tripleC 14(1): 51-61, 2016
http://www.triple-c.at

Introducing a Taxonomy of the "Smart City": Towards a Commons-Oriented Approach?

Vasilis Niaros

Ragnar Nurkse School of Innovation and Governance, Tallinn University of Technology, Estonia; P2P Lab, Ioannina, Greece, vasileios.niaros@ttu.ee

Abstract: The past decade has seen considerable debate over the relatively vague concept of the "smart city". Nowadays, the smart city has crystallised into an image of a city permeated with top-down and centrally controlled technological infrastructures that promise to improve the urban environment in terms of efficiency, security and sustainability. However, many scholars have criticised this perception of networked technologies for not being able to meet the needs of city-dwellers, raising privacy issues, and leading to an increase of environmentally harmful consumption of ICTs. The aim of this article is to contribute to the ongoing dialogue by providing a taxonomy of the smart city, based on certain technology governance models. After theoretically discussing the socio-environmental costs of each model, I argue for a commons-oriented approach, which could democratise the means of making and offer more environmental benefits.

Keywords: Smart city, Technology governance, Commons, Open source, Microfactories

Acknowledgement: The author would like to express his gratitude to the anonymous reviewers for their constructive criticism. This work was supported by the grant ETF 8571 "Web 2.0 and Governance: Institutional and Normative Changes and Challenges".

1. Introduction

The trend towards urbanisation is evident and well-documented. According to the United Nations (2008), the majority of the world's population is now living in urban areas. The fact that most resources are consumed in cities, contributes to their economic importance, but also to their poor environmental performance (Glaeser 2011). By 2050, it is expected that more than two-thirds of the global population will be living in urban environment. This demographic pressure, coupled with global warming and economic instability, has led to a range of new conceptualisations for the city.

Additionally, during the last two decades we have been witnessing a shift towards information- and networked-based socio-economic structures (Castells 2000). As a result, local governments have propagated a persistent interest in the concept of the "smart city". Yet, this concept is nebulous since there is neither a single template of framing it, nor a one-size-fits-all definition (for a discussion on the definitions see Albino, Berardi and Dangelico 2015). The current leading narrative arose from private corporations dealing with advanced information and communication technologies (ICTs) and was later embraced by local governments and advocates of technology solutionism. According to this view, the "smart city" idea has crystallised into an image of a technology-led urban utopia permeated with top-down and centrally controlled technological infrastructures, with the aim to improve the urban environment in terms of efficiency, security and sustainability. In short, common goals for the smart city are better energy and garbage management; reduced water consumption; improvements to citizen mobility; and crime prevention (Albino, Berardi and Dangelico 2015).

However, many scholars have criticised this view of networked technologies claiming that they do not meet the needs and desires of city-dwellers, mainly because they are not attuned to the ways that people use technology (Sassen 2012). Moreover, they raise social issues related to privacy and democracy (Carvalho 2015; Kitchin 2014). As Hollands (2015) argues, the unrestrained deployment of these technologies is shaped around the motives of the sup-

Date of acceptance: October 14, 2015
Date of publication: February 17, 2016

pliers, i.e. the commodification of their existing products and services. Therefore, environmentally harmful consumption of ICTs increases without serving the true needs of the citizens or even addressing actual problems. Hence, this version of the smart city is seemingly not accomplishing its goals, primarily due to the design and implementation of the technological infrastructure.

It becomes apparent that the adoption of a certain technology governance model will partially determine the formation of the smart city. In other words, the question that arises is who will design, develop and control the technological infrastructure? Are we going to follow a proprietary-based model for designing our cities or should we explore the potential of a more citizen-engaged urban design? As Townsend (2013, 15) asks: "what do you want a smart city to be?".

This article aims to contribute to the ongoing dialogue by theoretically discussing the social and environmental aspects of the smart city and shedding light on an alternative approach, that of commons-oriented technological infrastructures. It is argued that the urban design can no longer be addressed from a singular perspective; hence, a commons-oriented approach should be adopted in order to promote an emerging mode of production. This new mode, named commons-based peer production (Benkler 2006), could arguably democratise the means of making with more environmental benefits. I will tentatively propose the adoption of an alternative technology governance model, which enables the utilisation of existing conditions in the city and sparks the creation of small-scale, bottom-up and need-driven solutions. The latter arguably increases the active participation of citizens in the design and decision-making processes for a sustainable city.

In order to simplify possible outcomes, two axes or polarities are used which are giving rise to four distinct types of the smart city. Section 2 provides a short description of the axes and the emerging quadrants, while section 3 discusses in detail the characteristics of each of the four types. The essay concludes by drawing assumptions about which technology governance model would be ideal for a more democratic and sustainable smart city.

2. Framework

Inspired by Kostakis' and Bauwens' (2014) approach, I adapt their theoretical framework into this analysis as seen in the figure below. Specifically, the first axis concerns the polarity of centralised/global versus distributed/local control of the technological infrastructure, whereas the second axis relates to an orientation towards the accumulation or circulation of capital versus an orientation towards the accumulation or circulation of the commons (figure 1).

The left quadrants include the "corporate smart city" and the "sponsored smart city" where ICT firms and their ambition for profit maximisation are in the forefront. Still, the nature of the implemented technological infrastructures does not follow the same pattern in both types. On the other hand, the "resilient smart city" and the "commons-based smart city" are oriented towards the production of common value with a focus on either local or global scale. The four types of the smart city are described through prominent cases of corporations and collaborative spaces, which produce technologies that exemplify the characteristics of each quadrant. It should be noted that the positioning of the selected cases in the respective quadrants is based on the author's view of their aims and activities.

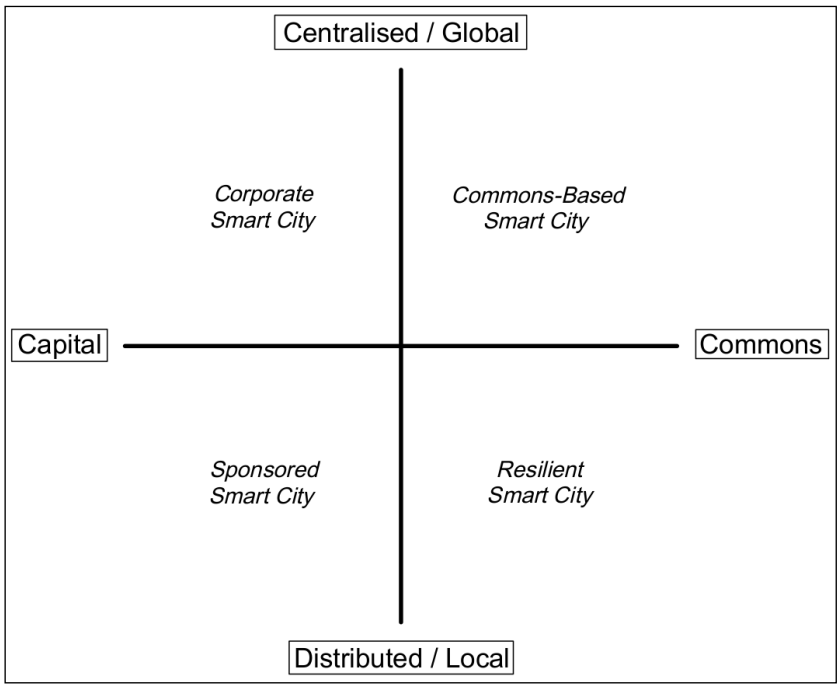

Figure 1: A taxonomy of the smart city

The comparison amongst the technology governance models adopted in each quadrant is defined by the following criteria: i) *citizen participation* during the design and implementation processes of the technological infrastructure; ii) *citizens' privacy*; and iii) *environmental impact* in terms of ICTs consumption.

It should be highlighted that this essay does not aim to offer an all-inclusive account but rather to provide a framework, which could facilitate further discussion around the concept of the smart city. Last, all of the smart city types featured here follow a techno-deterministic approach, overlooking that a non-technical solution could be a better option. However, this does not mean that technological solutions are the only viable way to solve urban problems.

3. Four Types of the Smart City

3.1. The "Corporate Smart City"

The top-left quadrant is related to the leading narrative of the smart city. By employing an often techno-deterministic approach on the uses of ICTs, governments have been looking into how cities might improve urban economies, quality of life and tackle other issues. This has led to a growing role of commercial activities through firms, such as Cisco Systems, IBM and Siemens, which promote themselves as "stakeholders" in public consultation processes (Hollands 2015). As chief executives of Cisco claim, they can provide "intelligent and efficient stewardship of growing cities" (Chambers and Elfrink 2014). These large ICT powerhouses are the major industries involved in the smart city and the Internet of Things (IoT) cluster of technology, having made massive investments. For example, IBM recently announced an investment of US$3 billion over the next four years to establish a new IoT unit (Reuters 2015). Of course, their goal is not just to stumble upon the needs of "actually existing smart cities" but, rather, to create a new market and shape it in certain ways (Shelton, Zook and Wiig 2015).

Popular examples of smart cities are Songdo (South Korea), Masdar (United Arab Emirates) and PlanIT Valley (Portugal). These cities have been built from scratch through public-private partnerships in places with no former residency or infrastructure (Carvalho 2015). Amongst others, IBM and Cisco Systems have been largely involved in these initiatives by providing their products and services. Through the installation of countless wireless sensors

and the utilisation of the IoT at the city-scale, the installed networked technologies are usually targeting real-time traffic solutions, crime prevention, environmental information services etc (Hollands 2015). Such developments aim to transform cities from “dumb” to “smart”. For instance, in Rio de Janeiro (Brazil), the Intelligent Operations Center for Smarter Cities was built in 2010 by IBM for hosting the World Cup 2014 and the Olympic Games 2016. The role of this big control room is to help city leaders gain insight into all aspects of the city and even predict its future performance (IBM 2014). Such optimisation centres have been created elsewhere by many ICT corporations and it is highly expected to see them expanding in the years to come.

Nevertheless, the aforementioned practices have been broadly criticised by many scholars (see Greenfield 2013; Hollands 2015; Kitchin 2014; Townsend 2013; Vanolo 2014). According to Greenfield (2013), even if the involved firms present their initiatives as being city- and citizen-orientated, what they really do is push for the adoption of market-led technological solutions to city administration in order to maximise their profits. Hence, many issues are emerging that affect both the urban environment and the citizens themselves.

To begin with, this techno-deterministic approach cannot arguably meet the true needs of the citizens, since they do not come first. Moreover, corporations propagate rhetoric of the smart city that fosters citizen participation and democratic decision-making. But, as it happens in this quadrant, control and governance in today’s smart city are located within a single proprietary hierarchy, whose main motive is profit maximisation (figure 2). In this case, citizens do not participate neither in the design process of the technological infrastructure nor in its implementation. They are merely treated as another source of information. This is why newly built smart cities such as Songdo and Masdar have evidently failed. Not only are they literally ahistorical but, most importantly, their developers appear to lack any feel for the ways in which cities actually generate value for the people who live in them (Greenfield 2013). It is obvious that smart city vendors like Cisco and Siemens try to redirect the focus of some of their initiatives from being top-down to highlighting inclusivity and citizen empowerment (Greenfield 2013). Through such discursive moves, advocates seek to silence the critics while keeping their central mission of capital accumulation and technocratic governance untouched.

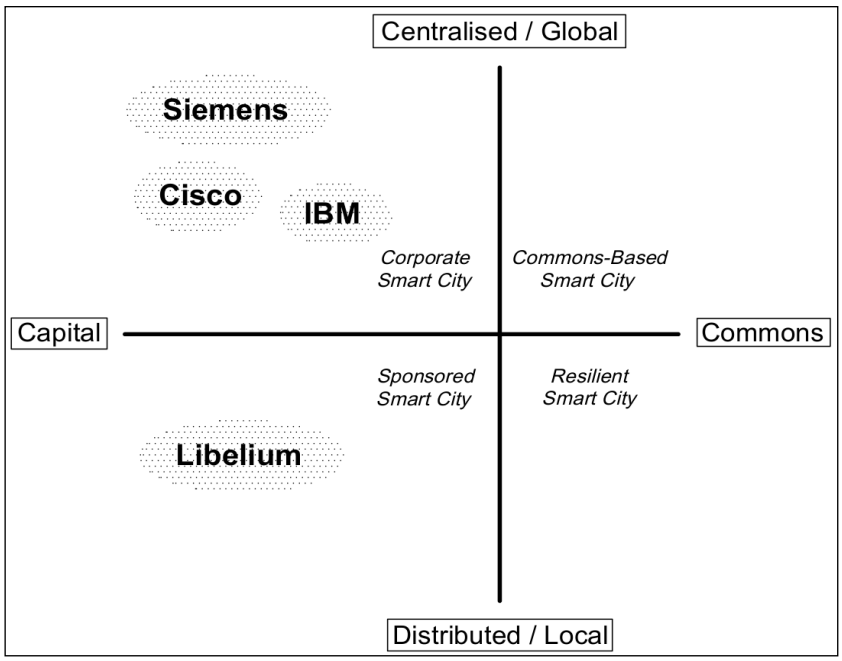

Figure 2: The profit-oriented types of the smart city

Secondly, the installation of thousands of cameras by government and corporate actors and the collection of myriads of data generated by the inhabitants, may have serious conse-

quences with respect to citizens' freedom (Kitchin 2014). The fact that corporations have the control and ownership of the implemented ICTs, transforms the city into a highly privatised space and poses significant threats concerning privacy, surveillance, censorship, and manipulation, that should not be underestimated (Morozov 2013).

Furthermore, the "corporate smart city" does not exhibit only serious social issues. As already mentioned, one of the main reasons for the deployment of ICTs in the city is the reduction of environmental harm. However, as Viitanen and Kingston (2014) argue, the goal here is the expansion of consumerism and not the saving of energy or resources. Since the main motive is profit maximisation, these firms aim to sell as many of their products as possible. Hence, we are witnessing a huge consumption of ICTs with virtually no utilisation of the existing infrastructures. Taking into consideration the underlying material aspects of ICT infrastructures (Fuchs 2013), i.e. slave-like working conditions, class relations and undesirable environmental consequences, it is assumed that the adoption of this technology governance model will not lead to a socially and environmentally sustainable city.

3.2. The "Sponsored Smart City"

The second combination (bottom-left quadrant) matches distributed control of the technological infrastructure with a remaining focus on capital accumulation. Similar to the "corporate smart city", ICT firms are playing a key role here as well. What primarily separates the two types of smart city is the nature of the produced technologies. While in the former type proprietary technologies were in the forefront, in this quadrant the utilised technologies are open source. Yet, there are different kinds of open source projects, which have different goals and requirements. Following West and O'Mahoney (2008), the open source projects are distinguished between "sponsored" (i.e. corporate-led) and "autonomous" (i.e. community-developed). In sponsored projects, one or more corporate entities control the development of the project and employ most of the developers, whereas in community-developed projects, governance and control are shared among the community. What mainly sets apart these two types is their primary goal. On the one hand, corporations aim at maximising their profits from their investment, while an open source community would seek for improvements of the capabilities of the shared technology. Therefore, in this quadrant engages only with the "sponsored" kind of projects.

From corporations' point of view, going open source has a lot of benefits, since it allows them to reduce their development and maintenance cost, and receive greater market recognition (Widenius and Nyman 2013). Companies like Libelium are participating in the formation of the smart city by developing open source technologies. For example, Libelium designs and manufactures hardware and application programming interfaces for wireless sensor networks to establish a platform for the IoT. Recently, they released a new platform for "Precise Urban Monitoring" to enable the creation of future smart city applications and services (Libellium 2015a). But, could the utilisation of corporate-led open source technologies offer more socially acceptable solutions?

Contrary to the conventional technological infrastructures, open source technologies offer a high degree of transparency since the code or the designs of the project are shared through the use of appropriate licenses. However, accessibility to the development process is not assured since the code might not be easily forked. Although companies recognise the importance of attracting participants to the communities built around their projects, most of them provide less accessibility in order to retaining some controlling influence and to ensure that the community will remain aligned with the corporate strategy (West and O'Mahoney 2008). Thus, the distributed control of the technological infrastructures in the "sponsored smart city" entails only the implementation part. In other words, citizens are able to acquire these products and install them wherever they wish, contributing to the generation of local data, but they do not participate in the design process of the technologies, since corporations undertake it. Such practices are opposed to the collaborative way of producing solutions, which allow citizens to discuss common needs, exchange ideas and finally produce better solutions. In its place, Libelium (2015b) has " [...] a sales engineer assigned to you to ensure

you choose the right and optimal configuration to your needs". Nevertheless, even if it is feasible to fork the code of an application or modify a device—which is not the most favourable scenario in the case of corporate-led technologies—great citizen engagement is not granted. In order to adjust an acquired product according to their needs, citizens need certain technological capabilities, which they do not always have. Despite the proclaimed advantages of ICTs use in cities, they can also increase inequalities and promote a digital divide (Norris 2001). Hence, certain factors should be considered when implementing ICTs with regard to inequality and the digital divide.

Similar to the "corporate smart city", privacy issues may also be a central concern. Since the design and the control of the technological infrastructure is in the hands of the "sponsors", it is really up to them to choose the degree of transparency and openness for their technologies. Driven by their motives, corporations will determine who may have access to the generated data and whether it will be freely distributed or not. In addition, anonymity for those using the technologies cannot be guaranteed. What differentiates the "sponsored smart city" from the first quadrant is the fact that, here, users might be able to see what kind of data is gathered and how. Therefore, it becomes easier for them to decide which products they should buy and where to implement them.

Last, although the sustainability of open source technologies might allow for a longer use, corporations may keep producing additional products to make more profit. As a result, a higher consumption of ICTs is possible. Still, in case users are able (both in terms of accessibility and technical capabilities) to fork the code, planned obsolescence will be more difficult to implement. Overall, it seems that environmental sustainability is not entirely linked with this type of the smart city. However, in order to speak more accurately about how these technologies affect the environment, a lifecycle assessment would be needed.

Hence, this approach might be less socially and environmentally harmful than the "corporate smart city", but there are drawbacks in exclusively adopting the technology governance model of the "sponsored smart city".

3.3. The "Resilient Smart City"

So far two types of the smart city have been described whose driving force is profit. The "resilient smart city" (bottom-right quadrant) follows a different philosophy which, instead of encouraging the use of top-down, proprietary technology, is focusing on enabling and empowering citizens for the creation of common value (figure 3). This bottom-up approach aspires to foster new forms of participatory planning and governance, where social and cultural factors are of significant importance. Contrary to the "sponsored smart city", the two right quadrants are associated with the philosophical views of the "free software" movement, which are quite different from those of "open source". As seen in section 3.2, many corporations have adopted the open source rhetoric ("sponsored" projects) due to highly practical reasons, like, for instance, it is producing affordable, powerful and reliable technology (Stallman 2015). On the other hand, the philosophy of the "autonomous" (i.e. community-developed) projects is resembling the "free software" movement, which highlights the meaning of the word "free" and respects the users' essential freedoms to run, study, change and redistribute the developed project. These freedoms are vitally important for society as a whole because they promote social solidarity, i.e. sharing and cooperation (Stallman 2015).

Through the intersection of digital technologies with urban life, several initiatives have emerged that overcome the need for firms or governments to provide solutions and are building their own. Such solutions are now being developed at co-working places, universally labelled as microfactories—alternatively they may be called makerspaces, hackerspaces, fablabs or media labs. In general, microfactories are defined as community-led spaces where individuals meet on a regular basis to engage collaboratively in the creation of meaningful, creative projects (Kostakis, Niaros and Giotitsas 2014). Activists, hackers, researchers and others may have access to prototyping tools there, allowing them to explore and produce small-scale solutions for problems of daily life. Hence, cities of this type are becoming laboratories where common value is produced and problems are addressed by citizens who en-

gage in the research, design and testing of solutions (Hardt and Negri 2011; Hemment and Townsend 2013).

An indicative example of such places is the Metalab, which is a non-profit innovation centre based in Vienna. Like all hackerspaces, it offers a physical space for free exchange of information and collaboration between technology enthusiasts, hobbyists and hackers. Amongst others, Metalab's fields of interest include hardware hacking, free public networks and urban hacking/street art. Another initiative that could be linked with the "resilient smart city" is the Medialab-Prado. This collective innovation laboratory has been established by the Madrid city council and is mainly interested in the production, research and dissemination of cultural projects. Through the development of various collaborative projects and events, the Medialab-Prado focuses at sustaining an active community of engaged citizens.

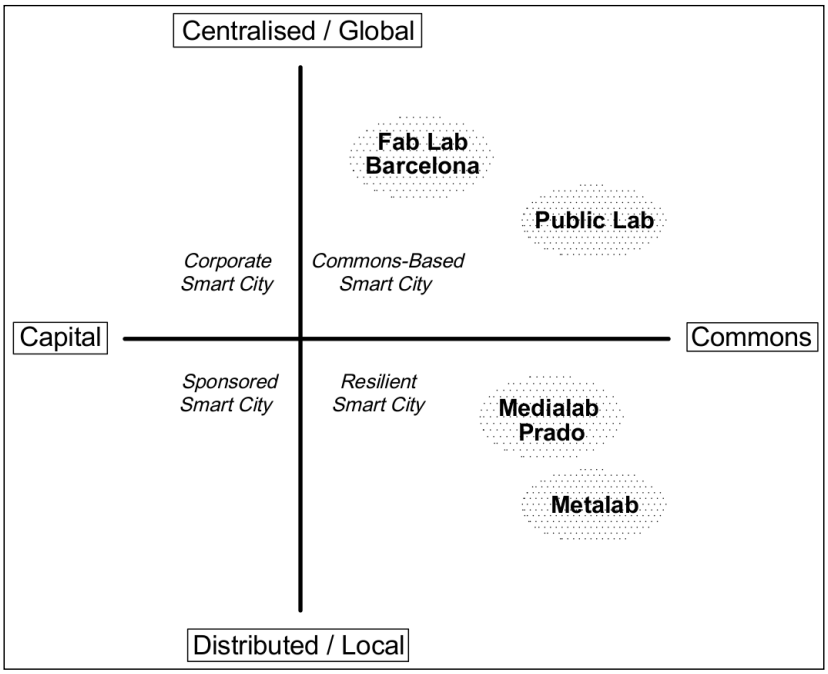

Figure 3: The commons-oriented types of the smart city

The technological infrastructures developed in the aforementioned initiatives have certain characteristics that appear to render this type more efficient than the previous ones. To begin with, they are impregnated with the Do-It-Yourself (DIY) culture which empowers non-experts to become the designers of their own technologies (Antoniadis and Apostol 2014). The threshold for participation in the design process of the technologies is as low as possible, thus we meet higher levels of social inclusiveness. Nevertheless, there are challenges related to digital divides which do not seem to be properly tackled but could be partially addressed through the technical support from the community. Moreover, the fact that citizens have a say during the design and implementation of the technological infrastructures means that almost all of the produced solutions meet existing needs. Hence, this approach is opposed to the supply-driven production system manifested in the previous types and effectively establishes a demand-driven one.

Contrary to the proprietary technologies which come with risks to users' privacy, DIY infrastructures offer a wide range of services that can be operated outside the public Internet (Antoniadis and Apostol 2014). Additionally, since the community has the ownership and the control of the infrastructure, users are able to interact privately within a local network and avoid sharing details beyond it. Also, they have the option of anonymity and can secure their private location information, such as GPS coordinates (Antoniadis and Apostol 2014).

Concerning the environmental impact, the "resilient smart city" demonstrates some more advantages. Firstly, the technologies produced in this type of smart city are designed for a

long-term usage. Thus, less consumption of ICT will take place, compared to the left quadrants. Moreover, the modularity of these technologies allows for a better match between citizen's needs and produced solutions. Even if a technological solution fails to tackle a certain problem, the community's ability to adjust it might reverse the situation. Hence, there may be no need to develop new solutions from scratch and consume more materials.

Last, a fundamental characteristic of the "resilient smart city" is the rejection of the value of bigness and an opposition to the organisational tendency toward large scale. Although relations of collaboration and solidarity may well extend to the global level, the solutions are designed in a smaller scale. This includes strong pre-defined goals that can be bound with measurable results, reduced costs but also quick decision-making. On the other hand, it could be claimed that this locally-oriented approach is not utilising the existent dynamics. The knowledge produced in this case may not be widely applicable or even available for adoption elsewhere. Consequently, the scalability of produced solutions is under threat, potentially hindering the circulation of common knowledge and the subsequent diffusion of innovation.

3.4. The "Commons-Based Smart City"

The last quadrant (top-right) includes a type of the smart city, which currently is far from being mature. It exists only in a seed form but, hypothetically, could offer a sustainable alternative for the evolution of the smart city. The manifestation of the smart city in this quadrant draws the attention towards the global commons (figure 3). Advocates and builders of this approach argue that the commons should be created and fought for on a transnational global scale (Kostakis et al. 2015). The "commons-based smart city" is characterised by wide citizen engagement, while designing and implementing the technological infrastructures, and an ongoing circulation of the commons, which promotes continuous innovation and knowledge diffusion on a global scale.

As already mentioned at the "corporate smart city" (section 3.1), there is a tendency to group smart city discourses into an all-inclusive narrative and use certain examples as indicative of all cities. Unquestionably, cities share some characteristics, but they also have distinct cultures, histories and political economies that shape the urban environment and the relational dynamics. Hence, it can be argued that a globally-organised system for urban development might not be sustainable.

On the other hand, there are numerous small-scale urban commons projects emerging which might be applicable to other cities as well. Consequently, a logical next step would be to communicate the scattered knowledge produced at the local level. One way to do this is through microfactories. Such spaces are considered as essentially networked and might catalyse the up-scaling of the produced commons, not only within the city of origin but universally as well.

An initiative working towards that direction is the Public Laboratory for Open Technology and Science (Public Lab). The Public Lab is a worldwide community of local activists, educators and researchers, which develops and applies open source hardware and software tools to environmental exploration and investigation. Their goal is to grow a collaborative network which will support and enable citizens to discover, contribute and collaborate on locally important matters. Another initiative, which shares the global-orientation is the Fab Lab Barcelona. As a core member of the international fab lab network (Fab Foundation), it aims at creating opportunities to improve lives and livelihoods around the world, by providing citizens with access to the necessary tools and knowledge. Currently, the Fab Lab Barcelona is developing projects in different scales, from smart devices for data collection by individuals (Smart Citizen), to conceptualising new models for cities (Fab City).

However, there are constraints that lead us to the assumption that microfactories alone cannot accomplish the aforementioned goal. First of all, while an increasing number of people are getting involved with microfactories, there is a large part of the population who do not. Yet cities cannot afford to neglect them, since through the collaboration with commons-oriented communities, every citizen could bring to the front an interesting idea and succeed in implementing it (Kostakis, Fountouklis and Drechsler 2013). In addition, as Harvey (2012)

argues, in order to address large-scale problems, such as the global warming, more "centralised" forms of organisation are needed.

It becomes evident that, in order to succeed at scale, grassroots innovation needs support from the appropriate institutions (Kostakis, Bauwens and Niaros 2015). Therefore, this type suggests that smart cities should follow a more synthetic approach which combines: i) the bottom-up innovation through which citizens seek to create a better life for themselves and their community and ii) the top-down policies and planning that seek to distribute resources fairly so that everyone has the opportunity to innovate successfully. This notion has also been articulated by Campbell (2009), an urbanist whose "Massive/Small" concept and theory of "Smart Urbanism" are based on the belief that cities need to harness the collective power of small-scale innovation to make a big difference.

In a nutshell, the adoption of the "commons-based smart city" might encompass all the advantages of the third quadrant infused with characteristics like interoperability and scalability. This could present a more viable alternative for a smart city which takes advantage of the global knowledge commons and utilises them on the local level. Of course, it is not claimed that all cities should apply the same technological solutions and disregard their peculiarities. Instead, they could follow a demand-driven approach and leverage the part of knowledge that suits best to their needs. In addition, collaborating and sharing knowledge on a global basis may inspire the communities to create new tools and solutions related to their local environments and, thus, enrich the global commons.

In order to enhance the functionality of this model, the creation of a unique culture is vital. This may be accomplished through supporting small-scale innovation, which can serve as an awakener for the local community and lead to the creation of a robust paradigm whose core value is collaboration. Towards that direction, governments and local authorities should provide appropriate facilities to enable the deployment of participative ways of working, which will help in producing social innovation outcomes. This could be done by promoting the establishment of collaboration spaces, such as microfactories, in the city and enhance the digital connectivity amongst citizens. Furthermore, governments should focus on establishing legal frameworks that offer the best opportunities to develop local sustainable solutions (for a discussion on the relationship between law and technology see Drechsler and Kostakis 2015). After ensuring the existence of the basic infrastructures, the next step would be to integrate them into every day social interaction and make all data available to citizens. This could be achieved by building digital platforms to promote open governance through the collaboration between local governments and city-dwellers. Moreover, in order for locally-produced innovations to be diffused and adopted globally, the infrastructure should comply with standards that would be designed to enhance interoperability. These standards should shape technologies that are easily accessible, transparent and open to adaptation to local conditions. At the same time, local authorities could contribute to the adoption of open standards through planning frameworks and procurement practices.

4. Conclusions

This essay argues that the formation of the smart city is partially determined by the model of technology governance they embody. The four types differ in their vision for the prime focus, either for the profit maximisation or the production of common value, and the nature of the produced technologies.

It can be articulated that without the adoption of open ICT infrastructures and platforms (i.e. free/open source software and hardware), the construction of a truly smart city will be highly unlikely. Thus, I support a commons-oriented smart city that will provide the capacity for open participation and democratic problem-solving procedures. Citizen engagement in the decision-making processes is essential to create a direct link between technology and the needs of city-dwellers. Participatory urban technologies, greater social inclusion, and a substantial shift in power from corporations to ordinary people and their communities, are crucial elements of a socially sustainable city.

Further, this essay suggests that a commons-oriented smart city exhibits less privacy is-

sues than a corporate one, due to the citizens' motives and the openness of the deployed technologies. Nevertheless, it would be risky to make any assumptions about how scale relates to this matter. Although many researchers and activists have the tendency to presuppose that local equates with 'good' and it is preferred over non-local scales, Purcell (2006) claims that we cannot assume a priori that locally controlled structures are inherently more democratic than global ones or vice versa.

From an environmental perspective, this work argues that the demand-driven production system established in the commons-oriented smart city may offer more benefits. In fact, the reduced consumption of ICTs and the utilisation of the existing conditions in the city allow for more sustainable outcomes.

Last, it is worth noting that there is a lack of in-depth empirical research on a range of smart city developments. Until recently, there have been relatively few extensive case studies on smart cities. Most of the academic work either provides short overviews and critiques on the smart city concept or follows a more technical perspective and introduces new technologies. Thus, further investigation could focus on the empirical study of smart cities and, possibly, compare the propagandised smart city with the actual one.

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About the Author

Vasilis Niaros
Vasilis Niaros is an engineer/urbanist and a PhD candidate at the Ragnar Nurkse School of Innovation and Governance, Tallinn University of Technology. His research interests include open source technologies, smart cities, makerspaces and do-it-yourself culture.