



Open Governance: A New Paradigm for Understanding Urban Governance in an Information Age

Albert Jacob Meijer^{1*}, Miriam Lips² and Kaiping Chen³

¹ School of Governance, Utrecht University, Utrecht, Netherlands, ² School of Government, Victoria University of Wellington, Wellington, New Zealand, ³ Department of Life Sciences Communication, University of Wisconsin, Madison, WI, United States

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*Correspondence:

Albert Jacob Meijer
a.j.meijer@uu.nl

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This theoretical viewpoint paper presents a new perspective on urban governance in an information age. Smart city governance is not only about technology but also about re-organizing collaboration between a variety of actors. The introduction of new tools for open collaboration in the public domain is rapidly changing the way collaborative action is organized. These technologies reduce the transaction costs for massive collaboration dramatically and thus facilitate new forms of collaboration that we could call “open governance”: new innovative forms of collective action aimed at solving complex public policy issues, contributing to public knowledge, or replacing traditional forms of public service provision. These innovative open and collaborative organizational forms in cities seem to point toward not only a wide variety of digitally connected actors but also to a fundamentally different and more invisible role of government in these arrangements. We argue that the recently emerging paradigm of New Public Governance (NPG) (Osborne, 2010) also fails to capture the dynamics of open governance since it does not acknowledge the emergent—pop-up—character of the new collaborations; neither does it present an understanding of massive individualized collaboration in cities. This paper aims to theoretically and empirically explore the core elements and the underlying socio-technical developments of this new Open Governance (OG) paradigm and compare and contrast OG with existing governance paradigms. Based on illustrative real-life cases, we will argue that we need a new paradigm that is better capable of explaining these emerging innovative forms of governing cities. We will argue that this requires an understanding of governance as a platform that facilitates an urban ecosystem. By connecting new insights from studies on digital governance to the debate about governance paradigms, this paper results in a set crucial empirical and normative questions about governance of cities and also in guidelines for urban governance that builds upon the rich, emerging interactions in cities that are facilitated by new technologies.

Keywords: smart city, open government, new public governance, urban platforms, multi-actor collaboration

INTRODUCTION

The introduction of new tools for open collaboration in smart cities is rapidly changing the way collaborative action is organized. These technologies reduce the transaction costs for massive collaboration dramatically and thus facilitate new forms of collaboration that we could call “open governance”. A recent example highlights the power of this new form of governance (Potts et al., 2011).

Shortly after a strong earthquake had struck the Canterbury region in New Zealand’s South Island, first in 2010 and subsequently in 2011, university students in collaboration with several international and national NGOs (e.g., the Red Cross, Ushahidi), Christchurch City Council, Civil Defence, and the local population quickly created an online regional map using open government data and other open data (e.g., GoogleMaps), where people could create data points of places where fresh water, power, gas, or grocery supplies were available, roads were blocked or damaged, and where family or friends were missing or found. The map was updated in real-time, so that people affected by the earthquake not only had immediate access to critical information for making decisions on primary needs but also were able to help others by providing their latest information on local circumstances. This emergent “*ad hoc*” organisation consisting of a large variety of individual, organisational, and institutional actors all using open data, a digital platform and web-based digital networks turned out to be critical in order to manage this natural disaster more effectively for all people concerned—an activity that has traditionally been undertaken by an institutionalised public sector organisation, usually part of government and using a command-and-control style approach.

This real-life case example illustrates the emergence of what we call open governance: fundamental changes in collaboration in smart cities caused by the widespread use of networked technologies and the collaborative sharing of data are leading to new innovative forms of collective action aimed at solving complex public policy issues, contributing to public knowledge, or replacing traditional forms of public service provision. These innovative open and collaborative organizational forms in the public domain seem to point toward not only a wide variety of digitally connected actors but also to a fundamentally different and more invisible role of government in these arrangements. Consequently, these societal changes are difficult to understand and explain from the perspective of traditional government-centric paradigms of Public Administration (PA) and New Public Management (NPM). The recently emerging paradigm of New Public Governance (NPG) (Osborne, 2010) also fails to capture the dynamics of open governance since it does not acknowledge the emergent—pop-up—character of the new collaborations; neither does it present an understanding of massive individualized collaboration.

Studying these new collaborations is crucial for developing an understanding of smart cities that go beyond the focus on technology or centralized governance. Several authors highlight that the smart city is about using a variety of technologies to develop new ways of collaboration between a variety of urban actors and with a strong focus on the contribution of

citizens (Nam and Pardo, 2011; Kitchin, 2014; Meijer and Bolívar, 2016). New technologies do not only enhance the information position of governments but also reduce the transaction costs of collaboration and therefore facilitate new forms of large scale engagement. Building on the literature on open collaboration in the public sector, these forms of engagement in cities can be referred to as open governance. A strong theoretical understanding of these new forms of collaboration is absent and needed in the current literature on smart city governance.

This theoretical viewpoint paper aims to explore the core elements and the underlying socio-technical developments of this new Open Governance (OG) paradigm and highlight its value for understanding smart city dynamics by comparing and contrasting OG with existing governance paradigms. Based on illustrative real-life cases, such as the one described above, we will argue that we need a new paradigm that is better capable of explaining these emerging innovative forms of governing. We will argue that this requires an understanding of governance as a platform that facilitates a public sector ecosystem. By connecting new insights from studies on digital governance to the debate about governance paradigms, this paper results in a set crucial empirical and normative questions about governance in a time of platforms¹.

This paper will first present some examples of open governance from different policy domains to show that the use of new media to facilitate massive forms of collaborations occurs in different policy domains (section Open Governance: Examples From Different Policy Domains). We proceed by presenting an overview of the current debate about Old Public Administration, NPM, and NPG to highlight that we need a new theoretical frame for understanding these examples (section Shifting Governance Paradigms?). The different components of the new frame are presented in the next section: radical openness, citizen-centricity, connected intelligence, digital altruism, and crowdsourced deliberation (section Core Elements of the Open Governance Paradigm). The final section presents a critical reflection on this new paradigm and highlight a research agenda for studying new forms of urban governance facilitated by (platform) technologies (section Outline of a New Paradigm).

OPEN GOVERNANCE: EXAMPLES FROM DIFFERENT POLICY DOMAINS

The rapid changes in massive, individualized collaborations the private sector are well-known and intensively studied. We read about the changes that AirBnB and Uber bring to the hotel and taxi sectors and many authors argue that this is only the starting point for a drastic re-ordering of markets (Sutherland and Jarrahi, 2018; Van Dijck et al., 2018). We read much less

¹This theoretical paper is based on the authors’ interpretation of (1) a host of examples from different continents that we encountered in our academic work and reading, (2) our interpretation of academic and popular literature on new forms of organizing (e.g., De Kerckhove, 2001; Wellman et al., 2003; Von Hippel, 2005; Goleman, 2010; Lathrop and Ruma, 2010; Kitchin, 2014; Noveck, 2015) and (3) a connection of this literature to the debate on governance (Bang, 2003; Kjaer, 2004; Osborne, 2010).

about the changes in the public sector but highly interesting developments are also taking place. In this paper, we will discuss practices from crisis management, security control and environmental governance.

The first empirical domain in which open governance results in interesting practices is *crisis management*. The Canterbury earthquake case example presented above is not an isolated, one-off event: indeed we can observe more real-life examples that point toward new collective forms of technology-enabled data-sharing across a wide range of actors, where the role of government is limited and mass digital altruism, openness, and bottom-up self-organization are important features in these processes of collective action. For example, a case similar to the Canterbury earthquakes can be found in the State of Alabama where, immediately after the April 2011 outbreak of tornadoes, a large group of people called Toomers for Tuscaloosa quickly arose with more than 80,000 followers on Facebook discussing and coordinating the exchange of basic needs items like food, water, diapers, and shelter (Crowe, 2013, p. 89). In comparison, the State of Alabama Emergency Management Agency only had slightly more than 3,000 followers at the time and struggled to find ways to quickly and adequately address basic needs in the local community that were brought up via the social media sites. Also, the State of Alabama struggled to maintain the speed of information exchange that the public was expecting. The Toomers for Tuscaloosa “digital altruism” group quickly filled the needs gap by facilitating both organizational and peer-to-peer response in real-time.

The second domain is *environmental governance* and here we see that massive, individualized forms of collaboration can also be initiated by governments. In the United States, Federal Government agencies and non-government agencies are partnering with large groups of individual volunteers in order to address societal needs and solve complex problems. In so-called “citizen science” initiatives, members of the public participate voluntarily in the scientific process, addressing real-world problems in ways that may include formulating research questions, conducting scientific experiments, collecting and analyzing data, interpreting results, making new discoveries, developing technologies and applications, and solving complex problems (Holdren, 2015). Crowdsourcing initiatives are used to invite, via an open call, a large group of individual volunteers for online, distributed problem solving (Holdren, 2015). With millions of people being mobilized, practical examples of these citizen science and crowdsourcing initiatives include volunteers collecting air quality and other environmental data to improve the health and well-being of their communities and crowdsourced traffic congestion maps which shorten commuting times and make roads safer. Another example can be found in The Netherlands, where the extension of Amsterdam Airport had triggered public debate about the level of noise generated by air traffic. After contesting the noise pollution measurement models developed by the Dutch government, citizens set up their own digitized data collection and measurement system of noise pollution. Simple, networked data collection tools were installed in many households across the region, which led to a fine-grained network of data points generating more accurate

information on noise resulting from air traffic. This information played an important role in the development of public policy measures by the Dutch government to manage and reduce noise pollution levels.

A third domain in which forms of open governance can be found is *security control*. For example, during the Arab Spring, millions of videos of human rights violations have been uploaded by citizens. A similar example of open, “self-organizing” citizen journalists can be found in several initiatives around the world where citizens have taken the initiative to start up an online group with people from the same local area to monitor public safety in their local area: using Whatsapp as their online platform, people share information about public safety issues in their local area and monitor neighborhood safety together. These emergent online collaborations are generally spurred by concrete problems, such as a series of burglaries in the local area. Another interesting form of open governance in this domain is how New York citizens generate a real-time crime map of the City by reporting and uploading suspicious crime activities to a public website managed by the New York Police Department.

Real-life case examples such as the initiatives presented above demonstrate in a powerful way that traditional governance paradigms, with government as the dominant player, are no longer applicable to many emergent, technology-enabled initiatives where complex policy problems are solved in more effective ways. Instead, governments around the world see the increasing reliance on digital technology as providing an opportunity to enable a new governance paradigm for the future public sector, where citizens and civil society will be empowered to take on greater responsibility and start new more horizontal, collaborative partnerships with public sector organizations (OECD, 2011). Although the practices vary considerably, three underlying principles are seen as critical to achieve effective mass collaboration initiatives in the public sector, namely (1) *openness of data*: treating information as a collective strategic asset and worth collecting, using, preserving and sharing; (2) *data quality assurance*: data collected and/or used by volunteers should be credible and usable; and (3) *open participation*: treating the collective expertise and information of members of the public as valuable assets which enhance the effectiveness of public policy and improve the quality of public decision-making, individual volunteers are acknowledged for their contributions and see benefits from participating (Holdren, 2015). These horizontal collaborations do not consist of networks of organized actors but of massive number of individuals. Incentives, nudges, and reputation stimulate the contributions of individuals rather than steering (monetary), rewards or negotiations. Platforms are either set up by governments or by citizens themselves to facilitate these collaborations.

Based on these digital network opportunities and the creation, sharing, and use of open data, several scholars also observe a shift in governance arrangements toward the collaborative production of knowledge in the wider public sector and the development of more equitable, efficient, and sustainable data commons with active participation of multiple and varying stakeholders (Benkler, 2006; Hess and Ostrom, 2006; Borgman, 2015). Cities are expected to become smarter through these

new collaboration. In particular, digital technologies support new innovative opportunities to democratize the ability to produce information and knowledge through data-sharing and collaborating around open data, rather than confining the power of data to its producers and those in a position to pay for access (Kitchin, 2014). We argue that these examples highlight the contours of a new form of collaboration in smart cities. To develop a firm understanding of this new form of governance, we will compare it with existing models of governance.

SHIFTING GOVERNANCE PARADIGMS?

The thinking about the potential need of a new governance paradigm in a digital era where traditional government-centric paradigms no longer seem fit, is not new and is supported by several scholars (e.g., Benkler, 2006; Dunleavy et al., 2006; Hess and Ostrom, 2006; Osborne, 2010; Lips, 2012; Kitchin, 2014). For instance, some argue that the traditional NPM paradigm is dead, and is being replaced by a so-called “Digital-Era Governance” (DEG) model (Dunleavy et al., 2006). Due to newly available pervasive information-handling opportunities, the DEG model is seen as a response to emerging public sector problems resulting from NPM reforms and can be characterized under the following three themes (Dunleavy et al., 2006): reintegration, needs-based holism, and digitization changes. The argument is that Information and Communication Technologies (ICTs) will put back together many of the functions and expertise clusters that NPM separated into single-function organizational units, they will simplify and change the entire relationship between agencies and their clients, moving away from the NPM-focus on business process management and toward a citizen- or needs-based foundation for organization; and electronic channels become the central feature of administrative and business processes, leading to new forms of automation of administrative operations without human intervention and increased transparency.

Other scholars too argue that we are witnessing the transition from traditional Public Administration (PA) and NPM paradigms, which are focused on government- and organization-centric ways of managing the design and implementation of public policy and the delivery of public services, toward a NPG paradigm which helps us to better understand and explain how “wicked” policy problems and societal needs can be met more effectively (Osborne, 2010; see also: Bang, 2003; Kjaer, 2004; van Kersbergen and van Waarden, 2004). In comparison, NPG acknowledges the importance of positioning government agencies in a networked, pluralistic environment with other actors from the public, private, and non-governmental sectors. With network theory as an important foundation, the emphasis of NPG is on the interactions, relationships, and horizontal coordination between a variety of actors, rather than on the governance, management, or actions of a single government actor (Koppenjan and Klijn, 2014). Its main focus is on policy formation, policy implementation and service delivery in a network of interdependent actors, which are predominantly autonomous organizations (Rhodes, 1997; Agranov and McGuire, 2003; Koppenjan and Klijn, 2004).

Moreover, NPG acknowledges that these interdependent actors have different world views and, consequently, frame strategies, problems and solutions differently (Schön and Rein, 1994). Another core element of NPG is the institutionalization of relationships between actors, which can be understood as patterns of social relationships, such as interactions and power relationships, and patterns of rules that regulate behavior within the network, thus reducing transaction costs and influencing network performance (Koppenjan and Klijn, 2014). Horizontal coordination and network management are required to initiate and facilitate interactions between actors, create and change network arrangements for better coordination, manage complex interactions, and negotiation patterns, and create new content, such as exploring new ideas and organizing joint fact finding (*Ibid.*).

These NPG core elements are different from traditional government-centric governance paradigms but do seem to have some similarities with these emerging, technology-enabled open governance arrangements, such as participation of diverse actors and their networked arrangements. At the same time, crucial elements of the new, emerging forms of governance are not captured such as the role of platforms, the emergent/pop-up character of these collaborations and the massive individualized nature of them. Several authors (Klijn and Koppenjan, 2012; Lips, 2012; Sørensen, 2012) warn us for the possibility that one particular paradigm will not be replaced by another (“either-or” scenario), but rather a “hybrid” model of combined paradigms might evolve (“and-and” scenario): for example, alternative strategies for promoting public sector innovation, such as the NPM model of inter-agency competition and the NPG-model of networked governance, can happen next to each other or in a complementary way (Sørensen, 2012).

In this contribution, we will argue that a new open governance paradigm is needed to be able to understand and explain the new forms of collaboration in cities. The key limitation of the NPG framework is that it focuses on collaborations between (loosely) organized actors in networks and not—or hardly—on massive forms of individual engagement. The dynamics of collaboration that resulted in initiatives such as Wikipedia and Linux but also in responses to disasters, up-to-date information about traffic jams and participatory forms of security governance are not therefore insufficiently covered by NPG and require new theoretical building blocks. To develop a theoretical understanding of these new forms of collaboration, we use various theoretical approaches to develop five key components of open governance.

CORE ELEMENTS OF THE OPEN GOVERNANCE PARADIGM

Rapid technological developments are leading to the creation of large volumes of digitized data; enhanced speed at which data can be generated, accessed, processed, and analyzed, including in real-time; and strongly improved capacity to analyse both structured and unstructured data sets from sources as diverse as web logs, social media, mobile communications, sensors, and financial transactions. As we are increasingly living our

lives through digital networks and devices, data about people, things, and places are produced on a massive scale nowadays. For example, the “digital breadcrumbs” that we leave behind as we move around in the digital world, such as phone call logs, tweets, GPS location data, and credit card transactions, allow us to analyse patterns of human life through data that previously appeared to be related to random events (Pentland, 2009). Moreover, processes of “datafication” are increasingly common in our society as a result of embedding sensing technologies and networks into objects, such as in buildings, road infrastructure, driverless cars, or fitbits, turning many aspects of our lives into digitized data. According to the UK House of Commons Science Technology Committee (2016), the exponential growth of data can be illustrated by the following observations: (1) 90% of all data on the Internet were created within the last 2 years, (2) in 2014, every minute, more than 200 million emails were sent, 4 million Google search queries were conducted, and more than 2.4 million Facebook posts were shared, and (3) the total amount of global data is predicted to grow 40% year on year for the next decade. In addition, both existing digitized data sets made available for re-use through open data initiatives and active “data philanthropy” by people and organizations will also greatly enhance the potential for new forms of data use and analysis.

Open Governance is connected with a widespread diffusion of ICTs that reduce the transaction costs of collaboration. These reduced transaction costs facilitate a model for governance collaboration that radicalizes certain notions in NPG. We use the term Open Governance to refer to these new, emerging configurations of collaboration. Based on a variety of theoretical approaches, five core elements of the open governance paradigm can be observed: radical openness, citizen-centricity, connected intelligence, digital altruism, and crowdsourced deliberation. We will discuss these components and relate them to the variety of examples that we have presented previously. An overview of these five elements is presented in **Table 1**.

TABLE 1 | Core elements of the open governance paradigm.

Element	Description
Radical openness	Polycentric open data Massive interactive citizen-government communication Culture of openness
Citizen-centricity	Citizen-citizen contacts central to governance Government facilitates C2C interactions Unofficial forms of democracy
Connected intelligence	Organizing without leadership Deconcentrated forms of intelligence Large-scale, connected, and distributed interactions
Digital altruism	Coproduction of public value Data commons-based communities Principle of reciprocity
Crowdsourced deliberation	Diverse, equal, and deliberative participation Government with the people Open, asynchronous, depersonalized, and distributed deliberation

Radical Openness

Openness under OG is broader and more diverse than NPM and NPG. Whereas, NPM is built on the notion of calculated transparency—mostly: performance reporting—and NPG on negotiated transparency, OG stresses transparency as a key aspect of coordination between large numbers of participants. We could even speak of “radical transparency” (Goleman, 2010). The governance is more inclusive and includes diverse (citizen) voices on a large and more representative scale. The governance includes deliberation rather than just participation, that is, people of plural values are heard and considered. The basic idea is that open collaboration will result in most productive forms of interaction.

Governments around the world are opening up their non-personal administrative data and invite citizens, businesses and NGOs to actively engage around these open datasets in order to enable new innovative forms of collaborative knowledge production, policy making, and public service provision. This trend is coined with the term open government to highlight the shift from a closed bureaucratic relation with citizen to an open which makes information available and is accessible to citizens (Meijer et al., 2012). At the same time, developments can be observed where NGOs and businesses reuse open government data and combine them with their own datasets to create new innovative products and services, such as apps and other interactive communication services. There is this already a shift from governments being closed by default to governments opening up their datasets to become more transparent and achieve more effective public policy and service provision but openness is a more radical notion. It requires open access to governance arrangements and facilitative rather than directive governance arrangements.

Open governance is fundamentally a method to engage citizens and improve policy effectiveness and efficiency. The new open governance paradigm moves NPG a step further through attending to the quality of the open innovations. For instance, for opening data, it not only requires the government to open data but to make the data meaning and interpretable to users. Another example is on opening the policy making process. It not only requires the government to consult the stakeholders (as in the network governance), but also requires the consultation in a more large-scale, that is, to engage diverse groups of citizens. Moreover, the opening is not just about consulting citizens, but to give citizens feedback and open the process on an ongoing basis.

Openness is no longer something that is provided by governments to society: it is a polycentric notion of openness. Citizens too are generating data and mixing and matching these with open government data in a way that new insights are derived and added to knowledge available in the public domain, such as new evidence for policy making (citizen experts), news items (citizen journalists), and even scientific knowledge (citizen scientists). The example of the Christchurch earthquake clearly highlights how citizens collectively construct openness.

Open Governance is not only based on openness as a structure but also as a culture. The culture of openness—collaboration and hacker culture—has embraced the culture of civic hackers,

where they want to push openness to the full. However, the anti-institutional tendencies of the IT collaboration culture will inevitably clash with public administrations' principles of hierarchy, stability, management by rules, and accountability (Pyrozhenko, 2017). This argument highlights that the structure of government needs to be adapted to the new culture of openness and openness needs to be a principle for organizing. Scholars have pointed at the opportunities for public sector reform as a result of opening up digitized government data in relationships with external stakeholders (e.g., Lathrop and Ruma, 2010; Meijer et al., 2012; Kitchin, 2014; Noveck, 2015). New technology-enabled forms of openness are expected to fundamentally change relationships between citizens and government through the engagement of citizens as active democratic participants in the public sector, rather than passive observers of what government agencies are doing (Lathrop and Ruma, 2010; Noveck, 2015).

Citizen-Centricity

In his recent book on design in the public sector, Bason (2017) stresses that we need to move from government-centricity to citizen-centricity. The individual citizen does not only become a contributor to government policy but constructs his/her own forms of governance through individual networks. The relations between citizens rather than their contacts with government are at the heart of OG. Governments—and other platform providers—can facilitate these interactions rather than focusing on interactions between citizens and government.

Open governance notifies the increasing trend of public data that are created by the public. With the development of Information Communication Technologies (ICT) in the recent decade, citizens have begun to generate data to help government identify crime, manage environment, and the public infrastructure; to organize social movements and protests or to report and monitor government misbehavior. (Grace et al., 2015, p. 251): “Citizen science is a type of crowdsourcing in which individuals participate in scientific endeavors related to their personal interests rather than based on their formal professional credentials. For example, NatureNet adopts a ‘community field lab’ approach, in which hypotheses and the experimental design to support them are developed both top-down by scientists who suggest data collection tasks and bottom-up by the community of educators, naturalists, students, and members of the public who identify topics of interest and set about collecting data.”

To fortify this feature of citizen-centricity in OG, we can add an example from an unexpected corner: China. One would not expect open governance in an authoritarian state but Yang (2009) highlights the power of online citizen activism. In this book, Yang argues that China is experiencing a “communication revolution” that is “expanding citizens unofficial democracy.” Yang shows that more societal organizations/individuals have used Internet to raise public discussion and awareness of contentions issues in the society, to monitor the government and to call for collective action. The Internet has made citizens more active and more powerful in shaping government policies and in influencing the politics even in authoritarian countries. Usually NPG and NPM are discussed in the setting of democratic regimes. Yet,

OG, because of its feature of digitalization and ICT, attends to phenomena in authoritarian regimes.

Finally, open governance arrangements can function to link information seekers and information holders rather than actually storing information: e.g., participants post to the network, hoping that someone with the requested information will spot their request and provide an answer (Lakhani and von Hippel, 2003). Prominent examples in the medical field are specialized websites where patients with relatively rare conditions can for the first time find each other and/or find specialists in those conditions. Patients and specialists who participate in these groups can both provide and get access to information that previously was scattered and for most practical purposes inaccessible.

Connected Intelligence

Open governance acknowledges the emergent, dynamic and instant nature of complex problems and stresses that individual behaviors may have consequences at system-level. For that reason, open governance is not built on the notion of command-and-control style, market interactions or networks but of platform facilitated forms of self-organization. Shirky (2008) refers to this as the power of organizing without organizational leadership. The basic idea is that centralized intelligence is not suitable for detecting and processing signals about complex system changes and a radically deconcentrated form of intelligence is needed to process these signals. At the same time, connections are needed to ensure that the radically deconcentrated forms of intelligence do not result in anarchy. The platform is crucial for bringing the required connections.

These forms of self-organization provide instant access to the wisdom and experience of the crowd: magnification of input and response feedback loops. These forms of self-organization result in what De Kerckhove (2001) refers to as “connected intelligence”. This intelligence emerges from large-scale, connected, and distributed data and knowledge interactions. The examples that we presented in section the introduction and the second section highlight how signals about an earthquake, mobility, the environment or security can be connected through a platform to generate insights that could not be produced through centralized systems.

Digital Altruism

The open governance paradigm disconnects the idea of co-production—as formulated in the NPG Paradigm—from a relation between government and citizen. (Alford, 2009, p. 23) presents the following definition: “co-production is any active behavior by anyone outside the government agency which: is conjoint with agency production, or is independent of it but prompted by some action of the agency; is at least partly voluntary; and either intentionally or unintentionally creates private and/or public value, in the form of either outputs or outcomes.” The co-production (co-creation) model emphasizes on the volunteer role of citizens to, in effect, provide public services. The OG paradigm also uses this notion of volunteerism but does not connect it to engagement in public services but rather to engagement in the commons to produce public value.

Von Hippel (2005, pp. 165–166) argues that open governance communities—data commons-based communities—will form under the following conditions: (1) some actors have information that is not generally known, (2) some actors are willing to freely reveal what they know, and (3) some actors beyond the source of information have uses for what is revealed. The notion that “some are willing to freely reveal what they know” is interesting. This is sometimes referred to as “digital altruism” (Klisanin, 2011). This form of altruism is based on the principle of reciprocity and the belief that, in the end, everyone benefits from sharing information.

We can see these forms of Digital altruism/volunteerism in the Alabama case (Crowe, 2013): volunteers from anywhere in the world come together to share data and facilitate coordination and both collective and personalized response to particular needs.

Crowdsourced Deliberation

The core element of a more representative, equal, and deliberative civic engagement makes OG differ from NPG. Under NPG, although the element of network governance emphasizes on policy making as a collaboration between government, business and civil society actors, the governance networks are based on interdependencies and are not necessarily equitable (Klijn, 2008). The government still takes the dominant role in leading the whole process. Moreover, this network is limited to the interested stakeholders and experts. Differently, the OG paradigm calls for a more diverse, equal and deliberative participation from all sectors of the society particularly those minority groups. This core element of public value also makes the open governance paradigm differ from the incorporation of computer into local government in the 1950s (Danziger, 1977). The goal of the technological development in the government sector focuses more on the technology rather than on the interoperability, openness and participatory dimension that the technology might enhance how government operates (Hansson et al., 2015). It also focuses more on the goal of achieving agency efficiency rather than achieving the goal of democracy.

Noveck (2015) refers to this as “government *with* the people” and indicates that it is based on the idea that working in an open, transparent, participatory and collaborative way helps improve public sector outcomes and decision-making, encourage entrepreneurship and solve “wicked” problems more effectively. One example here is the Palo Alto democratic reform since 2014. The government invited citizens—online crowdsourcing and offline deliberation—to draft the Palo Alto Comprehensive Plan for the next 15 years. This case shows that citizens can be the leading subject to generate public data.

Aitamurto and Landemore (2016) introduce the concept of “crowdsourced deliberation” to indicate an “open, asynchronous, depersonalized, and distributed kind of online deliberation occurring among self-selected participants in the context of an attempt by government or another organization to open up the policymaking or lawmaking process.” The authors use the case of online crowdsourcing on the Law on Off-Road Traffic in Finland to demonstrate the knowledge search and the deliberation value of crowdsourcing value on a large scale. The concept and the empirical evidence of crowdsourced deliberation indicate a

form of governance that integrates mass scale, technology, and deliberation. This differs from NPG because it is of a much larger scale of participation than NPG; it uses online platforms (user-interface) to facilitate more dialogues among participants; it also encourages a more deliberative dialogues among participants.

OUTLINE OF A NEW PARADIGM

In this paper we have argued that the new forms of individualized massive collaboration in cities, facilitated by new technologies, should be understood from the perspective of a new paradigm for governance: Open Governance. This new paradigm follows up on NPG but radicalizes this notion by focusing on what Wellman et al. (2003) refer to as networked individualism (see also Rainie and Wellman, 2012). Collaboration no longer builds upon the notion that individuals create (forma) organizations and these organizations interact but rather on the notion that new technologies facilitate massive forms of collaboration around information and communication platforms. This results in a set of new features for these forms of collaboration and we have categorized as five components: radical openness, citizens-centricity, connected intelligence, digital altruism, and crowdsourced deliberation. The discussion of these components is used to develop a more systematic comparison of open governance vis-à-vis the earlier governance paradigms (see **Table 2**).

The table highlights that the theoretical roots of Open Governance (OG) are complexity theory and sociological theories on the collaboration between individuals in networks. The nature of the state has evolved from closed to regulatory to plural and then, finally, to open. The state provides a platform for collaboration of networks of individuals to produce relevant information around a shared value (such as security, mobility, or relief). The notion of government as a platform replaced earlier notions and fits similar developments in the private sector.

We would like to highlight that we see the overview as a sedimentary one rather than as different stages in the development of government. OPA, NPM, NPG, and OG are all still relevant to understand interactions in the public domain. They are forms of governance that co-exist and interact. One should regard this in the same way as the development of our economies where agriculture and heavy industry still exist next to newer forms such as (digital) services. The complexity of governance increases over time with the addition of new “layers.”

The perspective of open governance is sometimes understood as a normatively superior one: building upon the ideal of an open society open governance could be conceptualized as a desirable form of governance. This, however, is not how we view this concept. For us, open governance is a concept that can be used to understand and study new, emerging governance arrangements and to develop practices that are additional to the current governance practices. We do not necessarily think that a platform is more desirable than hierarchy, market, or network. The key point in this paper is that those other paradigms fall short in conceptualizing new forms of collaboration such as the disaster relief after the Christchurch earthquake and therefore

TABLE 2 | Open Governance as the new paradigm.

Paradigm	Theoretical roots	Nature of the state	Focus	Emphasis	Resource allocation mechanism	Nature of the service system	Value base
OPA (Old Public Administration)	Political science, public policy	Unitary	Political system	Policy development and implementation	Hierarchy	Closed	Public sector ethos
NPM (New Public Management)	Rational/public choice theory, management studies	Regulatory	(Service) organization	Management of organizational resources and performance	Market	Calculated openness	Performance
NPG (New Public Governance)	Institutional theory, organizational networks	Plural	Governance network	Negotiation of values, meaning, and relationships	Networks	Negotiated openness	Constructed in networks
OG (Open Governance)	Complexity theory, Networked individualism	Open	Network of individuals	Massive collaborative production of information	Platform	Radical openness	Collaborative around a shared value

we need to develop a new “lens” to understand these forms of massive, mediated collaboration between individuals as forms of governance.

In the applications of this paradigm for studying and developing governance practices, one should not be blinded by the positive connotations that various authors have attributed to this model. There are also important drawbacks and risks—a dark side—to this new governance paradigm (as there also are for the other paradigms). Steen et al. (2018) highlight that there are seven evils connected to the dark side of co-creation: the deliberate rejection of responsibility, failing accountability, rising transaction costs, loss of democracy, reinforced inequalities, implicit demands, and co-destruction of public value (see also: Meijer, 2016). These evils may also be connected to the new open governance paradigm that heavily relies on notions of co-production and co-creation. For this reason, care these to be taken in the application of this paradigm and more research into the dark side of open governance is needed.

Although, these risks need to be taken into account, the new paradigm of open governance does also provide new opportunities for urban governance. As we have already indicated, the open governance paradigm will not replace the other paradigms but it does offer new opportunities to realize public value in cities. This means that governments should explore and experiment with this new role of providing a platform for interactions between individuals in urban environments. Current reflexes of governance focus on hierarchy, market, or network as strategies for tackling problems in the city. Governments should add the platform to this range of possible governance interventions and explore if this intervention works for the specific policy context. Our exploration indicates that in the domains of crisis management, environmental governance

and security control these are certain options for applying this new governance strategy. The core notions we have developed about this governance approach—radical openness, citizen-centricity, connected intelligence, digital altruism, and crowdsourced deliberation—can form the building blocks for this type of governance strategy.

The Open Governance paradigm provides a lens for studying new forms of collaboration such as citizen science, massive coproduction, and crowdsourced deliberation in smart cities. This results in a set of questions regarding these forms of collaboration. We need to understand (1) the dynamics of the collaboration, (2) the role of the platform, (3) the incentives for engagement, (4) the emerging nature of the networks, and (5) the resulting performance. These topics can form the starting point for a research agenda that focuses on citizens as individual collaborators in the smart city and how they are supported by governments or other public platform providers.

DATA AVAILABILITY

This review article is based on an analysis of publications. All the publications that were analyzed are presented in the list of references.

AUTHOR CONTRIBUTIONS

AM has been the coordinating author. He has played a key role in developing the framework. ML played an important role in developing the framework and contributed the empirical material for the Canterbury case. KC contributed to the framework as well and provided important input for the core elements of the open governance paradigm.

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