

THE DATACRACY THREAT OF SMART CITIES

Luiz Guilherme Antunes - <https://orcid.org/0000-0003-0121-4521>

Abstract

Called “Smart City” by commercial enterprises, media and marketing departments, the fully connected metropolis risks being anything but. It is undeniable that the digitization of metropolitan infrastructures is both desirable and ultimately needed, but the way it may be performed demands consideration. A mechanistic approach, focusing mainly on databases and predictive analytics risks ignoring the subjective values that make communities lively and diverse places. Besides raising concerns about privacy and surveillance, this approach may further alienate citizens in the homogeneous bubbles of peer groups, isolating them from major structures that define contemporary urban living. It may also increase social fragmentation, inequality, intolerance and many psychological illnesses that are hard to measure, such as depression and loneliness.

Beyond data and analytics, smart city information and communications technologies approaches need to tap into the organic flows that make up a living city. This research believes it is the most effective way to turn cities into serviceable interfaces for urban development, with people at the heart of the process. The Digital revolution is less about the physical matter of cities and more about how the infrastructure and its inhabitants will communicate with each other.

But some questions remain unanswered: who owns the data accumulated by smart grids and networks?

A proprietary system may lock its client cities into expensive and ineffective policies which may reduce incentives to cultivate in-house expertise. What happens when strategic data is hosted on a propriety platform, in another country, subject to its laws? How will these new relationships work? If information is power, information asymmetries tend to lead to power imbalances. A digital information society will only be fully democratic when everyone relevant has equivalent access to the information concerning their environment. It is a very different situation than the one that is lived today, in which centralized entities know much about their users, who are instead unaware of which data is collected, how is it traded and what kind of profiles are being made with it.

Keywords: Smart Cities, Datacracy, Social Networks, Internet of Things, Datasphere.

The *datacracy* threat of smart cities

In science fiction literature of the 1950s and 1960s, the reader is frequently presented to a concept of a futuristic city enclosed by an all-encompassing “dome” that shelters its dwellers from a hostile environment, while providing them the comfort and infrastructure needed to develop a safe and productive community. These domes are no longer fiction: they already exist, invisible, enabled by the wireless Internet infrastructure that surrounds and supports most of the contemporary urban activities.

The network intelligence is now expanding to citywide infrastructure services, promising to develop a complete revolution in urban administration intelligence and planning strategies. It is undeniable that the digitization of metropolitan infrastructures is needed, but the way it may be performed demands consideration.

Such transformation is hard. Both cities and their populations are immense and hugely complex networks, with a plethora of specific demands. Digitization is to be understood as an evolutive process, never to be considered fully accomplished. Unlike wind turbines or jet engines, cities are not spinning machines. Their subjects are neither gears nor cattle, and shouldn't be treated in an automatic, impersonal, and powerless way. They seek and need empowerment, which is both a social benefit and a business

opportunity. Many are capable of creative insights that should be cultivated and harvested in a productive and socially fulfilling way.

The challenge of global urbanization

Modern urbanization is happening at an unprecedented rate. Over half of the planet population now live in cities, and this figure is predicted to rise to more than 70% by the second half of the century. It is important to remark that in the same period the human population will have increased by two billion in the same time frame¹, which means that the amount of people living in urban areas by the end of this century will be more than the total population of the planet today.

Despite wireless technologies and mobility widening the possibilities for remote work, cities are still –and there is strong belief that they will continue to be– places of bigger economic opportunities, better education, greater communal safety, wider individual self-expression, improved accessibility and better health facilities. Being such attractive poles, it is of no surprise that cities are undoubtedly the world’s engines of economic growth, accounting for roughly 70%² of global GDP.

Geoffrey West’s work³ shows that larger cities create more wealth, more efficiently, than smaller cities. That tends to attract more residents, which makes them grow bigger and accelerate wealth creation. It is a self-reinforcing process, that usually results in an ever-increasing demand for resources. Like many industrial processes, it enabled the growth of the industrialized world in the eighteenth century; it is powering the growth of cities in emerging markets today; and it is driving the overall growth in global population.

Growth is also happening too rapidly for many infrastructure services to cope. City authorities are sometimes being stretched to a breaking point in their endeavor to meet basic requirements such as clean water, adequate waste treatment and the adequate supply of energy and food.

¹ Data from the United Nations, DESA - Department of Economic and Social Affairs, July 10, 2014 <https://www.un.org/en/development/desa/news/population/world-urbanization-prospects-2014.html>

² UN data, available at <https://www.oecd.org/regional/regional-policy/44232251.pdf>.

³ Some of Geoffrey West’s ideas are condensed in a paper of BETTENCOURT et.al. (2014): *Growth, innovation, scaling, and the pace of life in cities*, published in the *Proceedings of the National Academy of Sciences*, available at <https://www.pnas.org/content/104/17/7301.short> and in an interview recorded by EDGE Magazine, available in https://www.edge.org/conversation/geoffrey_west-why-cities-keep-growing-corporations-and-people-always-die-and-life-gets

To make matters worse, cities are far from efficient. Contrary to the commonly held belief that densely populated urban areas should be more sustainable than less concentrated rural settlements, for everything is closer together, cities account for more than 75% of the consumption of non-renewable resources, and create around three quarters of global pollution⁴. Buildings alone account for nearly 40% of the total energy consumption in the United States, including 70% of the country's electricity, and 38% of carbon emissions⁵. With a global population explosion underway cities face the challenge of becoming unmanageable. In some places this already happened⁶.

In a context of global mobility, cities strive to differentiate themselves, emphasizing their economic, cultural, physical, sometimes even climatic advantages. But they shouldn't be regarded as consumer products, but living environments that have to develop efficient urban design and management of core services.

Too many smart city visions concentrate on big data and the Internet of things, despite facing more urgent problems⁷. Billions are spent on relatively conventional development and infrastructure projects that aren't particularly "smart", but mere updates of eighteenth century structures and values. City management have yet to turn their experience to date into prescriptive, re-usable guidance, capable of supporting city-level objectives such as wellbeing, social mobility, economic growth and infrastructure resilience.

Some of the most transformative programs in recent years have been inspired not by technology, but by better thinking: bicycle sharing programs; rapid transit systems; livable-streets movements; and carpooling initiatives are among many programs that may not depend exclusively on sensors and computers. Even when they incorporate latest technologies, they don't stem from them.

One of the best examples of enhancing a city quality of living with better policies is Medellin, in Colombia, site of innumerable gang murders a few decades ago. Its

⁴ KAMAL-CHAOUÏ, Lamia, ALEXIS Robert (eds.) (2009), *Competitive Cities and Climate Change*, OECD Regional Development Working Papers N° 2, 2009, OECD publishing. Available at <https://www.oecd.org/regional/regional-policy/44232251.pdf>

⁵ According to the U. S. Green Building Council, in a report available at <https://www.eesi.org/topics/built-infrastructure/description>

⁶ In 2013, the 11 million people of the Chinese city of Harbin were forced to face a citywide shut down due to poor air quality, reported by Reuters in <https://www.reuters.com/article/us-china-smog-idUSBRE99K02Z20131021>

⁷ Several urban administrations are exploring data dashboards and citywide sensing projects to address issues around traffic congestion, when what they really need is an improved public transport system, according to the June 2015 NESTA Report "Rethinking Smart Cities From The Ground Up", available at <https://www.nesta.org.uk/report/rethinking-smart-cities-from-the-ground-up/>

problem favelas were reintegrated into the city not with smartphones but with publicly funded sports facilities and a cable car connecting them to the city.

This research believes that a true smart city project should neither be technophile nor technophobe, for these represent a narrowing of vision that may overlook critical problems with straightforward and lasting solutions.

Smart Cities: dataspheres

Cities are networks per excellence. The usual structure of concrete, glass, and steel conceals a vast underworld of water mains, sewage pipes, subway tracks, telephone lines, and electrical cables, creating a versatile infrastructure for controlling the physical world. Many refer to the digitization of this infrastructure as the fundamental process to make a city “smart”. The Institute of Electrical and Electronics Engineers⁸ has a vague definition of such urban environments:

A smart city brings together technology, government and society to enable the following characteristics: smart cities, a smart economy, smart mobility, a smart environment, smart people, smart living, smart governance.

Such a definition is too unclear to be taken into account. It is not the only one, rather the opposite. While it is widely believed that a smart city is one in which the structures of the various urban systems are made clear, simple, responsive and malleable via contemporary technology and design, there is little more than that for such a complex system to be understood. Definitions like the one from the design and consulting firm ARUP⁹ suggest an ambiguous user participation:

Citizens may or may not be directly informed about the relationship between their activities and the wider urban ecosystems, but are actively encouraged to see the city itself as something they can collectively tune, such that it is efficient, interactive, engaging, adaptive and flexible, as opposed to the inflexible, mono-functional and monolithic structures of many 20th century cities. Even the Smart Cities Council defines such environments as ones in which

⁸ Available at <https://ieeexplore.ieee.org/document/8559763f>

⁹ Available at https://www.arup.com/-/media/arup/files/publications/s/arup_smartcities_june2011.pdf

*[U]ses information and communications technology to enhance its livability, workability and sustainability by collecting, communicating and crunching data within and across departments and third parties.*¹⁰

Despite the wide media coverage that the subject of Smart Cities have been received in the latest years, there seems to be little consensus on the matter. In fact, the combination of city infrastructure and telecommunications revolution can mean just about anything. The reshaping is so broad, deep and ongoing that it's practically impossible to list all ways technologies can (and will) reshape what cities and their inhabitants will be able to do.

Despite the vague definitions about the role of citizens on these applications, one thing is certain: information and communications technologies are at the core¹¹ of a Smart City, integrating its assets –such as schools, libraries, transport, amenity spaces, utility plants and distribution networks –and services –such as governance, procurement, land use planning, urban density management, water supply, waste management, health and law enforcement integration– in order to build modern urban spaces fit for their main stakeholders (namely Government, Business and Citizens) in their many changing interactions, ensuring demand and supply matching.

Cities should be optimized for sustainability, scalability, flexibility and resilience over extended time frames, while also becoming more resilient to natural disasters or unexpected situations. It's a very big promise. Since the industrial revolution nothing on this scale has been proposed. While the European Union has devoted many efforts on devising a strategy for achieving 'smart' growth for its metropolitan regions¹² under what it calls "Europe's Digital Agenda", such transformation demand a lot of consideration. They not only require an unprecedented investment, but also a profound change in the relationships among the government sectors, the commercial enterprises and the general public.

The term has become so popular and commercially user that municipalities of many sizes, development rates and urban concerns –a group as diverse as Southampton, Manchester, Amsterdam, Barcelona, Helsinki, Rio de Janeiro, Stockholm, Taipei,

¹⁰ More definitions at <http://www.smartcitiescouncil.com/>

¹¹ According to BSR, Business for Social Responsibility, a global non-profit organization. Statement available at <https://www.bsr.org/en/our-insights/blog-view/my-wish-list-for-the-information-and-communications-technology-industry>

Glasgow, Calgary, Seoul, New York, Tehran and Singapore¹³– is already claiming to be among the first to implement “smart” technologies, “smart urbanism” or “digital urbanism”.

To make the processes clearer, the Smart Cities Council released its framework, the Smart Cities Readiness Guide¹⁴ which maps relationship between city's responsibilities and seven “ICT enablers”: Instrumentation and Control, Connectivity, Interoperability, Security and Privacy, Data Management, Computing Resources, and Analytics. These enablers, according to the same report, would be responsible for managing what they call the “nine city responsibilities”. The list is quite comprehensive, regarding:

1. **Built environment.** Buildings, parks and public spaces;
2. **Energy.** Powering services, needs, processes and comfort;
3. **Telecommunications.** For people, businesses and devices;
4. **Transportation.** Streets, vehicles, railways, public transportation, air and maritime ports. Systems related to urban mobility;
5. **Health and human services.** Provision of health care, education and social services;
6. **Water and wastewater.** Collection, distribution and recycling. Pipes, distribution centers, treatment facilities, stations, plants;
7. **Waste management.** Collection, distribution, reuse and recycling of waste materials;
8. **Public safety.** Police and fire departments, emergency and disaster prevention, courts and corrections facilities; and
9. **Payments and finance.** Government services, consumers, businesses, banks, payment instruments providers.

¹² KOMNINOS, N. (2009, p. 339)

¹³ Wikipedia has an updated list of “flagship cases” available at https://en.wikipedia.org/wiki/Smart_city#Flagship_cases

¹⁴ Available at <http://readinessguide.smartcitiescouncil.com/>

The digitization of these infrastructure technologies will generate huge quantities of data, much of it in real-time and at a highly granular scale. The efficient combination of these systems is, therefore, far from trivial. Many variables have to be taken into account, including interdependencies between agents, partial observability of a living environment, unpredictability and non-deterministic nature of actions, management of vast amounts of information and issues related to imperfect communication, data gathering and its interpretation.

This whole situation in which cities may become a new form of huge social media networks for sharing information between humans and machines, is very recent. It is not clear how will the millions of networks in thousands of cities interchange information among their multiple agents. Urban citizens are beginning to live in a “datasphere”, a dense data layer that surrounds the planet like its ionosphere, layer that is denser in urban areas. It can be represented, following the model proposed by anthropologist Arjun Appadurai¹⁵, as an invisible environment, a virtual data landscape rich in information, cultural and social data.

Harnessing multiple layers of big data to create dynamic urban models, that change in real time and have their performance assessed against specific criteria is a dangerous bet. If successful, the knowledge and insight it creates may become a powerful managing and intelligence tool. Perhaps too powerful to be handled by current social systems.

The urban OS

At present many infrastructure systems operate in functional silos, with their own specific hardware and software, operated by companies with specialist knowledge¹⁶. In a smart city a single, shared control system could avoid duplication and provide a richer picture of what is happening; enabling more informed decision-making and more rapid deployment of measures to deal with emerging situations. This “urban operating

¹⁵ According to anthropologist Arjun Appadurai, the global cultural economy can be characterized by disjunctive flows, or ‘scapes’. In his research he has identified five of them: *ethnoscapes*, flows of people; *technoscapes*, flows of machines; *finanscapes*, capital flows; *mediascapes*, image and media flows; and *deoscapes*, ideological and idea flows. Some of his ideas can be found at <https://eclass.aegean.gr/modules/document/file.php/SA200/Appadurai%201991.pdf>

¹⁶ BORLASE (2012, p. 337)

system” would be akin to operating systems used by the computer industry, most probably employing a layer of middleware between the various city infrastructure hardware devices and the operational software of its control applications.

It is an abstraction with unprecedented power upon its subjects. Through information, education, persuasion, coercion or force, it can change citizen behavior and enable rulers to spot opposition. It is not clear what may happen when so much power is yielded to a single, central operator. How can one be sure of the legitimacy of its goals? It can quickly become very dangerous, turning into a condescending, paternalistic, and even dictatorial arrangement, depending on the values built in or emerging from the system.

When users don't come into contact with the operating system, but merely reap its rewards, the result is its obfuscation. Their operators quickly become familiarized with its responses, assuming it is the “new normal” and start to depend on its recommendations without questioning their purpose. In a political system, this may eradicate any political opposition.

Citizens mustn't be treated like children. Some core civic values, like diversity, engagement, serendipity, personal and civic responsibility have to be a part of the smart city vision, embodied formally in its interfaces. If successfully implemented, these interfaces could enable governments and opposition parties to prototype new versions of themselves, meanwhile giving citizens these same tools to investigate urban power structures and access to resources. If something like a “big brother” has to exist, it must watch the government and big corporations, rather than ordinary people.

Besides that, what may happen when/if it goes wrong? Slightly wrong, enough for a long-term damage, but not noticeable in everyday business, like a bad medicine? How to respond whether some parts of it are hacked? Or if it suffers a systematic failure? How to deal with fraud or access to privileged information? Will the savings resulting from the rise of efficiency be enough to pay for the growing cost of security? What types of governance models are appropriate for smart cities and how to measure their success? Current systems boast efficiency, optimization, predictability, convenience and security. It is important to remark that, despite these things being of great value to make a city bearable, they don't make it necessarily valuable.

Not everything is measurable

Despite the natural resistance to robotizing, research in data science has shown¹⁷ that it is possible to examine human behavior in a way that is similar to the scrutiny of many social colonies, like bees or ants. Unlike insects, however, human activities are (mostly) not determined by instinct. Unobservable, human thought is said to be unpredictable and based on personal choices. But the very act of making a lot of decisions demands a great cognitive effort, so the average human being ends up resorting to everyday habits and heuristics. The sensation of free will is, for most people, much bigger than its true reality. Data collected by some social experiments show that the deviation from average is so rare that can be considered almost a statistical fluctuation.

In retrospect, the recurrence of behaviors is surprising but, in a way, expected. It is easy to imagine that people's mood tends to be worse while stuck in traffic, the same way it is usually happier in holidays and weekends. Despite being useful to pinpoint the issues that excite or annoy most people, it cannot be used as a true window to personal feelings.

There are some aspects of personal lives and of cities that are not, and will probably never be¹⁸, machine-readable. Affect, beauty, empathy, creativity, boredom, loneliness and stress, for example, are feelings too complex and personal to be translated, interfaced or fitted into patterns. Likewise, some dimensions of human experience about the world cannot (and should not) be quantified.

It is not clear how will systems adapt to the vagaries of human behavior and still deliver the promise of high efficiency. There is nothing stated in a quantitative approach that makes it immune to biases, rather the opposite: it is not uncommon to make assumptions and justify decisions based on data reports. It is a way of thinking that may lead to serious dangers, including the misinterpretation of data sets; algorithmic shortcomings ending up in systematic errors; coincidences understood as correlations; and interpretation biases towards finding data points that reinforce beliefs¹⁹.

¹⁷ The idea is developed in PENTLAND (2015)

¹⁸ Galloway (2012, p. 91)

¹⁹ There are a series of interpretation biases that should be taken into account when interpreting large datasets, like the *Texas Sharp Shooter* fallacy, described in <https://academic.oup.com/lpr/article/8/3/257/926184?login=true>

The Technopoly risk

POSTMAN (1992)²⁰ devised a classification of cultures regarding their relationship to the tools they use in three categories: Tool users; Technocracies; and *Technopolies*. According to the author, until the Seventeenth century all societies were of the first kind, with slight variations regarding available tools and their use. Tools weren't capable of altering the dignity or integrity of a culture. New tools weren't intruders, for they were integrated to community values. In *technocracies*, tools become central in the world view. Foreigners to the culture, they become their antagonists, trying to take the leading role.

According to the author, along the nineteenth century technocracies were well under way. The most popular of their inventions was the very idea of *invention*, the belief that if something could be done it must be done. This new relationship to tools start to question the old community values with new, industrial ones, like objectivity, efficiency, specialization, standardization and measurement. It is not said here that these values are wrong, for most of them were essential to achieve technological development. But that they are not absolute, and shouldn't be applied to all relationships, especially human relationships. The fascination with technology, in the form of Technocracies, contributed to the demise of traditions, achievement of civil liberties and society modernization. But it also created a culture of constant rush, marketing and competition which contributed to turn citizens against each other and transform the ones once considered unfortunate to mere "losers" in the "game" of life.

In 1911, Frederick W. Taylor published *The Principles of Scientific Management*²¹, one of the first formal draft of what a *technopoly* might look like. It says the main, if not only goal of human work and knowledge is to be efficient; that human judgment, being unclear, fallible and complex, shouldn't be trusted; that subjectivity is in itself an obstacle to be surpassed; that what couldn't be measured shouldn't be taken into account; and that citizen issues would be better left to specialists. Despite being proven ineffective as a management practice²², it still is widely practiced in sweatshops and third world factory processes.

²⁰ POSTMAN (1993, loc. 47)

²¹ Available at <http://www.gutenberg.org/ebooks/6435>

²² See MAIER, Charles (1970) *Between Taylorism and Technocracy: European Ideologies and the Vision of Industrial Productivity in the 1920s*, Sage - Available at <https://www.jstor.org/stable/259743>

Postman defines a technopoly as being a form of technocratic totalitarianism, whose greatest output is information. Its followers tend to believe that most of the world's problems could be solved by the gathering of information, despite the reality of contemporary famine and wars not happening due to lack of data²³. In this regime the very idea of Information distances itself from significance or purpose and starts to appear by itself, addressed to no one in particular, in great volume and velocity. It is, by no coincidence, a way of thinking that replaces the main communal goal of human development with commercial success and technological progress.

The main risk of trusting social, ethical, moral or political issues to a bureaucrat, albeit human or technological, is its indifference to any concerns outside its area of specialization. Subjects in which efficiency is not a measurable value, like citizenship, education or human relationships tend to be ignored. When situations arise demanding some flexibility in the established rules, the results tend to be disastrous.

Despite all their potential, new technologies can't solve essentially political questions about power and rights. Given the complexity of these networks, and the profound implications their algorithms can have for their urban "subjects," a democratic system should give its inhabitants means of looking inside its black boxes, even tinkering with its underlying algorithms. It should enable friendly interfaces that allow everyone to monitor those aggregators and protocols, and even deeper levels of the urban stack, including its code and hardware. This kind of empowerment intelligence, like democracy itself, is an ongoing process, never to be considered finished. Cultivating it requires well-managed tools, regulations, and processes in addition to a general cultural outlook, for, in most cases, it is a social experiment as much as an economic one.

The Datacracy threat

Contemporary world views and institutions were shaped in a different era, a time with less people and more abundant resources to manage. That world demanded less decisions, happening in a slower, less connected pace. The origin of contemporary society began in the late 1700s, and took its final shape in the first half of the 20th

²³ POSTMAN (1993, loc. 298)

century. The accelerated urban growth which happened after the industrial revolution created social and environmental problems similar, in a way, to the ones faced today.

The solution envisioned at the time was the development of what became defined as “modern” cities, with centralized distribution networks of drinking water, sanitation, energy and transport. The substantial funding of infrastructure enabled the growth of commerce, health, policing, education and services, adapting their practices to the emergent values of the industrial revolution, among them the concepts of mass production and efficiency. It was the same period in which the most important social simplifications used today, like the ideas of markets and socio-political classes²⁴ were shaped.

Many of the urban stress and social problems emerge from a way of thinking developed in the modern city, whose scale gave rise to bureaucracies and processes that led to the objectification of relationships. In hyper connected times, these industrial values are frequently challenged, both by new, “disruptive” business models²⁵ and by citizens themselves, who increase their power of free speech and manifestation through social media.

The industrial way of thinking that tries to fit social institutions into mechanical models is not only outdated. It is also inefficient, and it tends to create power imbalances and organizational shortcomings which, like most of the cities infrastructure components are in urgent need of revision. These days that the ubiquitous flow of data surrounds everyone, changing the very nature of what has been formerly known as identity, privacy, safety, culture, education, citizenship and entrepreneurship. The social animal is gradually being blended with the machine. It makes little difference that the fusion is more of a functional nature than of a physical one.

Immersed by the swarming flow of data while becoming themselves data sources, urban citizens are witnessing the transformation of the traditional and civic regimes into “Datacracies”, in which databases play an ever growing role in decision-making administrative processes. New quantitative social sciences, using computational theories to prevent social interactions can detect anomalies, compare scenarios and adjust variables to help building a better management.

But the mere digitization can't in itself rule out all cognitive obstacles both rulers and Internet users face today. Despite very useful assisting the rational decision making process, Big Data results can, when misguided become instruments of control, repression and retaliation. A decision can only be strategic when it is taken from valid data in an equally valid context. Whenever any of these conditions is not valid or cannot be verified, the result is, at least, irrelevant.

Digital algorithms, like all human-made codes, can bring in themselves strong ideological components, which, masked within technical structures, can be hard to recognize, understand and resist.

By joining fields as diverse as Economy, Sociology, Psychology and Mathematics, social sciences are due to a complete transformation. New decision-making processes may be able to see beyond classes, professions, neighborhoods and parties to develop a *datacracy*, that helps avoiding future crises.

But for such regime to be achieved it is fundamental to assure that data will not be misused. The power is big, and the temptation to abuse it can be even bigger. Future *datacracies* can be meritocratic, bureaucratic or even technocratic, but it has to be defined and sustained by a strong institutional and legal system, capable of protecting individual liberties while enabling full transparency.

Balancing social powers

Cities nowadays provide an environment that is far from engaging. The overall crises and a growing income inequality are leading to a greater gentrification, which means, in many cases, the privatization of public areas, that become more fortresses than places of heterogeneous humanity, because they are meant only for specific classes of people. One class to be served, the other to be surveilled and contained.

Since ancient Egypt, pharaohs and religious leaders know that there are few better crowd manipulation tools than the collective illusion of omniscience and omnipotence, usually attributed to external entities, like gods, spirits or machines. Free from ethical

²⁴ Respectively, the theories of Adam Smith and Karl Marx

²⁵ Companies like *AirBnB* and *Uber*, that, by enabling collective affiliation, disrupt traditional hotel and taxi businesses.

and moral constraints, these entities are free to act in a way above the human race, therefore fit to rule over it. Ubiquitous computers bring with them the illusion that all areas of human endeavor can be controlled.

According to this frame of mind, the individual user would cease to be important, becoming a mere node in a huge network, whose main task would be to keep it stable. It is a very dangerous and alienating simplification, displacing citizens from their protagonism to a mere supporting role in a digital democracy.

The smart city can't be a present-day, redesigned, digital suburbia. This privatization of public spaces in the city has deep significant implications for equity, democracy and rights. Many experts and planners fear that new smart cities may become governed by powerful corporate entities that could override local laws and governments. In a monograph for a conference on smart cities in Mumbai in January, economist Laveesh Bhandari²⁶ described smart cities in India as “special enclaves” that would use prohibitive prices and policing to prevent “millions of poor Indians” from “enjoying the privileges of such great infrastructure”. He states:

*In their present form, India's smart cities are rechristened Special Economic Zones business-friendly zones exempt from taxes, duties and stringent labor laws. They are subject to a form of “privatized governance”, due to a constitutional amendment that renders local governments powerless.*²⁷

There is no single solution for ensuring that the benefits of creating smart cities are achieved while negative effects are neutralized. Like all dynamic systems, a smart city demands a multi-pronged approach, applying a suite of solutions, some of which are market driven; some more technical in nature; others policy, regulatory and legally focused; and some governance and management orientated. It is widely stated that the citizen should also play a strong role in this setting, despite rarely described how this action should take place. In most of the planned solutions the citizen loses agency²⁸, while regarded as a mere user or consumer of services, with little to no involvement in

²⁶ India's SPECIAL ECONOMIC ZONES ACT, 2005, available at https://www.indiacode.nic.in/handle/123456789/2042?view_type=browse&sam_handle=123456789/1362#:~:text=India%20Code%3A%20Special%20Economic%20Zones%20Act%2C%202005&text=Long%20Title%3A,connected%20therewith%20or%20incidental%20thereto, allows for exclusion rules in the new planned Smart Cities.

²⁷ Available at <https://www.dropbox.com/s/fr1h3m7d42mv9a/smart%20cities.pdf>

its design or dynamics. The alienation of the general public from public spaces, along with its deep implications for equity, democracy and rights, also stifles innovation, creativity and diversity.

Modern technologies may enable urban citizens to retrieve information about the mechanisms and invisible infrastructures that make the city work and suggest new approaches. The more visible these interfaces and their interaction are, the easier is to call attention to underrepresented populations and urban problems that are filtered out of whitewashed and abstracted city renderings.

Urban interfaces can be used to educate citizens about the nature of government and urban management: their data gathering and analysis methodologies, visualization politics, and the algorithms that lay behind the urban operating system, developing a vision everyone can understand and contribute to. But what role will the citizen play? That of unpaid data-clerk, voluntarily contributing information to an urban database that is monetized by private companies, who takes the city for granted, a fate to be endured? It is a false, dystopian abstraction, to consider urban population as smoothly moving pixels, traveling sheepishly to work, shopping malls and home, visible, measurable and controllable on colorful three-dimensional graphic display. Like all human beings, citizens should be rightfully regarded as unpredictable sources of disorderly demands and assertions of rights.

Every new tool changes the way its users think about the world, as well as the object of thought itself. The printed word helped to define abstractions while also widening the borders of thought. Newspapers shrank the world, which was also shrunk by the telegraph, the telephone, the World Wide Web, social media and smartphones. At each innovation, cultural prophets debated whether society was standing before an utopia or a technological apocalypse. Neither has happened so far, but the powers are stronger than ever. If the amount of information generated makes ubiquitous measurement and surveillance unavoidable, the design of actionable interfaces can act like a citizens' lookout tower.

²⁸ The concentration of power and its risks for democratic participation is raising concerns around the world. Some considerations can be seen at KOTKIN (2016) and WAKEMAN (2016)

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