

From Assumptions to Artifacts: Unfolding e-participation within Multi-level Governance

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Abstract: The role of technological innovation within the context of governance processes is often embraced with rhetorical enthusiasm and seen as a de facto enabler for democratic decision-making. Underpinning this enthusiasm is the leap of faith made from transparency to trust, from complexity to coherence. The belief that using new tools for e-participation can generate dramatic transformation in public sector redesign and result in societal benefits is heralded as a shift towards public innovation. It is precisely this belief that we examine in this paper. We start our investigation by providing a conceptualization of what e-participation means within the context of multi-level governance. By using a cross case comparison of two European research projects, we provide an empirical base upon which we can examine the process of e-participation and the implications of digital e-participation tools for various levels of governance and public accountability. Furthermore we provide an interdisciplinary contribution in understanding the gap between what technological innovation makes possible and the acceptance or openness on the part of decision makers to embrace citizen input within policy processes.

Keywords: Social Sensors, Open Governance, Crowdsourcing, e-participation, Trust

1. Introduction

Complexity is ever increasing with respect to the data becoming available to decision makers. Ranging from sensor data to text, from social media to expert repositories of knowledge, policy makers are grappling with how to make the journey from noise to signal. The challenge that emerges is how to make sense of and structure this vast body of data at their disposal, emerging as a by-product of various new forms of e-participation enabled by various Information and Communication Technologies (ICTs). Citizens and policy makers alike wrestle with how to intelligently filter information according to relevance, relationship and provenance. The endeavour at once becomes one of sense-making as well as trust-building. Within this context, decision makers are increasingly coming under pressure to be more inclusive and co-create policy with stakeholders, both from technologists as well as international and regional treaties such as the Aarhus Convention (1998). Situated in this transforming policy landscape, the role of e-participation has been met at times with rhetorical enthusiasm and at other times with critical concern (Barry & Bannister, 2014; Peled, A, 2014).

The idea of using new technologies and hence new forms of e-participation to support, augment or breathe life into democratic practices is not novel. Harrison & Falvey (2001) have argued that the introduction of ICTs routinely gives rise to intense speculation about their impact on the processes and practices of democracy. More specifically, there is the assumption that the Internet and its incumbent ecosystem of technologies may work to “amplify the political voice of ordinary citizens” [Hindman, 2008] in broad political processes. The shift that we observe here is therefore one away from the provision of information, documents and other one-way channels of communication to a multi-channeled dialogue and policy co-creation process.

While more collaborative and co-creating forms of public e-participation in administrative decision making are acknowledged to hold potential, there is also considerable evidence to suggest it is not always successful [King, 1998]. According to Fung [2006], participation in general varies according to three different dimensions: (1) who participates, (2) how participants exchange information and make decisions, (3) the link between public participation and decision making. Thus to simply suggest that more participation is always better is problematic in that different forms of participation (along the above dimensions) are more or less desirable depending on the characteristics of the policy process and the goals pursued.

Entering the landscape of e-participation, in some instances as incentive, in others as by-product are vast volumes of data. Boyd and Crawford [2012] see Big Data as a cultural, technological, and scholarly

phenomenon that rests on the interplay of three factors: *technology* – where the trend is towards maximizing computational power and algorithmic accuracy to gather, analyze, link, and compare large data sets; *analysis* – drawing on large data sets to identify patterns in order to make economic, social, technical, and legal claims; and *mythology* – where they refer to the widespread belief that large data sets offer a higher form of intelligence and knowledge that can generate insights that were previously impossible and with an aura of truth, objectivity, and accuracy.

At present, there is a paucity of systematic research investigating the assumption that immediate and widespread disclosure of public data results in an accountable and transparent government. Our paper provides a critical analysis via two case studies, testing the utopian rhetoric accompanying the marriage of data with policy decision support.

In order to analyse how these new forms of e-participation influence decision-making within multi-level governance, in this paper, we examine the role of citizens as ‘social sensors’ in opening up traditional governance processes. We do so by drawing on insights from two large scale European initiatives that are built around policy modeling, simulation and decision support. The paper is structured as follows. Section 2 presents our conceptual framework, followed by the case study contexts and methodological details in Section 3. We analyse the results in Section 4 and the paper concludes with a discussion of whether e-participation involving citizens as sensors results in any meaningful transformations within government and what affordances these new forms of e-participation bring.

2. Conceptual Framework

2.1 Conceptualising participation

The concept of participation in decision-making has evolved over a number of decades and is by no means a new concept. Based on a literature review of stakeholder (rather than broader public) e-participation in decision making, Reed (2008) argues that participation approaches have progressed through a series of phases: awareness raising in the 1960s, incorporation of local perspectives in the 1970s, recognition of local knowledge in the 1980s, e-participation as a norm as part of the sustainable development agenda of the 1990s, subsequent critiques and recently a 'post-participation' consensus regarding best practice. Consequently, there is a growing body of research focusing on the development of the widely recognized trend across policy structures suggesting that the status of traditional representative democratic processes and institutions is declining and new structures of governance are emerging (Bang, 2003).

Multi-level governance, which refers to the increasing interconnectedness of the various political arenas due to the processes of devolution, is of particular relevance to this discussion, as it offers elements precisely contributing to this complexity. Hajer (2009) talks about a change from the classical modernist governance into the modes of network governance, where people find themselves in new, ad hoc circumstances created by the current situation or a particular policy problem. Furthermore, there is the argument (Hajer & Wagenaar, 2003) that there are no pre-given rules that determine the responsibility, authority or accountability of complex processes. Recognising the importance of participatory practices then, in the network society, implies looking not only at what happens in formal participatory practices but also at what happens behind the scenes, in informal practices (Turnhout, et al., 2010). These informal practices are not necessarily organised in invited spaces, but are emerging spontaneously and are based on common concerns created by the particular situation at hand (Cornwall, 2002). This relates particularly to the use of social media when framing policy decisions or anticipating their impact.

2.2 From e-participation to Collaborative Planning

Some studies have suggested that trust in e-government can be built through increased responsiveness to user needs and inquiries and through increased transparency but such efforts are thus far limited (Gauld, et al., 2009). One of the advantages offered by transparency (be it in relation to data, process, or decisions), is that it leads to - and one can argue is even imperative for - trust. The relationship between transparency and trust has increased in importance in the modern discourse about democracy (Bannister et al., 2011). In particular, when the discourse turns to e-governance and the opening up of data, the assumption that by opening up or releasing data, the governance process automatically becomes more transparent and hence engenders trust on the part of citizens, is at best a problematic one.

Via the lens of an experiment, Grimmelikhuisen (2009) examines the extent to which web-enabled e-transparency influences trust of a government agency as conceptualized through the dimensions of competence, benevolence, and honesty. His results show that the relationship between e-transparency and trust dimensions was not unequivocal, and that while perceptions of benevolence and honesty are positively affected by the level of transparency, perceptions of competence may actually be lowered. Critically, the findings show that while e-transparency increases the level of knowledge *about* the government agency (which is to be expected), it does not automatically translate into a higher level of trust *in* a government agency. The value of this study lies in the fact that it provides for the first time empirical evidence that e-transparency may exert a heterogeneous or ambiguous effect on trust dimensions and, in contrast to the view of Bouckaert and Van de Walle (2003), that a high degree of e-transparency does decrease certain aspects of citizen trust in government agencies. Grimmelikhuisen (2009) refers to the negative aspects of his findings as *the dark side of transparency* — which results from a demystification of both government processes and performance.

While demystification can act as a force weakening trust in government, the counter force to that is of legitimization. This is linked to the belief that opening up data and processes of governance to citizens will create greater trust in the process of public policy making. One form of ‘buy-in’ within this context could be generated via citizens acting as points of data collection (or in other words when citizens become social sensors), rather than being called in at the end of a policy decision in a more tokenistic sense to offer mere preference-elicitation. New forms of distributed e-participation here offers a unique opportunity where citizen observations and inputs can be brought into the decision making process at an early stage of agenda setting within public policy.

2.3 New forms of distributed e-participation: what are Social Sensors?

The term “Social Sensors” includes a multitude of concepts and hence needs clear definition before we proceed. The core idea of involving the public in data gathering is referred to as citizen science, people-centric sensing or participatory sensing by different scientific disciplines (Wehn and Evers, 2015). From a technical perspective, the term implies technologies such as physical sensors (stationary devices such as weather stations or mobile devices such as smart phones or dedicated sensor devices), social media as well as software to make sense of, or parse large bodies of, open data. The latter comprise of a range of computational mechanisms (algorithms) that are used for semantic and sentiment analysis, linked open data, as well as policy simulation and modeling. From a social perspective, the term ‘social sensors’ refers to citizens (individuals and collective groups) who contribute information, explicitly or implicitly. In particular, we refer to a ‘social sensor’ role as one that relates to observations that are obtained in two ways: i) collected and mined from social media without citizens necessarily realising that their observation about a local situation is being included in a decision making process (labeled as ‘implicit data collection’) or ii) the intended and volunteered observations by citizens, collected using photos, videos, or sensor technology (‘explicit data collection’). Either way, at the conceptual level, acting as social sensors constitutes a distinctly new role for citizens, enabled by advances in, and the high diffusion of, mobile telephones as well as sensing technologies (Wehn et al., 2015). Policy makers and scientists now have a new data stream (i.e. data provided by citizens) to consider when researching a given policy problem, or modeling its impacts within society. Twitter in particular has been effective for early event spotting (Opsahl, 2010; Sakaki, et al., 2010). Such monitoring strategies are also being employed in epidemiology, where monitoring needs to be both distributed and longitudinal (for example in applications of e-health, where disease origin and evolution are mapped). In cases where there is need of continuous monitoring, social media can help measure the effectiveness of control measures and propaganda (Kavanaugh et al., 2012).

2.4 e-participation via crowdsourcing – opening up the governance process

Within the broader context of multi-level governance, *crowdsourcing* emerges as an explicit manifestation that can be used to increase e-participation. Crowdsourcing technologies make possible distributed and decentralised interaction (Donner J., 2010). This takes the form of outsourcing a given action in the form of a call to a community or to an undefined group of people, i.e. a crowd (Howe, 2006). What this enables is for citizens to share observations during events such as natural disasters, elections, community violence, etc., via online and mobile technology (e.g. SMS, voice, instant messages, Twitter, email) to a centralised server. Crowdsourcing in particular was made popular in development circles through the open source Ushahidi platform first used for post-election monitoring of violent acts in Kenya 2007-2008 (Hellström & Tröften, 2010).

Of particular interest to our research on the role of crowdsourcing as a form of e-participation within policy, is the assertion (Bott & Young, 2012) that “the core risks and challenges arise around the concept of trust”. They warn that potential end-users may find such initiatives rigid or centrally controlled, or lacking any real incentives and hence would not see the benefit in participating (Bott & Young, 2012). Furthermore, there are also risks such as information overload caused by unverified data, inaccurate information, and threats to citizens’ privacy and security when reporting (Currión P., 2010; Joyce M., 2010; Morozov E., 2011; Poblet M., 2011). Crowdsourcing thus has a range of anticipated and unanticipated knock-on effects that “need to be addressed to avoid the consequences of technological misuse and subsequent risks for citizens” (Poblet M., 2011, p.215). These risks associated with crowdsourcing are heightened when the crowd is asked to share personal information (e.g. on sensitive issues such as migration, wars, ethnic conflict or infections) that can be used to criticise the government, powerful industrial lobbies or public services.

Building on the above discussion, there emerges a niche of citizens within the broader crowdsourcing discourse, who add their voice, expertise and preferences via advanced ICT tools. Nevertheless, it has been argued that current initiatives are usually limited in three areas (Liu et al., 2014; Wehn et al., 2015). The first of these concerns one-way citizen e-participation, where the role of citizens is constrained to passive inputting of data, with little or no feedback. The second area refers to the lack of integration of citizen inputs with other infrastructure sensing data. Finally, the third area relates to the lack of personalised or real time spatio-temporal visualisation tools that would allow citizens to benefit from an augmented situation awareness. Lewenstein (2004) builds upon the above by pointing out two other definitions of the term which focus upon the governance aspects of public e-participation: the engagement of non-scientists in true decision-making about policy issues that have technical or scientific components, and the engagement of research scientists in the democratic and policy process.

To summarize what we have discussed so far is the changing face and role of e-participation within the discourse of governance. With regard to the remit of this paper, what is of particular significance is the opportunities opened up by these new forms of e-participation and via our case studies (introduced below) we will critically examine to what extent this changes the current status of multi-level governance.

3. Methodology

3.1 Case study method and rationale for selection

In order to gain comprehensive and in-depth understanding of the phenomenon under investigation, i.e. the role of new forms of e-participation within multi level governance, we selected two cases for a comparative study. These two cases addressed various levels of decision making (from the local to national to regional and even EU level) using new participatory methods and tools via which the traditional silos of governance and decision making were being challenged and opened up. We could map the results we derived from our extensive field work on to the theoretical frame of multi level governance and thus examine the impacts.

The two empirical cases were selected precisely because they are demonstrators or showcases for new participatory tools (ranging from citizen science to policy modeling and simulation) that impact and change traditional notions of multi level governance. These cases complement each other in that they are approaching e-participation from the dual perspective of both citizens and policy makers. We selected them because of their unique use of ICT tools (sensors, semantic/sentiment analysis tools for social media data, policy simulation and modeling) and their intention to bring decision makers and citizens closer via the mechanism of e-participation.

3.2 A tale of two European initiatives

Both Sense4us and WeSenseIt are two European Research initiatives (funded under EU Framework Program 7) that were conceived to assist policy makers and citizens to make more insightful and informed decisions. This was done via the design of tools that would take into account the views of citizens on policy issues in real time (via social media and linked open data) and help them to better understand the implications of proposed policies. The Sense4Us project emerges from the challenge that even once a policy is formulated, it remains difficult to make useful predictions about its likely impact and effectiveness. In addition, policy specialists may lack the resources and the methodology to be able to access the most current data and may not be in a position to take into account the views of citizens on policy issues expressed in real time through social network discussions. An articulated desire for the Sense4us project was the advancement of policy modeling and simulation, data analytics and social network discussion dynamics, in the hope of providing economic and

social benefits to policy analysts at all governmental levels across Europe. To realise this goal, the project set out over three years (2013-2016) to develop tools that would enable the extraction of information from big and open data sources; the automatic annotation and linkage of homogeneous data; the lexical analysis of sources; the creation of policy models combining quantitative open data sources with qualitative data from social media; the likely impacts of a policy to be simulated, via understandable visualizations; and the tracking of discussion dynamics via social media.

A key aspect of the WeSenseIt project (2012-2016) was the direct involvement of user communities within the data collection process. The WeSenseIt project had the articulated desire to enable citizen involvement by collecting data via an innovative combination of easy-to-use sensors and monitoring technologies as well as harnessing citizens' collective intelligence, i.e. the information, experience and knowledge embodied within individuals and communities communicated via social media (e.g. Twitter, Facebook, etc.) and dedicated mobile applications. These citizen observatories were intended to go beyond 'mere' sensing in order to harness environmental data and knowledge to effectively and efficiently manage water resources. The project aimed to define a framework in which authorities and citizens cooperate in: (i) sharing collective intelligence about events and places, (ii) supporting a shared situation awareness, not only to improve response and recovery, but also to improve prevention, protection and preparedness for future emergency situations (e.g. floods), and understanding citizens' needs; (iii) implementing new approaches to e-participation in planning, decision making and governance.

A crucial difference between the two projects is that in the Sense4Us project, the primary stakeholders were policy-makers & their support staff of analysts and assistants at the EU Parliament, national (UK) and local (Germany - regional) levels, while in the WeSenseIt project the focus was on involving citizens and local authorities as core stakeholders. Below, we present the similarities and differences between the two cases to draw on the ways they complement and enrich our analysis within this paper:

Table 1: Comparison of Case Study parameters

Focal elements	Sense4us	WeSenseIt
Stakeholders	Policy Makers, Analysts and Support Staff	Citizens, NGOs, Urban/Rural residents, Special Interest Groups
Policy contexts	Transport, Climate Policy, Migration, Health	Flood risk management, Environmental governance
Innovation and new participatory tools designed	Semantic/Sentiment Analysis tools for social media data, Linked Open Data, Policy modelling and simulation tool	Citizen observatories on flood risk management, data collection apps including feedback and visualisation, visualisation platforms, semantic social media analytics.
Multi-level governance process	Local, regional and EU level of Governance in UK, Germany, Belgium (EU Parliament), as well as peripheral cases in Sweden.	Local, and regional level of governance in case studies in Italy, the Netherlands, and the UK

3.3 Method

The data gathered, analysed and presented within this paper draws on a rich body of work spanning multiple actors within the two projects over three years. The data presented here is qualitative and was collected via semi-structured interviews, focus group sessions and questionnaires. Table 2 below presents a summary of the research landscape we traversed within the two case, whom we interviewed and what the body of data comprised:

Table 2: Summary of data collection instruments and respondents per case

Sense4Us	WeSenseIt
<ul style="list-style-type: none"> The data set consists of twenty four (n=36) interview transcripts. Of these, 24 were conducted during the initial round of requirements analysis, and comprised of ten at the level of the European Parliament, eight from the national level (UK) and six from the regional (German Westphalia County). The remaining 12 were conducted during the second and third year of the project on evaluation and validation exercises. The respondents ranged from MEPs, to their assisting administrative staff, from members of the House of Commons in UK to regional ministers from the Bundestag in Germany. The interviews cover a range of questions spanning an early stage requirements gathering and stakeholder mapping exercise, to latter reports of hands-on testing of the current iteration of the tool set by policy support staff in the UK, Germany and the European Parliament. 	<ul style="list-style-type: none"> The data set consists of: Transcripts of semi-structured face-to-face interviews (n=52) with leading staff for emergency and crisis control, planning as well as infrastructure maintenance at the local level, planning and emergency services at the regional level and (in the UK) the Environment Agency at the national level. Formal and informal discussions combined with observations throughout the life-time of the project involving the case study-related local authorities, professional users and trained (citizen) volunteers (e.g. regarding the selection of physical sensors for each case, identification of suitable locations for these sensors as well as mobile app functionalities, web-based data visualisation, feedback and interaction options).

In both cases, the transcribed interviews were analysed according to the conceptual framework introduced in the previous section and the collected data triangulated with information from desk research, such as country reports about the implementation of relevant EU Directives (incl. the Water Framework Directive, Flood Directive) and the Aarhus Convention. In our analysis of the data, we take an Interpretivist stance. This is aimed at producing a closer understanding of how an information system influences and is influenced by its context (Walsham, G., 1993). A key task in interpretive research is seeking meaning in context - the subject matter is set in its social and historical context so as to better understand the evolution and emergence of outcomes (Klein, H. & Myers, M., 1999).

4. Results and Analysis

The overall objective within this section of the paper is to examine the implications that new digital e-participation tools might have for various 'levels' or 'modes' of governance and public accountability. In order to do so, we first dive into the question of who are selected to participate in the decision making process.

4.1 Understanding the "Stakeholders"

In Sense4Us, given that the primary focus was to design and develop tools to assist policy makers and their support staff, we spoke to those stakeholders already engaged within the process of researching and analysing diverse data streams to make more informed decisions. Our intention here was to better understand what their current use of e-participation tools was and how they perceived the added value of the new tools becoming available, for their everyday work context. During an interview with a senior UK civil servant, our discussion turned to the value of social media data in drafting policy:

"Social listening tools do not currently provide appropriate insights for policy-making as they are almost exclusively designed for marketers. As a policy-maker you are trying to capture the essence of online discussions and what that means for scoping and implementing policies."

Thus what was articulated was a deficit in current practices for civic engagement within the policy context. What was felt to be missing, was a clearer picture on who was being targeted by a given policy, to build up knowledge of those people, understand when and how policy makers should intervene in discussions. There was a clearly articulated need to understand and be able to predict which types of people (demographics) will take part in specific discussions. He went on to say:

“Who they are, where they are, what things appeal to them” – this kind of knowledge would really help to understand different networks better and therefore how to best implement certain policies and know where areas of concern might be in relation to policies that are already implemented.”

Would the policy-maker be better off targeting electric cars at people who are environmentally conscious or at those who are more interested in saving money? The motivating factors are different for these two groups. Being able to know about groups that are currently not on their radar but are having related conversations elsewhere, was articulated as being very useful.

In WeSenseit, we saw a shift by the UK (local) authorities trying to change the mind-set of citizens from being a customer ‘receiving services’ to taking responsibility, including for flood risk management. There is a clear push for various stakeholders to collaborate (Environment Agencies (EA), local authority, communities) and this presents a shift in citizen e-participation to the start - rather than the end - of the planning process. For example, while the EA’s traditional way was to decide what flood risk schemes (e.g. infrastructure investments) needed to be done, then announce these and defend them, more recently, communities are expected to be more involved in the decision making process. The sequence of the project cycle for decision makers in this case has therefore changed from ‘design – defend – implement’ to ‘discuss – design – implement’ (Wehn et al. 2015). This presents a shift of the interactions with citizens to the start of the planning process, avoiding confrontation with communities just before project implementation. The municipal public authorities were seen to be proactively approaching the communities via the Parish councils and flood wardens (volunteer representatives from the local communities) to identify their biggest worries or perceived risks face-to-face.

4.2 The “When” and the “How” of e-participation

From the Sense4Us project, in our discussions with policy makers, we observed a marked hesitancy in the nature of, and stage at which, citizen inputs were sought. This was neatly captured in the response of an MP who articulated:

“In general the specialist divisions (e.g. energy) work together with domain experts – the federal government engages people from commerce (e.g. lobbyists) or recruits them to work on special legislative processes. The Internet plays a limited role within this process – during the legislative process the Internet will for instance be used to investigate third party opinions.”

Thus we find here an acknowledgement of the limited role non-expert opinions could be allowed to play within the remit of certain policy fields. Within WeSenseit too, we found in the Italian case context of Vicenza, that mostly ‘selective’ citizen e-participation was taking place and it was foreseen that it would be mainly citizen scientists and trained members of the Protezione Civile who would be consulted. In the case context of Delfland (the Netherlands), participation with citizens was found to be highly institutionalised and the role for citizens to influence decision-making was fairly limited or even passive, leaving little to no room for e-participation to change the existing paradigm.

In both our empirical cases, we find policy and decision makers expressed a relatively heavier preference to involve citizen scientists, trained volunteers, experts, local and regional authorities as opposed to lay citizens. The anticipated influence of the ‘citizen voice’ via the internet or social media, at a more general level was seen to be secondary to that of more targeted, expert groups. However, when it came to inputting data at the social sensor level as opposed to preference elicitation (i.e. choosing between policy options), policy makers in both cases were more open to “listening in” to gather a richer, more nuanced picture. In the section below, we consider how this form of e-participation manifested itself and towards what impact.

4.3 The question of trust

During an event where Sense4Us was presented to policy makers within a regional parliamentary context in Germany, we gathered some interesting insights into how the stakeholders (policy makers in this case) conceived of new participatory technologies that could assist in sense-making of data. Four MPs from the North Rhine-Westphalia region suggested that the toolset under development have two settings. These would be “light” and “advanced”. “Light” here would refer to the case where policy makers would see less information in contrast to “advanced”. This would enable them at the beginning to not use all background information that justifies the results of the algorithms. As and when the policy maker then became more

interested in the processes and the toolbox's transparency, the user may switch to the "advanced" setting. This would come with the same standard functionalities, but shows more parameters and additional functionality. This would offer the opportunity to better trust the results and to justify why the results are trustworthy. What is of particular interest here, is that within the Sense4Us case, the end users participated at two levels. The first is the more obvious one in which their inputs, such as the one above regarding advanced settings, influence how policy makers can come to trust technological processes that inform their decisions and in return to inspire trust via the transparency that this affords. On the other level, we see an opening up of the e-participation process here, in the sense that citizens are invited to be witness to hitherto closed processes within governance – relating to how policy decisions are arrived at, and how their governments are informed. On this latter point, we witnessed some contention amongst our stakeholder group, where understandably some policy makers were happy to open up the dashboard to the public, while others less so. This links to the fear and hesitation on the part of those that currently wield the knowledge and information of decision making processes to open their practices to citizens and be thus open for scrutiny. From a technological stand-point the opportunity exists, however from the political perspective of how traditional governance is performed, this is seen as a key challenge.

Another factor to consider when investigating the leap from transparency to trust relates to the inherent risks built into the appropriation of data models to gain legitimacy (as we discussed in an earlier section of this paper). This concern was articulated by UK parliamentary officials, when they mentioned that MPs in particular were not sufficiently data literate to understand the limitations of the models put forward by such sense making technologies. They feared that they would not be able to fully question the data these models would be based on. This would, they argued, have direct bearing on their ability to participate in any meaningful way.

"You put a number on anything and it gives a certainty... as soon as you have numbers being bandied around there's a risk that there might be too much certainty attached to anything that any model could come out with. Pitching it at a level that informs but doesn't give more certainty than any model is ever going to be able to capture..."

The suggestion was made in a parliamentary focus groups that MPs would be likely to use a 'killer fact' to support a political point they were trying to make rather than using information they were sure was representative of the body of evidence around an issue. Providing context and guidance about how the tool should be used is therefore crucial if it is to be used by MPs or others with potentially low levels of data literacy. This raises the question of citizens rights and interests being protected rather than policy maker wielding such tools as the ones presented in Sense4Us and WeSenseIt, in order to entrench their already powerful positions and reinforce a status quo politically. Additionally, there is an inherent traditionalism about the way government in particular conducts business, and the suggestion from the interviews and focus groups was that although many participants were becoming familiar with the use of social media in engagement, outreach and marketing contexts, few could envisage the use of social media data in meeting their policy-development needs.

Similarly, in WeSenseIt, the authorities in all three case studies repeatedly expressed their concerns regarding trust and accountability for information made available via the respective observatories, how this would be interpreted and by whom (e.g. potentially causing panic among citizens based on biased or incorrect data). Each of the authorities made their own choice in being responsive in an equal dialogue with their residents. In the UK WeSenseIt case study, the platform was given to the community, as a communication channel, like Facebook and Twitter, on which everybody can post their water-related pictures, comments and concerns; communities use it to share experiences between neighbourhoods, to build reference points on water levels over time and to get information from the water levels sensors installed. The local authority is also active on the platform; posting, reacting to posts and comments and viewing the sensor data – but it is not responsible to provide an answer to or solve everything that is posted. If there is a serious issue that needs to be reported to - and dealt with by - the authorities in charge, the traditional routes (i.e. the emergency number and response procedures) are still standing procedure and not influenced by the observatory. In the Italian WeSenseIt case study, the authorities host a platform that is more closed: only trained volunteers are allowed to post information at moments that the authorities feel that additional ground level information is needed from a specific location. Finally, at the other extreme, in the Dutch WeSenseIt case study, the authorities decided that an observatory existing next to their traditional communication channels like the Customer Contact Center (KCC) would create confusion for the residents and new responsibilities for their employees;

when an alert is issued, the water authority will depend on its own data sources and sensors, arguing “*It [data collection] is our responsibility, we should not be depending on citizens*”. The observatory therefore does exist but separately and decoupled from the authority.

Linked to the above notion of trust is the ability to follow the evolution of discourse within any policy area. In other words, not only is the trust built along the dimension of transparency but also chronologically as those entrusted with making decisions can track the dynamic flows over time. Within the Sense4us project, we found that policy makers expressed what they were most interested in was the ‘delta’ or the change (evolution) of their search terms, since they last monitored a given topic. So for instance, in the case of Germany, where policy makers were researching the term ‘inclusion’ and ‘migration’, what became of key relevance to them, was to be able to track the evolution of discourse and the rate of change. By adding citizen discussions via social media here as a variable, we found a unique form of e-participation taking place, where citizens as social sensors, contributed their views, sentiments, knowledge and preferences, and in doing so formed an additional layer (to the big, open data), shaping the final policy under discussion.

4.4 The diversity of roles for social sensors within multi-level governance

Within the WeSenseIt project, we were reminded of the diversity of participatory relationships between citizens and their governments – an often forgotten attribute within much of current research, where “stakeholders” and “e-participation” are treated as blanket terms. In the Italy WeSenseIt case study, for example, e-participation was mainly focused on information exchange (to/from the citizens), with limited involvement on the part of citizens in more direct decision-making. While in the UK WeSenseIt case, we found a heavy reliance on regular and intense face-to-face contact and interaction with citizens; albeit with mostly older and less technology-savvy members of the communities. In the Dutch WeSenseIt case, participation with citizens was found to be ad hoc (depending on the project context); citizens were informed as opposed to consulted about plans and decisions. Thus we see here an expression of the ‘design-defend-implement’ paradigm, rather than a more concerted shift towards e-participation in the sense of genuine deliberation and negotiation. This serves to highlight the gap between what technological innovation (in this case the application of new participatory tools such as citizen science and policy modeling) makes possible, on the one hand, and the acceptance or openness on the part of decision makers to embrace citizen inputs on the other hand.

As the hesitation to use less formal methods to collect feedback from citizens suggests, policy makers from both projects said they needed reassurance as to the validity of the data collection and analysis methodologies related to social media data collection and usage. Thus we return to the issue of trust and provenance and are reminded of the (often tacit) boundaries to e-participation set in direct conflict with the rhetoric of the opening up of governance. This was illustrated within the WeSenseIt project, where the UK decision makers clearly felt the impact of social sensors would be to ‘advise and consult’ but not to co-govern. On a more positive note, they felt that such e-participation would definitely help bridge an existing gap (largely generational) by involving previously unengaged segments of the communities such as the Digital Natives and their parents. In the Dutch WeSenseIt case, we were informed that increasingly, tuning into social sensors, was being perceived by the authorities as an opportunity to hear the ‘voice of the citizens.’ How then this voice was translated into the policy agenda set and its implementation, remained an unanswered question.

4.5 Impact of e-participation - the political instrumentalisation of scientific facts

Within the Sense4us project, we were informed by an MEP’s assistant, of a very interesting case highlighting the tension that is created by new participatory tools based on social sensors:

“At the time of considering the Kyoto protocol (i.e. referring to Greenhouse emissions), all policy makers saw a scientific simulation of what will happen in the future, if this policy is adopted. We had scientific data and worked on this data for years and years but in the end it went to a different direction. Scientific truth is put into doubt by a political instrumentalisation. We can’t anticipate decisions as it is all politicization.”

Two key points emerge from the above. The first relates to the lack of trust in “political artifacts” as opposed to “scientific facts”. This is attributed to the question: *in whose interest* are such tools deployed? Within both projects that we are considering here, there is an explicit concern articulated by citizens and experts (scientists) that politicians will use analytical as well as simulation tools to put a “political spin” on opinions

they give more weight to. The second point is that within debates on e-participation today, there is a heavy focus on technological design and what this enables, rather than on behavioural adaptation required for more sustainable outcomes. The above quote highlights this quite well, in that it showcases how the lack of behavioural change can result in new innovative designs being used to reinforce existing dichotomies. However, on a more hopeful note, the above MEP assistant went on to pinpoint:

“Scientific evidence is very interesting and important for the European Parliament because that would lead to no game between the opposition and the ruling party and ensure less instrumentalisation.”

In other words, he calls for a de-coupling of scientific fact or expert knowledge from political manipulation, within the decision making sphere. A similar de-coupling is called for by other policy makers in our sample, of citizen opinions emerging from social media and expert opinions emerging from emergency services (as in the flood risk management scenario we see in WeSenseIt), in that the former are more subjective concerns of communities and hence open to greater manipulation.

Nevertheless, in all three WeSenseIt case studies, one of the first and foremost valued outcomes was that each observatory and its sensors leveled the access to relevant and specific information. In all three cases, the process of participating in the project was perceived as having enhanced existing conversations and discussions between authorities and citizens. The caveat, however, also in all three cases, was the ownership of the information and how to allocate the responsibility to act upon it- “who decides on when and how to take action”. This element of the equal dialogue between authorities and citizens generated tensions in all three case study areas, since all involved authorities realised that participation cannot be thought of lightly.

5. Discussion

While some approaches to analysing the impact of e-participation attempt to draw a straight line from individual actions or behaviors to policy or developmental outcomes, we argue that intermediate outcomes may be equally important. A summary of the intermediate outcomes and impacts of e-participation for our respective cases is provided in Table 3 below.

Table 3: Summary of intermediate outcomes and impacts of e-participation

Outcomes and impacts of e-participation	Sense4us	WeSenseIt
Roles for citizens	Envisioned citizens as advisors and scientific experts rather than co-creators of policy decisions	Scientific advisors and not decision makers
Public accountability and legitimacy	Hesitation to open up the processes to public scrutiny due to fear of criticism and misinterpretation of intent.	The new tools enhanced existing conversations and discussions between authorities and citizens. The caveat, however, was the ownership of the information and how to allocate the responsibility to act upon it - “who decides on when and how to take action”.
Trust	Lack of trust in the provenance of data sources and citizen inputs gathered from social media sources within the policy decision making context.	Trust in the equal dialogue between authorities and citizens generated tensions, since all involved authorities realised that participation cannot be thought of lightly.
Challenge faced	Gap between what the technical participatory tools enabled and what forms of citizen inputs policy decision makers were willing to integrate within traditional forms of governance.	Ad hoc engagement with citizen stakeholders in various roles (data collectors, advisors and feedback providers) where the design-defend-implement tradition was not shifted.

Challenge faced Gap between what the technical participatory tools enabled and what forms of citizen inputs policy decision makers were willing to integrate within traditional forms of governance. Ad hoc engagement with citizen stakeholders in various roles (data collectors, advisors and feedback providers) where the design-defend-implement tradition was not shifted.

Within the Sense4Us case, we saw that policy makers were open to the idea of a greater scientific advisory role played by such tool sets, that could, in theory enable them to make more informed decisions. By addressing the complexity of information and providing an innovative, linked, as well as relevant projection of policy impacts, they felt their relationship with the communities they represented, would be strengthened. In the case of the WeSenseIt project, the coming together of diverse sensors (physical and social) the collaborative nature of knowledge co-creation was highlighted. Citizens were enthusiastic about what this could mean in terms of being given a greater role in managing and mitigating risks within their community.

However, the issues of public accountability and legitimacy emerged as key concerns on the part of authorities' decisions based on citizens' data, in both projects. This links clearly to the first assumption discussed in this paper regarding the transparency-trust relationship and the wider discourse on what counts as evidence in policy making (Adams and Sandbrook, 2013; Haddaway and Pullin, 2013). What policy makers expressed an unequivocal desire for, was a technology environment that would render political processes and decision making processes more trustworthy. However, the rationale for this was more to justify (defend) their decisions to citizens and not necessarily to bring on board citizen voices during early stages of deliberation.

Gaventa & Barrett (2012) suggest from their findings that we cannot consider "success of e-participation" and "level of democratization" to be linked in a linear or progressive manner. In addition, they argue that change happens through multiple types of citizen engagement: not only through formal governance processes, even participatory ones, but also through associations and social movements that are not created by the state. A typical example of this being - discussions and movements emerging from the use of social media. Strengthening these broader social change processes, and their interactions, can in turn create opportunities for state reformers to respond to demands, build external alliances, and contribute to state responsiveness. The role of social media here is of critical importance. By capturing discussions and opinions within an informal sphere inhabited by citizens and initiated from a grassroots level, policy makers have a unique opportunity now to tap into sentiments, perceptions and priorities of the very groups that will be affected by the decisions they make. This does not stop at a one-directional "listening in", but instead also includes a genuine dialogue where citizens and stakeholders are allowed to give iterative feedback on the design of both platforms and policies. In particular, as we have shown with citizen scientists and experts in the WeSenseIt project, this e-participation can take the form of data collection and provision, rather than relegating citizens to more tokenistic forms of engagement after policy decisions have already been made.

With the two platforms we have presented here, we see a shift away from tokenistic forms of e-participation towards more engaged and hands on participatory practices, albeit to varying degrees depending on the existing institutional setting. While this is a sustainable model to follow, what needs to be problematized here, is the way in which assumptions on the part of the designers of such platforms get built into the models, which are then used for predicting and influencing policy. One instance of this has already been discussed earlier on in this paper – the question of trust (or lack thereof) emerging from the political use of scientific artifacts. The predictive models being developed within the Sense4Us project, had one assumption underpinning them. This relates to the point we raised on interest and impact. The designers of the models build a platform with the assumption that the priorities and concerns of citizens/stakeholders will hold a higher position than those of the policy makers. This assumption does not always hold true, due to the resistance to behavioural change within multi-level governance environments.

This brings us to the second assumption we discussed in this paper, regarding the implicit belief that such innovations in the public sphere will be applied for societal benefit. As we have seen via the two cases presented here, while there is a clear motivation towards fostering dialogues with citizens (in their capacity as social sensors), incentives need to be built into the design of such initiatives, to motivate policy makers to listen and address citizen concerns, as well as motivate citizens to want to engage. Such incentives can be both technological and social. With regard to the technological, we argue that these incentives can take the form of transparency (two-way) and inter-connectivity. Transparency and openness in design can be built in to serve both decision makers and citizens alike, who can thus be motivated to engage in return for a better

understanding of the processes and outcomes. With regard to inter-connectivity, we refer to the ability to ‘connect the dots’, or relate diverse and complex information in an intuitive manner, allowing one to have a fuller understanding of the consequences or societal impacts of certain policy decisions. This we feel will make for a more sustainable model of engagement. However, on a more skeptical note, we find that transparency can act as a double-edged sword here, with the risk of increasing apathy amongst citizens, if participatory processes are manipulated to gain legitimacy alone, and no meaningful shifts in the imbalance of power are perceived.

With regard to social incentives, these can be more challenging to achieve. Apart from political cachet how can we engineer the motivations of a politician or citizen lobby to engage and act upon articulated concerns? Community grassroots initiatives (that are crowdsourced and bottom up in their design) are one indication of how change can be facilitated at this level. This is because, we argue, when an initiative emerges from a genuine articulated need (e.g. policy makers arguing for certain tools to assist them in making more informed decisions, or communities taking an initiative in flood risk management with very real outcomes for their neighbourhoods), then the adoption and engagement is more sustained, compared to initiatives where the design is more top down and the approach reflects a “build it and they will come” assumption. This also links to the third assumption discussed in this paper about the hidden costs of engagement. We appeal for observatories for citizens that are grounded in their current concerns and local decision making. For if the thrust of engagement is not bottom-up, as we observed in the WeSenseIt project, it is often more work than anticipated, to integrate the social sensor inputs within policy. The reduction of costs thus is not a factor of using technology to replace more traditional forms of participation, but stems from leveraging relationships built over time, between citizens and their governance authorities. This leveraging can be facilitated via innovative participatory tools that give a voice to hitherto silent stakeholders; however, the tools should remain a means and not become an end in the engagement exercise.

Finally, what can we generalise from the two case contexts presented here that can be taken away as learning points for future initiatives elsewhere? While the unique contexts of the two European Research Initiatives presented here, throw light on a specific geographic (European) and temporal reality, we believe there are several insights to be gained for multi level governance initiatives taking place elsewhere in the world, both now and in the future. These insights pertain to the need for genuine co-creation between citizens and policy makers around matters of concern, as well as the need for such initiatives to be driven by bottom up needs rather than top down policy mandates.

6. Conclusion

We find ourselves increasingly inhabiting a landscape where in theory many ICT-mediated artifacts, services and knowledge infrastructures exist as facilitators of transparency, openness and relatively low-cost engagement. And yet the gap that lies in realizing this potential and transforming these artifacts into capabilities and meaningful choices continues to grow. In this paper we asked: what is the impact of new digital e-participation tools on various levels and modes of governance and public accountability? What we found via our investigation of the two empirical cases is that while there is a marked shift taking place away from tokenistic forms of e-participation to more hands on ones, there still exist many challenges in the realization of the utopia of open governance. These challenges are directly related to the assumptions we foreground within this paper, namely assumptions regarding a homogenous, ill-defined “stakeholder” group, with a lack of grounded research on the needs, fears, expectations and motivations of multiple actors involved.

Furthermore, we argue that the very processes of e-participation need to be conceptualized as evolving, unfolding layers of engagement rather than as a one-off design event. Through two case studies, we demonstrated the threshold of e-participation as it varied across national, regional and administrative boundaries. We focused on the hesitation on the part of policy makers to engage with citizens in informal processes of data gathering and preference elicitation. We also examined critically the preference to date, on the part of decision makers, to bring citizens (scientists, sensors) on board as advisors, rather than as co-creators of policy. We highlighted the motivations on the part of the decision makers, which vary from tokenism, legitimization of entrenched interests to an inertia in response to change in power structures. We argue that the application of such new forms of e-participation (ranging from citizen science to policy modeling and simulation based on social media discourse) need to be driven bottom up by citizens, that wield the tools for grassroots, community interests as opposed to building political cachet.

With regard to the new understandings emerging from our paper and their relevance to the transforming landscape of policy making, these are threefold. First, we examined the new role of participants as “social sensors” in shaping policy decisions. We found great potential in fields such as flood risk management (in the case of WeSenseIt) and policy modeling (in the case of Sense4us) for crowdsourcing citizen knowledge, needs and preferences. However, our study shows that this potential can only truly be realized when the role of these social sensors is transformed from advisors to co-creators of policy. Second, we looked at the ‘point of initiation’ in e-participation. In other words: where does the engagement take place and are these artifacts evolving from an organic need expressed by citizens and policy makers, or is it a more top-down, technology push, where platforms are built and then applied to a given context, with e-participation tagged on as an afterthought? We argue for citizens to take on the role of data providers from an early stage of policy agenda setting, rather than towards the end of the process. Finally, we examined the assumption that transparency in design and openness of data necessarily equals greater democracy or a leveling of the playing field in policy decision-making. In conclusion, we suggest that a lot more thought and effort is needed to build trust and meaning within the context of multi-level governance and e-participation. As a step towards that direction we need to challenge assumptions entrenched in the very fabric of our technical design and governance processes by opening the doors for more genuine co-creation between decision makers and citizen stakeholders.

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