10/2016

Algorithmic Governmentality, Smart Cities and Spatial Justice

Nuno Rodrigues

Abstract This paper deals with the forms of governmentality emerging from various technological changes, particularly with projects related to smart cities and digital technologies. Firstly, the relationship between governmentality and digital technologies will be introduced and explored, looking at issues such as the possibility of an algorithmic governmentality and the role of technique and technology. The following section will provide a critical approach to current smart city projects, focusing on a contextualization and a genealogy of these projects, and on the forms of governmentality that they express. The paper ends with an exploration of the challenges and potential risks inherent to the forms of algorithmic governmentality present in smart cities, such as the possibility of spatial injustice.

Keywords: Governmentality, Algorithmic Governmentality, Technology, Smart City, Spatial Justice

Introduction

The effects and the central role that digital technologies hold has recently renewed and brought to the agenda the discussion of the relationship between society and technology, including the forms of governmentality that could emerge, or the forms of territorialization associated with them. This isparticularly exemplified with the case of so-called smart cities.

For Rob Kitchin (2014: 1-2), a smart city is the combination of, on the one hand, a ubiquitous and pervasive form of computing that monitors the city, and, on the other hand, a vision and a strategy for the city where one can observe the adoption of forms of governance and economic practices targeted for innovation, creativity and entrepreneurship. For this author, these two

dimensions are part of a neoliberal “ethos” which gives primacy to the market and the search for technological solutions to the governance and development of the city. This description of a smart city, to be explored subsequently, leads to the question of whether these dimensions are in line with an idea of spatial justice: this article will explore whether the current forms of implementation and use of smart cities make possible the existence of a fair and equitable distribution, in space, of the multiple and socially valued resources, as well as the opportunities to use them (Soja 2009: 2).

Firstly, I will synthesize Michel Foucault´s proposal regarding governmentality, before relating it to newer approaches, with the intention of updating this proposal due to a diverse set of technological changes. Following this, an exploration of the question of technique and technology will be made based on the contributions of the philosophy of technology, criticizing the positions that take them as something neutral and merely instrumental. I will stress instead its mediating and productive dimension of relations and worlds. After this theoretical review, the intention is to discuss the smart cities as historical projects, and what this project means in terms of governmentality faced with current hegemonic projects and assumptions. Finally, the relationship between smart cities and spatial (in)justice will be discussed, whilst relating to the theoretical discussion related to the text.

Governmentality

The reflection on governmentality, as introduced by Foucault, can be summarized as a reflection on the "art of government" in a historical perspective, referring to a process of "governmentalization of the state" which marks the history of Western modernity and had impacts at various scales. These include the territory, the bodies of individuals or the population as a whole. At the core of this issue lies the relationship between the "arts of government" and the economy. Foucault's questioning highlights how occurred the "introduction of the economy" in the realm of "practical politics" and of "State reason", changing the very meaning of the word "economy": it has

become a way to exercise power seen here as a "field of intervention" in the "real world" aiming at a "certain disposition of things" that uses and follows the model of the economy[1], as well as a particular "convenient end". It is this "certain disposition of things" and "convenient end", and no longer the exercise of power in a territory and its inhabitants, which, according to Foucault, marks and leads to a distinction between government and sovereignty (Foucault 1994: 208-210). For Foucault, this transformation implies the emergence of a new definition and purpose of government, now defined as the correct means of the disposal of things in order to lead not to a common good, but to an end considered "convenient" for the things that will be governed. This change leads to an alteration in the relationship between means and ends, given that, while in the case of sovereignty the instrument was the law, in the perspective of government it is no longer the law but the "disposition of things" that prevails. This in turn implies the use of certain tactics to get a certain arrangement of things and certain purposes (Foucault 1994: 211). This change impacts the practice of government, giving rise to various government apparatuses.

This change, which should not be taken as a complete rupture, is contemporary of a set of general processes occurring in the eighteenth century and which Foucault characterized as the "emergence of the problem of population" - processes such as population growth, the increasing abundance of money/currency, the expansion of agricultural production, among others -, processes and their effects which the "art of government" should be able to

1"The things, in this sense, with which government is to be concerned are in fact men, but men in their relations, their links, their imbrication with those things that are wealth, resources, means of subsistence, the territory with its specific qualities, climate, irrigation, fertility, and so on; men in their relation to those other things that are customs, habits, ways of acting and thinking, and so on; and finally men in their relation to those still other things that might be accidents and misfortunes such as famine, epidemics, death, and so on." (Foucault 1994: 208-209).

overcome, to respond to and to manage[2] (Foucault 1994: 215). The art of government is replaced by a model positing the population as a model, at the same time that the population emerges as the "ultimate end of government"[3]: unlike sovereignty, whose purpose is the government itself, the government shall be directed towards the welfare of the population, the increase of their living conditions, the increase of wealth or longevity, and the analysis and the means used by the government are immanent to the population (Foucault 1994: 216-217). Thus, the population is to be taken as an object. It should be under the scrutiny of the government, and, from there, the government should build knowledge about it in order to be able to govern it – thereby making inseparable the knowledge creation processes of government, and the knowledge of the processes related to population, i.e. the relationship between population, territory and wealth (Foucault 1994: 217).

Foucault ends his presentation by introducing the term "governmentality", which involves three dimensions:

2 As will be explored through Agamben (2015) – in turn, influenced by Foucault - this change is associated with the reversal of causes and effects that emerges with the economic thinking of François Quesnay and the Physiocrats, and that sets up a cybernetic model of government.

3 A questioning which refers, in part, to the issue of biopolitics and for the change from disciplinary societies to societies where there is a predominance of devices and mechanisms of security. As regards Manuela Cunha, the apparatus of security calculates probabilities, risks and costs, something that "implies considering individuals in a series, as a population" (Cunha 2008: 75). Population is to the societies of security what individuals are to disciplinary societies, and what territory is to societies of sovereignty. The security apparatuses "follows the population in their own dynamic", in an immanent way, and the action of governments "appears as necessary and sufficient to the overall balance" (Cunha 2008: 75). However, and as mentioned above, this passage should not be viewed linearly and as total rupture, but rather as a reconfiguration of society and the forms of governmentality through the relationship between different apparatus and population: "Accordingly, we need to see things not in terms of the replacement of a society of sovereignty by a disciplinary society and the subsequent replacement of a disciplinary society by a society of government; in reality one has a triangle, sovereignty-discipline-government, which has as its primary target the population and as its essential mechanism the apparatuses of security." (Foucault1994:218-219).

"1. The ensemble formed by the institutions, procedures, analyses, and reflections, the calculations and tactics that allow the exercise of this very specific albeit complex form of power which has as its target population, as its principal form of knowledge political economy, and as its essential technical means apparatuses of security. 2. The tendency that, over a long period and throughout the West, has steadily led toward the preeminence over all other forms (sovereignty, discipline, and so on) of this type of power-which may be termed "government"-resulting, on the one hand, in the formation of a whole series of specific governmental apparatuses, and, on the other, in the development of a whole complex of knowledges [savoirs]. 3. The process or, rather, the result of the process through which the state of justice of the Middle Ages transformed into the administrative state during the fifteenth and sixteenth centuries and gradually becomes "governmentalized." (Foucault 1994: 219-220).

Algorithmic Governmentality

The hypothesis of a form of algorithmic governmentality forces, at first, to question the existence of a form of governmentality that no longer holds political economy as its means of operation – or, at least, as its privileged means of action - but, instead, operates via digital technologies, and in particular algorithms. However, for reasons of space and in order to follow the initially proposed objectives, of this article, the exploration of this hypothesis - that of a total rupture of a particular model of governmentality for another - will be explored in another text.

Deleuze (1990) in his hypothesis concerning societies of control (somewhat equivalent to Foucault"s societies of security), made a proposal that would, at least in part, in the sense of combining economic and algorithmic governmentality - and not a rupture between the two - Deleuze claims that to each historical context and each society corresponds certain technologies/machines, to which corresponds specific social forms and relations, - although he affirms that technology should not be taken in a

deterministic way, but rather as an expression of the social forms capable of generating them and using them, thus stressing the importance of taking into account the remaining historical and social context (Deleuze 1990). In the societies of control described by Deleuze, these correspond to the computer and the code, which is the "numerical language of control (...) that mark access to information, or reject it." (Deleuze 1990: 5). At the same time, the dichotomy of the individual and masses is blurred, leading to the emergence of the "dividuals" in place of individuals, while the "masses" become "samples", "data", "markets", or "banks" (a list that leads to the idea of statistical patterns and to a certain "objectification" of the real, something to be explored later). Furthermore, the subject of the society of control "is undulatory, in orbit, in a continuous network" (Deleuze 1990: 6).

These hypotheses foster a discussion that tends to intensify, particularly in the debate focusing on the forms of governmentality related to the technological and historical transformations already highlighted, a debate still marked by the influence of Foucault.

For example, Matteo Pasquinelli (2015) talks about the emergence of an "algorithmic governance", which constitutes a new "epistemic space" and involves two functions/dimensions: 1) the recognition and analysis of regular and common patterns from data correlation – even those that, from the start, would not have a meaning or relation to each other. This includes data of different dimensions used to identify and control not so much a specific individual, but rather the common characteristics and relationships between different individuals, for a subsequent construction of meaning from that knowledge and analysis. This enables the creation of profiles from different subjects/social groups to which are associated some possibilities and duties that are intended to structure;

2) the detection of "abnormal", of something or someone that is not in conformity and/or is deviant in relation to a given pattern previously identified. That is, deviant in relation to what is taken as "normality": it becomes possible

to identify the "abnormal" in relation to this pattern alone and thus pay greater attention to it as well as design an intervention.

Pasquinelli points out that, given the inherent complexity of the technical and mathematical dimensions of the algorithms and of the size and diversity of data, the only possibility of constructing meaning from this enormous collection goes through these two dimensions: pattern detection and the detection of "anomalies" in relation to these same patterns. The combination of these two dimensions refers to the relationship between societies of security (or control) and disciplinary societies: as several authors point out (Foucault himself being the first), it is not so much a rupture between the two, but rather the subsumption of the techniques, mechanisms and disciplinary apparatus in the societies of control/security. Thus, on the one hand, it is an attempt to control the population as well as social relations. This is not so much achieved by acting on the body of individuals, but rather by the identification of what "normal relations between individuals" are - an identification made in an immanent way, to society itself, that is, by identifying common/"normal" patterns in society. On the other hand, it does not dispose of disciplinary measures, though now directed at what is considered "abnormal" in relation to the common pattern.

Antoinette Rouvroy (2013) explores how the subjects and the physical world are taken as "objects of observation, classification and evaluation" by automated systems, as well as their possible impacts. Based on Foucault's analysis of power and following governmentality studies, the author focuses on how the physical world and the subjects are taken as visible, endowed with meaning, evaluated and produced, and how, from such practices and processes, forms of governmentality emerge that seek to steer subjects or certain social groups. Hence the phrase "conduct of conducts", taken as "modes of action, more or less considered and calculated, which are designed to act on the possibilities of action of others", according to a conception seing government as the "structuring of the field of possibilities of action of others" (Rouvroy 2013: 7). To Rouvroy, and somewhat similarly to Pasquinelli, the forms of governmentality of

these types of automatic computation[4] assume a mode of statistical intelligibility that implies the non-selective collection of as much information as possible – although, at least a priori, independent of a specific purpose, of a use that would be possible to anticipate prior to its collection. So, for this author, with automatic computation an epistemic change in terms of the relationship with the "real" occurs. It marks the passage from a "perceptual regime and visibility" which is essentially deductive, to another, inductive in its logic, where the causes of phenomena become indifferent but only in the sense that it can emerge from the statistical correlations between different dimensions. According to Rouvroy, it is a form of governmentality based on prediction, and it reinforces a governmental rationality marked by contingency. Predictability, stability, security and the control of social conflicts replace the need to identify and to act in according to the resolution of the causes of the phenomena[5]

4 Automatic computation is often justified for what it "promises" to solve: "Ubiquitous and autonomous computing, multimodal observation, ambient intelligence and all these new technological *infrastructures* purporting to make our life safer, easier, more efficient and enjoyable are the next step in the colonization of the physical world by digital technology. They enrich our daily life cognitive experience with dynamic and individualized informational content. Their celebrated capacity to detect, sort, evaluate and, most importantly, predict our desires and preferences, needs and propensities, and to customize and adjust deliveries, services and offers to our individual profile as if it knew us better than ourselves spares us time and discomfort." (Rouvroy 2013: 11-12).

5 It is a reflection that relates to others, also of Foucault's influence, such as the characterization presented by Agamben of the forms of modern governmentality and of the current societies of security, which are based on an inversion of the relationship between causes and effects, taking for granted that the aim of the government is no longer to solve and intervene on the causes, but govern and manage the effects, according to a logic that is considered to be more secure and useful from the government's perspective (Agamben 2015). For Agamben, this transformation means that while the causes require to be known, the effects can only be checked and controlled. An example of this reversal is the extent of security techniques, particularly the biometric ones which have been boosted by the advent of digital technologies extending into everyday life.

(Rouvroy 2013: 13). However, this automatic computing has various epistemic limitations[6].

These forms of governmentality are also explored by Josh Scanell (2015), who states that the predictive logic which is becoming hegemonic intends to operate and control "future actions". It tries to govern the "ungovernable", and to structure what is taken as possible - following the logic identified by Agamben, a logic that acts on the effects rather than the causes. However, and again referring to the relationship between security and discipline, it is also possible to identify here a reactive logic, through a mechanism similar to that reported by Pasquinelli: the data and algorithms obtained from the predictive performances are combined with others, obtained from events and from the contingency of the present, and they are incorporated into constantly updated databases, thus creating a relationship between a "mathematized past" and both a present and future intended to be conditioned. In this sense, once again in reference to Scannell, social structures and social relationships, which are historically contingent, find themselves reduced to an algorithm and/or a computer application. It confers them a status of objectivity and neutrality despite their being built on certain assumptions and their involving of certain techniques and criteria for the collection and analysis of the data. Thus, they imply the reproduction and naturalization of diverse power relations and forms

[6] "- the possible inaccuracy of data used, or invalidity of models or routines; - the fact that these are correlations-based systems possibly relying on categorical variables rather than causal inquiry;

- the fact that these systems may produce 'rational' (facially non-biased) but 'unfair' results (further victimizing already vulnerable groups, in contradiction with common views of justice or fairness);

- the "lack of ground truths" to evaluate the validity of detection mechanisms aimed at preventing certain behaviors to happen (in a security scenario), or to detect users' preferences and consumption propensities (in a marketing scenario) as by hypothesis, these detection systems also impact on the material or cognitive preconditions of actions." (Rouvroy 2013: 17).

of social inequality. At the same time, they represent society as a body without contradictions and complexities, one that can be reduced to a calculation and an algorithm.

Technique and Technology

The issue of algorithmic governmentality becomes more relevant as we consider it alongside other debates - especially those regarding technique and technology. Andrew Feenberg gives a synthetic introduction to this issue. He criticizes two positions relating to technology - instrumentalism and substantivism (Feenberg 2009: 146). While the first position states that technology is something neutral and capable of being used according to our desires for a particular purpose (with a total ethical separation between means and ends, wherein the means are relegated to achieving a certain end), substantivism claims that it is technology, in itself, which constitutes a means able to determine a particular purpose (as might be the case of a dominating situation). Such positions, as Peter-Paul Verbeek explains, start from an assumption of a complete separation between technology and society, and they do not take into consideration the existence of a "technological mediation" which leads us to understand that technology holds an "active role" in the relationship between man and his environment/world, thus contributing to the shaping of their actions and experiences (though not determining them altogether) (Verbeek 2006: 1106).

Bernard Stiegler, who focuses on the relationship between time and technique, explains this further. According to Stiegler, a given technological innovation is not only accompanied by the obsolescence of existing technology, given that these technologies mediate the everyday life and the social forms and relations that are made possible by them – forms of life, activities, habits and representations of the world (Stiegler 1998: 14). In addition, this replacement is experienced unequally, crossed by various dimensions - an issue that,, given the present complexity and pace of innovation and technological transformation, acquires particular contours (Stiegler 1998: 14-17). This, as stated by Stiegler,

translates into a continuous separation between the rhythms of cultural evolution and the technical evolution of rhythms, in a relationship that implies continuous tension between "progress" and "delay" due to the different temporalities of culture and technology – thus, technique has a constitutive dimension, made of both time and space (Stiegler 1998: 16-18).

Another position, which is very influential and singular in the field of the philosophy of technology, is that of Heidegger. In his essay on the question of technology, he intends to explore what a "free relationship" with technology could be, contrary to what is claimed to be the current situation that sees us "unfree and chained to technology" (Heidegger 1977: 4). He begins his questioning by criticizing the assumptions that take technology as something merely neutral, identifying them both as a position that takes "technology as a means to an end", as well as one that takes the "technology as a human activity" – a conception that Heidegger calls an "instrumental and anthropological definition of technology" (Heidegger 1977: 4). These positions assume the possibility of a "correct use" of technology for a particular end - something that, given the complexity of modern technology, introduces the question of a continuing need to control technology and to allow its correct use (Heidegger 1977: 4-5). Heidegger intends, instead, to explore a different conception of what would be the essence of technology, one that could establish a free relationship with it. That is because, for the author, "wherever ends are pursued and means are employed, wherever instrumentality reigns, there reigns causality." (Heidegger 1977: 6). The essence of technology is revealed when it is questioned its instrumental dimension and its causal relationship between means and ends, between causes and effects[7] (Heidegger 1977: 6).

Following this issue, and through a philological exploration of the concept of cause, Heidegger claims that technology is a "way of revealing" (das Entbergen),

7 A questioning that relates to the models of government identified by Foucault and Agamben, relating to a reversal of the relationship between causes and effects and the emergence of a cybernetic model of government - Heidegger also explores this model in other texts.

and, thus, of truth (Heidegger 1977: 12). In addition, technology, derived from the Greek word *Technikon*, means "that which belongs to *techne*" - which designates not only the "activities and skills of the craftsman, but also (...) the arts of the mind and the fine arts", thus implying a belonging to *poiesis*. And also it relates to the word *episteme*, a concept that refers to the forms of knowledge, as "an opening up" to something that, while opening, refers to a "way of revealing" (Heidegger 1977: 12-13). This is the reason why, for Heidegger, the decisive question in technique does not lie in its correct construction or manipulation, or what would be the correct use of means, but rather in what it "reveals" and how it makes things "come to presence" (Heidegger 1977: 13).

For Heidegger, modern technology differs from previous form, since its "way of revealing" does not manifest as *poiesis*, but as challenging (Herausfordern), in the sense that it causes and triggers an action that implies a different relationship with nature, a relationship in which nature is the source from which energy can be extracted and stored, where everything is stored, be it to be "ordered" and "standing-reserve" (Heidegger 1977: 14-17). However, this storage and instrumental use is not restricted exclusively to "nature", but includes man himself, taken in an instrumental way, as a "resource" - even in a different way in relation to nature - because it is integrated into the process of technological development and "management/control of nature" (Heidegger 1977: 18-19). According to Heidegger, the essential relationship between man and modern technology refers to an articulation that determines man to be in a position to "reveal the real", a way of "revealing the real" which is based on calculation and ordering, in the ordering of the "real" as "standing-reserve". The essence of modern technology thus urges man to act in a way that seeks to "reveal the real" in an absolute way, taking the real as "standing-reserve", available to be "used" in an instrumental way (a situation of Enframing, of Gestell) (Heidegger 1977: 24). Due to this a priori determination, this situation "challenges" man to act in a certain way – using man in an instrumental way – which makes it impossible for man, nowadays, to have a free relationship with

technology. At the same time, this situation structures what is possible through the already mentioned practices of ordering the world, that is, it makes impossible other "ways of revealing" and other truths (Heidegger 1977: 25-27).

From this final thesis of Heidegger on the relationship between man and modern technology, we can find similarities between the theses of authors like Foucault and Agamben. As Agamben signals, there is a proximity between the concepts of apparatus in Foucault and Gestell in Heidegger - common to both concepts lies a reference "(…) to a set of practices, bodies of knowledges, measures, and institutions that aim to manage, govern, control, and orient – in a way that purports to be useful – the behaviors, gestures, and thoughts of human beings." (Agamben 2009: 12). Just as with the issue of governmentality, the question of technology as problematized by Heidegger – and other authors -, calls for an understanding of how it can be used as a strategy and a form of government, as a "conduction of conduits."

In view of this, the question asked by authors such as Stiegler, Agamben and Heidegger on technique/technology[8] is one of a critique of instrumentalists and anthropological conceptions of technology (Heidegger 1977: 27-32; Agamben

8 "In recent work, Agamben has underlined the central role played by technical objects and technological systems in the activity of government today, and this provides one part of the answer given by contributors to this section. A computer, a cellphone, an electrical grid, each of these things carries and discloses a relation to the world; in each a history, a set of power relations, and a way of life are spoken. In a fashion similar to Bernard Stiegler (1998), Agamben inverts the 'who' and the 'what', such that technics becomes the 'who' to the 'what' of the human as much, or more, than the inverse. Once we begin to use a cell phone, Agamben insists, we are in a new world in which what 'life' is, and what it can be, has been irrevocably changed, and in which subjectification works in new and different ways. This is precisely why Heidegger – a strong influence on both Stiegler and Agamben – argued so vigorously against an anthropological or instrumental understanding of technology. Technology is not something that we invent and employ as a means to an end: it shapes us as much as we shape it. With each device, and with each technological system, come new modes of ordering life." (Wakefield and Braun 2014: 6)

2009). They stress that the danger lies not in the technology itself, that the question of technique and technology does not lie in what would be the determination of its "correct use", but instead lies in what emerges, what it reveals and what it produces – that is, in the forms of life, subjectivities, truths, and relations with the world produced from the relationship with technology (Heidegger 1977: 27-32; Agamben 2009).

Smart Cities – Contextualization

Digital technologies a manifest themselves in various forms in the city, in a process that is constantly changing, but that, in actuality, tends to be based on a variety of devices and sensors present in the urban environment (from personal devices such as smartphones, to another type of infrastructure related to urban services – like mobility – or present in street furniture, alluding to a more complex and non-dichotomous relationship between physical space and virtual space). These devices and sensors have the potential to be linked and operated in a network-like way (the so-called Internet of Things), allowing the collection and sharing of data and information relating to various dimensions and urban dynamics (sometimes, without the need for such action to be the result of human activity, or, at least, of voluntary and/or intentional action). From these possibilities, it becomes possible to measure and control various services and activities of urban daily life – a situation that, as has already been exposed, implies taking into consideration the disruptive and constitutive dimension of these technologies and transformations, from the forms of governmentality to the subjectivities and worlds that may emerge. This description tends to be associated with the emergence and operation of so-called smart cities. Although not reduced to those, it can also be associated with categories such as the socio-technical city, machinic city, ubiquitous city, intelligent city, virtual city or sentient city - concepts that invoke different ontologies and *epistemes*.

Shelton et al (2015) contextualize smart cities – and, in general, the changes under review -, in a genealogy that considers the proposals made by engineers

and planners from several disciplines. These are subsidiaries of an allegedly more "scientific" and technological vision with regards to intervention and city management that tend to favor the use of quantitative methods and technological/computerized tools for its analysis, modeling and management. Another genealogy of the smart city is offered by Alberto Vanolo, who sees the emergence of thinking about smart city as a result of the combination of 1) the debate about Smart Growth, in particular its discussion under the school of New Urbanism; and 2) the problematizations between technology and urban space underlying the concept of the "Intelligent City". In addition to this epistemic influence, Vanolo also states the role of various organizations which synthesize these two influences, such as public and supranational entities like the European Union, or the multinationals that are fundamental to the circulation and implementation of smart cities projects – such as IBM or Cisco.

Elvin Wyly (2013), using Allen Scott´s theory of cognitive-cultural capitalism, presents a historical overview of the changes in question, even without focusing specifically on the issue of smart cities. To this end, he refers to the fact that the historical moment in which digital technologies became central is the same moment seeing the culmination of the urbanization process on a global scale, as well as the same period which gave rise to the neoliberal hegemony: this points to the centrality of cities in the current global context, and to the changes in the forms and relations of production (Wyly 2013).

Smart Cities and Governmentality

Despite the fact that the emergence and implementation of smart cities policies, interventions, forms of governance and territoriality are recent there are already some critical approaches to them. Further issues are introduced, such as the rationale they present, which involves the defense of the ideals of efficiency and economic competitiveness (being the urban space and its subject taken as instrumental to obtaining this goal, often following a neoliberal logic); the techno-centered belief regarding the designed proposals, which are taken as "solutions" for the resolution and/or management of "problems" and

"challenges" of the city, or to achieve certain ends[9]; or the centrality given to certain agents in the circulation and implementation of ideas, projects and objectives associated with smart cities - often without due attention to the unequal power relations, as well as to the context, the specificity and the multidimensionality of the territory (Shelton et al 2015; Kitchin 2014; Wiig 2015). Another decisive aspect concerns the question of the political dimension and the possible effects of the collection, use and control of data and algorithms - a matter usually explored around issues of privacy and consent, or vigilance and control. Rabari and Storper (2015), in a questioning charing similarities with Rouvroy´s, suggest that these uses and practices can restructure what is or is not taken as relevant and visible and, thus, considered as a political priority. This can be achieved by the way it would be possible to "naturalize" certain inequalities and categories of analysis, which appeared as mere statistical "evidence", allegedly abstracted from wider social and power relations and not marked by a certain historical contingency. In addition, these authors refer to the existing asymmetries regarding access and interpretation of data and information – thus pointing the relationship between knowledge and power, ti.e. the question of who decides, who is responsible for a given decision, how and through what mechanisms a certain analysis and subsequent decision is reached, and whether the aims and objectives are the same; All of this opens a broader debate on the production of knowledge and the possibility of a reduction of the space of politics.

9 As reported by Kitchin (2014), it is assumed that all socio-spatial aspects of the city can be measured, monitored and treated as "technical problems", and, in that way, liable to be reduced to mere "technical" questions, with a specific "technical solution", which would appear supposedly universal, impartial and depoliticized, even if structuring what is taken as possible. Kitchin states that these conceptions fail to consider the context and other structural dimensions – that is, they are not focusing on the causes - and fail to consider the possible social and territorial effects of certain actions, a fact that may reproduce inequalities and power relations.

Jennifer Gabrys (2014), in a proposal anchored in the field of so-called governmentality studies, explores issues relating to the production of specific urban environments, questioning its objectives and possible impacts. In particular, through the possibilities afforded by the digital ubiquity and increased computing of the urban space, she refers to the objective of building programmable, efficient and productive urban environments, which, once in operation, structure the practices of conducts and the forms of interaction on the part of urban subjects. Making use of the concept of "Environmentality" proposed by Foucault, Gabrys says it is not so much an intervention for the production of certain subjects, but an intervention in the environment that, subsequently, conditions the behavior of others, implying certain subjectivation processes. Therefore, the question arises of the forms of production of certain subjectivities and of the forms of life associated with these interventions - and this particular development, following Gabrys´ questioning, addresses the issue of privilege and of the production of urban subjects that must be "context-aware", perceptive and sensorial. These subjects must be able to relate with the built environment and the digital technologies embedded in it, while they are left "free" to produce and share data and information both about themselves and about others, in relation to specific places and environments as well as certain time frames. These subjects should be able to adapt their behavior to a practice held responsible and informed by certain standards, and to maximize the objectives of efficiency and productivity of the city and the economy in general. This raises the question of who and what kind of subject will have the ability and the "incentive" to participate and relate to such technologies and services, as well as that of the possible attempts to design and build technologies and processes enabling the inclusion of as many urban citizens as possible to that end. This is something that could lead to tensions and inequalities at the level of access and use of specific technologies that will be central to daily urban life. Ultimately, this may lead to the exclusion of certain individuals and social groups. It is also important to stress the question referred by Kitchin (2014) concerning the possibility that, as computing has become

ubiquitous and pervasive in the urban environment of emerging services and urban spaces, these become increasingly dependent on software and codes for the day-to-day operation of the city, which can lead to a situation of vulnerability and dependence on technology.

As an example of these issues, Rob Kitchin (2014: 5-6) refers to Centro de Operações da Prefeitura do Rio, in Rio de Janeiro, a partnership between local government and IBM, to build a system allowing the collection of huge amounts of data (including data sent by the population) for the various services and activities present in the city - traffic and public transport, municipal services, security, among others. In this system, data is processed, visualized, analyzed and monitored by algorithms and a team of experts to investigate specific aspects of the city and its changes over time, while constructing predictive models relating to the management and development of the city. Another example given by Kitchin (2014: 7) refers to the "London Dashboard", which allows someone to access a wide variety of data and information about the city, not only for a better knowledge of the city by experts, but also as a means of enabling citizens to monitor the city for themselves and for their own interests – introducing, thus, a logic in which the citizen is responsible, through their practices, for managing the city, as well as the possibility of the citizen to change his/her conduct in view of the information that is presented.

As another example of these problems, the work of Offenhuber (2015) where he explores, through the analysis of infrastructure design proposals in Boston, the adoption of data management systems based on an interaction with citizens, at three major issues: 1) what the assumptions are regarding the users of the systems of data collection; 2) what motivates the participation of users and how the systems respond to these motivations; 3) through which mechanisms these systems/infrastructures facilitate or constrain the interaction between citizens and the city. Offenhuber concludes that the design of the systems (the inclusion and/or exclusion of certain elements; the interests and objectives; the forms and possibilities of interaction between the network, among others) turns out to

have a subtle effect, although central, in the mediation and interaction between citizens and the city.

In this sense, there is a form of governmentality, when associated with the currently hegemonic assumptions and implementations of smart cities, which consider the urban space as problematic and targeted for intervention (including its own population and subjects), as subject to an analysis and management in a quantitative way by the monitoring and programming of the urban environment held from data and algorithms, systems and digital technologies. Thus, databases are created with geographic patterns and time series, relating to various dimensions and territorial contexts, updated in real time, with the possibility of correlating diverse data and information for subsequent production of algorithms and applications. This allows for a more efficient and competitive analysis and management of the city - a management system that implies the production of certain subjects and the structuring of their conduct.

Conclusion

Given the above, it may be affirmed that smart cities, taking into account the logic and objectives with which they have been implemented, cause effects that jeopardize the possibility of achieving a situation of spatial justice. Thus, it can be said that these smart cities refer to and produce diverse and unequal smart cities, with geographic differences at various scales, be it internally in a particular city and with possible territorial fragmentation and discontinuities, or externally with regards their networking on a global scale. This situation exposes the (re)production of unequal power relations and the structuring of the realm of possibilities.

The prevailing logic in current projects relating to smart cities takes them as an "end in itself", for which the urban space and its population are seen as a means to a particular form of governmentality (economic and algorithmic), with efficiency and competitiveness objectives to be achieved, implying a certain normality and the (re)production of social practices and relations, certain

relationships with the urban environment and technology, and the production of certain subjectivities and forms of life.

However, and going back to the critique made by authors like Heidegger and Agamben about technology, the question would not be so much of the use or non-use of smart cities and digital technologies in urban space, neither of the identification of their correct use - an identification of a "correct use" that is observed repeatedly in the proposals that call for the "transparency" and "openness" of the data and their platforms, or on those that focus on efficiency and development possibilities which may be achieved (even if the legitimacy of such proposals is not in question). Instead, it is necessary to deconstruct the assumptions and rationalities present in the policies for the implementation of smart cities: an instrumentality observable at various levels, a reductive and techno-centric conception of development, the belief in total analysis and management of society and the city, as well as a neo-liberal ethos. The current situation makes it impossible for smart cities to allow the use of several socially valued resources by various individuals and social groups, as well as its fair and equitable distribution throughout the city - however, this does not imply that it cannot be otherwise.

In this regard, and even if such probing must be left for other texts, the hypothesis remains that smart cities and digital technologies could contribute to another situation, different from the one presented. That is, a situation of spatial justice, which could only happen through another relation with technology and what this new relation may produce and reveal. This implies that the policies and processes in question, related to smart cities, would allow the possibility of creating other subjectivities and forms of life, other truths and "revelations", other worlds and relations with the world. To sum it up, this calls for the possibility of going beyond a determination of the possible as strict and determined as the current one.

As a hypothesis for future research in terms of the practice of urban planning, this questioning should start with what are the current assumptions and ends, the forms of knowledge production and categorization of the city and the real,

in order to use a logic of intervention and management different from the one that has become hegemonic in recent decades, and that can be synthesized by concepts such as "urban entrepreneurialism". We need a culture and practice of planning that considers the context and the power relations that are present, as well as their own relations and mediations between society and the technique, the human and technology, or between the physical space and virtual/digital space.

About the author: Nuno Rodrigues, CEG, IGOT-UL

To quote this article: "Algorithmic Governmentality, Smart Cities and Spatial Justice", *justice spatiale | spatial justice*, n°10, July 2016, http://www.jssj.org

Bibliography

Agamben, Giorgio, «Por uma teoria da potência destituinte», Revista Punkto, 2015.

Agamben, Giorgio, What is an Apparatus? And other essays, Stanford: Stanford University Press, 2009.

Cunha, Manuela Ivone, «Disciplina, controlo, segurança: no rasto contemporâneo de Foucault», in A sociedade vigilante : ensaios sobre privacidade, identificação e vigilância, Catarina Fróis (org.), Lisboa : Imprensa de Ciências Sociais, 2008.

Deleuze, Gilles, «Postscript on the Societies of Control», October, Vol.59, 3-7, 1992

Feenberg, Andrew, «Critical Theory of Technology», in A Companion to the Philosophy of Technology, edited by Jan Kyrre Berg Olsen, StigAndur Pedersen and Vincent F. Hendricks, West Sussex: Blackwell Publishing Ltd, 2009.

Foucault, Michel, «Governmentality», in Power, edited by James D. Faubion, New Press: 1994

Gabrys, Jennifer, «Programming environments: environmentality and citizen sensing in the smart city», Environment and Planning D: Society and Space, 32(1), 30-48, 2014.

Heidegger, Martin, The Question Concerning Technology and Other Essays, New York & London: Garland Publishing, INC, 1977.

Kitchin, Rob, «The real-time city? Big data and smart urbanism», GeoJournal, 79 (1), 1-14, 2014.

Offenhuber, Dietmar, «Infrastructure legibility—a comparative analysis of open311 - based citizen feedback systems», Cambridge Journal of Regions, Economy and Society, 8 (1): 93-112, 2015.

Pasquinelli, Matteo, «Anomaly Detection: The Mathematization of the Abnormal in the Metadata Society», 2015.

Rabari, Chirag & Storper, Michael, «The digital skin of cities: urban theory and research in the age of the sensored and metered city, ubiquitous computing and big data», Cambridge Journal of Regions, Economy and Society, 8 (1): 27-42, 2015.

Rouvroy, Antoinette, «Governmentality in an age of autonomic computing: technology, virtuality and Utopia», 2011.

Scannell, Josh, «What can an algorithm do», DIS Magazine, 2015

Shelton, Taylor; Zook, Matthew; Wiig, Alan, «The 'actually existing smart city'», Cambridge Journal of Regions, Economy and Society, 8 (1): 13-25, 2015.

Soja, Edward, «The city and spatial justice», Justice Spatiale, Spatial Justice, (1), 31-39, 2009.

Stiegler, Bernard, Technics and Time, 1: The Fault of Epimetheus, Stanford: Stanford University Press, 1998.

Vanolo, Alberto, «Smartmentality: The Smart City as Disciplinary Strategy», Urban Studies, vol. 51, n. 5, 883-898, 2014.

Verbeek, Peter-Paul, «Tecnopólis: a vida pública dos artefactos tecnológicos», Análise Social, vol. XLI (181), 1105-1125, 2006.

Wakefield, Stephanie & Braun, Bruce, «Governing the resilient city», Environment and Planning D: Society and Space, 32(1) 4 – 11, 2014

Wiig, Alan, «IBM's smart city as techno-utopian policy mobility», City: analysis of urban trends, culture, theory, policy, action, 19(2-3), 2015.

Wyly, Elvin, «The city of cognitive–cultural capitalism», City: analysis of urban trends, culture, theory, policy, action, 17:3, 387-394, 2013.