upset the taxi market, and Airbnb challenged the traditional short-term accommodation business. This is not to say that these innovations come necessarily to the detriment of the urban citizen, but there is need for new policies countering the exploitation of workers and discrimination and regulating security and service delivery. The focus is on social control, in which behavior of citizens is monitored and explicitly or implicitly steered or nudged, resulting in a "quantified community with numerous overlapping calculative regimes designed to produce a certain type of social and moral arrangement" (Kitchin et al. 2019).

On the one side, smart cities create new avenues for citizens to participate...on the other side, they often lead to less meaningful and impactful citizen participation.

To test smart city initiatives, many cities set up smart districts to pilot new technologies (e.g., Quayside in Toronto, New Cairo in Cairo, Songdo in South Korea, or the North End Smart District in Charlotte, NC). In these places, smart technology becomes the central focus of new real estate development projects and city governance. For example, the big master plan for Quayside, a 12-acre lot on Toronto's waterside, creates an environment that is "connected, monitored, and self-regulating" (Bliss 2019). Unlike in the rest of the city, Wi-Fi will be publicly available, and sensors throughout the neighborhood will collect data on energy consumption, building use, and traffic patterns. A software platform will analyze and manage urban fluctuations and generate automated responses. The data harvested will be anonymized, held in a third-party trust, and administered by Sidewalk Labs, Google's smart city start-up and the driving force behind the project. The corporate appropriation by Sidewalk Labs in collaboration with Toronto's government has not gone without criticism, especially after The Star, Toronto's largest newspaper, disclosed corporate plans to expand beyond the small Quayside lot (Toronto Star 2019). The recently released master plan indeed calls for an expansion of the project to 350 acres and the creation of a smart "IDEA (Innovative Development and Economic Activation) district". Sidewalk Labs wants to redevelop Toronto's waterfront by planning, designing, and spearheading the technical implementation in return for a cut of property taxes and development fees, which would normally go to the city (Bliss 2019). Activists have criticized the project as a corporate takeover of what should be a citizen-driven, democratic process, and the Canadian Civil Liberties Association is suing the municipal, provincial, and federal governments to halt the process on grounds of privacy rights violations and the claim that the government essentially abdicated its responsibilities towards the public to a corporation (CCLA v. Waterfront Toronto et al. 2019).

The corporate and tech-driven smart city agenda is a result of neoliberal perceptions that assume public sector incompetence and inefficient service delivery and stress the need for marketization of state services and infrastructures and the expertization of city processes. Smart city advocates contend that public authorities lack the core skills, knowledge, and capacities to deal with pressing urban problems and argue that private partnerships, market competition, privatization, and heavy involvement by academia and industry deliver better, more efficient, and more cost-effective solutions (Kitchin et al. 2017; Collier et al. 2016). When announcing the master plan for Quayside, Sidewalk Labs chief executive Dan Doctoroff said, when asked about Sidewalk Labs' role in the development and implementation of the project, that "[i]t's hard for government to have all of that expertise" (cited in Bliss 2019). The replacement of public services by the market, the surrender of government responsibilities to corporations, and the reliance on algorithms, automated responses, and monitoring creates an "urgent need to critically engage with why, how, for whom and with what consequences smart urbanism is emerging in different urban contexts" (Luque-Ayala and Marvin 2015, 2105; Amoore 2013; Halpern et al. 2014).

The establishment of "functionally sophisticated enclaves" (Anttiroiko 2013, 503) in urban society leads to a fourth challenge, namely inequality, disparities, and the reinforcement of already existing social divisions, patterns of structural violence, and power relations (Kitchin 2014; Calzada and Cobo 2015; Cooper 2016; Rajagopal 2016). Social status, income, education, and labor-force participation determine access to technology, contributing to the digital divide (Dobransky and Hargittai 2006; Kitchin 2014; Reuter 2019). For smart cities to be effective, inhabitants must adapt to smart city living, which usually means access to broadband internet and high-end sensing devices (Vanolo 2014; Gurstein 2014). This leaves little room for the technologically illiterate, the poor, the elderly, persons with disabilities, and generally those who are traditionally marginalized in the city discourse and decision-making processes. Citizens are able to select smart city options only if they can afford them. Neoliberal approaches, corporate influence, and marketization have led to smart cities prioritizing the needs of the wealthy and businesses over the vast majority of inhabitants (Wastl-Walter and Staeheli 2005).



Brussels, Belgium | Pietro Na-Oleari

Electronic voting in Belgium during parlimentary elections.

Inequality, marginalization, and poverty have been largely absent from the smart city discourse and only recently have become a topic of discussion (Hollands 2015; Reuter 2019; Kitchin et al. 2019). Although governments and the private sector have been making massive technology investments in cities, there has been little focus explicitly on technology products and services that prioritize the inclusion of all citizens, especially those on the margins. Studies show that smart cities today are not inclusive and fail a large portion of their population (Odendaal 2006; Hollands 2008; Datta 2014; Luque-Ayala and Marvin 2015; G3ict and World Enabled 2016a, 2016b; Pineda and Thurston 2016; Reuter 2019). Most city planners, policymakers, urban designers, engineers, and software and technology developers are unaware of the needs of underrepresented groups. They design for a seemingly homogenous urban inhabitant or "general citizen" (Shelton and Lodato 2019) who is framed as white, male, straight, middle-aged, able bodied, cisgender, and middle class. The "absent citizens", referring to those who hold different values, identities, concerns, and experiences, are excluded and play no or only a marginal role in city policymaking and the urban design process. In addition, the absence of policies, laws, and financial resources dedicated to social inclusion places equity, fairness, and inclusiveness low on the priority list.

Ethical concerns regarding surveillance, violations of privacy, racial profiling, social categorization, and biased policing constitute the fifth critique of smart cities. Privacy violations and surveillance through geo-tracking, sharing of data trails, profiling, and anticipatory governance have wide-ranging implications on how citizens are treated and perceived (Kitchin 2016; Kitchin et al. 2019; Zoonen 2016). For example, geo-tracking and algorithms that predict a person's online and consumer behavior can potentially disclose a person's LGBTI status, political opinions, and religious affiliations to the government, which can cause personal and political harm to the person. It can also reveal risks for poor credit, insurance, or unsuitability for employment or admission to university based on data gathered. This type of "data determinism" judges, profiles, and treats people not based on what they have done, but what they might do in the future (Ramirez 2013). In addition, it can lead to miscategorizations of people, which can have real implications for the affected person's life (e.g., getting on a no-fly list or being unable to get a job). Data determinism is particularly harmful in the case of anticipatory governance such as predictive policing (Goodman 2015). Police departments use predictive analytics to anticipate the location of future crimes or turmoil, deploying patrols and police officers to the identified areas. Because the benefits of this practice seem obvious, innovative, and neutral, many city governments have enthusiastically embraced these technologies. However, predictive policing amplifies the targeting of people on the basis of race, creates algorithms with racial bias, and fosters the suppression of racial, religious, and ethnic minorities (Koss 2015). In other words, instead of creating more neutrality and equity in policing, already problematic police behaviors like racial profiling are now enhanced by algorithms and machine learning.

In addition, the use of these technologies does nothing to address the underlying issues of police-community relations or racial biases. Police forces are also known to monitor social media and communications by activists to try to anticipate spots for potential unrest (e.g., in Egypt during the Arab Uprising). Smart technologies can therefore be used to suppress political dissent and impact freedom of speech, assembly, and other fundamental human rights. Anticipatory governance, predictive policing, and data determinism create a situation in which "a person's data shadow does more than following them; it precedes them" (Kitchin et al. 2019), which has wide-ranging consequences for urban citizens' lives.

The sixth critique is concerned with the potential security vulnerabilities across critical infrastructures. The potential for immense damages from hacking has been well documented for both the communal (e.g. power outages, data breaches, and false emergency alerts) and personal levels (e.g., baby monitors, routers, and garage doors) (ITU 2018; Wired 2018). The potential for chaos and uncertainty is high, especially because smart city systems are often not adequately protected against security vulnerabilities, including easily preventable ones (e.g. guessable default passwords). Cities often use cloud computing, open source software, and open internet access for their sensors and devices, leaving them exposed for anyone to find and modify (IBM and Threatcare 2018). The more connected, computer-based, data-processing oriented, and systems integrated a city is – or, the smarter it becomes – the more vulnerable and exposed it is. Security updates are not always easily implemented due to limited resources, understanding of risks, and old operating systems. Because systems in smart cities are connected and interdependent, an attack on one part of the system can have a chain effect, leading to high damage. In addition, it can be hard to identify which part of the system was attacked, and less impactful breaches often go undetected, leaving the city even more vulnerable and open to attack. For people living in the city, these issues can have a major impact. From false alarms causing panic (e.g., the false missile alert in Hawaii 2018) to malfunctioning automated disaster response systems (e.g., failing flood gates in Pittsburg) to data breaches of personal information (e.g., of patients in the Los Angeles County's hospital and clinics in 2019), people's lives can be impacted and at risk. Citizens can do nothing or very little to counteract these scenarios as decisions on system security, disaster management, and responses to cyberattacks (or lack thereof) are usually determined by city governments alone.

The above considerations show that there seems to be one reoccurring theme in all of these critiques, and that is the absence of the "human", the citizen, the urban inhabitant in smart city initiatives. The smart city is perceived as a rational, steerable machine rather than a place of complexity and humanity, a space where humans live, interact, and create community. Smart city plans distort the picture of who and what cities are for (cars, data collection, or people?) and what "good city life" looks like (smooth traffic, data accumulation, or living, breathing, growing human communities?). Smart cities initiatives oversimplify social, economic, and political complexities and translate them into problems that can solved by technology (Green 2019).

While many of those promoting smart cities have become more attuned with the critiques presented above and have started attempts to reframe smart city interventions to make them more citizen-centric, it is often just the shell, discussion, or discourse that is changed, rather than the fundamental principles that lie behind the development and implementation of technologies and smart city initiatives. At the same time, critics of smart cities have realized that smart cities are here to stay, that some technologies provide workable solutions, and that smart city initiatives are generally well liked by citizens (see survey in Kitchin 2016). It seems therefore appropriate to look for solutions to the lack of citizen involvement and the creation of more equitable and inclusive smart cities within existing frameworks and structures. The focus needs to be on modifying the ideology behind smart city frameworks, minimizing peril, and implementing them in a citizen-centric way. The smart city agenda is not neutral, but fundamentally affects how people perceive the city, the way people interact with their environment, and how the urban landscape is shaped. The challenge is now to use technology in a way that promotes and protects human rights, creates equity and justice, and is mindful of inclusion of marginalized and underrepresented groups. It is in this context in which a human rights framework can help shed light on how to achieve such a human-centered smart city.

Towards the Smart Human Rights City

The localization of human rights is a relatively new trend in international politics, which was born from two distinct movements. First, the "right to the city" movement calls for all urban inhabitants to not only be part of city life and have access to city resources, but to actively contribute to developing, transforming, and shaping the city and to be involved in all parts of strategy setting, decision-making, and policy implementation. The right to the city has been debated since the 1960s based on the writings of French sociologist and philosopher Henri Lefebvre (Lefebvre 1996) and has recently experienced a renaissance in both scholarly discourse (Purcell 2002; Amin and Thrift 2002; Harvey 2003; Horlitz and Vogelpohl 2009; Attoh 2011; Garcia Chueca 2016) and practice (Habitat III 2016a). In this view, the city is seen as a dynamic, ever-changing space that is produced by and for the city's residents. The right to the city is thus a right "to urban life, to renewed centrality, to places of encounter and exchange, to life rhythms and time uses, enabling the full

and complete usage of these moments and places" (Lefebvre 1996, 179). It strives to establish an institutional framework that allows urban inhabitants to ascertain social control, to fully and effectively participate in all aspects of policy making, and to fight oppressive structures (Young 1990; Mitchell 2014). Scholarly discussions of the right to the city usually fall within two areas: (1) the right to participation, such as democratic urban politics (Purcell 2002; Harvey 2003; Gould 2004; Dikec 2005; Wastl-Walter, Staehli, and Dowler 2005; Marcuse 2007a; Marcuse 2007b; Mitchell 2014), and (2) the right to appropriation, which includes both the current use of space, physical access, and occupation of the city and the creation of new urban spaces physically, socially, politically, and economically (Smith 1994; Purcell 2002; Sklair 2017).

The second concept is the human rights city movement, which is led by cities themselves and focuses on translating international human rights documents such as the Universal Declaration of Human Rights to the level of the city (Merry 2006; Marks and Modrowski 2008; De Feyter et al. 2011; World Human Rights Cities Forum 2011; Oomen 2016; Smith 2017). International human rights city documents such as the European Charter for the Safeguarding of Human Rights in the City (2000, signed by more than 350 European cities), the World Charter on the Right to the City (2001), and Global Charter-Agenda for Human Rights in the City (2006) deal with a wide variety of human rights, including civil and political rights; economic, social, and cultural rights; women's rights; children's rights; the right to sustainable development; and the right to a healthy environment. In addition, a number of local level instruments have been developed, for example, in Montreal (Charter of Rights and Responsibilities of Montreal 2006), Mexico City (Mexico City Charter for the Right to the City 2010), and Gwangju (Gwangju Human Rights Charter 2011). At the core of these documents are the principles of human dignity, nondiscrimination, sustainability, democracy, and social justice. Economic, social, and cultural rights enjoy a special focus. These rights are often seen as aspirational in the international realm but are crucial to address some of the deep-rooted social issues in cities, such as socio-economic inequity, poverty, and marginalization. They deal with issues such as land allocation, access to basic services and infrastructure, pollution, inclusive governance and participation, culture, security, and quality of life (UNGA 2016). Attempts to transform the city through social action have led to the development of new areas of human rights in cities – for example, the right to mobility, the right to a sustainable and healthy environment, the right to political participation on the local level, the right to health, and the right to social justice (Garcia Chueca 2016).

Software-based and computational forms of participation do not have the same implications on quality of life, community-building, and sense of belonging as face-to-face interactions.

Despite the fact that these two movements evolved through different processes by different stakeholders with distinct theoretical, ideological, and philosophical backgrounds, they are often used interchangeably in both literature and practice. Both narratives developed in the end as a response to the perception that cities have become disconnected from the people who inhabit them, that urban spaces have become abstract, and that city governments do not adequately involve urban dwellers in their decision-making processes, urban planning, and service allocation. As Mitchell (2014, 18) wrote, "[m]ore and more spaces are produced for us rather than by us." The right to the city and rights in the city movements strive to realize a human-centered approach to urban development and embody the "collective right [of urban dwellers] to reshape the process of urbanization" (Mahmud 2010, 70). In both cases, grassroots strategies and bottom-up movements led by citizens are at the front and center. Human rights in the context of the city are understood less as legalistic entitlements and more as a political ideology and plan for pragmatic action that manifests itself in campaigns, activism, protests, social movements, and multi-stakeholder negotiations. Human rights in the city are therefore not to be distributed top down, but actively made through political struggles, social relations, and the definition and redefinition of social justice, equity, sustainability, access, and inclusion of all inhabitants (Dikec and Gilbert 2002; Darling 2016; Reuter 2019). It is through human rights that urban inhabitants reclaim their cities and by which cities are transformed into human-centered spaces that impact each and every life in the urban realm.

What does this mean in the context of the smart city? Is there such a thing as the "right to the smart city" or "human rights in the smart city"? As discussed above, digitalization and smart city initiatives amplify the impression that cities "are produced for us rather than by us." Smart cities are productions of corporate–government–financial bureaucracies, and "any right to the smart city is the right to act as a consumer, if one has sufficient capital (financial, social, and cultural) to do so. It is the right to gain the benefits of smart city technologies under the logics of neoliberal governmentality" (Kitchin 2019). Smart cities benefit rich elites, leaving large portions of the city population behind. This is the critique at the very

core of the right to the city movement—namely, that cities are disconnected from their residents, focus on the wealthy, and provide spaces in which urban dwellers are involved little or not at all.

How do we change the discourse surrounding smart cities and make issues of citizenship, democracy, fairness, equity, inclusion, and justice the center of attention? How can technological solutions, information and communication technologies (ICTs), and smart city initiatives become the avenues that produce urban spaces that reflect fundamental human rights values such as non-discrimination, equality, and access for all?

A number of recent works have started to discuss human rights, ethics, and citizenship in the context of the smart city (Reuter 2019; Green 2019; Cardullo, Feliciantonio, and Kitchin 2019; Coletta, Evans, Heaphy, and Kitchin 2019; Shelton and Lodato 2019; Morozov and Bria 2018; Datta 2018; Vanolo 2014; Greenfield 2013; De Lange and De Waal 2013; Marcuse 2012; among others). Successful smart cities have to "start with people … rather than blindly believing that ICT itself can automatically transform and improve cities" (Hollands 2008, 315). The first step to making inclusion a reality is to assess the "smartness" of a city based not only on how technologically advanced the urban environment is but also on social indicators. The goal is to create a framework to address social sustainability and inclusion in smart cities, especially with respect to underrepresented groups (Hoornweg 2011; Concilio and Rizzo 2016). Human rights in the city and the right to the city can provide this framework. The concepts and language of human rights are useful in reframing urban discourse and counteracting policies that are not inclusive.

A framework for the smart human rights city includes the following key points and action items:

Prioritize addressing the complex social, political, and economic issues and resist the temptation to focus on the ones that can be solved by technology or whose goals and values align with technological solutions.

The prevalence of "tech goggles" in smart city approaches leads to simplistic perceptions and conceptualizations of reality. As Green (2019, 158) writes: "[O]verlooking or striving to eradicate the world's natural complexity leads to 'solutions' that address artificial problems and often create more problems than they solve." To address urban challenges such as mobility, for example, it is not enough to set up a smart transportation system. Mobility is closely related to inequality, lack of access, and marginalization, and recognizing barriers to transportation and structural violence relating to mobility is key to finding holistic solutions that are socially sustainable. Technology is a tool and not a goal in itself, and technology should never dictate the objective of urban policies. In the smart human rights city, technology makes urban policies and reforms more effective, but it is never the driving force. Green (2019) proposes a "tech test" for urban policy: If the same outcome was possible without the use of technology, would the policy still be innovative and the outcomes desirable? If yes, then then the technology should be adopted. If not, it is only for shine and appeal, not to effect true social change. Cities need to build data-driven economic and political models with real inputs from citizens, enabling participatory democracy to model complex decisions. McLaren and Agyeman (2015) distinguish three types of community sharing, "counter-hegemonic" (Kitchin 2019) initiatives that go beyond commercial, monetized platforms (e.g., Uber): non-profit, peer-to-peer and communal platforms (e.g., Streetbank, a citizen initiated neighborhood platform where people can share items, and Freecycle, a grassroots nonprofit movement of people who are giving (and getting) stuff for free); commercial, sociocultural (as opposed to exclusively platform focused) exchanges (e.g., Enspiral, an online idea sharing platform co-owned by a charitable company and Enspiral members) and communal sociocultural exchanges, such as sharing with friends and families. Citizens are experts of their environment, and their knowledge and input can make a difference between policies affecting real change and policies that have little or no impact.

Implement human rights in cities and acknowledge the diversity of city populations.

Civil, political, economic, social, and cultural rights mentioned in the World Charter on the Right to the City, the Global Charter-Agenda for Human Rights in the City, and other documents need to be implemented to make sure that smart cities reflect the interests of citizens rather than markets or states. The right to participation needs to be reframed to mean inclusion, access, democratic governance, and civic engagement and move beyond data-gathering, consumerism, and token participation. Collaborative organizations and citizen decision-making processes need to be prioritized over both centralized state policymaking as well as market solutions. The right to appropriation needs to interpreted as alternative form of ownership not grounded in contracts and property rights, but in a,

> "sense of belonging to a collective place […] and [a] willingness to share a private resource with the collective in order to allow other citizens to act, without infringing on other people's right of ownership" (De Lange and De Waal 2017).

The focus of human rights-based smart city initiatives needs to be giving the public opportunities and decision-making power in all aspects of urban policy, including smart city initiatives. Technological solutions need to be designed

A human rights approach to smart city policy requires that addressing complex social, political, and economic issues are prioritized over what can be solved by technology.

with human rights concerns in mind: mobility technologies address inequalities, communication technologies enhance democratic engagement, machine learning and mathematical models help underrepresented communities, monitoring technologies protect privacy and institute checks and balances on algorithmic governance and practice, data accumulation technologies produce open access and commons, etc. Inclusive smart urban policies focus on the needs and empowerment of all citizens, including underrepresented groups, and curb the impact of corporate agendas. To counteract the tendency to design for "general citizens", a greater emphasis needs to be put on the exploration and examination of diversity in city populations and ways in which differing values, identities, and experiences can be accommodated in the smart city context. The smart city needs to be reinvented through the lens of feminist, gender, queer, race, class, disability, and post-colonial perspectives and theories. A number of authors have started this process (Reuter 2019; Baskaradas and Reilly 2019; Hubbard 2018; Short 2017), but more work needs to be done in this regard. In addition, smart city approaches need to be tailored to the specific city circumstances. Smart cities in the Global South, for example, are and will undoubtedly be different than those in the Global North as extent and nature of smart cities are determined by economic resources, cultural perceptions, social structure, and political approaches to governance.

A human rights approach also includes the creation and redefinition of digital rights and technological sovereignty for urban citizens (Ribera-Fumaz 2019). Digital rights should not only allow people to access, use, create, publish digital media and internet, but also to own and access the data and to know what kind of data is gathered about them, how the data is compiled into information, and how and what it used for. Citizens then must have the ability to control what data is collected about them and challenge the uses of the data (Franklin 2019; Jorgenson 2019; Shaw and Graham 2017; Galdon 2017). In the context of the smart city, this means wide-ranging broadband internet access in all parts of the city, including in disenfranchised neighborhoods that are often overlooked by internet providers. It also means the creation of digital data commons in which municipal data can be accessed by all stakeholders, including urban inhabitants. City governments need to commit to granting citizens access and ownership by using open source technologies, retaining oversight and control of data infrastructure (as opposed to tech companies), utilizing technology without curtailing citizen rights and entitlements, and limiting aggressive data harvesting by tech companies. To achieve these aims, cities need to re-municipalize public goods and cease transferring public assets into private hands. Cities should also consider whether building and growing alternative digital infrastructures based on decentralization and net neutrality could be an option. These commitments will promote digital democracy and digital sovereignty for citizens.

To create the smart human rights city, citizens can be empowered through human rights education (Flowers 2003; Suarez and Ramirez 2004; Mihr and Schmitz 2007; Bajaj 2011). Human rights education generally involves three areas of education: education about the content of human rights; education through human rights, designed to generate changes in behavior, attitudes, and ultimately values; and education for human rights, namely, action-focused activities, such as speaking up and acting in the face of injustice (Freire 1970; Andreopoulos and Claude 1997; Bajaj 2011). Human rights education has been shown to be successful in creating a relationship between citizens, policymakers, and public servants; to reduce discrimination and human rights abuses; and to strengthen a group's cohesion and potential for social action (Bajaj 2011; Reuter 2017). For smart cities, human rights education needs to include instruction on digital rights, on access and ownership of data, on the impact of technology on people's lives, and on ways to challenge top-down governance and corporate-driven approaches.

Create a multi-stakeholder engagement process.

As I show elsewhere (Reuter 2019), a multi-stakeholder process is the most promising avenue to create a human rights-based, inclusive smart city. A human rights approach to the smart city puts urban citizens at the front and center of city policy and urban and technology development, a position they are currently lacking. From a human rights

perspective, citizens, nongovernmental organizations (NGOs), community leaders, heads of neighborhood associations, and organizations representing specific marginalized groups are the driving forces and key stakeholders in the smart city design process. They are instrumental in changing the way in which policymakers and city planners think about inclusion and serve as experts pointing out barriers to access. Inclusion of all voices must be a matter of course, not an afterthought. Direct involvement of marginalized groups in the planning, development, and implementation process of urban policy is crucial to realize effective participation and inclusion. However, lack of agency and lack of ability, knowledge, and negotiation techniques to participate in political processes has often prevented marginalized communities to be heard. An inclusive citizen-driven urban policymaking process therefore needs to focus on advocacy and capacity building to develop an understanding of the local political and economic environment, inner-city power relations, and decision-making procedures. Effective participation in multi-stakeholder governance processes requires political maturity, substantive knowledge, organizational infrastructure, and a diverse and varied skillset, including the ability to understand the motivation, goals, and inner workings of other stakeholders; to evaluate top-down and bottom-up approaches to urban politics; and to translate somewhat abstract ideas into meaningful, on-the-ground results. Citizens and NGOs will have to develop both horizontal (peer-to-peer) and vertical (with governments and other actors) relationships, creating the basis for reciprocal trust, collaboration, innovation, and community engagement. There is need for data, especially cross-sectoral and cross sectional, and a careful needs assessment in underserved neighborhoods and across the city as a whole. In the context of the smart city, capacity and relationship building will have to include the effective use of smart city technologies and best practices of collaboration, feedback generation, and co-creation of technical solutions to social challenges.

Local governments and policymakers play an important role in facilitating the citizen-driven urban design process. They provide the governance framework and the circumstances in which the dialogue happens. The will of local authorities to recognize marginalized community members as citizens with equal rights and as stakeholders is the foundation for a successful multi-stakeholder process. Inclusion requires rethinking both political culture and the nature of local leadership. If designed inclusively, smart city technologies can facilitate citizen feedback, crowdsourcing of ideas, and engaging in civic activities. City governments and policymakers are also instrumental in providing the legislation, policy framework, procurement practices, and financial resources in which an inclusive, smart human rights city can develop and thrive.

The tech industry and academia provide the technologies, tools, and scientific methodologies to make an inclusive urban design process a reality. They are responsible for research on human rights-focused urban policy and inclusive smart city solutions, training of professionals, and developing technologies in collaboration and co-creation with citizens and city governments. Engineers and computer scientists are in charge of establishing high-density wireless connectivity, remote sensing, mathematical models, network analysis, and software and technological solutions. Social scientists can guide civil society actors, citizens, and marginalized groups to become effective participants in urban policy, advise policymakers on designing inclusive policies, and measuring the impact of technological and policy changes.

A structured, purposeful citizen-driven multi-stakeholder process serves as a way of integrating and uniting these different voices for the purpose of realizing the right to the city and the creation of inclusive and accessible urban environments. This process facilitates dialogue not just among different groups representing marginalized communities but also with other stakeholders, such as governments, academia, and the ICT industry. This process also leads to higher integration of all urban inhabitants; changes the accessibility of territory, services, and spaces; and results in a redefinition of social integration of marginalized groups. It establishes ownership and empowerment, giving citizens "the right to shape the city using human initiative and technology for social purposes to make our cities better and more sustainable" (Hollands 2015, 72).

How do we change the discourse surrounding smart cities and make issues of citizenship, democracy, fairness, equity, inclusion, and justice the center of attention?

Conclusion

ICTs and smart city initiatives are undoubtedly part of current and future city life. The intertwining of urbanization and digitalization since the mid-20th century and the transformation of urban spaces into smart cities over the last decades have altered cities and city living in very profound ways. Smart cities have revolutionized city governance, administration, and operations, changed the way cities deliver services, collect information, and respond to threats, and opened new avenues for citizen participation, urban mobility, and community interaction. Computer scientists and engineers, the ICT industry, and city governments have collaborated to develop new technological solutions to urban challenges and presented the smart city as a way to improve quality of life, foster economic growth, make city administration and service delivery more cost efficient, and increase urban resilience, sustainability, and citizen involvement.

However, little attention was given initially to the social and political implications of these technological advances and potential unintended consequences. With few exceptions, social scientists have only recently started to examine how digitalization affects urban residents and life in cities and to explore the smart city as a subject of study. They have developed a number of social critiques of smart cities and enriched the STEM-driven smart cities discourse. Social scientists have pointed out the risks overemphasizing technical solutions and the issues with 'tech goggles'. They have revealed the correlation between urban digitalization and technocratic, top-down governance and demonstrated the dangers of the rising impact and influence of tech corporations in city policy making. They have pointed to the problems of privacy, surveillance, and security for urban residents and perils of smart city policies reinforcing urban divides and excluding disenfranchised communities. Most of our serious urban challenges are not technological but social, political, and economic, thus requiring solutions that are policy-directed, not technology driven.

The reoccurring theme in these social critiques is the absence of the human element in smart city discourse and the portrayal of smart cities as rational, steerable systems untouched by the complexity of humanity. While many of those promoting smart cities have become attuned with the critiques and have endeavored to make smart city initiatives more citizen-centric, many attempts have been superficial and only changed discussion, not the fundamental principles that lie behind the development and implementation of technologies and smart city initiatives. Without consideration for all humans inhabiting cities, smart city and technological approaches have the potential to exacerbate socio-economic divisions, corporate dominance, and top-down governance. Smart cities must serve people first and find their basis in the appreciation for various abilities and requirements of every person.

A human rights framework can shed light on how to achieve a human-centered smart city and use technology in a way that promotes and protects human rights, creates equitable solutions, and is mindful of inclusion of marginalized and underrepresented groups. The right to the city and the human rights city movement provide guidance on how to change the discourse and policy-making process in favor of citizenship, democracy, fairness, equity, inclusion, and justice. The 'smartness' of a city needs to be assessed not only on the basis of technological advancement but also with regards to social indicators and levels of inclusion. This is where human rights are especially useful: they have the potential to reframe priorities, set standards for measuring and evaluating urban policies, counteract procedures that are not inclusive, and monitor implementation of equitable and inclusive approaches. A human rights approach to smart city policy requires that addressing complex social, political, and economic issues are prioritized over what can be solved by technology. It necessitates that human rights – civil and political rights plus economic, social, and cultural rights – are implemented and adapted to the local level and used to guide urban policy processes. It demands that diverse stakeholders are integrated in all parts of smart city initiatives, urban planning, and policy-making, including and especially those that currently lack agency to shape the urban environment. Finally, and most importantly, a human rights approach needs to be more than mere platitudes and lip service, it needs to be truly empowering and emancipatory for city residents. City governments and the tech industry need to look for ways to empower citizens to take on an active role in shaping and defining the smart human rights city. This means relinquishing some control and to put power behind bottom-up decision-making processes. Smart cities that prioritize their residents and build on the principles of human rights, equity, and inclusion have the potential to become the leaders of smart city movements, explore new markets and innovation, and serve as front-runners in making human rights a reality for all.

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