1.1 Introduction

The contemporary city is in the process of becoming smarter. Does this mean that so far the city was stupid? No, but it can illustrate a progressive process of digitization of the city which emerges as a new standard, that is to say as the construction of a representation of the reality on which we want to intervene. According to Pierre Muller [MUL 10, MUL 11], it is then with reference to this cognitive image that actors organize their perception of the problem, compare their solutions and define their proposals for action: this vision of the world is the reference framework for a policy. In this perspective, the smart city becomes an increasingly dominant model in the practice of urban planning, and especially in its methods. In the words of the presentation of Jean-Paul Lacaze’s [LAC 12] book on urban planning methods:

“Urban planning emerges as soon as someone intends to engage or induce an action to transform the modes of use of space in the city to result in a situation considered preferable. Because any approach of urban planning combines multiple forms of knowledge – scientific knowledge, technical references, know-how and project managers’ talents, but also legal norms or socio-political practices – the way of making choices, and thus developing decision criteria, is essential in this area.”
While digital technology gradually infuses lifestyles as well as knowledge and technical know-how, we can assume that the impact of digital technology on urban planning and its methods is and will be increasingly widespread.

The aim of this first chapter is to question the impact of this digitization process on urban planning methods. How do digital technologies enhance the knowledge and professional techniques of planning? How do these digital changes question the professional attitudes of the urban planner?

Answering these questions requires a look at the links between territories and technological developments, in particular in order to present the impact of the data produced by these new technologies, these famous Big Data. We will then examine the heterogeneity of the forms that the smart city can take, and more specifically the links that exist with another dominant concept (or label?) in urban planning theories and practices, that of the sustainable city. To conclude, we will discuss the significance of these transformations in light of urban planning theories, putting forth the idea that digital technology renews the rational approach by giving it a new smart and durable veneer.

1.2. From technological breakthroughs to urban planning transformations

1.2.1. City and technique: centralization or decentralization?

1.2.1.1. The impact of technological innovations on space and society

Normally, in the history of cities, the emergence of new technologies disrupts social and territorial balances [DUP 91, MUM 50]. Following on from the work of Lewis Mumford in *The Myth of the Machine* [MUM 70], Valérie Peugeot [PEU 14] notes that, regularly, these technical breakthroughs raise controversy over the project of “living together,” with a recurrent tension between, on the one hand, a centralized model and, on the other hand, a decentralized and locally distributed model.

In modern history, we can think of the consequences of the invention of the printing press on Western culture and society [EIS 79]. Although printing presses involve a certain centralization, disseminating the book is part of a decentralized model, which is a vector of profound transformations. The significant increase in the number of books enhances the effects of writing
on thought and expression, modifying the relative place of orality in the entire culture. Thus, the practice of private reading opens up new forms of emancipation. For example, this allowed a dissemination of Luther’s theses as early as 1520, leading to the Protestant Reformation as well as the reorientation of Catholic practices, and ultimately to the Renaissance.

Since the 19th Century, cities have been engaged in a process of technicization that resulted in the Industrial Revolution. At that time, Karl Marx [MAR 08] was one of the early thinkers to consider that technical evolution determines the evolution of societies. He then attempted to describe the workings of a capitalist economy where the division of labor allows the enrichment of the bourgeoisie through the exploitation and misery of the proletariat. Analysis of the contradictions of this mode of production suggested that it will collapse and be replaced by socialism.

Beyond Marxist analysis, the impact of the development of the technical on territorial organization is important. As regards centralization, we can note that from the late 19th Century, the steam engine structured the development of the industrial revolution with an integrated model. This technology could not be miniaturized and required the concentration of workers in large factories, resulting in significant migratory movements to cities. In the 20th Century, the introduction of the electric motor, which was smaller, opened up the possibility of a redeployment of production activities in a decentralized mode, with the Proudhonian dream of a return to the craft workshop. However, the centralized approach was required, with the large Taylorized company aspect, based on the development of railway, telegraph and telephone networks. Moreover, the arrival of new materials (concrete, steel, glass) and new equipment (elevators and air-conditioning) transformed construction techniques, notably by enabling the construction of high-rise buildings.

The decentralized model was more easily observed with regard to the changing conditions of urban mobility. Technological advancement, with the train, streetcar and subway, first organized a growth of the city around railways. Then, the introduction of private cars allowed widespread expansion when it became a product of mass consumption. This technical breakthrough profoundly disrupted the social and territorial organization of cities, by supporting the advent of diffuse and atomized metropolises.
1.2.1.2. Emergence of the Internet

The deployment of information and communication technologies is part of a similar dynamic. Initially, the Internet was developed by US researchers in the defense sector. Subsequently, large IT companies, including IBM, appropriated this technology. The size of the computers at that time was such that the organization of work was centered on the machine, which had to be fed with punch cards.

It was in the 1970s, following the development of the microcomputer, that the decentralized model made its comeback and established itself. Indeed, the Internet is also the product of American counterculture [CAR 10]. The global network was built on an ideal of sharing and neutrality that excluded any discrimination with regard to source, destination or content of information transmitted over the network. Beyond the technological revolution, there was a complete change in the way in which humanity understood the world around them. The constant and rapid availability of information, images and videos had consequences for the psychological, moral and social development of people, the structure and functioning of societies, cultural exchanges and the perception of values as well as beliefs.

There are different ways to explore the relationship between the digital and territory. In the 1990s, the Internet and digital networks were often analyzed in the historical continuity of other urban infrastructure networks. Thus, Gabriel Dupuy, in *L’informatisation des villes* [DUP 92]. (“The Computerization of Cities”), paints the picture of a network articulating with a set of existing networks, providing them with an intangible fiber and outside the benchmarks of traditional reticularities. This analysis of the Internet as an urban infrastructure did not yet address the complexity of uses, then booming and soon to be massive.

In 2000, Dominique Boullier, in his book *L’urbanité numérique* (“Digital Urbanity”) [BOU 00], establishes a new relationship of digital technology to the territory, through the changes brought about by the unprecedented acuteness that information and communication technologies offer to their users on the territory and its resources. The relationship between digital and territory therefore no longer only involves a continuity of the history of urban technologies and networks, but also a sociological and perceptive change on the part of digital technologies users. As such, these technological innovations introduce a new mode of appropriation of the territory. More
recently, according to Serge Wachter [WAC 11], “new information and communication technologies (NICTs) influence not so much the physical form of cities as the individual and social experiences of their inhabitants”.

In 2012, Boris Beaude insisted that the Internet is not so much a place of synchronization as a place of synchronisation, that is, a space that enables a common action for city dwellers: interaction. The city is a:

“privileged place of interaction, [...] all the more attractive because it associates all contact methods, maximizing more than ever the potential for social interaction of its inhabitants, with itself, and also its otherness. With the generalization of geolocation, the hybridization of space has accelerated. It closely associates territories and networks, tangible and intangible, analog and digital, to the point of changing qualities. The hybridization of space also implies consideration of the body, disembodied identity and interspatiality (when one is both on the Internet and in a classroom for example)” [BEA 12].

This decentralized representation of the Internet also corresponds to its historical evolution, with the advent of Web 2.0 in the early 2000s. This “social web” allows users to interact, create and collaborate on a given content [GOO 07]. In 2005, Tim O’Reilly popularized this term by talking about collective intelligence [LÉV 97]:

“Web 2.0 is based on a set of design models: smarter architectural systems that allow people to use them, light business models that make syndication and cooperation of data and services possible. Web 2.0 is the moment when people realize that it is not the software that makes the web, but the services”.

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2 See Tim O’Reilly’s Article, “What is Web 2.0?”, translation by Jean-Baptiste Boisseau, review by Daniel Kaplan: “Qu’est ce que le web 2.0: Modèles de conception et d’affaires pour la prochaine génération de logiciels”, www.internetactu.net/2006/04/21/quest-ce-que-le-web-20-modeles-de-conception-et-daffaires-pour-la-prochaine-generation-de-logiciels/.
Tim Berners-Lee [BER 08] considers that Web 2.0 and social networks correspond to the entry into the Global Giant Graph (GGG) period, where we no longer connect machines or documents but people.

1.2.2. Cities in the age of Big Data

Digital technology is about making any operational issue of any field tangible and technically exploitable. This movement is old [EVE 97, EVE 14] and today takes a new dimension with algorithms that produce a “logical tangibility” [BOU 16]. At the level of cities, this logical tangibility can take different forms because smart aspects are heterogeneous [CAR 14a, MAR 14]. This refers to different types of articulations, with digital technologies that can involve all urban services. This may concern the optimization of resource management, inputs or outputs (smart grid), movements (smart mobility), social relations (smart community), even city-dwellers themselves (smart citizens) and forms of governance (smart governance).

1.2.2.1. Data at the center of digital transition

At the heart of this relationship between the city and digital world are the data that are produced by these new technologies. These data make the link between territories and inhabitants or between territories and objects. This information transforms our relationship with the territory and our way of living there. The city’s smartness thus comes from its sensors, which accompany inhabitants and objects in their daily activities in real time.

The development of the Internet network is so extensive that the sum of the data produced and exchanged becomes considerable and carries significant technological and political stakes [BOU 16]. This is known as Big Data [BOY 12, KIT 14, LAN 12, MAN 11, MAR 12, MAY 13, ZIK 12], describing the volume of these sets of information that become difficult to process with traditional database management or information management tools. The prospects of processing these Big Data are enormous and partly still unsuspected.
The vast amounts of information circulating on networks provide many opportunities for companies or institutions to better understand their markets or areas of expertise and to customize their services and products. Thanks to the cloud storage of data online, constantly shredded algorithms [CAR 15] and the extraction of data mining (extraction of knowledge from data), consumers and users are profiled. The age of Big Data thus corresponds to “the 5 V’s”: volume, velocity, variety, veracity and especially the value of these data.

This Big Data issue recalls the antagonism between the centralized and decentralized perspectives of technology. On the one hand, a centralized and top-down approach would promote a reading of the city by the ubiquity of the sensors [GRE 06] and the high-tech environment, allowing the optimization of urban activity. However, these opportunities are also accompanied by questions about civil liberties:

“We are not dealing here with totalitarianism, understood as an authoritarian and coercive mode of exercising power, but with a kind of tacit or explicit pact that a priori freely binds individuals to myriads of entities responsible for assisting them, following a temporal continuity and a force of decline which takes an ever totalizing form [...]. Henceforth, we are moving from the age of private life to that of privatized life, which has the tendency to match any act to protocols elaborated and managed by economic actors who collect the traces emitted and monetize them” [SAD 15, p. 173].

These risks therefore require regulations by the public authorities. On the other hand, a decentralized and bottom-up perspective would enhance citizen energy relative to technological energy, as well as collaborative and democratic power relative to the power of machines.

Big Data are therefore a dynamic and interconnected relational set of databases from numerous urban collection points (telecoms, transport, energy suppliers, connected objects, etc.) giving rise to an unprecedented enrichment of conventional databases and new data aggregations allowing for an increased type of spatial production analysis. Although the city cannot be completely modeled, Big Data nevertheless contribute toward undermining complexities and questioning urban planning methods.
1.2.2.2. From Big Data to digital models

Big Data at the urban scale allow us to consider the creation of digital models, or building information modeling (BIM). They propose ways to model the plans of buildings and facilities, as well as the different energy flows. The digital model is based on the promise of being more than just a 3D representation to accompany the design, construction, operation and management of buildings and facilities, by bringing together on the same modifiable document useful data for all stakeholders. The digital model makes it possible to move from smart cities to smart buildings. Two issues are then quantified: on the one hand, digitized management of infrastructures and systems (water, energy) or flows (traffic, waste, real-time data collection such as noise, etc.) and, on the other hand, the buildings themselves, by the rapid development of BIM, which allows them to be modeled and connected. From BIM, we move to city information modeling (CIM). It is then a digital model on a neighborhood scale, which accompanies decision-making regarding urban planning from unprecedented visualization and simulation possibilities.

The digital model also relies on the connectivity of objects, which enables individual management of data by users. The networking of connected objects forms the Internet of Things (IoT), which contains other data sets that can facilitate everyday life and reduce energy consumption, but of course involving a risk of population surveillance. Finally, the Big Data revolution also refers to the development of artificial intelligence, which should offer increasingly important perspectives to structure urban life and its various flows.

1.2.3. Big Data to better understand the territories and urban planning actors

Traditional databases that come from statistical agencies or private companies are mainly based on samples (questionnaires, surveys, counting, case studies, interviews, focus groups, etc.). From the perspective of territorial studies and support for public action, these statistics give a partial view, limited in space and time. When it is possible (and this is an important issue, see Chapter 4), access to data from new technologies opens up a whole series of perspectives, as well as new questions and issues [BOU 15, MIL 10]. Potentially, these Big Data provide access to a more detailed and sophisticated understanding of territories and urban planning actors.
[ARR 15, OFF 14, RAT 16]. To illustrate this, we will examine data from digital social networks.

Thus, by observing the new forms of digital sociability [CAS 10] that are developing online on social networks [STI 12], urban planning actors can perceive from them new appropriations of space [SEV 15].

1.2.3.1. Observing peri-urban territorialities via the use of Facebook

Within the framework of a PUCA research contract [BER 15]³, we studied the georeferencing (check-in) of Facebook users [VIE 14, VIE 17]. The study area corresponds to a group of 252 communes of the peri-urban fringes of Ile-de-France and Picardy, representing more than 1 million inhabitants. The methodology used is based on a corpus of 1,935 locations that have gathered approximately 2 million georeferences. The choice of this type of space with intermediate densities makes it possible to question the collective representations of a peripheral space that would be characterized by a weak identification and an almost absent urbanity. The main results help to highlight the Facebook network as an original territorial descriptor, complementary to the traditional tools of spatial analysis. The analysis of georeferencing shows a density map and especially the important high places of these territories of intermediate densities. The observed territories present different situations in terms of density and attractiveness (see Table 1.1).

<table>
<thead>
<tr>
<th>Type</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>Tourism</td>
<td>7</td>
</tr>
<tr>
<td>Leisure</td>
<td>15</td>
</tr>
<tr>
<td>Service</td>
<td>41</td>
</tr>
<tr>
<td>Culture</td>
<td>5</td>
</tr>
<tr>
<td>Bar/restaurant</td>
<td>15</td>
</tr>
<tr>
<td>Transport</td>
<td>6</td>
</tr>
<tr>
<td>Territorial benchmarks</td>
<td>11</td>
</tr>
</tbody>
</table>

Table 1.1. Simplified typology of georeferenced locations on Facebook (source: corpus of 1,935 locations on Facebook in June 2013)

³ See the PUCA program, *Lieux et hauts-lieux des densités intermédiaires* (“Places and High Places of Intermediate Densities”).
Voluntary geolocations of users (inhabitants or non-inhabitants of the territories) are most often carried out within an environment of leisure, idle time spent traveling and entertainment, where users mark their use of the territory by a proximity or affinity with a precise location. Leisure as an individual and collective (real and virtual) mobility driving-activity turns out to be a major analysis parameter for the listed data.

The digital space represented geographically through the check-ins of the various locations helps to reveal the territorial centralities acquired and maintained by the action of Facebook users. Figure 1.1 shows the intensity of georeferencing publicly produced by the social network users and their relationship to the population pattern (densities).

Figure 1.1. Population density and georeferencing of locations on Facebook (source: corpus of 1,935 locations on Facebook in June 2013; produced by: François Vienne). For a color version of the figure, see www.iste.co.uk/douay/urban.zip

At commune level, this visualization confirms the relationship between the number of check-ins and the density. However, it is necessary to
consider that the characteristics of peri-urban spaces, fragmented, interstitial and reticular, reveal a geography of the check-in activity which can only be analyzed on a smaller scale than the communal level: at a smaller level, with a 200 m grid a side (INSEE grid), population and check-in densities are statistically independent and therefore spatially decoupled. We conclude that the practice of check-ins refers to a practice of space that does not correspond to the sole residential distribution of the population.

The places observed on Facebook are linked to the activity zones of the studied territory. We can thus take some examples showing the co-presence of activity zones and georeferencing locations. This observation confirms the understanding of check-ins by a dynamic approach, where the user confers a functional and attractive quality to a location. In this sense, the important digital place is a territorial descriptor revealing the attractiveness of the territory, with activity zones that appear as the real places of centrality of intermediate densities.

Thus, commercial, industrial, leisure and cultural activities spaces are identified by inhabitants in urban areas of high to average density, as here, in the Ecouen-Ezanville-Sarcelles area (see Figure 1.2). Significant locations in the territory are identified, both by common words and social networks, where the region’s important heritage sites serve as catalysts for structuring communities, as with the Château d’Ecouen here for example. These territorialized communities produce the weak links in which users with converging interests gather around a symbolic element of the appropriate space.

From a theoretical perspective, the main contribution of this work is the addition of an online information layer to traditional offline information, in the territorial analysis of local spaces. For the practice of urban planning, this makes it possible to renew the methods by digital technology [PLA 14, ROG 13] to better understand living modes [STO 04] and common practices, which can often move away from dominant territorial representations.
Figure 1.2. Territorial digital intensity and activity zones (source: IGN BD TOPO; produced by: François Vienne). For a color version of the figure, see www.iste.co.uk/douay/urban.zip
In the same perspective, while the Pokémon Go game is developing intensely, the study of “PokéStops” (locations that distribute the pokéballs needed to catch the Pokémon and various bonuses) can be useful to identify not the center of the Paris conurbation but a multitude of centers. The representation of these points (see Figure 1.3) reveals a diversity of common practices in Paris, with a high density in the areas of Père-Lachaise, Butte Montmartre, Parc des Buttes-Chaumont, Parc Montsouris, Quais de Seine, Jardin du Luxembourg and the Parc de la Villette: “more than the proximity of the capital’s geographical center, it seems that it is the proximity of a center of historical or architectural interest that takes precedence in the distribution of points”\footnote{See the article in French newspaper Le Monde, “Pokémon Go : les multiples facteurs des inégalités géographiques”, www.lemonde.fr/pixels/article/2016/08/03/pokemon-go-les-multiples-facteurs-des-inegalites-geographiques_4977738_4408996.html.}

![Figure 1.3. The “PokéStops” of Paris (source: Jules Grandin, Le Monde, www.lemonde.fr/pixels/article/2016/08/03/pokemon-go-les-multiples-facteurs-des-inegalites-geographiques_4977738_4408996.html). For a color version of the figure, see www.iste.co.uk/douay/urban.zip](image)

Beyond this analytical use of social networks, Big Data also bring new city models, like the smart city.
1.3. What is the genesis of the smart city?

1.3.1. Origins of the smart city

Belief in the opportunities offered by technology and data is old. Norbert Wiener [WIE 52], inventor of cybernetics, agrees with the hygienist tradition, which sees the city as metabolisms in networks and interactions, whose harmful externalities must be managed by improving the productivity of flows. This imaginary world of artificial intelligence for urban development also corresponds to the idea of the Cyborg City [PIC 98, GAN 05].

Today, the smart city is part of this filiation and originates from the opportunities offered by the exploitation of Big Data. The definitions of smart cities are still inaccurate and largely changing in both literature and practice [ANT 17, DAN 13]. However, the link with technology is obvious, although it may refer to a wide variety of uses and levels of appropriation. Michael Batty [BAT 12, BAT 16] conceives them as cities structured by the instant management of Big Data, resulting from the technologization of urban spaces and networks. For him, cities become smart when they allow recourse to simultaneous processing of information in order to manage and anticipate the dynamics of spaces, networks and populations. The smart city is thus based on the massive use of computers, sensors, supercomputers and the Internet, which make it possible to know and manage the city in the very short term [BAT 13]. For Anthony Townsend [TOW 14], Big Data are even the essential tool to allow the emergence of real smart cities, structured by a knowledge of the city updated in real time and a form of permanent ubiquity.

The ever-changing or even inaccurate nature of the definition of these smart cities makes it possible to associate it with different changes in our territories. Antoine Picon [PIC 15] notes that the ideal of the smart city is often presented as an opposition between a search for efficiency, especially in terms of infrastructure management, and a broader vision, which would also seek to promote exchanges and better quality of life. However, he notes

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5 See the Special feature on Smart Cities in Asia edited by Nicolas Douay, Benoit Granier, Carine Henriot, Raphaël Languillon-Aussel and Nicolas Lepêtre in the journal Flux.
6 See the definition from Wikipedia “Cybernetics is a transdisciplinary approach for exploring regulatory systems—their structures, constraints, and possibilities. Norbert Wiener defined cybernetics in 1948 as “the scientific study of control and communication in the animal and the machine.” In the 21st century, the term is often used in a rather loose way to imply “control of any system using technology.” In other words, it is the scientific study of how humans, animals and machines control and communicate with each other”, https://en.wikipedia.org/wiki/Cybernetics.
a convergence on the importance of information and communication, on the
need and challenges of sustainable development and finally on the
importance of humans in this smart city, which are both users and often
sensors. He also posits the idea that this involves a “self-fulfilling ideal” and
insists on the hybridity of configurations, which combine human and
material operations [PIC 13]. Smart cities then appear as the result of
dynamics that are partly technological because, fundamentally, they are at
the same time an ideal and a concrete set of processes of experimentation
and transformation of the urban, which gather a multitude of actors [PIC 15].

We can distinguish two types of approaches. First, a critical approach,
avowed, for example, by Adam Greenfield [GRE 13], notes that smart city
projects (mainly from the examples of Masdar in the United Arab Emirates,
Songdo in South Korea and PlanIT in Portugal) participate in a capitalist
logic that perpetuates economic growth by providing new markets to the
largest private groups (IBM, Cisco, Veolia, Dassault, General Electric,
Siemens, Philips, etc.), as well as that they do not meet the real needs of
citizens. Second, a more optimistic approach notes that the use of new
information and communication technologies improves the quality of life
and the resolution of environmental problems [SCH 14, CAR 09a, GIF 07].
Thus, digital transition is often associated with environmental transition. The
smart city’s contribution to achieving urban sustainability is not just limited
to improving infrastructure, as it also involves encouraging inhabitants
toward adopting more sustainable lifestyles by changing their behaviors with
regard to mobility, energy use and waste treatment [KHA 13]. A smart city
would then be a digital and sustainable city where the use of digital
technology would make it possible to achieve virtuous objectives by
integrating, through the optimization of its functioning, the objectives of
sustainable development [EVE 15].

Nevertheless, beyond the debate on the compatibility of the search for a
continuous increase in economic growth with the drastic reduction of
greenhouse gas emissions, the constant emphasis on the rising quality of life
[CAR 09, GIF 07] in smart cities poses a problem. Much research based on
social practice theories has recently highlighted the difficulty, if not the
impossibility, of predicting the impact of the introduction of new technologies
into the domestic space [GRA 08], with the latter likely to increase or even
create ever more energy-intensive comfort standards [SHO 10]. In this
perspective, Yolande Strengers qualifies the ambition to achieve sustainable
development through smart energy technologies as Smart Utopia [STR 13].
1.3.2. Dissemination of the models

1.3.2.1. The smart city as an essential object of contemporary urban policies

In a context of globalization, the evolution of development policies has been characterized for several decades by standardization and homogenization dynamics [HAR 89, HAR 14, HAL 98, MOU 05], which highlight “good practices” [DEV 07, NAV 07] to disseminate. These reference practices refer to not only the substantive characteristics of urban policies in their common content but also the procedural characteristics that are supposed to define “good governance”.

To refer to the work of Françoise Choay, these reference practices correspond to models that can be defined as a “spatial projection”, an “image of the city” both “exemplary” and “reproducible” [CHO 65, p. 16], corresponding to “ideal types of urban agglomeration” [CHO 65, p. 74]. These mainstream urban practices are not fully reproduced, but rather serve as reference in situations of adaptation from one space to another [PEY 14]. The concepts of policy transfer [DOL 96, DOL 00] and urban policies mobility refer to a process by which knowledge or knowledge about the policies and administrative as well as institutional arrangements used in a given policy system (past or present) are applied to develop policies and arrangements in another context. Exchanges are based on different communities of ideas, practice or expertise [PEC 10, STO 04]. In the context of metropolization, these transfers of models focus mainly on cities. These are the strategic nodes of knowledge and exchange, before States [MCC 11, MCC 11, MCC 12].

These standardized solutions then become classic or even dominant urban models, which often combine different essential elements of the smart city “kit”. Today, the smart city has become an essential model for the practice of urban planning [GRA 99], whose inaccurate definition allows it to be associated with different values and representations of the city. For example, the dream of creating a new Silicon Valley locally will encourage urban projects of urban renewal aimed at creating new business districts, which will serve as incubators for digital activities, with the development of FabLab, Hackerspace, Makerspace or TechShop[^7]. These third places of

[^7]: See the article in Make, “Is it a Hackerspace, Makerspace, TechShop, or FabLab?”, makezine.com/2013/05/22/the-difference-between-hackerspaces-makerspaces-techshops-and-fablabs/.
innovation then participate in urban marketing strategies in the context of competition between agglomerations to attract investment and the most creative citizens. Thus, in Paris and the inner suburbs, the creation of the Arc de l’innovation should allow the development of 100,000 m² area dedicated to innovation, with a multitude of larger or smaller spaces. The most emblematic is certainly Station F\(^8\), which was built in Freyssinet Hall in July 2017 to become the largest start-up campus in the world (34,000 m\(^2\)).

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8 See Station F website, stationf.co/fr/.
Another possible incarnation refers to the fantasy of a dashboard, which helps to control urban planning and management. This perspective is driven by the American group IBM, which aims to make cities smarter.

### 1.3.2.2. IBM’s “smarter cities” program

International Business Machines Corporation, known as IBM, is a US-based multinational company active in the fields of computer hardware, software and computer services for more than a century now. The company first became known for its ability to manage large databases related to population census and management of the US Social Security Act. Gradually, the design and marketing of computer hardware were abandoned in favor of a software development business and services. Since 2002 and following the acquisition of PricewaterhouseCoopers’ (PWC) consulting branch, IBM has become the leading consulting entity worldwide.

In the area of support for urban management through digital technology, IBM has emerged as the leader. The Smarter Cities program has been disseminated globally and produces a homogenization of solutions proposed and implemented locally. With great marketing support, the program develops a special storytelling [SAL 07], with a three-part argument aimed at local political, economic and technical elites, who find in it a complete kit intended to optimize the management of their city and place it in the best position in the global competition.

First, this serves as a reminder that these tools are aimed at all city sizes and that a wide range of local skills is concerned by this digital transformation: “Regardless of size, smarter cities are exploiting new technologies and focusing on usable knowledge to transform their systems, operations, and service provision”9.

Second, IBM notes that the emergence of these digital cities is taking place in a context of globalization of the economy and territories, where cities are competing against each other to attract investment and creative citizens. In a context where public budgets are more constrained than ever, the private sector necessarily appears as a key partner to enhance the attractiveness of cities through the implementation of strategic urban policies:

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“In competition with other cities to interest and attract new residents, businesses and visitors, they must constantly strive to provide a good quality of life and favorable economic climate. Forward-thinking leaders recognize that though tight budgets, scarce resources and existing systems often challenge their goals, both new and innovative technologies can help turn challenges into opportunities”\textsuperscript{10}.

Third, the argument puts forward the technical dimension of the project, by emphasizing the amount and complexity of the processed data, which would offer an opportunity to optimize the management of cities:

“These leaders see possibilities of transforming the use of big data and analytics to acquire more advanced knowledge. In the cloud for collaboration between disparate agencies. In mobility to gather data and address the source of problems directly. In social technologies to better mobilize citizens. They think that by acting smarter, there is a way of changing the manner in which their city works and making it realize its potential like never before”\textsuperscript{11}.

\textbf{Figure 1.5. Extent of the facets of IBM smart city (source: IBM, Smarter cities, www.ibm.com/smarterplanet/ca/fr/smarter_cities/overview/)}

\textsuperscript{10} See the website: www.ibm.com/smarterplanet/ca/fr/smarter_cities/overview/.

\textsuperscript{11} See the website: www.ibm.com/smarterplanet/ca/fr/smarter_cities/overview/.
Finally, nothing can escape IBM’s dream of control, which claims to offer a digitization of all urban planning, development and management activities (see Figure 1.5).

1.3.3. Local acceptance of models

Smart cities projects are multiplying and spreading across the globe thanks to an ecosystem of actors. In this movement, we can note the particular role of major American groups such as Cisco and its Connected Urban Development\textsuperscript{12} program set up in 2005, Microsoft and its Microsoft CityNext\textsuperscript{13} program from 2013 and, of course, IBM.

1.3.3.1. Rio de Janeiro Operations Center, IBM showcase

The local demonstration of IBM’s ability to transform urban management started in Brazil. The Rio de Janeiro operations center was inaugurated in 2010 and is the result of an IBM partnership with the municipality of Rio\textsuperscript{14}. This center is presented as the largest measuring instruments deployment worldwide. It thus updates the cybernetics project that emerged in the 1950s and the 1960s with the desire to anticipate, visualize and control urban events. This myth of the control room developed in the 1960s in American cities like Los Angeles, or in Chile in the 1970s [PIC 15].

The idea behind the Rio center is to plan and respond adequately to climate-related disasters (torrential rains, landslides, etc.). The center collects data from about 30 agencies and municipal services in the field of car traffic, public transport, public safety, public health, weather observations and spontaneous feedback by technicians or citizens. In view of the mass of information collected, the innovation developed by IBM consists of storing and processing it thanks to powerful algorithms that allow the visualization of these data: “Fifty screens set up in an area of 80 square meters operate 24 hours a day with nearly 400 professionals. 300,000 meters


\textsuperscript{13} See the presentation on Microsoft website, enterprise.microsoft.com/en-us/industries/citynext/.

\textsuperscript{14} See the article in New York Times, www.nytimes.com/2012/03/04/business/ibm-takes-smarter-cities-concept-to-rio-de-janeiro.html?_r=0.
of optical fiber, 700 cameras, 40 meeting rooms and a crisis room are also necessary for its proper functioning”\[^{15}\].


**Figure 1.6.** Rio de Janeiro Operations Center (source: Ville de Rio, www.rio.rj.gov.br/web/portaldoservidor/exibeconteudo?id=4975277)

Although the center’s initial focus was more on environmental risk management, it now however deals with broader issues. Indeed, in a metropolis of the size of Rio, risk can also be considered from the social and security point of view: crime, illegal trafficking, property, etc. With regard to the center’s officials, the aim is to put forward data modeling in order to ensure better management of mobility (traffic congestion, public transport networks, management of the movement of crowds during major sports events) and energy flows from a perspective of urban sustainability. The main critics of the center question the interest of such a system to citizens. Indeed, IBM is participating in a generalized control of citizens, but

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does not necessarily offer concrete answers to the challenges of Rio’s urban development and management, with the issue of quality and social accessibility of infrastructure in the first instance. In addition, the operations center is involved in a depoliticization of urban policies, where the construction of public problems leads to the formulation of technical answers without debating the solutions. Locally, protests are organized, with the *Meu Rio*16 (“My Rio”) movement, which allows residents to mobilize online on an alternative and open platform. The association was created in 2011 and it proposed to Cariocas to become potential whistleblowers and provided them with tools to defend certain causes, such as the fight against evictions or the quality of education services. Today, the network has 200,000 members, including one in five young members, and is exported to 25 Brazilian cities in the Our Cities Network17 [LEW 16, p. 122].

The smart city perspective put forward by IBM is similar to “solutionism”. This school of thought originates from Silicon Valley and highlights the ability of new technologies to solve the world’s problems. For Evgeny Morozov [MOR 14], this technological solutionism is a sham, which aims above all to avoid debating the political and social implications of new technologies. Therefore, the definition of a problem passes through its technological fix, without addressing the real causes and most often doing away with past practices.

Ulisses Mello, Director of research at the operations center, believes that the Rio experience is a model that can be reproduced in other territories:

“The COR principle can be replicated. It is possible to associate a large number of urban services by Cloud Computing, to operate at high or intermediate levels of services. It is possible to find other cities in the world where, in a specific context, the value created by technology has been proven [we can think of SongDo in Incheon province near Seoul in South Korea]. If we take the example of transport, flow optimization and forecasting can be easily exportable. In this context, I think that Rio de Janeiro is ahead of all of Latin America. Sao Paulo has already

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integrated some elements of the COR model, and other cities have a particular interest in this model"18.

Locally, IBM is involved in the dissemination of this model by offering local technical and political leaders access to this fantasy of better control of urban management. In France, we can note the cases of Montpellier19, which was pioneering but, after 3 years, decided to end the partnership with IBM and regain control over its data20. Lyon and Toulouse could also join this list soon. The city of Nice has also put forth its connected boulevard created in partnership with Cisco. Like in Rio, there is the promise of sustainable development, with a more fluid mobility, and also greater security. Faced with criticism with regard to the general surveillance of citizens, the former mayor of the city takes responsibility for his choices: “I readily admit being Big Brother, in the right sense of the word. We secure personal data much more than any company that sells them for commercial purposes. They are hosted in our own data center, not in a Cloud at an uncertain geographic location. The only ones who have to fear are the thugs!”21. Following the first terrorist attacks of the year 2015, the mayor asserted that “with 999 cameras, and one camera for 343 inhabitants [whereas] in Paris, there is 1 camera for 1532 inhabitants, I’m pretty much convinced that if Paris had been equipped with the same network as ours, the Kouachi brothers would not have passed three intersections without being neutralized and stopped”22. However, the 1,000 cameras unfortunately did not prevent, on 14 July 2016, the deadly course of a van on the Promenade des Anglais. Apart from the case of Nice, the commune of Issy-les-Moulineaux, in the Parisian suburbs, is also one of the most successful examples in the local acceptance of the model in France.

1.3.3.2. Issy-les-Moulineaux, French laboratory

At the French and even European scale, the commune of Issy-les-Moulineaux is a pioneer in the deployment of new technologies. In 2014, the European Commission and the Chinese Ministry of Industry and Technology published a study on smart cities projects implemented in 15 Chinese and 15 European cities. In this ranking, only two French cities – Lyon and Issy-les-Moulineaux – were distinguished. Since 1995, the municipality of Issy-les-Moulineaux has been providing an Internet service to its libraries, creating a digital public space, and starting to establish more direct links between citizens and the administration with the sharing of information (the city is the first to retransmit municipal councils online) or the possibility to request documents.

The use of new technologies also affects the substantial dimension of urban projects, with the creation of a smart grid. This can be defined as a smart grid using digital technologies to optimize the generation, distribution and consumption of all grid meshes, with the aim of achieving savings and reducing carbon footprint. The IssyGrid project was initiated in 2011 in Issy-les-Moulineaux with the intention of being a life-sized laboratory for testing these new technologies. It was created at the initiative of the municipality and Bouygues Immobilier, with a group of stakeholders who provide different technical expertise: Alstom, Bouygues Énergies et Services, Bouygues Telecom, EDF, ERDF, Microsoft, Schneider Electric, Steria, Total, as well as many innovative start-ups (see Figure 1.7). The experiment is limited to two neighborhoods and has an initial budget of 2 million Euros and concerns 2,000 homes, 5,000 inhabitants, 160,000 m² office space and 10,000 employees on a daily basis.

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24 See the digital public space website, www.issy.com/letempsdescerises.
25 See the municipality’s website, issy.com/demarches/a-votre-ecoute/l-accueil-iris/iris-laccueil-unique-qui-vous-simplifie-la-ville.
26 See the smart grid website, issygrid.com/.
The effective establishment of this network supports the creation of an eco-district in the former military fort of the city. All homes are equipped with programmable home automation boxes allowing, for example, households to remotely regulate their different electrical consumption\textsuperscript{27}. In addition, two geothermal wells cover 75\% of the district’s heating needs, a specific infrastructure collects waste via a pneumatic suction system and photovoltaic solar panels are present on certain public facilities.

1.3.3.3. The smart city as a new narrative of Hong Kong’s urban policies

Hong Kong’s urban policies are constrained by the specific context of power relations, which are subject to the influence of the close proximity between political and economic elites [MOL 76, DOU 10b]. This configuration results in a planning and development model that promotes growth. This guides the definition of urban policies, which seek mainly to preserve the respective interests of the government and tycoons, who agree

to maintain high real estate prices, the first to secure its fiscal resources and
the latter to optimize their profit expectations. Thus, urban planning tends to
put emphasis on the clean slate, with urban renewal operations in old
neighborhoods and the creation of new cities in the periphery, in the British
tradition, or the conquest of land on the sea. Until the early 2000s and the
rise of citizen mobilizations in favor of the environment, it has been the
classic mode of development of the city center around the shores of the bay
between the Hong Kong island and Kowloon peninsula. This is still the case
on the outskirts, as during the development of the new airport in the late 1990s
including the future bridge between Hong Kong and Macao or, soon, with the
project involving the extension (East Lantau Metropolis) of an island located
between the city center and the airport, which could eventually accommodate
approximately 700,000 inhabitants on a thousand hectares conquered on the
sea. Moreover, natural spaces are also sometimes urbanized, for example, the
extension of new cities in the new territories or during the creation of
technological parks like those of Cyberport, the science and technology park
on the edge of the Chinese University of Hong Kong or the future
technology park of Lok Ma Chau Loop, on the border with Shenzhen.

Thus, digital technology is emerging as the new common denominator of
many Hong Kong urban projects, where smart coexists with the concepts of
sustainable development or resilience. This digital label becomes central
[DOU 17] in public policies (in particular during the policy address of the
Chief Executive) storytelling [SAL 07] and stands out as the major priority.
This is also the subject of a dedicated strategy, Digital 21, developed through
IBM services. Finally, in efforts toward updating the 2007 plan, from Hong
Kong 2030 to Hong Kong 2030+, the strategy put forward now focuses on a
Smart, Green and Resilient City [29].

Beyond the effects of announcing this new watchword, the contents of
the policies are overtaken by the reality of power relations, with a rational
and technical approach to digital technology made of smart grid or smart
mobility, to the detriment of a more civic and democratic approach, which
could move closer to the global Open Government Partnership movement.
This vision of digital technology is part of the general practice of planning
and territorial development in Hong Kong, which is struggling to move away

28 Storytelling is a narrative mode of communication that refers to the art of telling stories.
from a bureaucratic practice and to make citizen participation in the city development process effective. Thus, in line with the interests and values driven by the growth coalition, the official objectives of the smart city policy are focused on economic development issues, without offering any real prospects for citizen emancipation.

This new storytelling helps to enhance the social acceptability of urban projects, while controversies have become increasingly virulent since the handover. Who can oppose a sustainable, low carbon, resilient or smart city? These adjectives and objectives are indeed much less subject to debate than a compact, competitive or even solidarity-based city. This storytelling is currently extensively developed in the case of East Kowloon Urban Project (see Figure 1.8), which aims to become Hong Kong’s second Central Business District. However, observing the substance of the projects reveals above all the promotion of a few rare technological innovations, often still very experimental and therefore largely limited, which make it possible to mask the reproduction of traditional practices of planning, always benefiting the same actors, who enjoy the logic of real estate and property valuations [TAN 16].

![Figure 1.8. Planning concept for the smart city project in Kowloon East (source: [DOU 17], from EKEO data). For a color version of the figure, see www.iste.co.uk/douay/urban.zip](image-url)
Finally, smart experiments in Europe, Asia or South America appear to be the result of partly technological dynamics. Basically, they are both an ideal and a concrete set of urban experimentation and transformation processes that combine a multitude of actors [PIC 15]. The common point of these different experiences certainly lies in the search for sustainable development. However, the use of digital technologies with the support of Big Data and new management tools raises questions about the development of urban planning methods. We can, indeed, ask ourselves about a return of an expert-based urban planning dominated by networks and data processing.

1.4. The return of rational planning under a smart veneer

The traditional model of spatial planning is linked to the doctrine of comprehensive planning, which emerged at the turn of the 20th Century in an era of strong urban growth following the industrial revolution. The structuring of this theoretical approach owes much to the work developed during the 1940s and the 1950s within the Chicago School [ALL 09] during the American New Deal period. The Second World War then led to a strengthening of public intervention in economic planning. The Chicago School then proposed the development of rational approaches for all public policies including planning [MEY 55]. From a general point of view, the rational approach is based on the use of technical tools: “The first obvious characteristic of the technical phenomenon is that of rationality. In whatever aspect we consider technology, in whatever field we apply it, we find ourselves in the presence of a rational process” [ELL 54, p. 73].

With regard to planning, this was reflected in the advent of rational-global planning, which became the dominant paradigm in planning theories, as well as in professional practice [FRI 87, LIN 90].

This method was then widely questioned in theoretical debates by the strategic and communication approaches [MOT 06]. However, the practice remained marked by this influence, especially in France, with the continued existence of the plan as a central instrument in planning processes [DOU 13].
In the contemporary period, with the advent of digital technology in the practice of planning, we can put forth the hypothesis that the use of Big Data gives new life to this expert-based urban planning. A new system of truth is being established thanks to the opportunities offered by digital methods, which are based on four stages: information gathering, real-time analysis, detection of significant correlations and automated interpretation of phenomena.

1.4.1. **Actors: behind the geek urban planner aspect, the return of the engineer**

The significance of Big Data and their processing with very complex algorithms is part of the perspective outlined by the founding values of the traditional spatial planning approach. It was based on knowledge and scientific expertise to make the best decisions [MEY 55]. Today, it is the use of data processed by digital technology that allows the visualization and modeling of statistical information that is represented by maps.

Faced with the complexity of the data to be processed, the actors involved in urban development and planning are closing in on a small technocratic circle. This adequately corresponds to the traditional model, which only involved the interaction between policy makers and planners. Thus, urban planning in the age of smart and Big Data is essentially a matter of experts and geeks who can define the outlines and objectives of the algorithm. In this perspective, as Antoinne Rouvroy and Thomas Berns note [ROU 13], the uses of Data Mining are no longer anchored in any convention. With self-learning mechanisms, assumptions are made directly and automatically from the data. Objectivity appears absolute, and thus, standards seem to emerge directly from reality. The numbers speak for themselves through strong correlations. However, even if the ideal is to serve “public interest” [KAT 09], the complexity of statistical processing refers to a very bureaucratic planning style where governance is by numbers [DES 08]. However, these algorithms do not constitute public spaces. In fact, “the algorithmic government no longer focuses on individuals and subjects, but on relationships” [ROU 13, p. 168].

In this dynamic, the planner may have a central role, but this largely depends on their technical abilities, which go far beyond the disciplinary field of urban development and planning. This perspective corresponds to
the expert aspect, who dominates the traditional model of rational planning. This smart urban planner is therefore a data analyst who practices modeling and resorts to multi-agent systems [KAT 07] to define urban strategies. Their knowledge and legitimacy rely more on science and technology than on a sensitive relationship with the territories and their inhabitants. We thus find the traditional aspect of the engineer who dominated the practice until the 1970s. However, this does not involve the same engineers; with regard to content, algorithms replace civil engineering or mechanics, and as concerns form, the image is renewed by the attire “jeans, T-shirt, sneakers” and especially by the emergence of the use of different digital technological devices, from the indispensable smartphone to the tablet and connected watch.

1.4.2. Processes and methods: toward an algorithmic governance?

Like the traditional planning model, planning in the era of Big Data is based on methods that refer to science and rationality. Indeed, with the prospects for processing Big Data offered by the use of strong algorithms, new opportunities for aggregation, analysis and statistical correlations are opening up. Antoine Rouvroy and Thomas Berns present this as a “new regime of digital reality”, which is embodied in “a multitude of new automatic systems for modeling the ‘social’, both remotely and in real time” [ROU 13, p. 165]. Far from the objectivity that might be expected from this processing, the algorithms become “the mirror of the most immanent normativities in society” [ROU 13, p. 165]).

The aim of rational planning is always to take a global and objective perspective by placing quantitative information at the heart of the process. The development of a strategy always begins with a significant picture of the territory’s situation. Today, with digital processing, this diagnosis is ongoing and the knowledge of the territory is done in real time. Then, the planner highlights all possible options. The traditional model made use of the scenario method. Thanks to Big Data and computer processing, modeling is easier, and it is the algorithm that decides the best choice according to the intentions, scripts or scenarios from which it was designed [ROU 11]. Thus, as soon as these statistical processing devices are conceived, they embody visions of the world, the city as well as planning processes, even if these projections may be unconscious or at least not very explicit.
By using the algorithm, we thus find a contemporary version of the one best way, that is, the preferred scenario, valuable to the rational approach:

“By a rational decision, we mean one made in the following manner: 1. the decision-maker considers all of the alternatives (courses of action) open to him; i.e., he considers what courses of action are possible within the conditions of the situation and in the light of the ends he seeks to attain; 2. he identifies and evaluates all of the consequences which would follow from the adoption of each alternative; i.e. he predicts how the total situation would be changed be each course of action he might adopt; and 3. he selects that alternative the probable consequences of which would be preferable in terms of his most valued ends” [MEY 55, p. 314]).

At that time, this approach was nuanced by authors, who recognized limitations to this rational model:

“Obviously no decision can be perfectly rational since no one can ever know all of the alternatives open to him at any moment or all the consequences which would follow from any action. Nevertheless, decisions may be made with more or less knowledge of alternatives, consequences, and relevant ends, and so we may describe some decisions and some decision-making processes as more nearly rational than others” [MEY 55, pp. 314–315]).

From the point of view of the decision-making process, urban planning in the age of smart cities allows a return to a top-down approach. Indeed, the fantasy of a digital dashboard that would make it possible to monitor all operations related to urban management refers to the idea of a complex system that can be controlled in a set of decisions in a rather vertical and hierarchical dynamic: “to eradicate or minimize uncertainty, we rely on unintentional ‘devices’, that is, on a-signifying machines, thus dropping the objective of giving meaning to events” [ROU 13, p. 174].
The algorithmic government does not give rise or cause an active, consistent and reflexive statistical subject likely to legitimize or resist it [ROU 13]. Therefore, it depoliticizes planning issues and especially decisions and undermines the policy; there is no more uncertainty, so there is no need to debate and decide, in a perspective where there is an apparent disappearance of the project to govern, plan and develop the city. This denies the ability of city dwellers to share any uncertainty, radicalism or individual as well as collective emancipatory perspectives.

This algorithmic governance is part of the “webcentrism” described by Evgeny Morozov [MOR 14], in which Silicon Valley would try to put us into a digital straitjacket where, under the pretext of efficiency, transparency, certainty and perfection, we would succeed in eliminating tensions, opacity, ambiguity and imperfection. However, the author emphasizes that the possibility of tripping up and making mistakes are all elements of human freedom:

“If we don’t find the strength and courage to escape the Silicon Valley mentality – that fuels much of the current quest for technological perfection – we risk finding ourselves with a politics devoid of everything that makes politics desirable, with humans who have lost their basic capacity for moral reasoning, with lackluster – if not moribund – cultural institutions that don’t take risks and only care about their financial bottom lines, and, most terrifyingly, with a perfectly controlled social environment that would make dissent not only impossible but possibly even unthinkable” [MOR 14].

Cities have become smart or rather self-learning by the strength of algorithms. This change questions the technical skills and professional attitudes of urban planners who must interact with these devices.

1.4.3. Projects: the dominance of smart

The reference space of the traditional planning model corresponded to the political-administrative territory. This then involved planning the future of a city, an urban area or region, with a global approach. Today, modeling and simulation of planning strategies also make it possible to work on large
scales. These practices borrow a lot from the video games world of city builders [RAN 13], like the modeling of Gerland district in Lyon in the SimCity\textsuperscript{30} game. Start-ups such as ForCity\textsuperscript{31} offer professional solutions for urban simulations via interfaces that are similar to video games. The city is presented as a “systemic building where everything is closely linked” and the start-up proposes to “test, script, compare and challenge the possible futures of a territory”. The service is presented as combining “human expertise (expression of needs, process management, decision making support...) with advanced technologies for digital modeling of complex systems and representation of 3D territories”. This approach is presented as being based on the use of Long Data, to quote Samuel Arbesman\textsuperscript{32}:

“But ForCity’s approach is not exclusively part of Big Data, in the sense that it does not make it possible to react, but to build; it does not substitute the machine for man to accelerate their decision, it adds and subjects the machine to man to deepen their reflection; it does not address the decisions of the next hour or week, but those of the next month, next years, next decades. ForCity, as opposed to the immediacy of Big Data, is for the first time the application of Long Data to the city, namely information on slow phenomena, developing over the long term; and it is for the first time the projection of Long Data into the future, and not only onto the understanding of the past”\textsuperscript{33}.

Public studies organizations, such as the Institut d’aménagement et d’urbanisme de la région Île-de-France (Ile-de-France region Institute for Urban Planning and Development), are already integrating these solutions to represent the territory and its environmental issues as well as to simulate 3D development projects\textsuperscript{34}.

\textsuperscript{30}See the modeling of Gerland project, www.youtube.com/watch?v=XIXNINQcq-8.
\textsuperscript{31}See ForCity website, www.forcity.com.
\textsuperscript{34}See Xavier Opigez’ presentation, prezi.com/uubxru-jxj86/la-3d-a-liau-conference-esri-2014/.
ORUS\textsuperscript{35} start-up even proposes the use of an algorithm to help landowners, real estate professionals and local communities to identify “areas of land, their construction potential and availability”. This is made possible by an algorithm for automatically calculating construction land area, resulting from the analysis of the local urban plan (PLU) data, the various prescriptions and easements. Depending on the chosen product (housing, offices, activities, businesses, hotels, etc.), it allows the deduction of an estimate of the floor area. Backed by real estate market databases and socioeconomic activities, it makes it possible to know a land’s potential and to estimate its value with a simple click.

Beyond this ability to interpret the potential of urban planning law in relation to real estate markets, the use of algorithms to decide on spatial strategies is unlimited, or almost, and can present a number of risks. We could imagine the cross-referencing of data related to electoral behavior or ethnic origins to determine the allocation of resources in urban management (safety and maintenance of public space, equipment renovation, etc.).

Informally, these data are already involved in decision-making by the often unconscious or at least implicit practice of clientelism in the decisions of elected officials and technicians. Using powerful calculation methods, they would then take a scientific dimension that could give them more scope and enhance socioterritorial inequalities. However, civil society actors could also use similar tools to monitor public decisions on spatial planning and management.

Through the production of plans, the traditional spatial planning model focuses itself on the legal regulation of land use. In a context of strong growth, it often focused these plans on the installation of major facilities and infrastructures. Today, the issue is less central, but has not disappeared from planning issues. Infrastructure programs remain at the core of development approaches, but they become less cumbersome. It is no longer a question of constructing highways or subways, but rather an electronic grid. Smart grids thus provide a structure for networking and creation of “smart” buildings, objects and inhabitants using algorithms.

The implementation of these smart city projects with the help of control centers and smart grids fall within the framework of top-down approaches that leave little room for extensive interaction between actors. The smart urban project is therefore very static: it follows the course designed by the algorithm more than a project’s process that would refer to a territory and its actors. However, these digital tools may be appropriated by other private or civic actors, who can propose alternative models.

1.5. Conclusion

The spatial approach and the global rational method paved the way for the success of the traditional model of planning during the post-war 30-year boom period. Today, the advent of Big Data renews this expert-based perspective by having a global view of a territory, which is expressed by visualizations and modeling.

From a theoretical point of view, we can consider that the criticisms related to the traditional model can also be applied to this smart planning approach. These criticisms are of two types. First, Marxist critique challenges the very concept of rationality, for it questions neither society nor capitalism, but allows itself to be dominated by dominant economic forces.
Today, this can be expressed by large private groups or start-ups of the new economy, but the challenges remain broadly similar. The second criticism corresponds to the work developed around communicative rationality, which underscores the possibility and above all the need to involve citizens in planning processes. The next two chapters will discuss these two types of actors, who also contribute toward the redefining of frameworks and processes of the practice of planning in the digital age.