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Innovating and changing the policy-cycle: Policy-makers be prepared!

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ABSTRACT

Many policy-makers are struggling to understand participatory governance in the midst of technological changes. Advances in information and communication technologies (ICTs) continue to have an impact on the ways that policy-makers and citizens engage with each other throughout the policy-making process. A set of developments in the areas of opening government data, advanced analytics, visualization, simulation, and gaming, and ubiquitous citizen access using mobile and personalized applications is shaping the interactions between policy-makers and citizens. Yet the impact of these developments on the policy-makers is unclear. The changing roles and need for new capabilities required from the government are analyzed in this paper using two case studies. Salient new roles for policy-makers are outlined focused on orchestrating the policy-making process. Research directions are identified including understand the behavior of users, aggregating and analyzing content from scattered resources, and the effective use of the new tools. Understanding new policy-makers roles will help to bridge the gap between the potential of tools and technologies and the organizational realities and political contexts. We argue that many examples are available that enable learning from others, in both directions, developed countries experiences are useful for developing countries and experiences from the latter are valuable for the former countries.

1. Introduction

Policy-making is a complex interactive process, having many iterations, involving and impacting many stakeholders, and addressing intractable problems from a wide variety of topics (Birkland, 2011). It is widely recognized that advanced information and communication technologies (ICTs) have impacted the ways that policy-makers and citizens engage in the policy-making process (Chadwick, 2003). While e-democracy and e-participation have their roots dating back to the 1990s, the recent policy shifts toward opening more data, the publics' ubiquitous access to and facility with personalized applications and mobile devices and government's improved capability for advanced analytics, has once again sparked new visions for e-democracy and e-participation. Thus, the e-voting, online opinion polling, e-town hall meetings, and electronic discussion lists of the 1990s and early 2000s are moving on toward the next-generation of policy-making tools enabled by, and supported with new information communication technologies (ICTs). Not only is it possible, but much easier, to reflect on the outcomes of policy-making, it has also become technically easier for citizens to be involved with the substance of policy-making, particularly how policies are evaluated and new options and alternatives are explored (see Fig. 1.). Social networking and new media platforms, advanced simulation websites and serious gaming tools are used in incremental and full-scale ways to involve citizens, obtain their opinions, and engage them in political processes (Koliba, Zia, & Lee, 2011).

Early adoption of ICT-enabled innovation in participatory governance was predominantly seen in developed countries, but now innovations have spread to all parts of the world, at all levels of government. This proliferation brings to the forefront an important question, how are we to understand participatory governance in the midst of these changes and recognize the diversity of contexts and the challenges that are likely to exist within and among countries? Even high-censorship countries like China allow for a greater flow of information and government criticism (King, Pan, & Roberts, 2013). The goal of this position paper is to demarcate the changes in policy-making by examining the changing roles of policy-makers, and provide directions for further research. We will first investigate some of the recent socio-technical developments affecting policy-making. Thereafter, we discuss briefly how policy-making is often conducted. Two inductive case stories are illustrated to highlight the changes in the policy-making process. We analyze these stories by examining the technical as well as the social developments and discuss the implications for policy-making.

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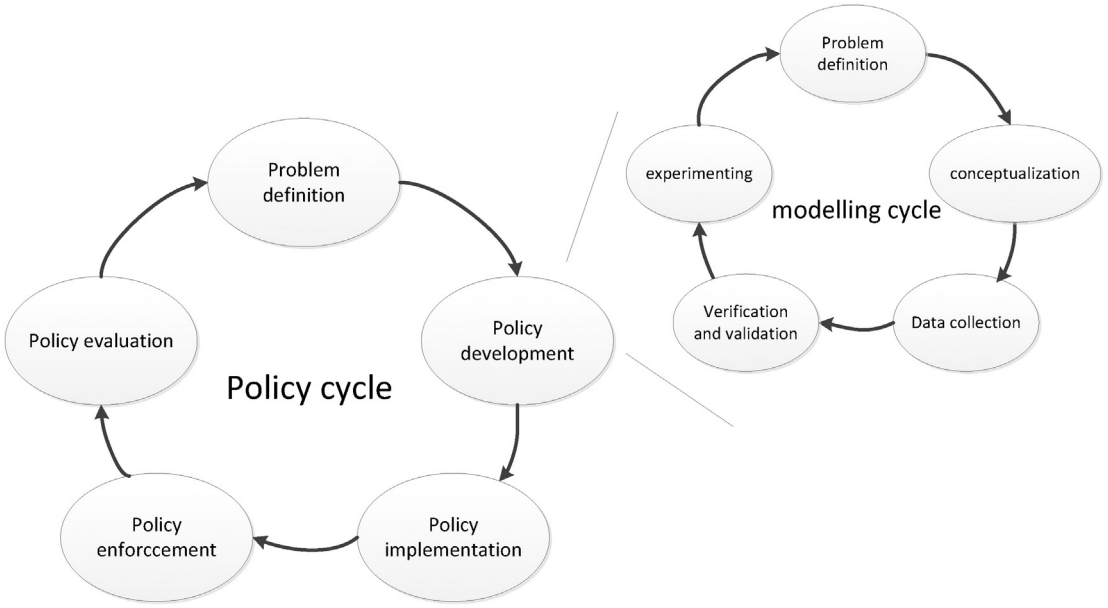

Fig. 1. Policy-cycle model and modelling cycle.

From these insights, we point at several salient and emerging roles policy-makers should pay attention to. Finally, we conclude by identifying some potential research directions.

2. Recent developments

The policy-making practice is affected by a number of relatively recent developments — the potential for ubiquitous civic engagement, more and more government data being released in open formats around the world, experiments involving citizens in solving government problems through advice and challenge platforms, and commercially-ready techniques for gaming and simulation that provide a virtual space to explore various social and policy dynamics.

While the main drivers of these developments are ICT-related, we are not advocating for technologically deterministic analyses and research examining these changes. Instead, we propose to view institutions and organization as 'ontologically social constructions' (Berger & Luckman, 1967) and choose to highlight the socio-technical implications of these developments. Policy-making is influenced by individuals, who create policy-making processes and interactions, and use technological tools, creating a dialectical relationship between policy-making and persons. The relational dialectics are catalyzed by technology innovation, information release, and computational advanced; but are further influenced by changes in political climate and acceptance of social technologies by the general public.

2.1. Ubiquitous civic engagement

Ubiquitous means existing or being everywhere at the same time (Merriam Webster Dictionary, 2014). Mobile devices and the supporting applications (apps) make it is possible to share information and collaborate anywhere at any time. According to PEW Internet Surveys, 91% of adults living in the United States have a cell phone, while 56% have a smart phone (Smith, 2014a, 2014b). Citizens use mobile and social platforms for all aspects of their personal, political, and professional lives.

Similarly, the meteoric rise of social media platforms and relatively quick acceptance by the public has impacted policy-making (Chun & Luna Reyes, 2012). Social media provides an additional channel through which social networking, crowdsourcing and interactive dialogues between citizens and other stakeholders in the policy-making process can occur. Facebook had 1.23 billion users in 2013, adding 170 million in one year (Sedghi, 2014) and a Pew Survey reported that half of all adult Facebook users have more than 200 friends in their network (Smith, 2014a, 2014b) enabling unprecedented access to localized and grass root efforts which ideally help to shape policy-making within specific contexts.

A survey in 2010 by the National Association of Chief Information Officers (NASCIO) reported that 23% of states were moving 'full-speed ahead' with social media, 49% were 'proceeding with caution' and another 26% were 'dipping toes in water.' At that time, most governments were using the communication channel to 'push out' information (Kavanaugh et al., 2012). Since that time, there has been continued adoption of social media platforms by government for government transparency (Bertot, Jaeger, Munson, & Glaisyer, 2010), for emergency response (Yates & Paquette, 2011), and health-related surveillance (Chou, Hunt, Beckjord, Moser, & Hesse, 2009). Governments are at the stage of moving from simple uses of the tools toward more sophisticated and complex practices of social media use (Ferro, Loukis, Charalabidis, & Osella, 2013). Mergel (2013) suggests that it is still unclear to what extent the information that flows into government by citizens through social media channels is governed, processed, and used, and it is equally unknown how government acts on that information.

2.2. Open and big data

Governments have been releasing their data for decades. What is new is the process of opening data and the political will to open it (Harrison et al., 2012). Contemporary descriptions of opening government data, or Public Sector Information (PSI), is the desire to make *all* of government's digital and non-digital information assets, into digitized, easy to use formats, available through platform independent, machine readable, and minimally restrictive use agreements that would not impede the re-use of that data or information (Zuiderwijk & Janssen, 2014). The opening of publicly funded data, is aimed at generating greater returns from the public investment in downstream use and creation of outputs (Arzberger et al., 2004).

Open data provides data to citizens and entities outside the government which then can become part of the policy-making process (European_Commission, 2010). Using open data citizens can become "democratic innovators" (Maier-Rabler & Huber, 2011). By providing access to data, this data can be used by anybody to analyze and make

suggestions for policy-improvement. This results not only in a transfer of data, but also in a transfer of knowledge from inside government to the outside (M. Janssen, Charalabidis, & Zuiderwijk, 2012). Open data can be analyzed and the results can be used to make informed arguments for embracing, rejecting or proposing new policies. Citizens often have limited time and expertise so it is likely that other parties jump into this gap and provide services to help citizens. New types of infomediaries arise that operate new types of business models (Marijn Janssen & Zuiderwijk, 2014). Indeed, there is a risk that those with more resources and expertise can use the open data for lobbying and strengthen their own position. Nevertheless, there is a shift from within to outside the government which influences the traditional power relationship between the government and the larger environment.

The Internet of Things (IoT) is a development contributing to the collection of large amounts of data. IoT integrates several technologies and communication solutions like identification and tracking technologies, wired and wireless sensors and actuator networks (Atzori, Iera, & Morabito, 2010). The IoT covers all devices, including smart phones, connected to the Internet and to each other, generating sensor-based signals that can be used for a variety of purposes. Public and private organizations are increasingly turning toward the IoT as a new source of data derived from continuously monitoring a wide range of things within a variety of situations.

2.3. Crowdsourcing

In 2009, Noveck introduced the world to the idea of utilizing everyday citizen expertise to solve government problems in her book *Wiki Government*. She described the now infamous use of the peer to patent system that uses information and research supplied by a community of interested citizens with varying backgrounds and levels of expertise as input to a very technical government agency process, approving patents. The website of PeertoPatent.org claims, "This process combines the democracy of open participation with the legitimacy and effectiveness of administrative decision making." This kind of crowdsourcing originated from the notion of the wisdom of crowds (Surowiecki, 2004). Linders (2012) describes the change as going from e-government to we-government where citizens are co-producers, suggesting that government sees citizens not as customers but as partners that effectively expands their role from passive to active problem solvers. Linders also identifies today's versions of coproduction — citizen sourcing which focuses on consultation and ideation, government as a platform which focuses on informing and nudging, and do-it-yourself government which focuses on self-organizing. All of these categories manifest as a result of changes in technologies, political motivations, and cultural shifts and each demonstrates a shift in the locus of power, away from bureaucracy and toward citizens.

Research since the 1970s has examined to what extent policy-makers use external types of knowledge to inform decision making (Weiss, 1977). Policy-making has long been characterized as carried out by elites (Bijlsam et al., 2011), in the sense that politicians are supported by policy-maker experts who provide advice and whose advice is viewed as authoritative. New tools are providing access and processes for collecting expertise from different sources, thus opening the process.

2.4. Visualization and gaming

In 1994, *SimCity*2000 was the bestselling video game in the world (*The History of SimCity*). The game was about city planning, where gamers became actual elected officials, created their own city, and managed its growth and future plans within a simulated metropolis (*The History of SimCity*). Since then, the use of visualization techniques and all types of games common people can become involved with have been used to understand and facilitate the policy-making process (Bachen, Raphael, Lynn, Baldwin-Philippi, & McKee, 2010). These techniques lower the threshold for ordinary citizens to participate. In this way, visualization and gaming provide a way for citizens to be a part of the policy-making process by using the simulations and games to poll citizen's opinion and receive feedback. Interactive simulations and games can support the legitimacy of the decisions made by enabling citizens to understand the process by participation in simulations and games.

2.5. Political will

Technology developments go hand-in-hand with a number of other developments, namely political will. Since 2003, the European Commission and in 2009, the Obama Administration, have increasingly made pleas for openness (European_Commission, 2003; Obama, 2009). The basic idea is that governments should be accountable to citizens and therefore the insight into government activities is a tenant of democratic governance. It is also well-recognized, after 20 years of research and practice related to digital government and the transformation of government through ICT-enabled reform, that existing structures need to change in order to fully derive benefits from the advantages provided by technology (Fountain, 2001; Weerakkody & Dhillon, 2008). Likewise, it is increasingly recognized that in order to understand how to create public value from these activities, a complex ecosystem metaphor is useful to guide a research agenda (Harrison et al., 2012) and that research and practice must examine how ICTs are transforming policy-making and the relationship between governments and the public.

3. Policy-making and complexity

Many public policy problems are a class of wicked problems where no optimal solution or a single answer exists (Rittel & Webber, 1973). The multitude of interdependent actors within society is growing and adds to the complexity of implementation, process, and finding solutions. This makes it difficult for policy-makers to assess choices and determine the impact of policy-interventions. One source of this difficulty stems from nonlinear interactions among system components. Nonlinearities can lead to unanticipated emergent behaviors (Holland, 1992). This unpredictability makes policy-making that much more difficult and hard to predict the effects of policies. Policy-making is aimed at solving societal problems by outlining and implementing laws and rules that can achieve certain goals. Although depictions of the policy process or policy stages vary through the literature; the most well-known conceptualizations are some combination of: problem identification, agenda setting, adoption, formulation, implementation, and policy evaluation (Gerston, 2004; Stewart_Jr et al., 2008; Lasswell, 1951; Easton (1965); Jones, 1977; Anderson, 1979; Stewart_Jr, Hedge, & Lester, 2008). Part of the policy-making is often the use of models. Models often follow a simulation modelling cycle consisting of the problem definition, conceptualization, data collection, verification and validation and experimenting (e.g. Law & Kelton, 1991). The latter often contains conducting 'what-if' analysis to investigate the consequences of alternative actions.

Expert-based approaches to policy-making are dominant, where stakeholders are involved but minimally (Bijlsam et al., 2011; Surowiecki, 2004). Government agencies not only conduct their own research and analyses to guide their decision making, but continue to use and rely upon, research conducted and submitted by third party experts (Napoli & Karaganis, 2010). Third parties, contracted to do this work, or as part of other funding mechanisms, include research agencies, consultancy organizations and academic institutions. On the other hand, participatory policy development has significant influence on stakeholder involvement on the development of substance in policy development (De Marchi, 2003). The main reasons for participative approaches is often to understand the needs and wishes from stakeholders and their opinions about certain directions.

The challenge of ICT-enabled innovation is to grasp the complexity of the technical and social system and to consider its interactions

when examining possible impacts. Designing complex socio-technical organizational systems poses significant challenges because of the large number of design options and the interdependency between the societal and the organizational parts, resulting often in the co-evolution of the both parts.

4. Recent examples

Two examples are investigated to better understand the changes in the policy-making and to inductively derive new roles and capabilities for policy-makers.

4.1. Self-organization

Recent earthquakes in the north of The Netherlands, a result of extracting natural gas and a pro-extraction energy policy, is one example of how self-governance is changing the policy-making process. Linders (2012) describes this kind of phenomenon as "Do-it-Yourself Government" where new technologies make it easier for "wired citizens [to] effectively self-organize" (p. 447). The following example demonstrates how self-organization occurs over various policy stages, including problem identification, agenda setting, and formulation. Self-organization and evolving toward order is a characteristic of a complex system (Anderson, 1999).

For several years, citizens in the area were complaining about possible negative effect of extraction of gas on their living environment due to the subsidence of the soil. They were unsure whether the lowering of the ground would cause earthquakes which might damage their homes or reduce the market price of their property. Elected officials and policy-makers initially denied and then ignored the evidence presented about the impact of the earthquakes, choosing to rely primarily on information collected from their own agencies which did not cover the impact on local homes and property. The "accepted" evidence by policy-makers was that the earthquakes would be limited and would have a minimal effect. Over time, however, citizen sentiment turned to disappointment and unhappiness.

Several community-based initiatives came into existence to deal with this despair. One initiative was a business (omnidots.com) that offered a sensor solution that could measure vibrations. For a paid subscription, citizens had access to a website and could see graphs and figures showing the changes in vibrations. This lowered the threshold of both collecting and visualizing data and this information came into the reach of ordinary citizens. A second initiative focused on using a citizen network to measure activity. Citizens could buy a seismometer and install it on a wall in their house. When an earthquake hit, the vibration and direction would be measured. If the wall could not stand straight anymore and was slightly sunken due to the earthquake, this would also be measured. The data was then collected and visualized on a network plotted on a geographical map in this way showing the impact of earthquakes. In this way the direct impact on their houses could be determined. Citizens, using data generated by them, were able to provide evidence and information back to the government experts, as well as elected officials. As a consequence, the topic of the earthquakes was put on the agenda. Among politicians there were discussions about compensating the citizens for the damage. After a while, a large budget was reserved for compensating the damage. The citizens were thinking that this amount was not sufficient. Once on the agenda, however, elected officials and policy-makers were initially too focused on compensating the costs of damage to surrounding housing. Meanwhile, the 'real' concern for citizens, was not compensation, but the fear of earthquakes generally and unfair treatment by the government. Citizens continued to feel unfairly treated, as gas extraction resulted in billions of euros of profit each year, none of which was reinvested back into the region. The elected officials were addressing the wrong concerns and misaligned the value the public placed on various aspects of the complicated earthquake problem. This misalignment resulted in ongoing discussions and no resolution.

A next step was to reduce the extraction of gas in some parts to lower the impact and possible damage. Although this step was appreciated, there were discussion about: 1) if the reduction would be sufficient and 2) why only some parts were tackled and others not. In the meantime, the earthquakes went on and seemed to become stronger which further strengthened the argument to take more measures. Although policy-makers already pushed for compensation and reduced the amount of gas extraction, the citizens were not satisfied and kept on using their data collected as evidence for influencing the political agenda.

This example shows that traditional policy-making is dominated by policy-makers who act as experts in their areas and politicians setting the objectives and intentions when negotiating with each other about the desired outcomes. In practice, policy-making is much more complex involving a large number of stakeholders who take care of their own concerns and include many organizations following different processes and procedures and using all kinds of instruments to gather and assess data and opinions.

4.2. Using gaming and immersion for innovating engagement

In Boston, Massachusetts the Mayor's Office of New Urban Mechanics (MONUM) piloted experiments in three major areas: participatory urbanism, clicks & bricks, and education (see: http://www.newurbanmechanics.org/). The office used platforms such as Community PlanIT or Participatory Chinatown, gaming and immersion platforms, to stimulate engagement in school based performance (Gordon & Baldwin-Philippi, 2014), or urban planning (see: http://engagementgamelab.org/projects/participatory-chinatown/). These platforms are an "upgraded" version of an electronic town-hall meeting by bringing in gaming and social networking. The goals of these platforms is to reduce barriers to participation, such as time conflicts, busy personal lives, discomfort in public speaking, lack of transportation to attend in person meetings, and simple borden or disenchantment with government to reimagine what public participation in policy-making could mean and look like.

Participatory Chinatown was designed as a complimentary process to traditional public meetings so that many different kinds of citizens could take on the role of virtual residents and do things that residents would have to do, such as finding a job, or housing, or figuring out where to go to eat. The history of Chinatown in Boston is an important backdrop to this gaming activity, since in the 1990s, the area has been involved in many different master planning activities, few of which have involved the residents, and such a broad spectrum of residents, in the planning process. Likewise, the master planning process for the area occurs every ten years, and significant changes in population demographics and economic and residential living occurred.

Using avatars, participants were asked to consider the future of the neighborhood by actually walking through the streets and commenting on what they think should happen. The comments were collected and then shared with decision makers. The online gaming aspect was supplemented with community face-to-face meetings. Together, the virtual and in person activities led to greater feelings of connectedness, and an ability of stakeholders to see and experience the opinions of a greater variety of community members. While this example demonstrated an experiment, it has since been replicated in numerous cities and across different policy problems and areas. Additionally, an online tool, available for other communities to use was created, further lowering the barrier for governments to utilize this tools within their communities. The tool demonstrates the role of policy-makers as intermediaries and conveyors, while also holding more traditional public meetings. These kinds of activities can also go on without government's direct involvement, by community advocates, as a way to help citizens express themselves in traditional public forums more effectively. Linders (2012) describes

this kind of co-production as "citizen sourcing" where "citizen consultation enables citizens to share their opinions with government, often in an attempt to improve representation and responsiveness and to help governments best select from among the policy and design alternatives" (p. 449).

4.3. What is trending

Table 1 below provides a summary of developments and the potential impact on governance. The two illustrative case stories show that there are already interesting examples out there that provide opportunities for learning. In contrary to what some researchers call future scenarios, this is not futuristic at all. This type of future already exists, however, the pieces of the puzzle are distributed over many places and the challenge is to combine them and learn from what works and what does not work.

Although there are many established instruments and tools for supporting policy-making and assessing the impact of policies, the current networked society enables new capacities. For example, the social web is becoming more important in the daily work of policy analysts and decision makers looking for ways to take advantage of understanding the impact of networks. Online services such DataKind.org (see: http://www.datakind.org/) were founded to match data scientists around the world with non-profits and mission driven organizations in order to utilize big data to solve complex societal problems. As Linders (2012) describes, "(t)he advent of digitized information and web-connected databases enables the government to deliver highly personalized information to help inform citizens' personal decisions. Government data mining, for instance, could notify users of relevant health risks, useful government programs for which they qualify, and neighborhood crime" (p. 448). In this view of "government as a platform," citizen entrepreneurs play an important role, they leverage their expertise in data mining to provide beneficial services for implementation and evaluation of policy. Hence, the existing tools and instruments should be translated and used for new forms of policy-making and interaction.

5. Implications for policy-makers and practice

The previous explanations make clear that the roles of policy-makers are changing and we provide descriptions of salient new roles emerging. A set of scholars have identified some of the ways. Rhodos (1997) described the changing role of policy-making in which the central role of government is overtaken by interdependence and policy network. Peters and Pierre (1998) described the changes to governance as operating in an organizational network, less about government control and more about influencing each other, an increase in the interconnection between public and private processes, and the prevalence of indirect policy instruments. The changes brought about by the most recent developments create additional changes to governance: expertise is not dominated by government experts but influenced from many different directions outside of government (Surowiecki, 2004) and engagement is about guiding the process, not just trying to build consensus.

The adoption of government using crowdsourcing as a technique has resulted in at least two new roles for policy-makers — *orchestration* and *quality assurance*. Orchestration becomes a critical capability for government to manage the policy-making cycle when dealing with diverse stakeholders (Marijn Janssen & Estevez, 2013). The orchestrator has the responsibility to ensure consistency among tasks within an engagement process and to oversee whether the various stakeholders work in concert to contribute meaningful engagement. In addition to orchestrating the interactions among citizens and between stakeholders, policy-makers will also play the role of assuring quality of engagement, legitimacy of the process, and the usability of the data and information. The policy-maker must create processes for checking calculations and complex simulations, falsifying arguments, and validating and verifying models. This will require new capability within government offices. Another new role is *aggregating and reporting* the vast amounts of data collected through new forms of connection and communication. Some conclusions and recommendations must be drawn, either by the policy-makers or through other forms of online voting techniques. The impact of these forms of engagement and democratic process are still being explored and government and the public have to find their new roles.

Many practices are available from all around the globe which enable learning from others; however, whether practices can be translated from one context to another is dependent on factors like the local circumstances and culture. An example is e-Petitioning which was made law in some countries and has since spread to many other countries, but is used differently in countries (Panagiotopoulos & Elliman, 2012). Practices might need to be translated to take into account different societal values, democratic systems, and other circumstances. One such example is participatory budgeting which started in Brazil and is now used in many countries (see for example Cabannes, 2004). Transferring practices should go in both directions. Developed countries have relevant experiences for developing countries and developing countries' experiences are useful for developed countries. Overviews of practices and methods for translating practices from one situation to another is an important research venue to advance this field.

6. Research directions

6.1. New roles for policy-makers

We argued that the traditional roles of policy-makers are changing and shifting, and new roles are added. This demands a reconsideration of the position of policy-makers, the relationship between politicians and public managers, and between citizens and public managers. A high-level politician made the following remark "you can question whether the government has sufficient knowledge and the right capabilities, but more important policy-making should be approached in a different way; decentralized and bottom-up driven". Instead of

Table 1
Mapping policy stages to developments and impact on governance.

Step	Policy developments	Impact on governance	Example
Problem definition and agenda setting	Collecting data by citizens/businesses (e.g., sensors) for agenda setting	Citizens identify the problems Petitions for agenda setting	Sensors measuring earth quakes for setting the policy agenda www.groninger-bodem-beweging.nl
Policy development	Simulation; Serious games; Crowdsourcing; co-creation	Citizens involvement as contributors; providing insight into policy options; being involved in selecting options	Energy-policy game to understand how the future looks www.energytransitionmodel.com
Policy implementation	Public-private sector collaboration	Co-creation between governments, citizen and businesses	Social intermediation to help neighbors: www.buuv.nu
Policy enforcement	Camera surveillance, use of smart phones, use of sensors	Citizens and businesses monitor using technology	Overview of surveillance in cities

www.datapanik.org/dossiers/camerabewaking/camerabel2/Policy evaluationDashboards, online reports, ex-ante simulationsCitizens can evaluate and propose actions (agenda setting)Publishing spend data to create transparency: www.openspending.nl

providing solutions, policy-makers should support the discovery of policy solutions. A condition for the policy-maker being able to orchestrate is that policy-makers can take a neutral and independent role. Ultimately, these changes might influence the capabilities needed and education of policy-makers and the need for developing new curricula and textbooks capturing the aspects of these developments. In essence, policy-makers have to have knowledge about the (im)possibilities and limitations of computational instruments and methods, whether a policy model is valid, how to use big and open data, know how to integrate instruments and methods in public discourse and understand the wishes, needs and behaviors of the broad range of stakeholders.

6.2. Adoption and effect on behavior

Developing mechanisms for participatory governance is complex and resource-intensive and the skill barrier needs to be lowered, and the discourse is frequently focused on technical solutions (Epstein, Newhart, & Vernon, 2014). Citizens should have the skills to be involved in policy-making. One way of doing this is by using simulations and games. Simulations can be used to involve persons in the policy-making process, but they might also be employed to change the behavior of citizens. An example of the latter is that by showing the disastrous effects of certain behaviors (e.g., drinking and driving too fast) the behavior might be guided in the right direction. The persons are nudged to change their behavior (Thaler & Sunstein, 2008). If constituents want to be involved is not clear. They might simply resist or prefer other and, as such, adoption might require a shift in behavior.

6.3. Aggregating and analyzing content

A lot of content is generated that can potentially be used to contribute to policy-making. Social media provides a rich source and inspiration for policy-makers. Yet this content and discussions are held at different places. Governments are embracing the concept of platforms to get an overview of the discussions (Marijn Janssen & Estevez, 2013). A platform is much more that creating a simple discussion forum. Platforms interconnect different stakeholder groups and allow participants to actively observe, report, collect, analyze, provide and disseminate information through a variety of tools covering the whole policy-cycle. Although the direction is clear, not much knowledge is available about how platforms should be governed and how they should operate in ecosystems of many stakeholders. Furthermore, analysis of opinions and contributions is important, but this level of examination should not deter people, or give them a sense that they are being watched all the time.

6.4. Effective use of tools and instruments

There are many tools and instruments out there and there are still many under development. Different countries use different tools and instruments and they might be context-dependent. As there is limited learning about which tools and instruments work at various stages, it is hard to derive practices about which work and why they work. Most of the tools and instruments are developed from a technology-driven perspective instead of derived from a problem-oriented perspective, where a particular (policy) problem is the focus. We are at the early stages of these developments and mature tools are limited.

6.5. Effect on policy-making

A question remains: what is the effect of these developments and new forms of interactions on policy-makers? Will they lead to more transparency? Will the government become more accountable? Or are these developments symbolic, and the main power relations remain, or do citizens feel that they are taken seriously? This line of research has established roots in understanding the differences between offline political engagement and online political engagement (Albrechta, 2006). Some might argue that the changes are limited and online and offline are quite similar, whereas others refer to the examples discussed and suggest that there are many differences. This is an ongoing discussion and evidence to support either position is lacking.

7. Conclusion

Aspects of policy-making are fundamentally changing by utilizing new technologies. Some include receiving different types and amounts of feedback, changing the speed at which we deliberate, and improving our ability to visually represent policy information for informing the public. This influences the way policy-makers create policy, and also affects the power balance between government and the public. In the past, the asymmetric information relationships between governments and the public was in favor of the government, where government was well-informed and had the expertise. With technology developments this balance is shifting and it is yet to be decided whether it reinforces traditional relationships or creates new openness and participation with the public. The public is well-informed and is able to collect information and evidence. Furthermore, the public can be very knowledgeable and might even contain experts in certain areas.

Although there are all kind of tools, there still remains a big gap (or structural issue) between creating policies and implementing policies and programs. This is also an important changing role for policy-makers. In some situations, we are seeing a shift from expertise-based policy-making toward orchestration by policy-makers. As orchestrators, policy-makers engage stakeholders, oversee the policy-making process, and assure quality engagement activities, legitimate processes, and ensure the usability of the data and information. The latter encompasses four important roles: engaging, quality assurance, aggregation, and reporting.

We observed different developments and examples to illustrate the developments and need for adopting new roles. The examples and practices are fragmented and it is hard to gain an overview. Hence, we recommend to learn from the experiences of other countries and take into consideration various contexts in order to make an appropriate fit.

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