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***Unplugged* - Thinking the organisational and managerial challenges of intelligent towns and cities: a critical approach to the Smart Cities phenomenon**

Norbert Lebrument ● Catherine de La Robertie

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Abstract. In just a few years, Smart Cities have become the object of all expectations. Smart Cities, supposedly improving the urban lifestyle while making the use of resources required for various urban activities more efficient, are based on a blind belief in the neutrality of the technological systems that structure them. However, the neutrality of the urban data collection and analysis technological systems is not self-evident, and raises the question: what relationship(s) with reality do they establish? What true freedom do they leave to the inhabitants? How is control and surveillance of the human activities they bring about to be interpreted? Through a firmly critical approach to Smart Cities, the objective of this article is precisely to answer these questions while enlisting the conceptual frameworks of the works by Heidegger and Foucault. By enlisting these two theoretical frameworks, two main characteristics of Smart Cities are highlighted and analysed. According to a Heideggerian approach, Smart Cities appear to be an organisational phenomenon, pertaining to enframing of reality where the existence of city-dwellers becomes a resource to be used and controlled in the same way as other resources. According to a Foucauldian approach, they are revealed to be a managerial phenomenon where disciplinary power is expressed across the various urban activities via technological systems.

Keywords: smart city, Foucault, Heidegger, surveillance, technical

INTRODUCTION

For around fifteen years, smart cities have been showcased as the urban paradigm of a controlled and anticipatory relationship of humans with their social, ecological and technological environment (Baraud-Serfaty, 2011). Controlled, as based on access to data through information and communication technologies offering the possibility of controlling and managing all aspects of living together within the city. Anticipatory as systematised surveillance of the various aspects of city life must provide for a viable and sustainable future for the town, through adaptive and efficient use of available resources (Caragliu, Del Bo & Nijkamp, 2011; Snow, Håkonsson and Obel, 2016).

The smart city aims to implement the ideal of urban organisation made efficient: - by using information and communication technologies, - by learning from multiple urban experiences in order to improve

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management of the system it embodies. According to Picon (2013), this intrinsic learning ability is precisely what differentiates a so-called smart city, that is to say a city promoting self-learning abilities, from the intelligence of a town, that is to say, the methods of integration and efficacy of technologies in urban activities. The smart city, as self-learning system (Rochet, 2016), thus enters into the continuity of the works by Wiener (Wiener, 1961) focusing on cybernetics, which is partly based on the works by Gödel (Nagel, 1997) and Turing (Turing, 1937).

The current notion of smart city originates from the article on the city of Singapore by Mahizhnan (1999) where the intelligence of a town is defined through the methods of integration and management of the information and communication technologies used in all urban activities. The objective is to reconcile economic developments, knowledge and well-being of the inhabitants. A city's level of digital readiness is thus the measurement standard by which its "intelligence" is determined. More recently, the works by the regional sciences centre of the Vienna University of Technology evaluating the 'smartness' of 77 European towns using 81 indicators sought to determine whether each town offers 1°) an environment conducive to innovation (Smart Economy), 2) the best training and learning possibilities (Smart People), 3°) effective governance integrating citizen participation (Smart Governance), 4°) sustainable mobility (Smart Mobility), 5°) good environmental conditions and 6°) remarkable quality of life (Giffinger, Haindlmaier & Kramar, 2010). A city is said to be 'smart' if it enforces an infrastructures and services development process pertaining to the 6 categories. In this last design, digital transformation of the town through the use of information and communication technologies only appears to be a dimension that cross-cuts the six dimensions of a smart city.

For all that, most academic research focusses *either*: on study of technologies management – infrastructures and IT networks, internet of Things, etc. – at the service of smart city development (Almirall, Wareham, Ratti, Conesa, Bria, Gaviria & Edmondson, 2016; Cowan, 2013; Lee, Phaal & Lee, 2013); *or*: On governance challenges and problems related to the management of the various stakeholders in the context of smart cities (Capdevila & Zarlenga, 2015; Gooch, Wolff, Kortuem & Brown, 2015; Mayangsari & Novani, 2015; Meijer & Bolívar, 2016; Thomas, Mullagh, Wang & Dunn, 2015).

Faced with messages praising the development of smart cities, numerous voices were raised to express the risks induced by management of self-learning urban systems based on massive collection of personal data (Sadin, 2015). Without claiming exhaustiveness, it is possible to identify three types of risk (Cardullo & Kitchin, 2018; Glasmeier & Nebiolo, 2016; Hollands, 2015):

- through management of data from connected objects, a first type of risk related to general citizen surveillance which, in the name of the principle guaranteeing a safer town, would excuse any invasion of individual privacy.
- a second type of risk residing in the loss of participation of part of citizens in the democratic life of the city, due to their inability to use the information and communication technologies when making public choices, or for using services offered by the e-administration.
- a third type of risk related to the societal and political challenges of the smart city consists of management of technological expertise by a small number of individuals, at the expense of a large portion of

citizens, who do not necessarily have the technological skills - through lack of resources, time, exposure - for evaluating the political stakes of the technological choices.

Beyond the social and political interest of considering the importance of management of such risks, it is necessary to grasp more deeply what hangs in the balance behind the concept of the smart city, to genuinely understand the challenges. In this context, Heideggerian and Foucauldian thinking is relevant for understanding the smart city phenomenon and its related organisational challenges: Heidegger, because his thinking of technique can be used to clarify what is at play in the relationships of citizens with the urban reality of the smart city. Foucault, because his thinking of power can be used to understand the process of normalisation of behaviour at work in smart cities. The two ways of thinking meet and are complementary where it is a question of analysing the challenges inherent to the surveillance and control technological systems found in smart cities. Using a dual analysis grid, based, on the one hand on Heideggerian analysis of technique (Heidegger, 1980), and, on the other hand, on Foucauldian analysis (Foucault, 1993) of the mutation in the economy of the power to punish, two assertions can be formulated regarding the smart city:

- Is the smart city not a sophisticated variation of the essence of the modern technique through which reality is only considered to be a set of resources to be used?
- Does it not contribute to political rationality by which a new authority figure sets up general and commonplace surveillance of inhabitants for disciplinary purposes?

The assumption we are defending in this article is that management of smart cities, understood in light of Heideggerian and Foucauldian thinking, cannot dispense with elements of response to these questions. The objective will consist of producing elements for understanding the two statements using Heidegger and Foucault.

To do this, in the first part, after having redefined the main concepts behind Heideggerian thinking on technique, we will address the smart city as a separate link in a system for examining nature. The system by which Man loses himself by forgetting his ability for “meditative” thinking (see Heidegger) at the expense of “calculative” thinking, confining him in an unequivocal relationship with reality that we will specify. However, the smart city does not only introduce a “technologised” relationship of the individual with urban reality, it also expresses implementation of normalisation of urban behaviours. With that in mind, in a second part, following on from the Heideggerian approach, the Foucauldian analysis of the smart city shall report, based on analysis of the Panopticon designed by Bentham (Bentham, 2002), on the specific features of the desire for disciplinary control, to which it can give body, thus explaining the rationality of biopolitical power at work in smart cities.

THE SMART CITY AS ILLUSTRATION OF THE ESSENCE OF MODERN TECHNIQUE: A HEIDEGGERIAN ANALYSIS

SMART CITY AND MATHEMATISATION OF REALITY

Smart cities, through the technological structure on which they are based, constitute multiple and coordinated data collection processes

aiming to continuously improve the use of the various resources necessary to a town's daily life. The data is processed according to a series of algorithms, each having a clearly defined function and serving a precise ultimate purpose. Therefore, since 2013, the Chicago police has been using a predictive model to determine when and where violent crime may occur, based on an algorithm of the criminal history of certain individuals. The model was developed by a team of researchers from the Illinois Institute of Technology, directed by Dr Miles Wernick. It must enable the police to assess the probability of a person being involved in violence, whether as perpetrator or victim, by using the data collected over the course of their criminal past. Once the possible suspects identified by the model from a list, a letter is sent to them reminding them of their past crimes, explaining that they have a one in four chance of being involved in an act of violence in the eighteen months to come. They are also informed that the Chicago town services (rehab, work training or even social services centres) are available to them to prevent them acting out.

This example of an algorithm-based crime prevention policy fully illustrates the anchorage of mathematics inherent to smart cities. Much more, it shows, according to Heidegger in *Being and Time* (Heidegger, 1985), the essence of modern science as a "mathematical project of nature" entering into the Cartesian project of a universal science based on a *Mathesis universalis* which "*should explain all that can be known about order and measure, (...) whether this measure be sought in numbers, forms, stars, sounds, or any other object*" (Descartes, 2002: 98). This project for mathematisation of nature is, according to Heidegger, what differentiates modern science (Sinclair, 2006) from ancient science, by definition. Its translation in the smart city consists of the use of algorithms that are supposed to provide real-time measurement and evaluation of all parameters that make up urban life (travel time between two points; air pollution level; library occupancy rate; waiting time at a public service desk; number of incivilities declared by the inhabitants; car park occupancy rate, etc.). This principle of mathematisation of urban reality is based on the belief according to which nature, and more generally reality, could be translated into mathematical language. In other words, mathematisation of the urban reality of smart cities consists of theoretically projecting a series of axioms onto reality, decreeing the order of relationships between urban phenomena and their meaning. De facto, transferring to urban phenomena the idea, according to which, the phenomena are able to be understood through data, ultimately consists of only acknowledging what is measurable, assessable by quantitative determination based on a theoretical mathematical analysis¹.

To this effect, the mathematised representation making up the technological systems of a smart city consists of taking an active look, theoretically shaping reality according to predetermined interpretative meanings. This phenomenon is precisely what defines modern science according to Heidegger: "*However, sufficient clarity is necessary as to knowing what science is. (...). We can express it in a short sentence: "Science is the theory of reality"*" (Heidegger, 1980: 50-51). Use of urban systems based on the algorithmic processing of data collected is therefore not innocent, as it is essentially based on theorisation of reality bearing specific meaning. This ability to bring about reality based on the technological systems of smart cities is what Heidegger explains as being a phenomenon illustrating understanding of the reality of the modern era where things are reduced to the status of objects: "*In the modern age, (...),*

1. Quantification of phenomena based on the theoretical belief in a mathematical essence of reality is at the heart of the *Big Data* phenomenon (Cardon, 2015).

the thing present is shown in such a way it places its presence in objectivity. To this kingdom of the object, like presence, corresponds science, in so much that, in turn, it brings about reality targeting its objectivity in particular. Science backs reality into a corner. It stops it and questions it, so it shows itself each time as what is occurring and what has occurred, that is to say in the supervisable consequences of given causes" (Heidegger, 1980: 62). Which means that modern science, through mathematisation of the reality of which it is made up, theoretically projects onto reality a format of the phenomena that it can measure and manipulate. Modern science no longer aims to discover reality, it is the creation of a reality that it can control and manipulate.

Yet, all smart cities relate to this vision of reality which determines the expected variations in urban phenomena – transport flows; people flows; thermal flows; etc. – through mathematical analyses, the ultimate purpose of which is to anticipate occurrence, or even change occurrence: "Therefore reality can be pursued and dominated by sight. (...). There results from that domains of objects, domains of which the scientific target can in its own way track objects. The method of representation that tracks and ensures reality in its "trackable" objectivity, is the fundamental trait of representation by which modern science answers to reality" (Heidegger, 1980: 62-63). A variation, admittedly odd, is played through the smart cities phenomenon, but takes basis on the same principle of "calculative thinking"² which derives from an intention which passes through it and goes beyond it. Domination of the technique inherent to the modern age as main characteristic of man's relationship with reality.

MEANING OF TECHNIQUE WITHIN THE SMART CITY

Even if smart cities can be considered as an illustration of mathematisation of reality enabled by science, what is at play behind mathematisation derives from a considerably more fundamental phenomenon, the era of the modern technique. In other words, the science that is incarnated in smart cities through data flows is only the expression of a more deep rooted phenomenon, the technique, of which it is only a manifestation.

According to the Heideggerian thought process, differentiating modern technique and ancient technique, it is necessary to start off from the etymology of the term "technique", to understand the original meaning. The term "technique" takes its origin from the ancient Greek *techne* (τέχνη) understood as the singular of *poiesis* (ποίησις), that is to say the singular of pro-duction of a thing. Yet, the act of pro-duction inherent to *techne* residing in the fact that a thing as such was made to appear within the world, consisted therefore of revealing the thing for what it is. Production was therefore a revealing process. It is the revealing process inherent to the essence of the ancient technique that Heidegger is referring to when he writes: "Therefore the decisive point, in τέχνη, in no way resides in the action of doing and handling, and no more resides in the use of means, but in unveiling (...). It is like unveiling, not as a fabrication, that τέχνη is a pro-duction. (...). The technique is a method of unveiling" (Heidegger, 1980: 19). Nevertheless, if the modern technique, in the same way as the ancient technique, essentially constitutes a phenomenon of unveiling, it is different from the latter in the sense that it does not relate to a pro-duction, but a pro-vocation "by which nature is summoned to deliver an energy which as such can be extracted and

2. A fundamental, but non-exclusive dichotomy runs across the entire last part of Heidegger's works, tacitly or explicitly, between "calculative thinking" and "meditative thinking", that it is fitting to recall in Heideggerian terms: "Where we establish a plan, participate in research, organise a company, we always plan according to given circumstances. We include them in a calculation which targets the set goals. We count on the defined results in advance. The calculation characterises all planning thinking and all research. (...). The thinking that counts calculates. It submits increasingly new possibilities to the calculations, ever richer in perspective and at the same time more economical. Calculative thinking leaves us no respite and pushes us from one chance to the next. Calculative thinking never stops, never collects itself. It is not meditative thinking, not thinking which contemplates the meaning which reigns in everything that is.

There are, then, two kinds of thinking, each justified and needed in its own way: calculative thinking and meditative thinking. This meditative thinking is what we have in mind when we say that contemporary man is in flight- from-thinking. Yet you may protest: mere meditative thinking finds itself floating unaware above reality. It loses touch.. It is worthless for dealing with current business. It profits nothing in carrying out practical affairs. And you may say, finally, that mere meditative thinking, persevering meditation, is "above" the reach of ordinary understanding. In this excuse only this much is true, meditative thinking does not just happen by itself any more than does calculative thinking. At times it requires a greater effort. It demands more practice. It is in need of even more delicate care than any other genuine craft. But it must also be able to bide its time, to await as does the farmer, whether the seed will come up and ripen." (Heidegger, 1990: 134-135).

collected" (Heidegger, 1980: 20). The modern technique does not aim to reveal an object or a thing, but to order its appearance, to question its occurrence. The example of the Rhine used by Heidegger³ to make this turning point specific to the essence of the technique understood is highly instructive. The electric power station is not built directly in the Rhine current as an old bridge uniting the two banks was. It consecrates confinement of the river it walls in to provide usable hydraulic pressure. The modern technique is thus characterised by this desire – conscious or unconscious – to command nature or the external reality to provide it with their power.

Smart cities enter fully into the essence of the modern technique which is a moment in History. In effect, although they lead towns to transition from passive energy consumption to an intelligent urban ecosystem (Rochet, 2016) capable of managing energy production, storage and consumption in real time – in a centralised or decentralised manner according to the type of energy -, the fact remains that it participates in this systematised formal notice to the real to deliver what it is as a manipulable resource. In this sense, smart cities are believed to participate in the Cartesian project, consisting, through the modern technique, of making us "*masters and owners of nature*" (Descartes, 1984: 62).

ENFRAMING OF THE UNDERLYING REALITY IN ALL SMART CITIES: THE RISK OF A WAY OF LIVING UNDER THE CONTROL OF TECHNOLOGICAL SYSTEMS

The fact that smart cities can be considered as projects aiming to optimise the use of nature and the real, only confirms the idea according to which they contribute to the essence of the modern technique. In effect, the objective of streamlining and management of consumption related to urban activities takes its basis in a relationship with the real in which every thing is always understood as being a resource that can be used at the service of a system of determined functions. Heidegger characterises this relationship with the real developed by the essence of the modern technique by the term Enframing (*Gestell*): "*Enframing (Ge-stell): therefore let us call the meeting of this entrapment (Stellen) that man requires, that is to say leads him to unveil reality as a stock in the mode of "commitment". Thus we call the method of unveiling which governs the essence of the modern technique and is itself in no way technique*" (Heidegger, 1980: 27-28). Through the concept of Enframing, Heidegger highlights the essence of the modern technique through which the relationship of man with the real comes down to considering the elements making up the world as simple objects of human desire (Gadamer, 2002): a thing only takes on meaning and reality provided it can be integrated in the technological system where it is always understood as an object that can be used and manipulated by and for man. Smart cities therefore appear to enter into this principle of Enframing of the real: the world and the things of which it is made up are only understood according to their immediate use and formal notice.

3. *Essais et Conférences*, 1980.



Source: J. Seifert www.flickr.com/photos/58978138@N00/6770579011

Vehicle from the Personal Rapid Transit (PTR) system, method of transport of people and goods developed in the new town of Masdar City in the Emirate of Abu Dhabi.

Through their objective to improve urban activities in view of better efficiency of the urban ecosystem, smart cities, using information and communication technologies, illustrate with evidence that modern science summons the real as being a calculable and manipulable forces system. Does enframing of reality on which all smart cities are based not have as outcome the confinement of man in an algorithmic fundamental relationship under the pretext of continuous improvement of living conditions? The Enframing in which smart cities participate carries a risk for man which does not only reside in the domination of a purely functional and utilitarian relationship with reality (Tirioni, 2015). More deeply, it resides in the fact that man becomes a resource in his own right in the stock of resources available that are usable and manipulable for and by the technique. The risk is therefore that man himself be an available resource within the planetary exploitation system of the world, based on the organisation and ordering of reality, that is to say planning of what is in order to ensure its full availability. Heidegger goes even further:

“In all areas of existence, man will be encircled ever more tightly by the forces of technology. These forces, which everywhere and every minute claim, enchain, drag along, press and impose upon man under the form of some technological contrivance or other – these forces since man has not made them, have moved long since beyond his will and have outgrown his capacity for decision” (Heidegger, 1976: 173).

In this sense, smart cities related to this essence of the technique, the main regulator of which is believed to be the planning and scheduling of reality in view of its generalised use through a system keeping man

under its yoke. This domination of the technique, which holds man under his power, has no other meaning than itself, has no other desire than itself and no room is left for freedom and choice: *“In the world of the technique, all decisions appear as having already been taken. There are no more choices possible, no more events deserving of the name. Only continues the destruction of the earth in favour of the perfectly circular movement of production and consumption* (Haar, 1994: 258). This desire for domination of reality – of which smart cities are only a manifestation – is realised through surveillance of what is in order to ensure it is fully available. This surveillance aims to permanently ensure that reality – including humans – meet the permanent injunction of ordering of resources in view of their use. Surveillance and control are therefore other challenges for smart cities through the technological systems they use. It is precisely on the question of surveillance and control that Heideggerian thinking and Foucauldian thinking meet and complete one another, on the subject of furthering understanding the challenges inherent to the smart cities phenomenon. In effect, on reading Foucault’s work, smart cities are not simply a new paradigmatic figure of domination of the essence of the technique. They illustrate the emergence of a political rationality seen in the conscious or unconscious form of a process of normalisation of the uniqueness of all consciousness through control and surveillance of the activities of individuals in the city (Gros, 2010).

CONTEXTUALISATION OF THE DISCIPLINARY RATIONALITY AT WORK IN THE SMART CITY PHENOMENON: A FOUCAULDIAN INTERPRETATION OF THE SMART CITY

THE SMART CITY AND INTERNALISATION OF UBIQUITOUS CONTROL AND SURVEILLANCE

There are numerous press or media articles on-line⁴ announcing the emergence of a surveillance society made possible by implementation of smart city projects or the ex nihilo creation of smart cities. Nevertheless, the same articles are losing from sight what is at stake behind the smart cities phenomenon. Deployment of a disciplinary rationality taking the forms of faceless, ubiquitous control and surveillance, managed by everybody and nobody. Yet, the work by Michel Foucault can actually be taken, primarily *Surveiller et Punir* (Foucault, 1975), as an attempt to question the various faces of disciplinary rationality. Even if Foucault’s work is marked by a significant change in the weight, or even meaning of certain concepts in its overall architectonics (Pezet, 2004), even if the concepts presented by Foucault have changed (Pezet, 2004), the fact remains that recurrent elements contribute to founding Foucauldian thinking based on several patterns of thinking. Study of the change in and the historical background of coercive, punitive and societal control systems in which different forms of power economies are expressed can be considered as one of the patterns of thinking over to which Foucault permanently returned.

To understand how the smart city carries within it the possibility of a disciplinary economy of internalisation of control and surveillance, it is necessary to go back over the Foucauldian analysis of the change in the punishment and societal control economy that Foucault analyses through the penal reform of the second half of the 18th Century by which *“the right*

4. www.city-journal.org/promise-and-peril-smart-cities-16035.html
www.information-age.com/darker-side-smart-cities-123473765/
www.siliconrepublic.com/enterprise/smart-cities-surveillance-4irc
www.smartcitiesdive.com/news/oakland-ca-bill-would-heavily-regulate-citys-use-of-surveillance-technology/523043/
www.govtech.com/fs/data/Smart-City-Data-Projects-Need-Transparency-and-Oversight.html
www.theguardian.com/world/2018/oct/23/toronto-smart-city-surveillance-ann-cavoukian-resigns-privacy
www.telegraph.co.uk/technology/2018/10/24/privacy-expert-resigns-google-backed-smart-city-surveillance/

to punish has been displaced from the sovereign's vengeance to the defence of society" (Foucault, 1975: 107). In the first two parts of *Surveiller et Punir* – "Torture" and "Punishment –", Foucault analyses the change in the punishment economy which is characterised by the move from a corporal punishment logic, by which depiction of a "tortured, butchered, amputated body, symbolically marked on the face or shoulder" aims to express the vengeful power of the sovereign, to a logic of universalisation of punishment through a criminal sanction marked by the "seal of the secret of execution", out of sight, in the standard prison space. Through this change in the punishment economy, power is believed to indicate not only humanisation of punishments in relation to a less costly and therefore more efficient system, but also an implicit desire to discipline bodies and minds by individualisation of punishment (Lefeuve Déotte, 2010). Everything happens as if, through this change in the power economy, appropriation of the punishment by the convicted person replaced corporal punishment. Internalisation of the punishment thus aims to discipline the accused as much as the social system made aware of the punishment incurred. The move to statute law also contributes to internalisation of punishments by the social system through the representation of offences and sanctions in people's minds. Consequently, the power economy at the start of the 19th Century is characterised by a dynamic of internalisation of control and surveillance of consciousnesses in the aim of developing preventive discipline of consciousnesses.

In this context, the Foucauldian analysis, in *Surveiller et punir*, centres on the Panopticon system considered to be a paradigmatic system of disciplinary practices generalised at the start of the 19th Century. The Panopticon, type of prison architecture designed by the utilitarian philosopher Jeremy Bentham in 1780 (Bentham, 1791), takes the form of a circular building, with a central tower with windows looking out onto the individual cells, opening onto the inside by a window looking out onto the central tower from where, without being seen by the inmates, the prison staff are keeping watch. The warden can see without ever being seen by the inmates. This way, the panopticon induces "*in inmates a conscious and permanent state that they are always being watched that assures the automatic functioning of power*" (Foucault, 1975: 234). The conscious representation of continuous surveillance in an individual is replaced by the physical surveillance of the wardens, creating self-discipline among inmates. Knowing they are permanently watched, the inmate develops normalised behaviour, meaning they conform to the expected standard, and is thus transformed by watching their own behaviour.



Source: I. Friman commons.wikimedia.org/wiki/File:Presidio-modelo2.JPG#filehistory

Inside of the prison El Presidio Modelo inspired by Bentham's Panopticon, Isla de la Juventud, Cuba

Foucault generalised disciplinary rationality at work in the Panopticon to other areas of social life, schools, hospitals, workshops etc. – where, as in the prison space, disciplinary systems are used and the function of which is to give rise to normalised behaviour among the social forces.

Does the smart city, through surveillance, control and regulation of human activities made possible by the technological systems at work within it, not contribute to this form of power economy? Does it not embody a variation of this new power economy, based on normalisation of urban behaviours?

SELF-DISCIPLINE OF INDIVIDUALS AND DISSEMINATION OF DISCIPLINARY POWER IN THE SMART CITY

The assumption that we are defending in this article is that the smart city fully relates to the specific features of modern power, the constituent characteristics of which Foucault analysed in his work. The technological systems enabling the smart management of the town are the vectors of disciplinary power which structure the citizens' behaviour in a diffuse and disseminated, but nevertheless pluralist and omnipresent manner. These technological systems based on IT infrastructures associated with connected objects are, on the one hand, centralised where they are systems managing energy efficiency or fluidity of town mobility, and, on the other hand, decentralised for the citizen when it comes to managing various aspects of their life, such as their energy consumption, surveillance of their home, their diet etc. In both cases, centralisation and decentralisation of management, the citizen enters into a process of normalisation of their behaviour imposed by others. The behavioural standard is internalised in such a way that the subject is represented as being the basis to the decision to apply it. In the same way, the citizen is integrated in a process of continuous and multiple surveillance (Gros,

2013) conducted through a myriad of points of data collection inserted in the objects of daily life (mobile, RFID, GPS, etc.) from which their behaviour is analysed to be controlled and connected if necessary. We find in these two characteristics of the smart city, two essential characteristics of disciplinary power as defined by Foucault: surveillance (panopticon society, eye of power) and normalisation (disciplinary society, age of social orthopaedics, normalisation society). The smart city can therefore be considered to be working, through the diversity of its behaviour surveillance and control systems, on this ubiquitous disciplinary power which is the third characteristic of modern disciplinary power according to Foucault:

“Omnipresence of power: not at all because it regroups everything under its invincible unity, but because it is produced at every instant, at every point, or moreover in every relation between one point and another. Power is everywhere. (...) . Clearly it is necessary to be a nominalist: power is not an institution, a structure, or a certain force with which certain people are endowed; it is the name given to a complex strategic relation in a given society” (Foucault, 1976: 122-123).

The ubiquitous disciplinary power economy inherent to any smart city is not intended to only be repressive. At the same time it produces normalisation, behavioural models written and embedded in algorithms. The behavioural normalisation process in which the smart city participates does not only reside in the simple application of repressive and judicial authority, but also constitutes a process of normalisation of individuals. In other words, the smart city is a set of systems producing individuals conforming with standards predetermined by a group of stakeholders (elected town representatives, technical experts, companies, national governments, etc.) the decisions and recommendations of which direct the specific features of normalisation implemented in the town.

The example of the town of Nice, which inaugurated its connected boulevard in 2013 – boulevard Victor-Hugo – in partnership with the company Cisco is highly instructive on the matter. The press release from the town of Nice said that *“boulevard Victor-Hugo in Nice is equipped with an intelligent communication network for optimising management of the town and offering new services to citizens (...) especially in the areas of traffic flow, street lighting, waste management, the environment, shopping and daily life”*. The virtuous objective would therefore be essentially to make energy savings on the lighting, to improve the transport flow of individuals, to improve traffic flow on the boulevard, etc. However, it is not stated in the press release that the system in place can be used for the surveillance and control of individual behaviour, despite the existence, like in Paris or Marseilles, of a video-verbalisation system. The safety aspect of the system is only clearly explained in an article by Cisco published on its blog following the Innovative City exhibition in Nice on 6-7 June 2012⁵. This system relates to panopticon power, the ultimate aim of which, to paraphrase Foucault, is to induce in an individual *“a conscious and permanent state that he is always being watched that assures the automatic functioning of power”* (Foucault, 1975: 234). Disciplining the individual by internalisation of standards, disciplinary power at work in the video-surveillance systems is what leads Girard to question the challenges

5. <http://gblogs.cisco.com/fr-smartcities/2012/06/27/innovative-city-nice-focus-sur-la-securite-publique-et-la-gestion-des-risques/>

for individuals and society:

“All sorts of systems are available for automatically tracing the images of an aggression, a stampede, or to even find a face. The operation is not neutral. The image thus becomes data, not only because of the digital nature of the images, but especially as algorithms can apply. The power of the image is set, no longer on the “representation” but on the “qualification”. (...). But who gives the classification for these behavioural patterns? Who decides on the relevance and bases of this normative semeiology? This surveillance ignores what is off-camera, defines the entire scope of reality as this single vision. (...). Under the inescapable eyes of these systems, the norm is not stated, it has been incorporated in the algorithm itself (...). It is therefore at the cost of a double reduction, taking what is filmed for the whole reality, and using semiotised flows as basis, that video-protection thinks it can hold reality” (Girard, 2015: 191-192).

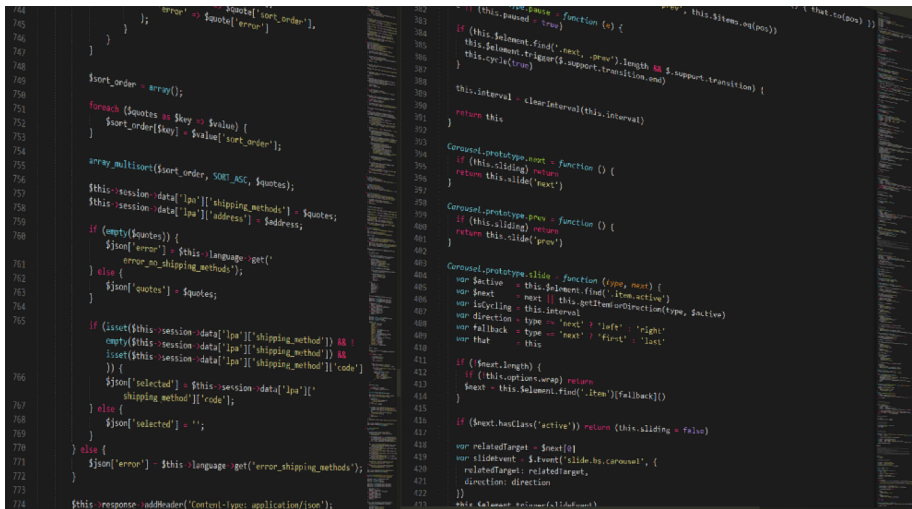
Nevertheless, can we pass ethical or otherwise moral judgement on this disciplinary power analysed by Foucault? For the latter, study of the disciplinary practices embodied by a society must not give rise to the least value judgement: the power economy within a society is neither good nor bad in itself. Is that to say that the rationality of modern disciplinary power that smart cities embody goes beyond what is good and evil?

RATIONALITY OF POWER AT WORK IN SMART CITIES: BIOPOLITICS BEYOND GOOD AND EVIL?

It would be tempting to believe that the Foucauldian approach to the smart city would lead to passing moralising judgement on the modern disciplinary power disseminating surveillance and control of individuals through the technological systems used in the town. In fact, Foucauldian thinking on this ubiquitous power is a lot more finely-shaded in this sense that it seeks to understand, without referring to the least transcendence, using historical descriptions, the disciplinary techniques at work in society. In other words, power is not evil itself according to Foucault (Salies, 2014).

In order to understand the uniqueness of the power working normalisation of behaviours within the smart city, it is necessary to go back over the acceptance of power according to Foucault. Power, to paraphrase Foucault, “does not exist” in itself, but takes the form of a network of relationships, of a “*more or less organised, more or less pyramidal, more or less coordinated bundle of relationships*” (Foucault, 2001b: 302). It is omnipresent in all relationships, is not related to a sphere above or outside society, but effectively to a multiplicity of sources – individuals or institutions – which take the form of ratios of power which are immanent to the area in which they are exerted, and constitute their organisation” (Foucault, 1976: 122). In our speech and our acts, power is immanent to all relationships which make society, belongs to no-one and is exercised everywhere.

The smart city fully embodies this Foucauldian concept of disciplinary power inherent to all points of society, deployed via IT networks and infrastructures across the many urban activities of citizens. The many algorithms on which a smart city is based contribute to the existence of pluralistic, anonymous and ubiquitous power, the decision centre of which is everywhere and nowhere.



Source: pixabay.com/photos/programming-html-css-javascript-1873854/

Programming, lines of code

The political rationality at work in smart cities is characterised by the fact that the disciplinary systems are appropriated by the entire social system. In effect, it is first of all because the inhabitants of a smart city are the active shareholders of this disciplinary power economy, that they are the living systems of it, offering thus a perfect illustration of the “biopolitical” concept developed by Foucault, that is to say power that is permanently exercised over and within the daily life of the individuals. Through its technological dimension, any smart city implements a process of reflexive discipline by the individual on self. The latter is able to judge the virtuous or non-virtuous nature of each of their acts, since the technological systems spread over the town (on them, in their car, in their home, etc.) allow them to see what is ethical in their daily behaviour.

The smart city would therefore be a sort of digital panopticon, opening the way to disciplinary power, the modalities of existence of which are outside the subject by the data created, but also in the subject, thus assuring the “automatic functioning of power” (Foucault, 1975: 235). The smart cities phenomenon would thus constitute a completed figure of the biopolitics described and announced by Foucault in *Sécurité, Territoire et Population* (Foucault, 2004a) and *Naissance de la biopolitique* (Foucault, 2004b), that is to say an illustration of the switch from government of systems to government of individuals by themselves.

CONCLUSION

Taking both the Heideggerian and Foucauldian analysis as basis, the objective of this article was to provide a critical understanding of the smart cities phenomenon. Our analysis thus highlighted two structural characteristics of the smart cities systems: control and provision of reality in which any smart city participates through technology; intensified internalisation of disciplinary power which spans, whether deliberately or unconsciously, the inhabitants of smart cities. Two main contributions can be underlined from this double argument around smart cities:

- According to a Heideggerian approach, smart cities are an illustration of this relationship with reality and nature – “Enframing” (Gestell) – where a thing only takes on meaning and reality provided it can be integrated in the technological system where it is always understood as an object that can be used and manipulated by and for man.. The risk for man does not only reside in the domination of an exclusively functional and utilitarian relationship with reality and nature (Tirioni, 2015), but also in the fact that man becomes a resource in his own right, that can be used for and by urban technological systems.
- According to a Foucauldian approach, the many algorithms on which the various data collection and processing technological systems in smart cities are based, contribute to the existence of pluralistic, anonymous and ubiquitous power, the decision centre of which is everywhere and nowhere. This power is characterised by the fact that inhabitants of smart cities are the active stakeholders in this disciplinary power, offering an illustration of the “biopolitical” concept developed by Foucault in *Sécurité, Territoire et Population* (2004) and *Naissance de la biopolitique* (2004).

The two approaches are complementary and find a shared, theoretical point of anchorage in the criticism of surveillance and control inherent to the technological systems mobilised by the smart city. According to a Heideggerian approach, surveillance and control aim to ensure availability of the smart city’s resources in view of their use. According to a Foucauldian approach to the smart city, it is not a simple illustration of the domination of the essence of the modern technique. It also embodies a political rationality governing a process for the normalisation of the uniqueness of all consciousness through control and surveillance of the residents’ urban activities.

These analyses do not aim in any way to resolve all questions underlying the challenges inherent to the management of smart cities. This article must above all be understood as the prolegomena to understanding the same challenges related to the smart cities phenomenon. It is intended to be a firmly critical approach to the smart cities phenomenon. Its ultimate aim is to show both the relationship with reality that smart cities can lead us to, and the disciplinary power they can embody for individuals.



Source: pixabay.com/photos/tianjin-twilight-city-scenery-2185510/

Tianjin, China, dusk

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