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Preface

The International Conference on eParticipation (ePart) aims to bring together researchers of distinct disciplines in order to present and discuss advances in eParticipation research. As the field of eParticipation is multidisciplinary in nature, ePart provides an excellent opportunity for researchers coming from different disciplines to disseminate and share methods, tools, and approaches as well as to plan future cooperation.

ePart is currently in its fourth year. The conference is organized annually along with the International Conference on Electronic Government (EGOV) now in its 11th year. Both conferences are supported by IFIP WG 8.5 (International Federation for Information Processing Working Group 8.5 on Information Systems in Public Administration).

This volume includes research work organized in the five groups following:

- Keynote Speech
- Reviews
- Policy Consultations
- Case Studies
- Techniques and Analysis.

This volume brings together 14 papers representing the comprehensive research of over 41 international authors.

All ePart papers (besides the keynote speech paper) were blindly peer reviewed by at least three reviewers from the ePart 2012 Program Committee with the assistance of additional reviewers. We would like to acknowledge their professionalism and rigor, which resulted in these high-quality papers.

As in the past, Trauner Druck, Linz/Austria, published the accepted work-in-progress papers and workshop and panel abstracts in a complementary proceedings volume. This year, the volume covers over 30 paper contributions, workshop abstracts, and panel summaries from both IFIP EGOV and IFIP ePart conferences. Edited by the Chairs of both conferences, the volume once again illustrates the close links ePart has with EGOV, our sister conference focusing on eGovernment research.

For the first time this year and per recommendation of the Paper Awards Committee under the leadership of Olivier Glassey, IDHEAP, Lausanne, Switzerland, the IFIP ePart 2012 Organizing Committee granted an outstanding paper award. The winning paper was announced in the award ceremony at the conference dinner, as a highlight of the IFIP ePart conference.

ePart 2012 was hosted by the Department of Information Systems in the School of Economics and Social Sciences at Agder University, Kristiansand, Norway. Established in 1839 as the Kristiansand Teacher Training College, the University College of Agder was formed through the merger of six public colleges in 1994 that already had a long academic tradition at that time. In 2007, the

college was granted the status of university covering the academic areas of business, economics, engineering, technology, the humanities, mathematics, nursing, teacher education, and the fine arts. With approximately 8,000 students and an academic staff of 1,000, the University of Agder is a bustling and intellectually diverse academic hub near the southern tip of Norway.

Kristiansand was founded in 1641 by King Christian IV of Denmark and Norway in an area that has been inhabited by humans since ancient times. It is a uniquely located and charming coastal city with a historic center at the mouth of the Otra river and a population of some 81,000. Today, Kristiansand is a hub of commercial activity, overseas trade, culture, research, and education. The city has a reputation for its warm, sunny, and long summer nights. It was a great pleasure to hold IFIP ePart 2012 at this special place.

Finally, we would like to thank Carl Erik Moe, Leif Skiftenes Flak, and their team at the University of Agder in Kristiansand for organizing the conference including all the crucial details pertaining to an international conference.

September 2012

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Table of Contents

Techniques and Analysis

Social Media and Counter-Democracy: The Contingences of Participation

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Abstract. As democracy goes through various crisis and citizens increasingly disengage with traditional party politics, extra-parliamentarian, alternative modes of democratic politics emerge on many fronts; manifesting a development towards what is called counter-democracy. Debates on the role of the internet in democracy have been with us since its inception; today the discussions focus on social media, which have quickly emerged as public sphere sites and tools for democratic participation. My argument rests on the notion of contingency: the factors that make a phenomenon possible but also that delimit it. In this presentation I look at some key contingencies of political economy, technology, and socio-cultural patterns and how they impact on the spaces of online participation and the forms of identity that they foster. In particular I note the emergence of what I call the solo sphere as a mode of participation that has debilitating consequences for alternative politics.

Keywords: social media, political participation, counter-democracy, web environment, civic engagement.

1 Introduction

Democracy finds itself in difficult times, its perennial problems now exacerbated by severe economic and social crises that further challenge its institutions. Meanwhile, the media landscape is in rapid transition, evoking both despair and hope from various quarters. Social media have quickly emerged as public sphere sites and tools for democratic participation, and some observers assert the positive role that these media can play, while others are less sanguine. These discussions continue the lines of pessimism and optimism that have been with us in the debates since the internet was hailed as a major democratic asset when it emerged as a mass phenomenon in the mid-1990's. In this presentation I underscore the positive potential of social media in this regard, but my main focus to analytically problematise that which can hinder them from playing a democratically progressive role.

My argument rests on the notion of contingency: we have to examine not only the factors that make a phenomenon possible in a given set of circumstances, but also those that shape and delimit it. Thus, we have to look more broadly at the conditions and circumstances that impinge on political participation via social media. These may not always be readily visible, yet nonetheless are crucial in forming the character of

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such participation. I will be looking at some of the political economic realities behind the digital spaces of social media, as well as socio-cultural patterns social media use and the web environment in which they are embedded. In the earlier debates about the internet and the public sphere, as well as the current ones centering on social media, we should not expect to arrive at an ultimate, universally valid evaluation, be it positive or negative. Rather, we need to actively keep in our sights these questions, and strive for provisional conclusions in concrete, ever-shifting circumstances.

The political economy and formal architecture of the web are in a sense invisible to us even as we are aware of their presence. They impact in subtle ways on the conditions and consequences of participation. In particular we should note the commercial logic, the algorithm of the search engines that sluice us towards certain sets of websites rather than others, the vast accumulation and selling of personal information, the centralized ownership of information. More subtle perhaps are the socio-cultural currents, the overall 'normal drift' in the meanings and affects of political import – especially in regard to the economic system – that circulate in society and not least in social media. These currents largely flow in neoliberal directions, and can readily carry us away from politics and the political, away from public spheres, and towards individualised consumerism, entertainment, and sociality, subverting the drive for alternative politics. Our identities as citizens become subsumed under our self-perception as privatized consumers, and feelings of disempowerment and cynicism can readily emerge. Moreover, these discursive motifs are played out not just at the level of formal ideas, but also at the level of affect and experience, of subject positions. Navigating these waters requires accurate charts and a constant monitoring of our course.

In the following section 1 very briefly sketch some of the key dilemmas facing democracy, as a scene-setting for the discussion to follow. From there, in section 3, I enter into the conceptual terrain of social media in the context of democracy, and the debates around this theme.. This is followed, in section 4, with a short discussion about the concept of participation, which is at once an obvious term, but can also prove to be quite slippery. The two sections that follow (5-6) deal, in turn, with the reefs, and currents. I offer a short conclusion in section 8.

2 Troubling Times for Democracy

Democracy is not a universal or static phenomenon, since its specific character varies under different and evolving circumstances. Its vitality, its functionality, and indeed its very survival, cannot be taken for granted. It is an historical project, criss-crossed by contestations between those forces that would in various ways constrict it and those who seek to broaden and deepen it, not least by enhancing participation. Even on the Left there is a variety of different visions of its future; see for example, Agamben et. al. [1]. A major problem today for participation (and democracy generally) is the tendency for accountable political power to drift away from the formal political system under the onslaught of neoliberal versions of societal development; see, for example, Harvey [2] and Harvey [3]; Fisher [4]; this not only

subverts democracy, but leaves social devastation in its wake (Bauman [5]). When market dynamics come to be seen as the most suitable path towards a better future, democracy and the opportunities for meaningful civic participation become eroded. Many established normative frameworks are subverted, as market values seep into and put price tags on just about all areas of human life (Sandel [6]. Thus, neoliberalism has became not just a polity horizon but also a socio-cultural motif, shaping social relationships and visions of the good society. These themes have given rise to an extensive literature; see for instance Couldry [7]; Lewis [8] Young [9]. Bauman, in his extensive writings about the contemporary world, weaves together political, economic, social, and cultural strands in his analysis of what he calls liquid modernity; see for example, Bauman [10].

Even in the wake of the global crisis of 2008-9, there has been no serious rethinking of this paradigm or any effort to reform the international finance system among the power elites (Crouch [11]). At the same time, governments at all levels have decreasing margins of manoeuvrability in the context of increasingly complex globalisation. This in turn means that within nation states and local political units the practical requirements of governance become hampered, which can set further limits to what can be accomplished within democratic systems – and thus lead to more measures to restrain effective participation.

The upshot of these trends is the growing dilemmas that Western democracies have been facing over the past 20 years; democracy is being transformed as its social, cultural, and political foundations evolve, and the character of participation is a part of these large developments. There has been a growing literature on how citizens are apparently disengaging from the political system, coupled with feelings of powerlessness and cynicism towards the power elites. There is a growing erosion of trust in the social institutions that undergird democracy, as many citizens feel that their visibility and voice are losing political impact.

Yet parallel with these developments we also note a contrary narrative: we see a renewed engagement across the political spectrum, as an array of groups, mostly operating outside the confines of party politics but often trying to impact on legislation, enter the public sphere. The political stage is populated by many established single issue groups, temporary issue publics, lobbying outfits, NGO's, social movements, protest activists, citizen networks and other formations, active at local, regional, national and global levels. On other fronts, along side of – or instead of – traditional politics, many citizens are also exploring 'life-', 'identity-', and 'cultural' politics. Indeed, the realm of politics is transmuting, as citizens broaden the notion of what constitutes the political.

The frustrations of feeling marginalised or excluded, the sense that the established parties are insufficiently responsive, the strategic perception that pressure can be brought upon decision makers by other means – all these impulses contribute to the development of what Rosanvallon [12] terms counter-democracy, the process whereby citizens, in various constellations, exercise indirect democratic power by bypassing the electoral system. Engaged – and enraged – citizens in various modes of organisation from Greece to Great Britain, from the Middle East to the American mid-West, are finding alternative paths to the political in pursuit of their own interests

or in their visions for better society, with varying degrees of impact. In these endeavours social media loom large.

3 Social Media and Democratic Hopes

At a general level, the web and its ancillary technologies such as mobile telephony have come to engender an ever more ubiquitous environment, where more and more people spend much of their time for an array of purposes. Especially people in the younger age cohorts are using the various affordances of those communication technologies in active and creative ways. The present online media landscape, often summarised under the rubric of Web 2.0, provides opportunities not only to send written and spoken words, but also to produce, upload, remix, link and share materials, in increasingly collaborative and complex ways.

The new cultural terrain is exciting but can also be confusing (Lovink [13]), as daily practices, identities, and relationships evolve. The web is not just something people 'visit' on occasion in order to seek something special, it is increasingly part of the terrain of their daily lives. Baym [14] offers a detailed analysis of how digital media's reach and capacities for interaction, their modes of social cues, their temporal structures, their mobility, and other features serve to facilitate social connections. From social interaction with friends to gossip blogging, from music perusals to news, from shopping to finding a partner, the web environment is becoming a taken-for-granted site where people's lives are increasingly embedded. It impacts on the strategies and tactics of everyday life and the frames of reference that provide them with meaning.

Turning specifically to social media, we should note that they are embedded in the larger web environment, which in turn is enveloped by the broader society at large, with its prevailing patterns of power, hierarchy, and ideological currents. Also, we can observe there are different genres of social media, and, ultimately, specific sites. Thus, any site does not operate in a vacuum, but is intricately woven into the political, economic, and cultural fabric of society and the web. Among the major genres, we can mention the most common forms: *blogs* are online journals, whose purposes, content, duration, and impact vary enormously; *microblogs* involve small scale content ('updates') , distributed online and via mobile phone networks, with Twitter as the obvious leader here; *social networks* like Facebook, allow people to generate personal web pages and to connect and share with others; *content networks,* organise and share particular kinds of content (legal as well as and illegal) – the largest is of course YouTube; *wikis* are websites where people to add and modify content collectively, generating a communal database, Wikipedia as the best known example; *forums* are areas for online discussion, usually focused on specific topics and interests; *podcasts* make audio and video files available by subscription, through services like Spotify and Apple iTunes.

In this sprawling webscape, there are distinctions worth taking into account. For example, wikis have mostly retained their basic open, communal character, and are predicated on trust and driven by the cooperative efforts of their uses. Blogs vary

enormously, but the blog platforms are largely commercial products. Both YouTube and Facebook began as community sites, were bought by Google and have become commercial operations. Especially in the case of Facebook, as I discuss below, this has immense implications for participation.

An important positive attribute of all these forms is that they share is a capacity to facilitate horizontal communication: people and organizations can directly link up with each other for purposes of sharing information as well as affect, for providing mutual support, organizing, mobilizing, or solidifying collective identities. This feature makes them well-suited as civic media. Digital networks, with their polycentric nodes, offer a communication structure which can foster democratic social relations, as Castells [15] and Fenton [16] demonstrate, impacting on how civic agency is enacted and how politics gets done. It is important to underscore the social character of such activity: the networking involved helps to avoid the debilitating consequences of isolation, promotes social (and political) capital, and helps to forge collective identities. People continue to develop their civic practices in online settings as they find new ways to use these evolving communication technologies. The tools are more and more effective, less expensive, and easier to use than in the past; access and collaboration are increasing. Digital media are very good in helping to promote a subjective civic empowerment, an enhanced sense of agency.

The vision of the web's potential for extending and deepening democratic involvement is thus compelling. The vast universe of the web makes it easier for the political to emerge in online communication: politics can 'break out' unexpectedly and go viral. Who would have thought a few years ago that that materials from political demonstrations would be uploaded on YouTube, and that it, Facebook, and Twitter would become important institutions of the public sphere, facilitating debates and opinion formation?

Yet, such general enthusiasm must be the contingent character of online political participation. We have to reject all the cheery techno-optimism that avoids seeing social media in their social contexts, as part of the larger social and cultural world, intertwined with the offline lives of individuals as well as with the functioning of groups, organisations, and institutions of society (see Couldry [17] for an integrated sociological perspective). Since the mid-1990's, research has extensively explored this theme, as I have discussed elsewhere, in Dahlgren [18]. An ambivalent picture emerges. In this literature. For one thing, research indicates that using the web for political purposes (at least defined in traditional terms) comes quite far down on the list of activities, far behind consumption, entertainment, social connections, pornography, and so on. Today the opportunities for involvement in consumption and entertainment are overwhelmingly more numerous, more accessible, and more enticing for most people, compared to civic or political activities.

Even in public sphere contexts, we should bear in mind that the density of the web environment in the contemporary media landscape results in an enormous competition for attention, not least in regard to political affairs, that all web-based actors face; getting and holding an audience is no easy matter for most actors on the web. Also, while social media are impressive tools of historic dimensions, they does not, on their own, politically mobilise citizens who may lack engagement. (See the recent

collections by Loader and Mercea [19] and by Feenberg and Freisen [20]). We must avoid reductionist thinking; policy discourses and journalistic commentary at times lead us astray in this regard, for example when the uprisings during the Arab Spring become simplistically framed as 'Twitter revolutions' (see more analytic views, see for instance, *Communication Review* [21] and *Journal of Communication* [22].

4 Contingencies of Political Economy

In using social media, we leave all sorts of electronic traces behind us. This kind of surveillance, the gathering and selling of private data, is a largely unseen – or at least often ignored – danger for democracy. It has troublesome implications not just for normative principles, but also for power relations. The features I discuss here are, so to speak, built into the architecture of the web, and its financial logic. This is not to make any essentialist argument about internet as a technology, but rather to highlightt how it is socially organised and used. The empowerment that the web does offer citizens is thus confronted by other relations of power in which citizens are rendered subordinate. These contradictions suggest continuous tensions of power and interests, an aspect we need to keep in view to understand the links between the web and democracy. An expansive treatment of this perspective is found in Fuchs [23].

As politics in society generally takes on a larger presence online, the prevailing structures of established power in society are increasingly mediated, solidified, negotiated and challenged via these media. I will exemplify the arguments by highlighting a few key elements in regard to the political economy of Google, then the surveillance and marketing mechanisms of Facebook.

4.1 The Google Gameplan

Google is not a part of social media, but it is such a behemoth on the web that the functioning of social media – and so much else – is profoundly affected by its activities, as Fuchs [24] and Vaidhyanatha [25] show. It has in a few short years become a decisive force in shaping how the web operates and what we can do with it (see Cleland and Brodky [26]). Moreover it has become the largest holder of information in world history, both public and private, shaping not only how we search for information, but also what information is available, how we organize, store, and use it. In many ways it is an utterly astounding development and has become a completely decisive feature of the net's architecture. For the year 2010, over 85 percent of all searches worldwide were carried out by Google; by comparison, its nearest competitor, Yahoo, accounted for just over six percent, as Fuchs [24] indicates. Google has also become a verb.

Locked into fierce competition with its competitors, especially Microsoft, on a number of fronts, Google established itself largely through the small text ads that accompany search results, but has grown into an enormous concentration of power that is largely unaccountable, hidden behind the cheery corporate motto 'Don't be Evil'. It has managed to generate considerable trust, but increasingly very serious

questions are being raised, about copyrights and privacy, about how it is using its information, about Google's own agenda in striving to organize knowledge on a global scale, about its role in democracy. All this is not to detract from its truly impressive accomplishments; rather, the issue is that the position it has attained, and the activities it pursues (which are quite logical given its position), raise questions about information, democracy, accountability, and power in regard to the web.

Google has an overwhelming global monopoly of the search engine market. The company tends to prioritise certain sites at the expense of others, particularly favouring those that are backed by wealthy and powerful interests, thereby jeopardising the public and democratic character of the web, as Beer, [27] discusses. At the same time, it denies transparency in regard to, for example, its PageRank algorithm and Googlescholar search process. It is now moving into other areas such as academic books, posing new threats to the democratic nature of knowledge.

Further, and perhaps most significant from the standpoint of participation, Google engages in surveillance and privacy invasion of citizens in the gathering of consumer-related data. The personal electronic traces are gathered up, stored, sold, and used for commercial purposes. This is done with our formal consent, but often via discrete, friendly strategies. And if we refuse, we effectively cut ourselves off from the major utilities of the web. As Goldberg [28] suggests, all participation on the net, even the most radical political kind, feeds data into the commercial system that is its infrastructure. The more people spend time online, the more Google's economic power is enhanced. What happens with all the surveillance data routinely gathered on us? Turow [29] shows how new kinds of high tech marketing and adverting firms integrate and analyse personal data from many sources in order to develop individual and household profiling and media customization – much of it channeled through social media. This not only undermines much the rhetoric about consumer power and initiative – we are decidedly not in the drivers' seat here, but rather at the receiving end of carefully planned strategies to offer us products and services the marketers think we should have, based on our profiles. On a deeper level, this kind of profiling of course has even more troubling ramifications, since with only a slight change in circumstances it can have consequences for our political freedom as well.

While Google presents an image of itself as a flat, decentralized organization, it acts as an extreme force for centralization, ideologically camouflaged by a techno-determinist discourse that asserts that the solution to society's problems lies in information technology – and not in, for example, in dealing with unaccountable power in the private sector. Its cooperation with the Chinese government between 2005 and 2010 in censoring politically sensitive search words also puts in question its commitments to democracy. Society benefits immensely from what Google has accomplished, but these problematic costs to democracy tend to be deflected from view. The prevailing neoliberal climate has made it harder to confront this private enterprise with demands about the public good, and the global character of its operations renders all the more difficult any attempts at national regulation.What is ultimately required, as MacKinnon [30] argues, is a global policy that can push regulation of the web such that it will treated like a democratic, digital commons; we have a long way to go.

4.2 What a Friend We Have in Facebook

It may well be that the daily socialisation to *not* reflect on these issues that can prove to be most significant in the long term. Discipline works largely by establishing patterns of thought and behavior, and can be seen as a power-driven form of socialization. While we cooperate indirectly with Google in providing personal information, with Facebook it becomes much more explicit, and here we should no doubt be more even concerned about what kind of information about ourselves we are making available to whom, as Dwyer [31] underscores.

In Facebook's role as a site for political discussion, one can reflect on the implications of the familiar mechanism of 'like': one clicks to befriend people who are 'like' oneself, generating and cementing networks of like-mindedness. As time passes, and people increasingly habituate themselves to encountering mostly people who think like they do, and as sustained debate evaporates, we can postulate on the danger to democracy. The social logic is that citizens lose the capacity to discursively encounter different views; the art of argument erodes, and deep differences to one's own views ultimately become seen as expressions of the irrational. Time will tell; meanwhile we have the very immediate issues of surveillance and privacy on Facebook.

Facebook, with now over 800 million users, compiles massive amounts of data on individuals, largely freely given (in this discussion I borrow considerably from Grimmelmann [32]. A full Facebook profile contains about 40 pieces of personal information, with a variety of tools available for users to search out and add potential contacts. The so-called Wall posts can convey personal information about the poster. The payment mechanisms for Gifts generates strong links between a profile and offline identities. To upload and tag a Photo of yourself documents your appearance; it also documents that the photographer knows the person photographed. And there is more: each game of Scrabulous one plays gives some a sense of one's vocabulary; one's list of Causes tells others what principles are meaningful to you; answering a Quiz reveals one's knowledge, beliefs, and preferences. And so on.

The interesting question sociologically is why so many people trust Facebook with so much personal information. Basically it has to do with the fact that people have very *social* reasons for joining *social* network sites. They gain social connections, and the sites become forums for developing identities and social capital. These are strong motivations and can explain at least in part why so many users tend to ignore the rather well-known risks to their privacy. The sense of collective identity suggests that we are basically alike and thus we are in this together. An element of group think may say that since everyone else is doing it, it must be safe, and if collectively define this as private, well then, it *must* be private. This can be seen as a case of misplaced trust.

5 Socio-cultural Currents

5.1 Social Imaginaries

Castoriadis [33] makes use of the notion of the social imaginary, which he takes to be the overarching collective meanings in society anchored in repetitive representations,

affect, intentions and will. One could also call them ideological motifs, or hegemonic discourses, depending on which theoretic tradition one prefers, but the basic idea is that social imaginaries permeate society, providing frameworks for making sense of the world and one's place in it. They serve to adjust not only our perceptions of external reality but also our inner subjective dispositions; they have political import. Straume [34] uses the concept to map the elements that comprise the key ideational horizons of neoliberal global economic system from the standpoint of the social world. Not surprisingly, she pinpoints such themes as a sense of never-ending economic growth, freedom, rationality, an absence of serious environmental concern, consumerism, a sense of privatized fulfillment, and a stance of non-interference in market mechanisms. The basic relationship of the individual to economic society is characterized by she calls depoliticisation. A number of these themes are familiar from the discussions above, and no doubt from other directions as well: they comprise much of the prevailing discursive currents of contemporary society and are by no means unique for the web, even if their online manifestations take particular forms of expression.

These currents of the social imaginary, while seemingly abstract, manifest themselves in concrete circumstances in the symbolic worlds of our everyday lives. We should be wary of reducing the wide range of political expression visible today – at times positively cacophonic – to just positions that support or criticize the dominant economic arrangement, but the themes of this prevailing current comprise an important referent for the fundamental health of democracy. Depoliticisation, the avoidance of the political, is as we can recall, one of the dilemmas in fact confronting democracy, and one that is challenged by the current waves of counter-democracy. Often they involve positioning us as consumers rather than citizens.

Significantly, these elements in the major currents of the social imaginary do not operate only at the level of formal ideas, but are embodied in many forms of expression from popular culture to journalism, from street humour to self-help therapies. Similarly, alternative politics does not manifest itself only as coherent political statements, but can be implied in televised satire (e.g. The Daily Show with Jon Stewart), manifested in the performance of rap lyrics, in social critique embedded in detective fiction, or evoked via expressions of solidarity and care for marginalized groups, and so on. Thus, while the coherent articulation of ideas still remains central to political life, political sentiments in the form of dominant and oppositional social imaginaries are increasingly embedded in various modes of cultural expression and resonate in the subjective realm of affect.

5.2 The Web Environment and Subjective Experience

If we transpose these thoughts to the online environment, it means that we should examine how the hegemonic and contested currents find expression in the Web 2.0 milieu, and we can assume that these currents are driven by both rational and affective elements, with the latter seemingly on the ascent. Media culture generally overall seems to be moving every further away from the ideals of the traditional public sphere and its rational character. As Lievrouw [35] aptly describes the situation:

> *Media culture in the digital age has become more personal, skeptical, ironic, perishable, idiosyncratic, collaborative, and almost inconceivably diversified, even as established industries and institutions seek to maintain their grip on stable messages and audiences and to extend their business models online (p.214)*

What she captures here in fact is some of the definitive textures of the late modern situation, with their cross-currents of power relations and their particular sensibilities and affect. It is against this historical backdrop, as I indicated earlier, that we have to understand contemporary political participation. Lievrouw's analysis underscores the interplay between the affordances of communication technologies and the practices by which people utilise them for their own purposes. They 'construct new meanings and expressions out of existing and novel forms of interaction, social and institutional relationships, and cultural works' (Lievrouw [35], p. 216). This perspective helps us to understand more concretely how hegemonic and contested social imaginaries are embedded and played out in social media, in particular where our potential identities as citizens are all too often overwhelmed by socio-cultural forces that position us as consumers.

Commentators of the web have coined the terms 'cocoons' and 'echo chambers' to signify the tendency for people to group themselves into networks of like-mindedness. This is of course an understandable human behavior pattern – one avoids conflicts and gets one's one world views and values reinforced. Socially it makes a lot of sense. But for democracy there is a danger: these public 'sphericles' tend to isolate its members from larger discursive flows within political society. Moreover, they also serve to reduce their participants' experiences with confronting alternative points of view, as well as their competence in engaging in argument. Let us recall Facebook's click logic and how it encourages enclaves of like-mindedness.

5.3 In the Shadow of the Solo Sphere

A further online pattern that seems to be emerging and which is worrisome in regard to participation and the culture of democracy, is a form of personalised visibility that engages in self-promotion and self-revelation. When (especially) younger people do turn to politics, it seems that these patterns of digital social interaction increasingly carry over into the political realm. Papacharissi [36] argues that while digitally enabled citizens may be skilled and reflexive in many ways, much civic behavior today has its origins in private environments, which she suggests is giving rise to a new 'civic vernacular'. I think this analysis is definitely on the right track, but while she labels this setting for political engagement as the private sphere, it seems to me that this may term may be misleading. It readily evokes the traditional, cozy family or home milieu. This is no doubt a part of the setting, but I would call it instead the solo sphere, to indicate its historically new character. The solo sphere can be seen as a historically new habitus for online political participation, a new platform for civic agency.

From the networked and often mobile enclosures of this personalized space, the individual engages with a vast variety of contexts in the outside world. It may well be

that the online setting, with its powerful technical affordances, discourages engagement beyond itself. Papacharissi [36] suggests that it fosters a retreat into an environment that many people feel they have more control over; a networked yet 'privé sociality' emerges. We can add that this also suggests that 'networks', necessary and always potentially of use, are not by themselves inherently mobilizing or liberatory. Thus, these feature introduces an historically new contingency for participation – which may in turn signal a historically new kind of democratic system. Yet we need not spend too much time with the crystal ball trying to predict the future; there is plenty to do in the present.

6 The Challenge of Participation: Modest Hopes

I have argued for here for the importance of the fundamental perspective of contingency so that we can better grasp the possibilities and limitations of social media for counter-democratic political participation. Analytically one can specify a broad array of contingencies. I have only touched upon some of the major ones, in the form of the political economy and architecture, as well as socio-cultural currents. It is in the analysis of the interwoven, configurational lines of influence of these and other such factors that we can begin to grasp the dynamics at work. At present, despite the problematic political circumstances and many uncertainties, the historical future for democracy still remains open. Counter-democratic participation, though seriously challenged, still hovers within reach and is enacted by many citizens. Social media are indispensible – but not politically decisive on their own. Research needs to continue to probe this complex relationship in order to better analytically understand – and enhance – participation.

References

1. Agamben, G., et al.: Democracy in What State? Columbia University Press, New York (2011)
2. Harvey, D.: A Brief History of Neoliberalism. Oxford University Press, Oxford (2006)
3. Harvey, D.: The Enigma of Capital and the Crises of Capitalism. Profile Books, London (2011)
4. Fisher, M.: Capitalist Realism: Is There No Alternative? Zero Books, Ropley (2009)
5. Bauman, Z.: Collateral Damage: Social Inequalities in a Global Age. Polity Press, Cambridge (2011)
6. Sandel, M.: What Money Can't Buy: The Moral Limits of Markets. Allen Lane, London (2012)
7. Couldry, N.: Why Voice Matters: Culture and Politics After Neoliberalism. Sage, London (2010)
8. Lewis, J.: Crisis in the Global Mediasphere: Desire, Displeasure and Cultural Transformation. Basingstoke, Palgrave (2011)
9. Young, J.: The Vertigo of Late Modernity. Sage, London (2007)
10. Bauman, Z.: Liquid Times: Living in an Age of Uncertainty. Polity Press, Cambridge (2007)
11. Crouch, C.: The Strange Non-Death of Neoliberalism. Polity Press, Cambridge (2011)

12. Rosanvallon, P.: Counter-Democracy: Politics in an Age of Distrust. Cambridge University Press, Cambridge (2008)
13. Lovink, G.: Networks Without a Cause: A Critique of Social Media. Polity, Cambridge (2011)
14. Baym, N.K.: Personal Connections in the Digital Age. Polity Press, Cambridge (2010)
15. Castells, M.: Communication Power. Oxford University Press, Oxford (2010)
16. Fenton, N.: The Internet and Social Networking. In: Curran, J., Fenton, N., Freedman, D. (eds.) Misunderstanding the Internet, pp. 123–148. Routledge, Abington (2012)
17. Couldry, N.: Media, Society, World: Social Theory and Digital Media Practice. Polity Press, Cambridge (2012)
18. Dahlgren, P.: Media and Political Engagement. Cambridge University Press, New York (2009)
19. Loader, B., Mercea, D. (eds.): Social Media and Democracy. Routledge, Abingdon (2012)
20. Feenberg, A., Freisen, N. (eds.) (Re)inventing the Internet: Critical Case Studies. Sense Publishers, Rotterdam (2012)
21. The Communication Review: Special Issue: Twitter Revolutions? Addressing Social Media and Dissent. 14(3) (2011)
22. The Journal of Communication: Special Issue: Social Media and Political Change 62(2) (2012)
23. Fuchs, C.: Foundation of Critical Media and Information Studies. Routedge, Abington (2011)
24. Fuchs, C.: A Contribution to the Critique of the Political Economy of Google. FAST CAPITALISM 8.1 (2011), http://www.fastcapitalism.com
25. Vaidhyanatha, S.: The Googlization of Everything (And Why We Should Worry). University of California Press, Berkeley (2011)
26. Cleland, S., Brodky, I.: Search and Destroy: Why You Can't Trust Google. Telescope Books, St. Louis (2011)
27. Beer, D.: Power Through the Algorithm? Participatory Web Cultures and the Technological Unconscious. New Media and Society 11(6), 985–1002 (2009)
28. Goldberg, G.: Rethinking the Public/Virtual Sphere: The Problem with Participation. New Media and Society 13(5), 739–754 (2010)
29. Turow, J.: The Daily You: How the New Advertising Industry is Defining Your Identity and Your Worth. Yale University Press, New Haven (2011)
30. MacKinnon, R.: Consent of the Networked: The Worldwide Struggle for Internet Freedom. Basic Books, New York (2012)
31. Dwyer, T.: Net worth: Popular Social Networks as Colossal Marketing Machines. In: Sussman, G. (ed.) Propaganda Society: Promotional Culture and Politics in Global Context, pp. 77–92. Peter Lang, New York (2010)
32. Grimmelmann, J.: Facebook and the Social Dynamics of Privacy (August 25, 2008), http://www.ciberdemocracia.es/recursos/textosrelevantes/facebook.pdf
33. Casrtoriadis, C.: Psychoanalysis and Philosphy, id, The Casatoriadis Reader. Blackwell, Oxford (1997)
34. Straume, I.: The Political Imaginary of Global Capitalism. In: Straume, I.S., Humphrey, J.F. (eds.) Depoliticization: The Political Imaginary of Global Capitalism, pp. 27–50. NSU Press, Malmö (2011)
35. Lievrouw, L.A.: Alternative and Activist New Media. Polity Press, Cambridge (2011)
36. Papacharissi, Z.: A Private Sphere: Democracy in a Digital Age. Polity Press, Cambridge (2010)

E-Consultations: A Review of Current Practice and a Proposal for Opening Up the Process

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Abstract. Information and communication technologies have altered the relations between the political system and citizens. Policy-formulation is enhanced by e-consultations that extend the knowledge base and the legitimacy of policy-making. However, current e-consultation practice in the EU falls short of the potential. The paper proposes a deliberative turn, the use of special purpose technologies and the integration of social media discourse into the consultation process as means to further open it up and to strengthen the connection between government and citizens.

Keywords: online consultations, social media, policy-making, e-participation.

1 Introduction

Information and communication technologies (ICTs) have altered the relations between the political system and citizens. They provide convenient access to large amounts of information, open up new channels for communicating with political representatives and other citizens and offer means to organise collective action and the formation of groups, thus contributing to vital democratic life. However, technology is not to be seen as an actor of social change, but merely as a facilitator or catalyst (or even inhibitor, depending on the viewpoint). To realise its potential, careful choices about technological, political as well as procedural designs have to be made [1].

This paper analyses the procedural design choices underlying e-consultations, considered as one of the internationally most important means of e-participation. E-consultations are viewed as lowering the threshold for individual citizens to participate in policy-making [2], on the other hand, their impact on policy falls short of the expectations [3]. Focusing on the role of e-consultations in the European Union's policy process, this paper discusses whether established and novel forms of consulting citizens online lead to more extensive consideration of the views of stakeholders and more openness of the policy-making process. It argues that e-consultations should embrace policy debates in social media "third" spaces and suggests a procedural model for open e-consultations, in line with the call to move from the notion of "e-participation" to that of "open participation" [4].

The paper starts with a discussion of current e-consultation practice in the EU on the background of democratic theory. It discusses several approaches to improve

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e-consultations with regard to criticism raised in the literature, and proposes a coherent procedural model integrating and extending these approaches to further open up the e-consultation process. The concluding section discusses issues and research needs that are raised by this proposal for a new consultation process.

2 E-Consultations in the Process of Policy-Making

2.1 Theoretical Background

E-consultations are top-down e-participation initiatives (see the classification in [5]) carried out with a twofold aim: to enhance the legitimacy of the political system and to improve the quality of policy-making. From the perspective of theories of democracy, (e-)consultations (as a democratic political procedure among others) offer one potential channel to connect the free and informal flow of communication within civil society to the political system and its decision making processes.

Consultations may be seen as an informal and not binding procedure. However, if consultations are more than a façade activity of government and offer transparency and accountability, they can exert a form of ”non-coercive coercion” in the sense of Habermas ([6], p. 132). In his view, communication channels between civil society and the political system serve to “rationalise” political decision making ([7], p. 364) in that the competency of the political system to reach collectively binding decisions is complemented by the competency of civil society to form a political will, based on the free association of citizens and the public exchange of views and opinions. In effect, not only the legitimacy of political decisions, but also their proper content is ultimately determined, at least in part, by the citizens. This marks a shift from a liberal model of democracy with a strong separation of the political and the private sphere with only little interconnections to a deliberative model of democracy [7]. But the extent to which such a shift occurs depends on the design of procedures such as e-consultations.

From the perspective of the policy process, e-consultations are typically carried out in the policy formulation phase. This is the phase after an issue has been identified as relevant and in need for regulation (agenda setting phase), but before actual decisions are taken and implemented [8]. Consultations are based on more or less extensive drafting activities within the administration, often preceded by informal reviews of individual stakeholders. Here, according to a model of deliberative democracy, political orientations, public views from citizens and stakeholders and the perspective of public administration have to be brought together to form high quality policy proposals that successfully advance through the political process.

E-consultations have gained considerable attention following recommendations by the OECD [9] and national governments (e.g. [10]). Today, they are considered as one of the most important forms of e-participation activities internationally apart from mere information activities ([5], p. 65) and have gained widespread adoption globally ([11], p. 45). However, the way e-consultations are conducted varies considerably with respect to the technology used (e-mail, online forms, online forums, web 2.0-tools etc.) and the design of the procedures (provision of background information,

provision of feedback on results, participation of political actors etc.). In the following, we will focus on the way e-consultations are used in the context of policy-making at the European level.

2.2 E-Consultation Practice in the EU

The European Commission has endorsed the use of e-consultations subsequent to the White Paper on "European Governance" [12] in what is called the "third generation" of the EU consultation regime [2]. This document called for "a reinforced culture of consultation and dialogue" ([12], p. 16) on the European level as well as in the member states with the aim to make policy-shaping more effective. This strategy was implemented broadly. A recent communication by the European Commission states that policy-making has been opened to stakeholders, and: "Stakeholder consultations and impact assessments are now essential parts of the policy-making process." ([13], p. 2).

The e-consultation process builds (though not exclusively, see [14]) on a common online platform for all Directorates-General (DG), the "Your Voice" platform (ec.europa.eu/yourvoice). This website lists open as well as closed consultations and provides links to related information. Consultations on EU policy initiatives are usually based upon a policy draft (e.g., a Green Paper) from the Commission (sometimes together with the Council) outlining the current state of affairs, the goals to be reached by the legislation, the regulatory approach favoured by the Commission (and/or other EU bodies), and some policy alternatives.

The consultations can be either multiple choice questionnaires, semi-structured questionnaires (structured by questions, but open for all kinds of answers), or fully open, unstructured questions [2]. Accordingly, submissions from participants are collected in the form of e-mails or via web-based questionnaires, with responses published on the consultation's website unless respondents specifically request the confidentiality of their contributions. Sometimes specific deliberative consultations are conducted [15]. The consultations are open to the general public, but citizens are specifically targeted only if an issue has high public relevance.

The effects of the EU's e-consultations have been assessed by only a small number of studies. Quittkat and Finke found that they "have become a regular instrument of consultation, introduced by nearly all DGs." ([2], p. 206) Online consultations have broadened the input to the policy-making process by addressing the wider public more often than traditional means and by attracting representatives of diverse interest groups. They are an indicator of a "strategy of knowledge collection" and not only of a participatory strategy ([2], p. 217). However, the study also found that the processing of contributions is far from transparent and that the focus shifts from open questions to more strongly structured consultations with closed (multiple choice) questions.

Tomkova's overview of research on e-consultations presents similar findings. The introduction of e-consultations on the one hand extends the spaces of interaction between political institutions and citizens. On the other hand there is few evidence that e-consultations impact mutual learning and policy outputs ([3], p. 9). This criticism is affirmed by a study on the involvement of NGO's in public consultations, which found that these stakeholder organisations do not receive enough feedback on their

proposals and how they affected policy-making. In consequence, stakeholders seek more informal and direct relations with governmental agencies to foster better mutual understanding ([16], p 48f.). Governmental agencies, on the other hand, have to design intensive communication strategies to get "users on board" the e-consultations ([17], p. 61).

Hüller sees the analysis of stakeholder contributions in e-consultations as the "needle eye" of the EU's participative policy-making ([18], p. 377). His case study points out several discrepancies between statements in the consultation and the outcome report by the Commission, concluding that the latter is not an accurate and objective summary account of the responses as claimed by the Commission's report ([18], p. 379). Furthermore, the one-way format of e-consultations does not allow to debate controversies that were initiated in the course of the consultation. Thus, the EU's e-consultations are considered an innovative instrument, but fail to open up policy-making towards a deliberative model of democracy.

To summarize, the experiences with the EU's e-consultations up to now have shown that this instrument of e-participation is broadly implemented across the different DGs, that it provides participation opportunities beyond what was offered before, and that e-consultations have extended the knowledge base of policy designs and decisions. On the other hand, the process is criticised as being narrow and one-way, disregarding the benefits of deliberation for fostering closer relations between government and citizens and for stimulating opinion formation among stakeholders. Furthermore, no transparent process is offered for analysing the contributions, and the impact on policy-making remains opaque.

Furthermore, only limited use is made of technology to support the consultation process. The Your Voice platform offers a state-of-the-art gateway to e-consultations, but the proper consultations are conducted with common, general-purpose tools instead of specific e-participation tools ([17], p. 63). In particular, the rise of the web 2.0 does not seem to have affected the EU's e-consultations, neither are web 2.0 tools used to conduct the consultations [19], nor are the new arenas of debate, such as the political blogosphere, integrated in the consultations' communication strategy. Aside the formal e-consultations, however, a number of web 2.0 initiatives was initiated recently by various European institutions (see [20]).

3 E-Consultations in the Process of Policy-Making

The criticism of the EU's e-consultations is well known among e-participation researchers, and a number of alternative approaches have been developed and are being experimented with on various levels of government. These set out from the notions that deliberation enhances the quality of input to the policy-making process (1), that specific technologies for e-participation should be used for e-consultations (2), and that governments should move towards those spaces where citizens debate online instead of providing distinct, but remote spaces for policy discourses (3).

3.1 Deliberative E-Consultations

Deliberation in the context of policy consultations means the opportunity not only to give comments on policy proposals, but also to discuss the proposal and the comments together with other participants and – ideally – the addressees of the comments. The idea is that preferences are not fixed, but are formed and modified in the process of deliberation (note the double meaning of "deliberation" as an individual as well as collective activity). The results of deliberation are supposed to better represent the stakeholders' views and also to promote the legitimacy of the consultation process [21].

Whereas the theoretical potential of deliberation is widely acknowledged, several problems limit its adoption in practice (cf. [22]). The concept originally derived from small group discussions in face-to-face settings. Adapting large-scale consultations to the deliberative paradigm means to stimulate large-scale interactive debate between participants. This entails high costs and runs counter to experiences showing that only a minority of participants actively engages in such debates. Further problems include the need to facilitate the debates to ensure a high quality of deliberation, the need to inform or even educate the participants prior to the deliberation and the fact that in most cases, stakeholders deliberate among themselves, because civil servants and politicians hesitate to participate actively.

Although there are several examples of successful deliberative e-consultations, not least at the EU level ([15]; [23], p. 53f.), this approach to enhance e-consultations faces challenges such as the big effort needed to get people actively deliberating, the limited adoption of technologies to support deliberation beyond web-based forums [17] and the fact that online spaces for deliberation are designed often as distinctive platforms, as exclusive spaces of political debate with little connection to more life-worldly spaces citizens are visiting online [24]; [25]. Deliberative e-consultations are a first and highly important step to improve e-consultations, but we need to look at further approaches to cope with the several unresolved issues.

3.2 Technologies for E-Consultations

Although e-consultations use the Internet as a channel for the communication of comments from stakeholders to the administration, surprisingly little use is made of specific technologies to support the communication process. As the survey by Panopoulo et al. concludes, "eParticipation initiatives mainly use existing, general-purpose ICT tools" ([17], p. 63). However, apart from special-purpose technologies such as geographical information systems (GIS) for planning issues, two technologies to be generally used in e-consultations have been proposed and experimented with recently: natural language processing and argument visualisation technologies.

Natural language processing is seen as a means of mitigating the burden of facilitating and summarising large-scale debates. Stromer-Galley et al. proposed using this technology in a question answering system to help participants in a consultation learn about the issue at stake, to confront them with issues raised by other participants, and to suggest new topics ([22], p. 86). Tigelaar et al. developed a method to summarise

discussion threads automatically, potentially easing the task of getting an overview of an online policy debate [26].

Evaluation results are mixed for these approaches, however. The summariser was only tested with artificial data and a small number of test users who gave average grades for the results of automatic summarisation, indicating "room for improvements" ([26], p. 180). Evaluation of the question answering system in real consultation contexts was hindered by the fact that participants tended not to use it voluntarily, those who did found it "somewhat useful" ([22], p. 90).

Another technology to support e-consultations is argument visualisation. Argumentation is a central feature of policy deliberation, and visualising the structure of individual arguments as well as the way they relate to each other is seen as a way of improving the rationality and efficiency of online debates [27]. Recent proposals to use argument visualisation in the context of e-consultations include Debategraph [28], ArgVis [29], and the "IMPACT" AVT tool [30].

While the latter two are still prototypes and in the process of being evaluated, the evaluation results for the Debategraph platform indicate that the tool's potential is in the agenda setting and policy analysis phase of the policy cycle [28]. It requires users some time to learn how to use it and poses some usability problems that make it appear less suitable for communication with the public, but rather for inter-institutional cooperation. Although the authors believe that their results can be extended to other argument visualisation tools, it has to be noted that the study is based on a small number of 12 test users.

Natural language processing as well as argument visualisation technologies are objects of ongoing research. Evidence of their practical use for e-consultations is growing only gradually. Initial results indicate that they have the potential to mitigate some of the problems of deliberative consultations, but more research and more evaluation is needed. An interesting feature of these technologies is that contrary to many e-participation tools that are developed in the context of dedicated platforms, these technologies can be applied to various platforms and thus various spaces of online policy discourse.

3.3 E-Consultations and Social Media Spaces

This feature is particularly interesting when we consider a third approach to take e-consultations further, namely to integrate them more closely with social media. It is based on criticism that policy consultations are organised as top-down initiatives and largely ignore that political debate is already going on among citizens in online spaces such as the blogosphere and social networking sites. An alternative approach to e-consultations is to link e-consultations to these "third places" ([31], p. 30).

Social media environments are places where "individuals express many different facets of their identities and in which diverse lifestyles and values play out" ([31], p. 30). Examples include personal weblogs, social networking sites like Facebook, but also older forms of social media like online forums where people exchange information and viewpoints on certain topics. Social media environments have become part of the daily life world of many citizens which is so vital for the constitution of civil soci-

ety ([7], p. 443). E-participation researchers increasingly view these places as political spaces, arguing that in these spaces, every day talk can have a political meaning and the distinction between the political field and the life world is being blurred ([31]; [32]; [33], p. 11f.).

This view is not only expressed within the research community, but also by activists from civil society who are dissatisfied with e-participation initiatives not opening up towards what is being felt as a "community of Internet users" (personal communication at a workshop at the Government 2.0 camp in Berlin, 2010). With social media becoming increasingly recognised as political space and civil society actors increasingly using the empowering potential of ICTs to initiate bottom-up e-participation ([5], p. 41ff.; [23], p. 57ff.), the question arises how consultations in the field of institutional politics can be connected to civil society's online spaces and the political talk and engagement in these spaces?

Approaches to connect e-consultations with social media spaces have been proposed in several e-participation research projects. The "Puzzled by Policy" platform is based on widget technology and pushes content from the platform to various social media platforms, thus attempting, among other aims, to "bring the platform to the users rather than trying to attract users to the platform." ([34], p. 130). In the "WeGov" project it was found that policy-makers already monitor social media discourse in areas relevant to them. The project develops tools to extend traditional press relations techniques into the social media environment, more specifically social networking sites, and also to inject policy-makers' statements into specific groups on such platforms [35]. The "Padgets" project provides policy-makers not with a consultation platform, but rather with widgets to consult people in specific social media environments [36]. The widgets provide functionality to inform, consult and analyse opinions and can be used flexibly within various social media environments [37].

The "IMPACT" project, last but not least, focuses on arguments raised in the policy analysis phase. It designs special purpose tools based on computational models of argumentation for argument analysis and visualisation as well as for policy modelling and structured consultations [38]. These are developed as web services that can be used on various platforms, based on widgets providing a common user interface. For example, a policy analyst may use the "argument reconstruction tool" to transform a statement from a social networking site into a formal argument on a policy issue, or the reader of a weblog may use the "argument visualisation" tool to make sense of the debate there.

4 Opening up the E-Consultation Process: A Proposal

These different approaches to enhancing the consultation process show great promise in their respective problem area, but they do not solve the problems identified with regard to the role of e-consultations in the policy process. However they provide a basis for a new form of e-consultations, which promises to be more open and effective than the current regime and thus may improve the quality and legitimacy of policy decisions.

E-consultations should not be seen as a primarily participative element of democracy, but also as a knowledge management procedure. This view shifts the focus from those who participate in a consultation to the views that are considered, in line with research on policy argumentation in e-participation. Assessing the views of stakeholders should be a multi-faceted process, with top-down institutional consultations (government asking citizens about policy proposals) being joined by more informal assessments such as media content analysis, public opinion research as well as social media research, all of which are already carried out as part of the policy formulation phase.

In this process, opinions resulting from deliberation should be regarded as superior to opinions resulting from non-interactive assessments, because the former are closer to a consensual view than individual opinions and the arguments are already structured and weighted. Given the problems with organising deliberation among civil society actors reported earlier, advantage should be taken of the deliberation already going on in diverse online spaces and in mass media. However, providing opportunities for deliberation should also be a focus of policy-makers, as the benefits for democracy clearly outweigh the associated costs.

The integration of social media environments in policy consultations should not have the form of merely using social media as an outlet to reach broader targets or as raising attention for a consultation (though the latter might make sense as an additional activity). Nor should social networking sites be used as spaces for institutionalised debates or to inject political messages, given that they are under the control of private companies and that users like to maintain the distinction between systemic and life-worldly spaces among their online environments [39]. Online discourse should rather be analysed as a form of public opinion to inform the policy formulation and to assess potential controversial issues associated with a particular policy (an example can be found in the activities of the German Federal Institute for Risk Assessment to measure public perception of nanotechnology in online discourse, [40]).

These proposals for e-consultations to become more open towards social media discourse and more active with regard to listening to stakeholders are procedural in nature to a large degree. But technologies also play a role, as these are needed to help analyse large amounts of textual data and to make sense of it in the course of debating policies. Tools based on natural language processing as well as formal models of argument appear to be promising, although their practical use has still to be put to the test.

We already found evidence that the tools should not be tied to specific consultation platforms, but rather be applicable to various discursive online spaces like the widgets proposed in some research projects. What is more is that the tools should not be designed for use by governmental agencies or facilitators, but should be open to citizens interested in making sense of policy issues and gaining an overview of debates. This would empower them by improving the preconditions for participating in e-consultations [41]. Furthermore, coupling several tools in a kind of toolbox seems appropriate to ease the administration and the application of the tools in the context of specific consultations, for example by help of a common look-and-feel of the user interfaces.

Finally, although some potential can be ascribed to technological support of e-consultations, it should be clear that the work of assessing the views of stakeholders cannot be automated, but will remain to a large part the work of human policy-makers, analysts and facilitators. Experiences so far have pointed out the limits of computerisation of tasks like summarising divergent viewpoints and evaluating statements and their respective context. The role of technology can be a supporting one, but not one of substituting the human factor.

5 Conclusions and Future Work

To summarize, the main differences between the proposed process of e-consultation and established ones are the following:

- The consultation makes use not only of ICTs in general, but of specific technologies to support deliberation and participation. These are provided as tools to empower all participants in the consultation, stakeholders as well as the organisers of the consultation. Technologies are provided platform-independent to allow their use across various consultation and social media platforms.
- The consultation is not restricted to comments sent in via a dedicated consultation platform, but is open towards deliberation on that platform as well as in social media environments, wherever policy issues are discussed. The social media environment is endorsed and respected not as outlet for marketing purposes, but as a space of debate that is part of the life world of citizens.
- Government agencies preparing policy drafts not only take into account what citizens tell them (passive listening), but also actively listen to citizens' public communication and analyse the relevance of such talk for planned policy. This active listening is implemented as a standard procedure in the process of participative policy-making, undertaken in conjunction with stakeholder consultations.

The process proposed here addresses several of the issues of e-consultations raised in the literature and builds upon current policy-making practice as well as recent work in e-participation research. It goes beyond current practice and other proposals to enhance e-consultations not only by offering a coherent, procedural approach, but also by dealing with some of their weaknesses, especially with regard to the handling of social media integration into e-consultations.

Several new issues are raised by this proposal, which point to needs for future research on open e-consultations. If lifeworldly third spaces are approached and analysed for policy comments, the privacy of participants has to be protected. People stating their views in semi-public social media spaces might not consider that their posts are analysed with the help of sophisticated technology and harvested for political statements. Thus, special attention has to be given to ensure that no one can trace individual users or build a profile of their opinions. On the other hand, the anonymity provided by some online platforms might lead to biased results if people deliberately misuse this feature. Here, a way to reconcile the need to identify participants and the

negative effects of forcing people to use their real name in political debates still has to be found (for some initial steps in this direction, see [42]).

Technical problems include the need to identify relevant debates in the vast and unstructured social media environment. Initial work has been done in the field of social media monitoring and also the "WeGov" project, but often tailored to specific social media platforms. Furthermore, neither natural language processing nor argumentation technologies are yet developed on the level of end user application, they are still areas of intensive research.

From the perspective of public administration, the transparency of the consultation process becomes even more important as more statements from more diverse sources are taken into consideration, including offerings strongly linked to a commercial orientation. Argument visualisation technologies might help to allow users to trace how statements are developed into modifications of policies, e.g. by linking the results to the original statements as proposed in the "IMPACT" project. But public administrations also have to further develop organisational cultures of active listening and openness, a process which has already begun in several countries in the context of "open government" initiatives.

A final issue is the fate of established intermediaries of the policy process, such as media organisations, but also parties. Their roles are put under stress in the process of institutional change of the political system. But they could play a strong role in open consultation processes by raising attention to specific policy issues and using the respective tools to strengthen their traditional activities like aggregating opinions and structuring complex debates.

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References

1. Wright, S., Street, J.: Democracy, Deliberation and Design: The Case of Online Discussion Forums. New Media & Society 9, 849–869 (2007)
2. Quittkat, C., Finke, B.: The EU Commission Consultation Regime. In: Kohler-Koch, B., De Bièvre, D., Maloney, W. (eds.) Opening EU Governance to Civil Society: Gains and Challenges. CONNEX Report Series No 05, pp. 183–222. MZES, Mannheim (2008)
3. Tomkova, J.: E-consultations: New Tools for Civic Engagement or Facades for Political Correctness? European Journal of ePractice 7 (2009), http://www.epractice.eu/en/document/287934
4. Ruesch, M.A., Basedow, S., Korte, J.-H.: From E to O. Towards Open Participation as a Guiding Principle of Open Government. Paper to be presented at EDEM 2012, Vienna, Austria, September 3-6 (forthcoming, 2012)
5. Institut für Informationsmanagement Bremen GmbH (ifib)/Zebralog e.V.: eParticipation – Electronic Participation of Citizens and the Business Community in eGovernment. Ifib, Bremen (2008), http://www.ifib.de/publikationsdateien/study_e-participation_engl.pdf

6. Habermas, J.: Moralbewußtsein und kommunikatives Handeln. Frankfurt/M. Suhrkamp (1983)
7. Habermas, J.: Faktizität und Geltung. Frankfurt/M. Suhrkamp (1992)
8. Nielsen, P.C., Santamera, A.S., Vondeling, H.: Policy Processes and Health Technology Assessment. In: Garrido, M.V., Christensen, F.B., Nielsen, C.P., Busse, R. (eds.) Health Technology Assessment and Health Policy-Making in Europe, pp. 19–30. The European Observatory on Health Systems and Policies, Copenhagen (2008)
9. OECD: Citizens as partners. Information, Consultation and Public Participation in Policy-making. OECD, Paris (2001)
10. Cabinet Office: In the Service of Democracy. A Consultation Paper on a Policy for Electronic Democracy, Cabinet Office of HM Government, London (2002)
11. United Nations: UN E-Government Survey 2012. E-Government for the People. United Nations, New York (2008)
12. European Commission: European Governance. A White Paper. COM (2001) 428 final. Brussels (2001)
13. European Commission: Smart Regulation in the European Union. COM (2010) 543 final. Brussels (2010)
14. Quittkat, C.: The European Commission's Online Consultations: A Success Story? J. of Common Market Studies 49, 653–674 (2011)
15. Winkler, R., Kozeluh, U.: Europeans Have a Say: Online Debates and Consultations in the EU. Research Report. Institute of Technology Assessment of the Austrian Academy of Sciences & Centre for Social Innovation, Vienna (2005)
16. Fazi, E., Smith, J.: Civil Dialogue: Making It Work Better. Study Commissioned by the Civil Society Contact Group. Civil Society Contact Group, Brussels (2006)
17. Panopoulou, E., Tambouris, E., Tarabanis, K.: eParticipation Initiatives in Europe: Learning from Practitioners. In: Tambouris, E., Macintosh, A., Glassey, O. (eds.) ePart 2010. LNCS, vol. 6229, pp. 54–65. Springer, Heidelberg (2010)
18. Hüller, T.: Gut beraten? Die Online-Konsultationen der EU Kommission. Zeitschrift für Politikberatung 1, 359–382 (2008)
19. Millard, J., Meyerhoff Nielsen, M., Warren, R., Smith, S., Macintosh, A., Tarabanis, K., Tambouris, E., Panopoulou, E., Dalakiouridou, E., Parisopoulos, K.: European eParticipation Summary Report. European Commission, Brussels (2009)
20. Dalakiouridou, E., Smith, S., Tambouris, E., Tarabanis, K.: Electronic Participation Policies and Initiatives in the European Union Institutions. Social Science Computer Review (forthcoming)
21. Bohman, J.: Public Deliberation. Pluralism, Complexity, and Democracy. MIT Press, Cambridge (1996)
22. Stromer-Galley, J., Webb, N., Muhlberger, P.: Deliberative E-Rulemaking Project: Challenges to Enacting Real World Deliberation. Journal of Information Technology & Politics 9, 82–96 (2012)
23. Beckert, B., Lindner, R., Goos, K., Hennen, L., Aichholzer, G., Strauß, S.: E-Democracy in Europe – Prospects of Internet-based Political Participation. Theoretical Framework and Overview. In-depth Examination of Three Selected Areas – Phase II. European Technology Assessment Group, Bonn (2010)
24. Davis, A.: New Media and Fat Democracy: The Paradox of Online Participation. New Media & Society 12, 745–761 (2010)
25. Ferro, E., Molinari, F.: Making Sense of Gov 2.0 Strategies: "No Citizens, No Party". eJournal of eDemocracy 2, 56–68 (2010), http://www.jedem.org/article/view/13/33

26. Tigelaar, A.S., op den Akker, R., Hiemstra, D.: Automatic Summarisation of Discussion Fora. Natural Language Engineering 16, 161–192 (2010)
27. Hilbert, M.: The Maturing Concept of E-Democracy: From E-Voting and Online Consultations to Democratic Value Out of Jumbled Online Chatter. Journal of Information Technology & Politics 6, 87–110 (2009)
28. Tambouris, E., Dalakiouridou, E., Panopoulou, E., Tarabanis, K.: Evaluation of an Argument Visualisation Platform by Experts and Policy Makers. In: Tambouris, E., Macintosh, A., de Bruijn, H. (eds.) ePart 2011. LNCS, vol. 6847, pp. 74–86. Springer, Heidelberg (2011)
29. Karamanou, A., Loutas, N., Tarabanis, K.: ArgVis: Structuring Political Deliberations Using Innovative Visualisation Technologies. In: Tambouris, E., Macintosh, A., de Bruijn, H. (eds.) ePart 2011. LNCS, vol. 6847, pp. 87–98. Springer, Heidelberg (2011)
30. Benn, N., Macintosh, A.: Argument Visualization for eParticipation: Towards a Research Agenda and Prototype Tool. In: Tambouris, E., Macintosh, A., de Bruijn, H. (eds.) ePart 2011. LNCS, vol. 6847, pp. 60–73. Springer, Heidelberg (2011)
31. Chadwick, A.: Web 2.0: New Challenges for the Study of E-Democracy in an Era of Informational Exuberance. I/S: A Journal of Law and Policy for the Information Society 5, 9–41 (2009)
32. Graham, T.: Beyond "Political" Communicative Spaces: Talking Politics on the Wife Swap Discussion Forum. Journal of Information Technology & Politics 9, 31–45 (2012)
33. Wright, S.: Politics as Usual? Revolution, Normalization and a New Agenda for Online Deliberation. New Media & Society (forthcoming)
34. Lee, D., Loutas, N., Sánchez-Nielsen, E., Mogulkoc, E., Lacigova, O.: Inform-Consult-Empower: A Three-Tiered Approach to eParticipation. In: Tambouris, E., Macintosh, A., de Bruijn, H. (eds.) ePart 2011. LNCS, vol. 6847, pp. 121–132. Springer, Heidelberg (2011)
35. Wandhöfer, T., Thamm, M., Joshi, S.: Politician 2.0: Information Behavior and Dissemination on Social Networking Sites – Gaps and Best-Practices. eJournal of eDemocracy 3, pp. 207–214 (2011), http://www.jedem.org/article/view/78/90
36. Charalabidis, Y., Gionis, G., Ferro, E., Loukis, E.: Towards a Systematic Exploitation of Web 2.0 and Simulation Modeling Tools in Public Policy Process. In: Tambouris, E., Macintosh, A., Glassey, O. (eds.) ePart 2010. LNCS, vol. 6229, pp. 1–12. Springer, Heidelberg (2010)
37. Ferro, E., Osella, M., Charalabidis, Y., Loukis, E., Boero, R.: Policy Gadgets: Paving the Way for Next-Generation Policy Making. In: Proc. of IFIP Third Int. Conf. on e-Participation – ePart 2011, Trauner, Linz (2011)
38. Gordon, T.: The IMPACT Argumentation Toolbox for Policy Deliberations. Paper presented at the Workshop "Open Government" at EGOV 2011, Delft, The Netherlands (2011)
39. Jones, N., Blackey, H., Fitzgibbon, K., Chew, E.: Get out of MySpace! Computers & Education 54, 99, 776–782 (2010)
40. Albrecht, S., Coenen, C., Yang, M., Trénel, M.: Perception of Nanotechnology in Internet-based Discussions. BfR Wissenschaft 08/2010. Federal Institute for Risk Assessment, Berlin (2010)
41. Macintosh, A.: Characterizing E-Participation in Policy-Making. In: Proc. of the 37th Hawaii Int. Conf. on System Sciences (HICSS-37), Big Island, Hawaii, January 5-8 (2004)
42. Ruesch, M., Märker, O.: Real Name Policy in E-Participation. The Case of Gütersloh's Second Participatory Budget. Paper presented at CeDEM 2012, Krems, Austria, May 3-4 (2012)

Choosing the Right Medium for Municipal eParticipation Based on Stakeholder Expectations

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Abstract. This paper examines the expectations and communication needs of relevant stakeholder groups for municipal eParticipation in a small Norwegian municipality. We identified relevant stakeholder groups with the municipality, and asked them about their communication preferences through a combined Delphi study and survey approach. The findings show that information about local issues, information about issues relevant for the individual stakeholder, and dialogue on business' needs and employment are the three most important communication needs. E-mail and the municipal web site are the two preferred modes of communication, with social media ranking third. For dialogue and participation, a face to face meeting is the preferred mode of communication. Our findings show that effective municipal communication requires a number of different media, depending on what is being communicated. We conclude by outlining a framework for media choice in eParticipation.

Keywords: eParticipation, stakeholder theory, social media, media choice.

1 Introduction

Digital media are increasingly used by governments and political parties in their communication with citizens, business and organisations. It has been claimed that digital media "are set to transform political structures and organisations, political campaigning, lobbying strategies and voting patterns" [1]. In Norway, the vision for digital communication is to be among the best in the world on digital citizen dialogue, digital services and efficient eGovernment [2]. Politics as a field is becoming more and more dependent on good media and communication skills [3], but information overload and filtering problems presents government with massive challenges related to media choice [4], and there is often a gap between government choice and citizen expectations [5].

Deliberation in various digital media can increase the political sophistication of citizens [6], and online participation extends the political centre by including more citizens, but may also increase the distance between the ones in the centre and those in the periphery [7], widening the gap between those who are "inside" and "outside" of the public debate. Participants in political deliberation initiatives are rarely representative of the general population, but organising deliberation programs in different settings such as online surveys and discussions, face to face meetings or informal dinners could include citizens with more diverse backgrounds [8]. The fact that today's government is technocratic and relies ever more on expert reports and

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opinion further alienates the average citizen, who feels s/he has nothing to contribute to a debate where the focus is on consultancy reports and numbers [9].

To include more citizens in the decision making process, governments have attempted to implement various participatory techniques, but these are often biased towards the socio-cultural background of government officials, and leaves little space for the actual needs of citizens [9]. Thus, our first aim is to discover what various citizen groups actually want to talk to government about, and through which medium they prefer to communicate. We have focused on the municipal level, as this is where the diversity of citizen interaction is largest in Norwegian government.

While political parties have embraced technology, they are yet to embrace the social concepts underlying the technology [10]. A recent study defines both the social and technical concepts of technology for research, and calls for practical applications of the theoretical framework [11]. This leads us to our second objective, which is to aid practitioners in government who are uncertain about which medium they should use for various eParticipation efforts. Thus, our research questions for this study are:

1: Who are the stakeholders in eParticipation at the municipal level?
2: What are their communication needs and media preferences?
3: How can practitioners choose media for various types of communication?

To answer these questions, we conducted a Delphi study of the various citizen stakeholder groups, and distributed a survey to capture the opinions of stakeholders who did not want to take part in the Delphi study. Finally, based on the findings from the Delphi study and survey we applied the theoretical framework of Johannessen and Munkvold [11], and synthesised several existing frameworks for technology choice and communication to create a tool that could help practitioners in government in choosing the right technologies for different communication needs.

2 Theoretical Premises: Technology Evaluation through Genres

While our study identifies citizen preferences for eParticipation, there is still the need to transfer this knowledge to governments' technological choice so that government can decide which tools to use for which purpose. Existing literature has several examples of this, but mostly focuses on either communication or technology. A synthesis between these studies could lead us towards a more holistic solution.

The eParticipation tool assessment [12] combines the analysis of technical functionality with several other factors such as the level of participation it can address and the stages in the decision making process that are supported. Existing frameworks address the technological requirements of eParticipation well, but it is made from the perspective of government, and does not take into account the varying needs of different citizen groups, or the socio-technical nature of technology. However, to succeed, it is important to take citizens' needs into account [13], and to address technology from a socio-technical perspective [11].

To extend the framework to include the socio-technical perspective so it can more easily be used to identify the communication needs of citizens, we used elements from genre theory. A genre is defined as "a typified communicative action which is invoked in response to a recurring situation" [14]. Genres that are routinely enacted,

such as questions to politicians, reports on potholes or specific types of input to the decision making process can be seen as a genre repertoire [15] of eParticipation. Genres are identified through similar form and function [14], as well as technical functionality [16], and can be analysed through the 5W1H framework, where you ask *Why* are we communicating, *What* is the content , *Who* are the participants, *Where* should the communication take place, *When* and *How* should we communicate. The framework helps uncover how and when the genre is enacted, in what situations it is used, who the participants are and why the genre is used [17]. Genre theory has been used in several previous studies of eParticipation [18-21].

There are some examples of genre based methods for systems planning and development in government. Päivärinta et.al. [22] present a method for Information Systems Planning based on genre theory, where the communication genres are the deciding factor for the technological choice. The framework includes a stakeholder analysis of who the producer and the user of the information is, as well as genre and metadata analyses. Others have built upon this framework to create a method for development of eGovernment portals, where the genre perspective is extended through the inclusion of life-events in the planning stage [23]. In another example, genre theory have been used to help structure and plan discussion forums for local eParticipation through the 5W1H method [18].

While both the assessment tools and the genre approaches are good, none of them address both the technological and communicative aspects of eParticipation. Combining the two into a genre *and* technological choice framework could aid practitioners in choosing the appropriate media for different eParticipation activities. In section five, we begin to sketch the outlines of such a framework, which combines the genre and technology analyses referenced in this section.

3 Research Method

The findings reported in this paper are part of an on-going collaboration between the university and a municipality in southern Norway. The municipality has 8000 inhabitants, and relies heavily on agriculture. Three large fjords have led to a scattered population, with about half of the inhabitants living in the centre, and the rest spread out across the municipality.

As our objective was both to identify stakeholder groups and their preferences, we chose multiple research methods. By a multiple approach different aspects of reality may be explored to gain richer understanding of the research topics investigated [24]. Our first objective was to identify relevant stakeholder groups through a stakeholder analysis. Stakeholder theory was originally a set of tools and methods to identify relevant stakeholders [25], and stakeholder theory has been adapted to the eGovernment field [26, 27]. Our stakeholder analysis was conducted in collaboration with politicians and government officials in the municipality, and we came up with a total of 23 local stakeholder groups. Stakeholders with similar characteristics were then grouped into 10 panels for the Delphi study, which provided us with a list of stakeholders from politics, government administration and civil society.

Data collection took place between April and November 2011. We collected our data using the Delphi method [28, 29]. The Delphi method is well suited for studies

where "judgmental information is indispensable", and has been used for concept and framework development in Information Systems studies [28] and public policy development [30]. The method consists of three phases: Brainstorming of issues, consolidation, where the list is narrowed down, and finally the ranking phase, where the participants attempt to reach consensus on which of the identified issues are most important [28, 29]. The respondents were asked to provide a qualitative answer to the question *what do you want to communicate with government about, and which media would you prefer to use?* In addition, there was a short text explaining the purpose of the study.

The municipality recruited participants based on our stakeholder analysis, and these were invited to take part in the Delphi survey. The survey was distributed to 80 participants, of which 22 chose to participate. In addition to this, we distributed a regular survey to the municipality's inhabitants, which resulted in 36 additional respondents.

We were not able to reach consensus, as the participants lost interest in the study after the first round of ranking. This is a common problem with the Delphi method, but fortunately the amount of data from initial rounds is often rich enough that we can draw some conclusions, as shown by Päivärinta & Dertz [31]. In our case, both the brainstorming and first ranking phases provided insights into the communication preferences for the different stakeholder groups, as well as their preferred communication technologies for each form of communication.

The brainstorming phase identified 31 different communication categories, which were narrowed down to ten in the consolidation phase. Eight of these were ranked by more than 50 per cent of the participants, and thus considered to be at least moderately important for a majority of the respondents. The survey data confirmed these as the most important issues. Finally, we asked the respondents to report which communication technology they preferred for each of the communication categories, and found that more than 70 per cent prefer some form of digital communication.

Treating the communication categories as genres of communication [14], we combined the technological framework of Tambouris et. al. [12] and the genre based frameworks [18, 22, 23] to create an overview of which technologies are suited to which communication genre.

4 Results

4.1 Who Are the Stakeholders?

Stakeholder groups were identified in collaboration with representatives from the municipality. The objective was to include every government and civil society group that has a need to communicate with the municipality.

In eGovernment we usually discuss three main stakeholder groups: Politicians, administration and the civil society [32]. For the municipality, it was important to solicit opinions from these as separate stakeholders. The relation between politicians and the administration was mentioned as very important, due to the different responsibilities of these groups.

Defining civil society stakeholder groups is more difficult, as they can be divided in several ways, such as age, education, ethnicity, business owners and associations.

We attempted to include as many groups as possible, and came up with eight civil society stakeholders: Business, Service users, associations, expats, immigrants, youth, senior citizens and finally a group for the "silent majority" of citizens with no organizational membership. The identified stakeholder groups are listed in Table 1.

Table 1. Municipal stakeholder groups

Sphere		Stakeholder groups
Political		Municipal executive board
Government Administration		Administration officials from city hall Municipal employees from health and education
Civil Society	Business	Business association, Tourism, Primary industry
	Organizations/ citizen groups	Service users: PTA, Health care patients
		Associations: Residents, religious groups, sports
		Expats
		Immigrants and new residents
		Youth (15-25 years old)
		Senior citizens (65+)
		Citizens with no organizational attachment

4.2 What Are the Communication Needs?

The reported communication needs from the initial brainstorming session are listed in table 2. It is worth noticing that some of the reported needs are available today if you know what you are looking for, but these are reported to be either hard to find, of poor quality, or in a language which is not easily understood by ordinary citizens.

Table 2. Communication needs

Communication needs	Description
Report problems	Report problems with physical infrastructure
Information: Nature	Information about local areas for hiking and fishing
Tourist information	Information about what happens, where to sleep and what to do
Municipal news	News about what happens in the municipality
Website links	Links to local web sites
Planning information	Information on construction, road works
Inform on political decisions	Information about decisions made by the municipal council
Debate urban planning	Create a forum for debate
Citizen surveys	Conduct surveys on big and important issues
Feedback	Receive feedback from municipality after making contact
Referral to laws	case correspondence from the municipality should include references to relevant law
After hours contact	The municipality should be available after 4PM
Accessible information	Policy documents are difficult to understand, and should be made more accessible to ordinary citizens.
Geographic information	Citizens should be informed on issues in their neighbourhood.
Rapid feedback	When contacting the municipality, receive feedback and case status.
Comment services	Comment and provide feedback on municipal services

Table 2. (*Continued*)

Urban planning dialogue	Dialogue between business and municipality
Information on business services	Information on services for business
Dialogue on land use	Dialogue between business and municipality
Dialogue on the harbour	Dialogue between business and municipality
Dialogue on apprentice recruitment	Dialogue between business and municipality
Dialogue with immigrants	Establish a forum for politicians, locals and immigrants to meet
Information: geriatric	Information about plans to cope with an aging population
Information: the church	Information about religious activities
Information: political objectives	Information about the long term ideas and thoughts of politicians
Information flow politicians/administration	Introduce routines for information flow between administration and politicians
Discussion forum	Create a forum for discussion on long-term political issues.
Electronic case handling	Case documents digitized for easier access
Information: services	Inform citizens about the municipality's services.
Information: Courses	Inform citizens about available short educational courses.
Patient evaluation	Patients in health care should be able to evaluate their treatment

The 31 communication needs of the initial brainstorming were reduced to ten in the consolidation phase, and the consolidated list was presented to and approved by the participants. The ten remaining factors were grouped in the categories *information dissemination*, *public services* and *public dialogue*, as the qualitative data from the first phase revealed that these were the three main concerns for the participants.

Table 3. Consolidated list of communication needs, grouped by category

Information dissemination	Public services	Dialogue
Generic information	Service dialogue	Forum for debate
Information tailored to individual needs	Evaluation of existing services	Business dialogue
Local information	Report problems with services	Municipal surveys
	Report problems with infrastructure	

Table 4 shows the communication needs that were important to the different stakeholder groups. We were not able to solicit answers from all of the civil society groups identified by our stakeholder analysis. Hence, some of the groups from table 1 are excluded from table 4. None of the stakeholder groups ranked *report problems with services* as important. *Tailored* and *local information* are important to almost all of the stakeholder groups, and the qualitative data shows that these are even more important than the table suggests:

"*Calling them does not work at all. It would be a lot more efficient if there was one person responsible for one area. We are located on an island where it can take one year for a light bulb to be changed, just because the right people aren't told about the problem*" (Associations respondent 1).

Except for the administration, all the stakeholder groups wanted to report problems with the physical infrastructure, such as potholes, missing streetlights, poor road maintenance in winter etc. Again, this is a very important issue also in the qualitative

data set from the brainstorming phase: "*My main communication need is to comment on municipal services such as* [problems with] *garbage disposal and snow clearing*" (Associations respondent 5).

Table 4. Stakeholder groups' communication needs

	Adm.	Politicians	Seniors	Business	Youth	Associations
Generic information		X		X	X	X
Local information	X	X	X		X	X
Tailored information	X	X	X	X	X	X
Service dialogue	X	X			X	X
Evaluation of services	X					
Report problems w/infrastructure		X	X	X	X	X
Forum for debate	X	X	X			X
Business dialogue	X	X	X	X		X
Municipal surveys				X		X

Respondents were asked to pick the most important issues, and to rank them from least to most important. Table 5 shows how many of the participants who included each item in their list of most important issues. While democratic dialogue is an important issue for eParticipation, a majority of our respondents call for information tailored to individual needs, dialogue on the needs of business, a way to report problems with the physical infrastructure or information about things happening in their local area, such as planned construction and power outages. The ranking confirms these as the most important issues.

Table 5. Ranking of communication needs, all stakeholders

Communication need	Percentage
Tailored information	100.0%
Business dialogue	77%
Report problems with physical infrastructure	69%
Local information	62%
Generic information	46%
Service dialogue	46%
Forum for debate	31%
Evaluation of services	15%
Municipal surveys	15%

4.3 How Can Practitioners Choose Media for Various Types of Communication?

In addition to asking about the communication needs of the stakeholder groups, we also asked them which communication media they preferred to use for each category. The findings are summarized in table 6. There were no notable differences between the stakeholder groups' preferences, so we do not report the results of the individual groups. The participants were able to choose more than one media preference for each communication need. Based on the input from the brainstorming phase, we grouped the media preferences into six categories. Four based on technology, and two physical contact points.

Internet, as in the municipality's web site or other web sites is by far the most popular medium overall, along with e-mail whereas social media and mobile phones are less popular. Age does not seem to play an important role as the distribution between age groups is fairly similar. In terms of dialogue, social media scored higher, which is consistent with the idea of social media as a two-way medium, and an indication that governments' social media presence should include some form of feedback option. Another interesting observation is that public meetings also received a high score. This indicates that, at least in small communities, physical contact is deemed important for dialogue. Even so, the trend is clear. In most cases, some form of digital communication is the preferred option, while physical contact is still in some cases seen as important.

Table 6. Media preference for each communication category

Preferred medium	**Percentage for each communication need**								
	Generic information	Local information	Tailored information	Service dialogue	Evaluation of services	Report problems w/infrastructure	Forum for debate	Business dialogue	Municipal surveys
E-mail	66	60	75	47	47	74	39	38	63
Internet	78	62	58	56	61	53	61	62	69
Social media	22	24	14	22	17	15	42	44	20
Mobile devices	16	19	25	14	9	35	6	18	14
Service bureau	8	16	14	14	12	32	12	18	6
Public meetings	8	5	6	19	12	6	46	41	9

5 Discussion: Towards a Framework for Media Choice

Knowing the communication needs and media preferences of the stakeholder groups in our case municipality, we are now able to move on towards the next phase, choosing the appropriate technologies for each communication need. The reported communication needs are translated into genres in our proposed framework, based on the phases from [22] and expanded with the technological framework [12].

Identify stakeholders and producers and users of information. A stakeholder analysis, such as the one presented in table 1, tells us who should participate in the communication. The next step is to identify producers and users of information (PUI entities), so that we know who should initiate and who should respond. See [22] for more on PUI entities.

Identify communication genres. For eParticipation, the first step has too often been based on the needs of government. Our identification of the communication needs of various external and internal stakeholder groups (tables 2-5), allows us to create genres that are grounded in citizen and other stakeholder needs. Identifying genres based on these communication needs can be done through the 5W1H method, as shown by [18]. *Who/m* is excluded from 5W1H, as it is addressed in the stakeholder analysis.

Define and gather metadata about the various genres. This should be done in collaboration with the stakeholders. Typical metadata varies depending on the type of communication, but could include preferred medium (see table 6), response time, reference number, and for government, issues such as archiving and access might also be necessary for compliance. This step overlaps with the technological analysis. These steps are shown in Table 7, with an example of a finished analysis in Table 8.

Table 7. Genre analysis

Genre :	**[name]**	
Stakeholders	Producers	Who is the one producing information/ the sender
	Users	Who is the receiver of information?
Genre properties	Why	What is the purpose and expected outcome of the genre?
	What	What is the information content and level of participation addressed?
	When	In what time-period, and where in the decision making process should the genre be enacted?
	Where	What is the reported preferred technology for the genre?
	How	What are the technological needs, how should the genre be produced? What activities are involved?
Genre metadata	Meta 1	Metadata is collected through user input
	Meta 2	Metadata can also be related to compliance issues such as archiving laws

Table 8. Example of a genre analysis

Genre :	**Report problems with infrastructure**	
Stakeholders	Producers	Citizen group members, business
	Users	Government administration (road and transportation office)
Genre properties	Why	Report issues such as potholes, broken streetlights, so they can be fixed. Expected outcomes: civic engagement
	What	Geographic location, type of issue, other relevant information. Level of participation: collaboration
	When	On-going when problems are observed. Stage in decision making process: Monitoring
	Where	e-mail to municipality, internet (municipal web site), mobile
	How	Web-site front end where information is stored in Database. Accessible through mobile app + mobile-friendly municipal web site. Activities: consultation.
metadata	Case no	Generate case number for each report
	Feedback	Provide feedback when problem is fixed. Linked to case number.

Analyse available technologies. The last step is shown in Table 9, with an example analysis in Table 10. Based on Tambouris et.al. [12], we analysed the communication media the stakeholders prefer to use for the specific genre. The technology evaluation includes the technical functionality, the level of participation and stage in decision

making process (based on OECD recommendations) the medium can accommodate, and actors. Activities and outcomes are other important factors in eParticipation [33], and these have been added to the original technological analysis to provide a more holistic picture. While our example includes only one technology, in most cases there would probably be many suitable systems, consistent with a multichannel strategy [5].

Table 9. Technology evaluation

Name of medium	**<insert name of medium>**
Functionality	Technical functionality, such as forms, video, feedback options
Level of participation	Information/two-way consultation/involvement in the political process/collaboration/power transfer to citizens
Stage in decision making process	Agenda setting, Analysis, policy creation, Implementation, Monitoring
Actors	Who has access to the technology?
Activities	Voting, discourse form, decision making, activism, consultation, petitions
Expected outcomes	Civic engagement, deliberative effects, democratic effects

Table 10. Example of a finished technology evaluation table

Name of medium	**Facebook**
Functionality	Personalised front page, Profiles, Groups, Networks, "Wall" for message posting, Photo uploads, Notes/links, status updates, events, Video, Chat, 3rd party applications, internal private messaging system, Search, Sharing of content, Mobile app for smartphones.
Level of participation	Information, two-way consultation collaboration
Stage in decision making process	Agenda setting, Analysis
Actors	Everyone with a Facebook account. Requires participants to register, may exclude privacy conscious people
Activities	Information, activism, consultation, petitions
Expected outcomes	Civic engagement

Based on tables 8 and 10, our example genre and example technology are not well-matched if the reported metadata item "case number" is seen as very important. Using a Facebook page or group would not generate case numbers, does not allow reported cases to be stored in a database, and privacy issues related to ownership of data could also be an obstacle for this particular genre. This short example shows the importance of addressing both the technology and the users' preferences for communication before starting on an eParticipation project, and we believe our framework could serve as a guide in this sense.

6 Limitations and Future Research

While this study provides insights into the communication needs and media preferences of various stakeholder groups, there are some limitations that need to be addressed. As we were not able to reach consensus in the Delphi study, we were unable to create a definite list of communication needs to be addressed. However, we were still able to identify some needs, and through the survey that was distributed

later, we also got data to verify the findings from the Delphi study. Our findings should however be read mainly as qualitative and interpretive, and within the contextual limitations of a small Norwegian municipality, rather than quantitative.

Our combination of the eParticipation technology framework and genre frameworks is mainly based on theory and inspired by the findings on communication preferences. A logical next step in this research would be to verify the framework through testing it in government. Specifically, validation of a common list of communication needs and the appropriate technology to support each communication need is considered to be an important contribution to further practical development.

References

1. Kitchin, R.: Cyberspace: The world in the wires. John Wiley & Sons, Chichester (1998)
2. Kjensli, H., et al.: eKommune 2012: Lokal digital agenda. Oslo, Kommuneforlaget AS (2008)
3. Mazzoleni, G., Schulz, W.: "Mediatization" of politics: A challenge for democracy? Political Communication 16(3), 247–261 (1999)
4. Gurevitch, M., Coleman, S., Blumler, J.G.: Political communication -old and new media relationships. Annals of the American Academy of Political and Social Science 625(1), 164–181 (2009)
5. Ebbers, W.E., Pieterson, W.J., Noordman, H.N.: Electronic government: Rethinking channel management strategies. Government Information Quarterly 25(2), 181–201 (2008)
6. Gastil, J., Dillard, J.P.: Increasing political sophistication through public deliberation. Political Communication 16(1), 3–23 (1999)
7. Davis, A.: New media and fat democracy: The paradox of online participation. New Media and Society 12(5), 745–761 (2010)
8. Carr, D.S., Halvorsen, K.: An Evaluation of Three Democratic, Community-Based Approaches to Citizen Participation: Surveys, Conversations With Community Groups, and Community Dinners. Society & Natural Resources 14(2), 107–126 (2001)
9. Rayner, S.: Democracy in the age of assessment: Reflections on the roles of expertise and democracy in public-sector decision making. Science and Public Policy 30(3), 163–170 (2003)
10. Jackson, N.A., Lilleker, D.G.: Building an Architecture of Participation? Political Parties and Web 2.0 in Britain. Journal of Information Technology and Politics 6(3), 232–250 (2009)
11. Johannessen, M.R., Munkvold, B.E.: Defining the IT Artefact in Social Media for eParticipation: An emsemble view. In: European Conference on Information Systems, ECIS, Barcelona (2012)
12. Tambouris, E., Liotas, N., Tarabanis, K.: A Framework for Assessing eParticipation Projects and Tools. In: Hawaii International Conference on System Sciences, Hawaii (2007)
13. Rose, J., Sæbø, Ø.: Designing Deliberation Systems. The Information Society 26(3), 228–240 (2010)
14. Yates, J., Orlikowski, W.J.: Genres of Organizational Communication: A Structurational Approach to Studying Communication and Media. The Academy of Management Review 17(2), 299–326 (1992)

15. Orlikowski, W.J., Yates, J.: Genre Repetoire: The Structuring of Communicative Practices in Organizations. Administrative Science Quarterly 39(4), 541–574 (1994)
16. Shepherd, M., Watters, C.: The evolution of cybergenres. In: Proceedings of the Thirty-First Hawaii International Conference on System Sciences (1998)
17. Yates, J., Orlikowski, W.: Genre Systems: Structuring Interaction through Communicative Norms. Journal of Business Communication 39(1), 13–35 (2002)
18. Päivärinta, T., Sæbø, Ø.: The Genre System Lens on E-Democracy. Scandinavian Journal of Information Systems 20(2) (2008)
19. Sæbø, Ø., Flak, L.S., Sein, M.K.: Understanding the dynamics in e-Participation initiatives: Looking through the genre and stakeholder lenses. Government Information Quarterly 28(3), 416–425 (2011)
20. Sæbø, Ø.: Understanding twitter^{TM} use among parliament representatives: A genre analysis. In: Tambouris, E., Macintosh, A., de Bruijn, H. (eds.) ePart 2011. LNCS, vol. 6847, pp. 1–12. Springer, Heidelberg (2011)
21. Rose, J., Sæbø, Ø.: Democracy Squared: designing on-line political communities to accommodate conflicting interests (2005)
22. Päivärinta, T., Halttunen, V., Tyrväinen, P.: A Genre-Based Method for Information Systems Planning. In: Rossi, M., Siau, K. (eds.) Information Modeling in the New Millenium, pp. 70–93. Idea Group Publishing, Hershey (2001)
23. Haraldsen, M., et al.: Developing e-Government Portals: From Life-Events through Genres to Requirements. In: The 11th Norwegian Conference on Information Systems (NOKOBIT), Stavanger, Norway (2004)
24. Mingers, J.: Combining IS Research Methods: Towards a Pluralist Methodology. Info. Sys. Research 12(3), 240–259 (2001)
25. Freeman, R.E.: Strategic Management. A Stakeholder Approach. Pitman, Boston (1984)
26. Flak, L.S., Rose, J.: Stakeholder Governance: Adapting Stakeholder Theory to the e-Government Field. Communications of the Association for Information Systems 16, 642–664 (2005)
27. Scholl, H.J.: Involving Salient Stakeholders. Action Research 2(3) (2004)
28. Okoli, C., Pawlowski, S.D.: The Delphi method as a research tool: an example, design considerations and applications. Information and Management 42(1), 15–29 (2004)
29. Schmidt, R.C.: Managing Delphi Surveys Using Nonparametric Statistical Techniques. Decision Sciences 28(3), 763–774 (1997)
30. Rayens, M.K., Hahn, E.J.: Building Consensus Using the Policy Delphi Method. Policy, Politics & Nursing Practice 1(4), 308–315 (2000)
31. Päivärinta, T., Dertz, W.: Pre-determinants of Implementing IT Benefits Management in Norwegian Municipalities: Cultivate the Context. In: Wimmer, M.A., Scholl, H.J., Ferro, E. (eds.) EGOV 2008. LNCS, vol. 5184, pp. 111–123. Springer, Heidelberg (2008)
32. Grönlund, Å., Ranerup, A.: Elektronisk förvaltning, elektronisk demokrati: visioner, verklighet, vidareutveckling. Studentlitteratur, Lund (2001)
33. Sæbø, Ø., Rose, J., Skiftenes Flak, L.: The shape of eParticipation: Characterizing an emerging research area. Government Information Quarterly 25(3), 400–428 (2008)

A Communication Genre Perspective on e-Petitioning: The Case of the Citizens' Initiative

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Abstract. The European Citizens' Initiative is designed to make European democracy more direct by allowing citizens to propose (including electronically) legal acts to the Commission. The present paper offers a conceptual model for the analysis of this eParticipation case, and other similar e-petitioning practices, which is not biased by political ambition or technological determinism. The operational framework proposed aims to understand the nature of communication between citizens, governments, and the civil society among other stakeholders in the contemporary media landscape by using the concept of genre systems for this purpose.

Keywords: eParticipation, e-petition, European Citizens' Initiative (ECI), genre theory, communication studies.

1 Introduction

It is no longer possible to imagine socio-political life in isolation from digital channels for information and communication. The role of the Internet for new democratic practices, transparency, accountability, participation, etc., is rapidly growing. However, governments are still struggling to find ways of using such tools in conjunction with their formal operations. More ambitious aspirations of eParticipation, such as citizen consultation and involvement in decision making are yet largely lacking, although there have been numerous trials over many years.

In this perspective the upcoming European Union (EU) "European Citizens' Initiative" (ECI) is a bold and potentially ground-breaking innovation, announced as "the next big thing" [1] in its history of democratic experimentation. Starting in 2012 a citizens' committee will have an opportunity to register a trans-European citizens' initiative and request the European Commission to examine the issue in question and possibly devise a legislative proposal based on it. For the first time a multi-national, multi-linguistic polity will make use of a common participatory mechanism to empower the citizens and engage them in the agenda-setting process. There is an active debate about whether the ECI will revolutionize public participation in the EU decision-making and give citizens a voice in the EU institutions, or whether it is a bogus type of participation, a political façade which will not have much influence on

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the “clandestine committee-based policy-making” [2] in the EU. The actual outcome will of course depend on a large number of factors [3], like legal/policy environment, political culture, socio-economic environment, interest intermediation structures, technological pool etc., to name a few. While both sides have made reasonable points regarding the democratic effects of the ECI, the discussion itself - framed in black and white - is too simplistic. ICT-mediated communication can grant more opportunities for interaction but at the same time create a more complex environment requiring new skills and tactics. In this perspective the ECI deserves a more nuanced analytical perspective, which is the purpose of this paper.

This paper offers an analytical framework of the communication practices which are to take place at different stages of the ECI process and discusses the prospective use of Internet technologies therein. It is a conceptual paper with the aim of advancing the understanding of the new participatory tool and building a basic analysis matrix for it. It uses a neutral communicative theoretical framework, is not tied to any specific technology, and includes a process perspective including antecedents and outcomes. Although our focus is to analyze the ECI specifically, the framework can be used for studying e-petitioning activities as well, given that the Citizens' Initiative belongs thereto in the eParticipation lingo.

2 The European Citizens' Initiative

The European Citizens’ Initiative was introduced in the Article 11 paragraph 4 of the 2007 Treaty of Lisbon which reads: “not less than 1 million citizens who are nationals of a significant number of Member States may take the initiative of inviting the Commission, within the framework of its powers, to submit any appropriate proposal on matters where citizens consider that a legal act of the Union is required for the purpose of implementing the Treaties” [4].

All along the development of the formal rules a balance between user-friendliness and credibility of the participatory instrument was sought. Following intense negotiations between EU decision-making bodies, the Regulation on the citizens’ initiative was passed on 16 February 2011 and specified all the requirements for launching a Europe-wide citizens’ initiative. The following makes up the basic regulatory framework as outlined in the Regulation [5]:

- An initiative can only be launched on a subject matter which falls within the EU competence and in which the Commission has the power to propose legislation;
- An initiative can only be organized by natural persons, a committee of at least 7 EU citizens coming from at least 7 member states;
- Signatures have to come from at least ¼ of member states while each country has an established quota for the minimum number of signatures required;
- Admissibility check of the initiative (formal and legal) will be conducted by the Commission upon its registration in the web-based Official Register;

- Signature collection can be done on paper as well as online, the Commission has developed an open-web software OCS precisely for this purpose, all signature collection software (including the one offered by the Commission) has to be certified nationally to prove compliance with security requirements;
- Signatures will be verified by the competent authorities of the member states where they were collected according to the procedures to be determined;
- The minimum age of signatories is the voting age for the European Parliament elections (16 in Austria, 18 elsewhere);
- The Commission is obliged to respond to the submitted initiative with 1 million signatures within 3 months.
- Mandatory public hearings will be organized in the European Parliament on successful citizens' initiatives where the organizers of ECIs will be able to officially present their proposal backed up by 1 million EU citizens.

The official launch of the ECI took place on 1 April 2012, this is when it became possible to register the first initiatives in the Official Register of the Commission (online). A number of initiatives on a variety of subjects, e.g. environment, animal protection, taxes, education, telecommunications etc., have already started the process. The role of social media in the ECI process has attracted much attention recently: at a conference organized by the European Commission in January 2012 to demonstrate its official register and signature collection software representatives of major Web 2.0 companies (Facebook, Twitter, Google, DailyMotion) all emphasized their vital role for the ECI via the support of trans-European campaigning which social media facilitate [6].

3 State-of-the-Art of eParticipation

Over the past several years we have seen numerous eParticipation applications at various levels; however it would be pretentious to say there is stringent research and conclusive findings yet [7, 8, 9, 10]. It is no news that the status of government-organized eParticipation is not impressive by any standard, and certainly not when compared to the use of social media for other purposes. For instance, according to the European eParticipation Study [11], eParticipation initiatives prevail on the local and regional levels; information provision, deliberation, and consultation are most common activities; and the case owners aspired for more participation in quantity as well as quality.

In the past decade European countries have been accumulating experience in using online petitions at national, regional, and local levels. Although the integrated e-petitioning experiences with parliaments and governments in Europe and the UK are mostly positive, Panagiotopoulos and Elliman conclude that "solid evidence about significant impact achieved" is not provided [12]. The most prominent experiences of e-petitioning practice include those of the Scottish Parliament, German Bundestag, and Bristol City Council. At the EU level citizens' petitions (both paper-based and online) are handled by the Committee on Petitions (PETI) of the European

Parliament, and in the year 2010 it received 1,655 petitions, of which 64% were submitted in an electronic form (via e-mail) [13]. The use of Internet tools for facilitating 'distributed citizen participation' (across geographically dispersed territories) in Europe has also been recently piloted in the e-petitioning project EuroPetition[1] effective in five EU countries – Spain, the Netherlands, Sweden, UK, and Italy.

eParticipation research has also been advancing in conceptualizing the democratic outcomes of using various technology tools for political participation; thus there is a number of models at the principal or theoretical level defining different kinds of democracy (e.g. deliberative, "quick", "strong", direct etc.) [14, 15, 16]. One of such recent frameworks is the modes of e-citizenship by Coleman [17] - "info-lite", "push-button", and "actualizing"; it offers a holistic view of the possible effects of citizens' online participation in various venues (not only government-controlled) and by using the varied media landscape at citizens' disposal. This model gives an understanding that eParticipation investigations should embrace as broad a context as possible in terms of process and available tools to accurately pinpoint changes.

4 Analytical Framework

In the foundations of our analytical framework lies genre theory which was specifically picked from a large set to avoid the shortcomings of existing eParticipation/eDemocracy models (such as politicizing research and using technological determinism) [18]. Genre theory provides a neutral communication perspective, besides it meets the following basic criteria: 1) it is empirically oriented; 2) serves to induce theory; 3) can be used for comparison with real-life developments.

Thus our framework characterizes the ECI process based on five aspects of communicative genre systems (5W1H) developed by Yates & Orlikowski [19]. This approach, using genre taxonomy, recently gained popularity in the analysis of participatory processes and democratic interaction, including as mediated by ICT [20, 21, 22]. As a result, each of the stages of the ECI process corresponds to a genre system constructed based on the characteristics of the communication practices taking place at each phase. Before presenting the model we briefly introduce the genre framework and its relation to eParticipation.

4.1 Genres and Genre Systems in eParticipation

There are genre studies in many disciplines, most often connected with literature and other creative arts, but genre studies have over many years also been applied to information systems. Orlikowski and Yates define genre as a socially recognized type of communicative action "habitually enacted by organizational members to realize particular communicative and collaborative purposes" [19].

[1] www.europetition.eu

Although there has yet been no explicit genre analysis of eParticipation systems or processes, it is easy to see that similar concepts occur in a number of stage models in eParticipation research and practice [18]. There is a range of terms which in resemblance with genres describe various styles of communication bearing positive as well as negative connotations. For instance, deliberation, engagement, two-way communication to name just a few refer to the positive communicatory outcomes; while one-way communication, provision of information, pseudo-participation and the like have the negative colouring being seen as intermediate steps on a ladder of improvement.

Modern eParticipation reality is a network of spaces, tools, actors, and objectives; a Facebook post can link to a newspaper article which reports on in-person interaction and so on. To distinguish specific types of communicative action is hardly possible, given the broad choice of media (online and offline) available for communicative purposes and the complexity of the participatory landscape including multiple actors, stakes, agendas, relationships etc. To cater for this situation it is proposed to use the concept of *genre system* which is a set of "interdependent genres that are enacted in some typical sequence (or limited set of acceptable sequences) in relation to each other, and whose purpose and form typically interlock" [23 cited from 19].

4.2 Applying the Framework to the ECI

The genre system framework proposed here is aimed to help answer the question: **What is the nature of communication as it evolves during the ECI process?** Hence, in our investigation scheme genre system is a dependent variable.

To classify genre systems Yates & Orlikowski [19] proposed a set of characteristics: purpose, content, participants, timing, location, and form (5W1H). In our model an additional component is added to the original arrangement - technology tools - to adapt the framework further to the eParticipation domain. In Table 1 we apply the genre system characteristics to the three stages of the ECI process. The stages – in the top row – represent the process perspective: alliance building, the official ECI process, and policy response as presented by Initiative.eu platform of the EurActiv PoliTech foundation [24].

In Table 1 each stage of the ECI process is characterized by a genre system devised based on the characteristics of the participatory practices taking place at each phase. For the purpose of this paper we limit the presentation of genre systems to three ideal types - deliberation, engagement, and dialogue; however each of the cells in the table can be filled in different ways since participants' experiences with the ECI will certainly vary. It is our intention to elaborate on the functioning of the ECI as a democratic ideal because this will provide a structured understanding of the high expectations vested in this eParticipation project. Moreover once empirical data becomes available it will be possible to assess the level of success of the Citizens' Initiative comparing the actual outcomes with the designed ones. Hence in the forthcoming empirical enquiry we will use an inductive approach which has good chances to elicit differing genre systems than the described ideal ones.

Table 1. Characterization of the ECI process based on 5W1H genre taxonomy

		Stages of the ECI process		
		"Alliance building"	"Official ECI process"	"EU policy response"
Characteristics of genre system	Purpose, why?	To federate interested individuals (and organizations)	To gather citizens' support for a registered proposal in the form of 1 million signatures	To enter in conversation with the EU authorities who are to make a final decision
	Content, what?	To prepare a consolidated legislative proposal, secure financial support, develop campaigning strategy etc.	Communication with EU citizens through a variety of channels	Validity of the proposal, the level of support in the society, its implications for Member States
	Participants, who?	All interested parties including NGOs, think tanks, companies, individuals etc.	Initiative organizers and their supporting networks in Member States	EU institutions, initiative organizers, and other interested parties
	Timing, when?	Undefined term	1 year since registration of proposal	Within 3 months after submission of initiative
	Location, where?	Anywhere	In EU countries, online	EU official channels of communication for the formal response, open format for civil society contributions
	Form, how? Technologies used	Open format E.g. discussion forums, blogs, social networks, designated platforms, wikis	Range of activities for the purpose of obtaining signatures Online signature collection systems, media coverage, social media, websites, blogs etc.	Public hearing, official correspondence for the formal response; open format for public debate
ECI ideal genre type (Intentions)		Deliberation	Engagement	Dialogue

5 Ideal Types of Genre Systems for the ECI

In this section some major eParticipation genre systems are applied to the communicative phases of the ECI. While other genre systems may emerge during our studies of the ECI practice, these ones depict how the participatory practices are envisaged to turn out in an idealistic way. We use this normative conceptualization in order to be able to compare the empirical data against the normative ideas and see if, to what extent, and how the reality differs from the democratic design.

5.1 "Deliberation"

In a broad sense deliberation can be defined as “mutual and carefully-balanced consideration of different alternatives” [25]. The recognized authorities theory-wise when it comes to deliberative communication in a democratic society are the classic works of Habermas and Dewey. In relation to democratic decision-making the concept of deliberation denotes a state when different perspectives and views are communicated and discussed in detail by all involved parties and thus the proposed decision is carefully motivated [25]. Political deliberation occurs in the ‘public sphere’ which, according to Habermas, has three distinct characteristics: the rational-critical argument as the only criterion of judgment of contributions in the discussion; the restriction of discussion topics to the domain of common concerns; and openness of discussions to all members of the public [26]. As Freelon [27] emphasized, deliberation is a normative idea which is rarely discovered intact in the field, but it is regarded as the ‘golden standard’ with regards to the democratic performance in virtual discussion spaces. Furthermore, the deliberative ideal is not the only metrics according to which political discussions in virtual spaces can be evaluated; different theoretical frameworks exist which draw on the critique of Habermas by Fraser and describe discursive environments online as various “counter-public spheres” [28].

The process of developing a legislative proposal (leave aside organizational aspects of campaigning) which would address a trans-European problem, meet the formal admissibility criteria, and adequately respond to the stakes of different stakeholders is an essentially deliberative process as defined in the above. The normative scenario thought of in the introduction of the Citizens’ Initiative was that it will empower ordinary citizens from EU Member States with an opportunity to get together, reflect on their common problems, and come up with a proposal for an EU law. Early observations show that indeed there are some organized efforts to support discussions and debate among prospective ECI organizers, e.g. the Initiative.eu platform[2] which aims to bring together stakeholders in the process and facilitate alliance building. Another example is using crowd-sourcing technologies for the formulation of prospective initiative proposals, like it was the case with users of the social media site Reddit who produced a draft of the Free Internet Act using GoogleDocs and intended to submit it as a citizens' initiative[3].

5.2 "Engagement"

The topic of inclusion in the context of political participation (‘no one is left behind’) is both relevant in discussing traditional and digital media of citizens’ engagement. For instance, a study by Grönlund, Hatakka, & Ask [29] compared manual governmental services with their electronic versions and found that in most cases the levels of knowledge and skills required from the user (“administrative literacy”) were

[2] An online space bringing together ECI stakeholders and other interested parties for the purpose of discussing, cooperating, sharing, and gaining support for their ideas of citizens’ initiatives (www.initiative.eu)

[3] http://snuproject.wordpress.com/2012/02/29/reddit-reveals-first-draft-of-crowdsourced-free-internet-act/

lower in the case of eServices. However, in certain eServices cases a replacement of skills was required to use digital services compared to traditional ones, e.g. Internet search skills instead of communicative abilities [29]. In this respect, making ICT-mediated interaction 'inclusive' is one of the core values when creating virtual spaces of communication between all sorts of participants in the political process.

There is an on-going debate in the research community about the transformative potential of the Internet in relation to participatory inequality, or the so-called 'democratic divide'. The discussion revolves around two contesting theses – the mobilization and reinforcement effects – although a recent literature survey by Taewoo [30] suggests the latest empirical works support the reinforcement hypothesis to a greater extent, i.e. that online participation channel simply replicates the existing social inequalities in offline political participation. Yet, analyzing extensive citizen survey data Taewoo concluded that both mobilization and reinforcement effects are valid observations at the same time and that this "dual effect" is more advantageous for participatory democracy than the prevalence of just one effect over the other [30].

Regarding the potential of the ECI to enhance citizens' engagement in the democratic processes, the participatory instrument combines both offline and online media for citizens' political participation. However, the formal requirements for an initiative to be admitted and put to investigation by the European Commission are quite stringent – one million statements of support from at least a quarter of the EU Member States. It is a valid question whether European citizens running into millions will actually take up this opportunity to play a part in the agenda-setting process. In other words, will the ECI extend the scope and reach of public participation in the EU? On the one hand, there are quite obvious socio-political trends of the decade: declining voter participation, decreasing party membership, diminishing trust in institutions etc. Additionally, an 'ordinary citizen' may face a great deal of hurdles if willing to become an initiative organizer – due to the limited amount of resources and time one can allow, the general lack of experience with campaigning, the absence of contacts in other EU member states etc. [31].

To understand the factors behind the uptake of e-petitioning tools, including the Citizens' Initiative project, the qualitative framework by Cruickshank and Smith [32] which is based on the concept of 'self-efficacy' can come particularly useful. In a broad sense self-efficacy can be understood as an individual's belief about one's capabilities; in the context of eParticipation it takes on two dimensions – computer self-efficacy (CSE) and political self-efficacy (PSE) [32]. Thus as a preliminary hypothesis it can be inferred that the success of the ECI to a certain degree depends on the perceptions of the prospective users of 1) their abilities to participate effectively (including to use technologies confidently for this purpose) and 2) of the responsiveness of EU institutions to the citizens' demands.

5.3 "Dialogue"

The meaning of dialogue in communicative practices is the subject of a special field of studies - dialogic theory. To define the concept of dialogue it is not enough to equal it with mere interaction, response, or finding a common ground. The key for grasping

the meaning of dialogue is "multivocality", or refusal to privilege any single opinion, interest, ideology etc.; therefore, for a dialogue to be possible therefore it is vital to reduce any socially determined asymmetries determining who gets to speak, what is being communicated, and if the voices count [33]. The understanding of dialogue in democratic contexts builds on the works of Habermas and Arendt and largely relates to the discussion of deliberative, "strong" democracy, and public sphere.

Looking at the ECI case in this perspective, the final stage is the examination of the initiative proposal by the European Commission and the public hearing at the European Parliament on this instance. The adoption of required policy is the ultimate aim of initiative organizers and the essence of the direct democracy element of the ECI instrument. To illustrate how the policy making works in this case a largely accepted model by Kingdon [34 cited from 35] is useful as it accounts for the human element and gives a realistic view of the process [35]. The multiple-stream (or agenda-setting) model (Figure 1) depicts the emergence of policies as a “policy window” which is when a pressing problem is identified, an appropriate solution is developed, and the political conditions are favorable.

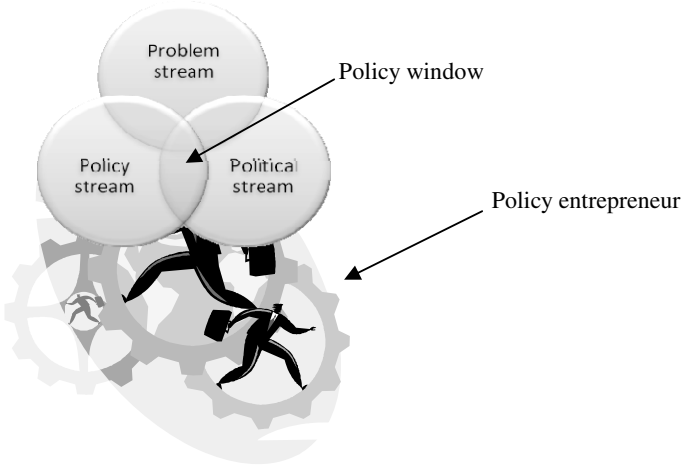

Fig. 1. Multi-stream policy-making model (Source: Kingdon, 1984)

Regarding the impact of an ECI, it needs to be kept in mind that the European Citizens’ Initiative is a democratic procedure of moderate strength. By definition, a citizens’ initiative “allows citizens to initiate a vote of the electorate on a proposal outlined by those citizens” [36]; while an agenda initiative “enables citizens to submit a proposal which must be considered by the legislature but not necessarily put to a vote of the electorate” [37]. Thus, the official name of the ECI is misleading, as the European Citizens’ Initiative was designed not as a citizens’ initiative per se but as an agenda initiative. Comparing agenda initiatives with petitions, on the other hand, the latter have little formal structure, can be initiated by one or several persons, and can have the form of a simple letter to the legislator [37]. This means an agenda initiative is a better regulated and stronger instrument of direct democracy. In practice there is often confusion of these three terms, including when it comes to the ECI; Balthasar

[38] for instance underlines that the ECI is not a mere petition (the right to petition the European Commission is already granted in the Treaty on the Functioning of the EU) but an instrument comparable to "requests" of legislation the European Parliament and the Council of the EU can address to the Commission.

Thus, it is entirely up to the Commission's discretion to make decisions regarding whether to propose a legislative agenda to the decision-makers based on a successful initiative or not (and the Political Stream element in Figure 1 will thus play an important role in the final decision). Prior to the adoption of the Regulation the involved stakeholders urged to make it compulsory by law for the Commission to make a legislative proposal in the case of success of initiative organizers. But instead a provision was introduced that guaranteed initiative organizers who overcame the 1 million signature threshold a public hearing in the European Parliament. This is an opportunity for the citizens behind the initiative to engage in direct communication with the decision-makers, to enter in a dialogue if we may say so, to be heard by the politicians who are accountable to their constituencies all over Europe.

6 Conclusion and Further Work

In this paper we have applied a communication genre perspective on a particular case of eParticipation - the European Citizens' Initiative - and constructed a framework of genre systems which can be used to analyze the process of e-petitioning at large apart from the chosen case.

By applying the genre framework to the ECI project we have shown that although there are desired democratic targets (in the form of three ideal genre systems) the reality is open to many possible developments. It is therefore essential to empirically investigate actual outcomes in terms of the nature and content of the communication on the various arenas involved in the policy-making process. To "fill in" the theoretical framework with real-life data our intention is to structure the inquiry by the three stages of the ECI process (Table 1). At each stage we will look into the five aspects (5W1H) of the communication realities: purpose, content, participants, timeframe, and form (including medium). Thus, first, we plan to look into the ways initiatives-to-be are being conceived; second, to study the specifics of trans-European campaigning; and third, to follow the interaction of the initiative organizers who were successful with the EU institutions.

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References

1. Pichler, J., Kaufmann, B.: The Next Big Thing – Making Europe Ready for the Citizens' Initiative. European Academic Press, Vienna (2011)
2. Hierlemann, D., Wohlfarth, A.: A revolution in disguise: the European Citizens' Initiative. Spotlight Europe, 7 (2010), http://www.bertelsmann-stiftung.de/bst/en/media/xcms_bst_dms_32090_32220_2.pdf

3. Smith, S., Macintosh, A., Millard, J.: Major factors shaping the development of eParticipation. Study and supply of services on the development of eParticipation in the EU. European Commission (2008)
4. Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the European Community. Official Journal of the European Union 50, C306 (December 17, 2007), http://eur-lex.europa.eu/JOHtml.do?uri=OJ:C:2007:306:SOM:EN:HTML
5. Regulation (EU) No 211/2011 of the European Parliament and of the Council on the citizens' initiative. Official Journal of the European Union, L65/1, (March 11, 2011), http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:065:0001:0022:EN:PDF
6. Europe's Information Society, Thematic Portal, http://ec.europa.eu/information_society/newsroom/cf/itemdetail.cfm?item_id=7612&utm_campaign=isp&utm_medium=rss&utm_source=newsroom&utm_content=tpa-4
7. Susha, I., Grönlund, Å.: eParticipation Research: Systematizing the Field. Government Information Quarterly 29, 373–382 (2012)
8. Grönlund, Å.: Connecting eGovernment to Real Government - The Failure of the UN eParticipation Index. In: Janssen, M., Scholl, H.J., Wimmer, M.A., Tan, Y.-h. (eds.) EGOV 2011. LNCS, vol. 6846, pp. 26–37. Springer, Heidelberg (2011), http://www.springerlink.com/content/w246q260jt71n557/
9. Medaglia, R.: The Challenged Identity of a Field: The State of the Art of eParticipation Research. Information Polity 12(3), 169–181 (2007)
10. Sæbø, Ø., Rose, J.: The Shape of eParticipation: Characterizing an Emerging Research Area. Government Information Quarterly 25(3), 400–428 (2008)
11. Panopoulou, E., Tambouris, E., Tarabanis, K.: eParticipation Good Practice Cases and Diffusion. Study and Supply of Services on the Development of eParticipation in the EU, D4.2c. European Commission (2009)
12. Panagiotopoulos, P., Elliman, T.: Online engagement from the grassroots: Reflecting on over a decade of ePetitioning experience in Europe and the UK. In: Charalabidis, Y., Koussouris, S. (eds.) Empowering Open and Collaborative Governance, pp. 79–94. Springer (2012)
13. Meyer, W.: Report on the Activities of the Committee on Petitions. European Parliament (2011), http://www.europarl.europa.eu/sides/getDoc.do?type=REPORT&reference=A7-2011-0232&language=EN
14. Åström, J.: Should Democracy Online be Quick, Strong, or Thin? Communications of the ACM 44(1) (2001)
15. Barber, B.: Strong Democracy. University of California Press, Berkeley (1984)
16. Sæbø, Ø., Päivärinta, T.: Models of e-Democracy. Communications of the Association for Information Systems 17(1), 818–840 (2006)
17. Coleman, S.: Making the e-Citizen: A Socio-Technical Approach to Democracy. In: Coleman, S., Shane, P. (eds.) Connecting Democracy – Online Consultation and the Flow of Communication, pp. 379–395. MIT Press, USA (2012)
18. Grönlund, Å.: ICT Is Not Participation Is Not Democracy – eParticipation Development Models Revisited. In: Macintosh, A., Tambouris, E. (eds.) ePart 2009. LNCS, vol. 5694, pp. 12–23. Springer, Heidelberg (2009)
19. Yates, J., Orlikowski, W.J.: Genres of Organizational Communication: A Structurational Approach to Studying Communication and Media. The Academy of Management Review 17(2), 299–326 (1992)

20. Päivärinta, T., Sæbø, Ø.: The Genre System Lens on e-Democracy. Scandinavian Journal of Information Systems 20(2) (2008)
21. Johannessen, M.: Genres of Participation in Social Networking Systems: A Study of the 2009 Norwegian Parliamentary Election. In: Tambouris, E., Macintosh, A., Glassey, O. (eds.) ePart 2010. LNCS, vol. 6229, pp. 104–114. Springer, Heidelberg (2010)
22. Sæbø, Ø., Flak, L.S., Sein, M.K.: Understanding the Dynamics in eParticipation Initiatives: Looking Through the Genre and Stakeholder Lenses. Government Information Quarterly 28(3), 416–425 (2011)
23. Bazerman, C.: Systems of Genres and the Enactment of Social Intentions. In: Freedman, A., Medway, P. (eds.) Genre and the New Rhetoric, pp. 79–101. Taylor & Francis Ltd., London (1994)
24. Foundation EurActiv PoliTech, Initiative.eu, http://www.initiative.eu/page/eci-faq
25. Englund, T.: Deliberative Communication: a Pragmatist Approach. Journal of Curriculum Studies 38(5), 503–520 (2006)
26. Habermas, J.: The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society. MIT Press, Cambridge (1989)
27. Freelon, D.G.: Analyzing Online Political Discussion Using Three Models of Democratic Communication. New Media & Society 12(7), 1172–1190 (2010)
28. Fraser, N.: Rethinking the Public Sphere: A Contribution to the Critique of Actually Existing Democracy. Social Text 25(26), 56–80 (1990)
29. Grönlund, Å., Hatakka, M., Ask, A.: Inclusion in the E-Service Society – Investigating Administrative Literacy Requirements for Using E-Services. In: Wimmer, M.A., Scholl, J., Grönlund, Å. (eds.) EGOV 2007. LNCS, vol. 4656, pp. 216–227. Springer, Heidelberg (2007)
30. Taewoo, N.: Dual Effects of the Internet on Political Activism: Reinforcing and Mobilizing. Government Information Quarterly, 29(suppl. 1) (2012)
31. Beier, B.: The European Citizens' Initiative in the Context of the European Democratic Deficit. In: Pichler, J., Kaufmann, B. (eds.) The Next Big Thing - Making Europe Ready for the Citizens' Initiative. European Academic Press, Vienna (2011)
32. Cruickshank, P., Smith, C.: Understanding the "e-Petitioner". Transforming Government: People, Process and Policy 5(4), 319–329 (2011)
33. Anderson, R., Baxter, L., Cissna, K.: Dialogue: Theorizing Difference in Communication Studies. SAGE, USA (2004)
34. Kingdon, J.W.: Agendas, Alternatives, and Public Policies (1984)
35. Lee, D., Loutas, N., Sánchez-Nielsen, E., Mogulkoc, E., Lacigova, O.: Inform-Consult-Empower: A Three-Tiered Approach to eParticipation. In: Tambouris, E., Macintosh, A., de Bruijn, H. (eds.) ePart 2011. LNCS, vol. 6847, pp. 121–132. Springer, Heidelberg (2011)
36. International IDEA: Direct Democracy: The International IDEA Handbook, Annex B. Glossary. IDEA, Stockholm (2008)
37. International IDEA: Direct Democracy: The International IDEA Handbook, ch. 4. Agenda Initiatives. IDEA, Stockholm (2008)
38. Balthasar, A.: The ECI – A Trojan Horse for European Democracy? In: Pichler, J., Kaufmann, B. (eds.) The Next Big Thing - Making Europe Ready for the Citizens' Initiative. European Academic Press, Vienna (2011)

Citizens' Evaluation of an Online Argument Visualisation Platform for eParticipation

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Abstract. Argument visualisation (AV) tools facilitate structured debates utilising elements such as issues, positions and arguments. In this way, AV tools seem promising for improving eParticipation e.g. by avoiding repetition and enhancing clarity in debates. In this paper we present and discuss citizens' opinion on utilising an AV platform for eParticipation, specifically for discussing the emerging topic of environment and climate change. Results have been interesting; most users found the platform and topic interesting and understandable stating that they would use the platform again in the future and recommend it to other people. However, negative feedback has also been received, mostly in relation to things that frustrated users (e.g. the logic behind AV) and suggestions for improvement. As our evaluation is based on a mature AV tool and focuses on general aspects of such tools, we believe that results may be applicable to other AV platforms as well.

Keywords: Citizens, climate change, policy making, argument visualisation.

1 Introduction

Nowadays, there is an increasing interest by practitioners and researchers regarding open and transparent governance. This is due to recent efforts to cope with current decline in political trust and engagement [1], but also due to the emerging possibilities through the use of modern Web technologies. The European Commission has recognised this urging governments to "*use the right tools*" in policy making and ensure that "*the voices of those affected are being heard*" [2]. According to European Commission's 'Smart regulation' mandate [3] stakeholder consultations and impact assessments are viewed as essential parts of the policy making process as it is believed that the policy making process may be improved through the utilisation of evidence-based policy making.

In this context, numerous consultation and deliberation initiatives, also supported by modern Information and Communication Technologies and particularly Web technologies, have recently emerged. Such initiatives mainly aim at informing citizens about policies and consulting them with regards to policy alternatives [4].

However, it has recently been recognised that forum-oriented online deliberation has a number of drawbacks mainly relating to the vast amount of resources needed for

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moderation and for processing debate results (e.g. creating summary reports). Such drawbacks become more evident as online deliberation (e.g. number of posts) increases. However, another family of tools, termed Argument Visualisation (AV) [5] tools (e.g. Debategraph, Cohere [6], AVER [7], Parmenides [8], etc.), seem to offer a new approach to eParticipation debate helping to minimise some of the drawbacks identified in forum-like solutions. The innovation these tools bring to eParticipation is found in the structured way in which deliberation is performed. Instead of unstructured debating (i.e. adding posts of plain text), AV tools only allow contributions through structured well-defined elements such as issues, positions, positive/counter arguments, etc. In this way, people may offer their thoughts in the context of others' opinion, hence avoiding repetition and enhancing clarity, while at the same time facilitating the creation of summary reports. AV tools have started gaining considerable usage but are still not widely used in eParticipation. There is therefore a need for a thorough evaluation of such tools in order to deeper explore their strengths and weaknesses and understand whether they can be widely adopted.

The objective of this paper is to present and discuss citizens' opinion on utilising an AV platform for eParticipation, specifically for discussing the emerging topic of environment and climate change. Through this analysis we aim to understand whether AV tools may be successfully used for eParticipation and under what conditions.

The structure of this paper is as follows. Section 2 shortly presents the AV platform. Section 3 presents the methodology followed for gathering and analysing citizens' feedback. Section 4 presents the gathered results and section 5 provides a detailed discussion of results. Finally, section 6 sums up and concludes this paper.

2 Argument Visualisation Platform

WAVE is a Web-based, AV platform developed to facilitate understanding and debating of European legislation. From a technical point of view, WAVE comprises a customised content management system (based on Drupal) which integrates Debategraph, an AV tool developed by Thoughtgraph and provided free as a service to everyone to use or embed in a website. In WAVE, the Drupal interface and Debategraph are integrated, thus enabling data flow between the two sub-systems [9].

The platform operated between December 2009 and January 2011, facilitating debate on climate change at European level but also at national level in France, Lithuania and the UK. Figure 1 displays the platform's home page and Figure 2 an argument map.

A user of the WAVE platform can take advantage of a number of functionalities summarised in three main groups of actions as follows.

1. *Explore the map, rate and share ideas.* The most important functionality of an AV tool is the ability to explore debates and participate. Through the embedded Debategraph AV tool [9], WAVE enables exploring maps' exploration by clicking on an idea; then, all ideas directly related to the clicked idea are displayed. In this way, visitors can easily transverse from idea to idea throughout the whole map. Debategraph also enables registered users to rank and manage ideas. There is a plethora of idea types available (e.g. issue,

position, supporting argument, opposing argument, protagonist, etc.) as well as different link types. Adding a new idea involves typing a short description (70 characters maximum) and, if desired, also providing additional details e.g. a larger description (300 characters maximum), text, photos, video (e.g. from YouTube), links etc. Any registered user is able to change any idea on the map. A moderator has been assigned in each map being responsible for editing ideas, deleting irrelevant or offensive contributions, etc.

Fig. 1. Platform Home Page (EU pilot)

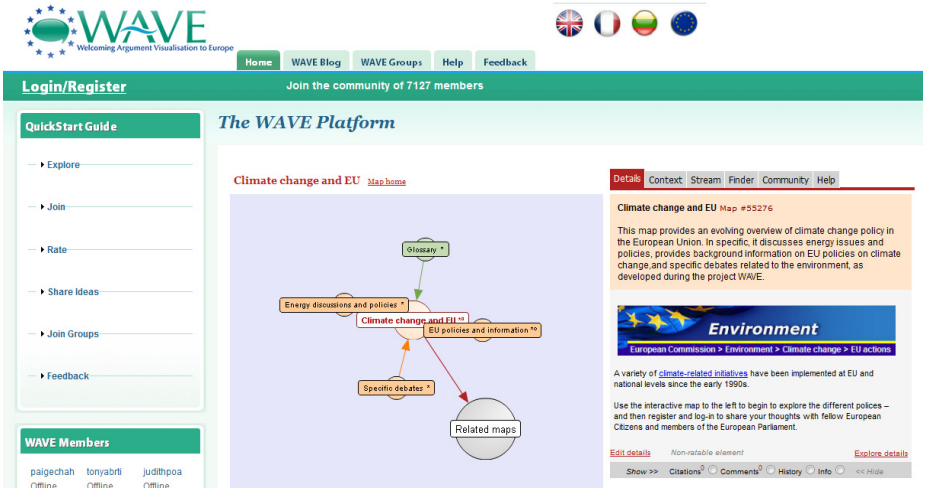

Fig. 2. Exploring an argument map

2. *Create and join groups/invite others.* The platform enables registered users to create and manage groups. Each group's home page can embed its own home map which has as the starting point any point of the overall map. The platform also enables writing to blogs, creating events, creating and contributing to polls, and inviting others to groups and maps.
3. *Create account, login and provide feedback.* Finally, the platform enables registering by simply requiring a valid email address. It also provides an online form for users to evaluate the platform.

3 Evaluation Methodology

Evaluation methodologies for electronic participation initiatives have recently emerged in the literature. Most of them are based on Rowe and Frewer's work [10] on participation evaluation and adapt it further to address the "e-" aspect. Most evaluation methodologies have been developed within the context of specific projects, therefore most available frameworks are project-oriented, e.g. [11], [12], [13]. There are, however, a few methodologies that approach eParticipation evaluation from a different aspect, assessing government programmes [14]; specific tools, like e-consultations [15]; or best practice [16]. These methodologies propose evaluation axes, criteria or metrics allocated to measure a number of different perspectives: technical-, social-, process-, democracy-, project- oriented, and they are designed to involve one or more of the following stakeholders: users (targeted groups or the general public), government officials or elected representatives, policy-makers, owners or managing staff of the eParticipation project, experts in the eParticipation field.

The evaluation methodology selected for work presented in this paper is heavily influenced by the methodology created by MOMENTUM project [12], although adapted accordingly. According to the selected methodology for gathering evaluation feedback by citizens an online questionnaire would be used. The questionnaire would be available on the platform making it thus easy for users to contribute. Users from any country are welcome to participate, although it is expected that most of them will come from the three pilot countries, Lithuania, France and UK, as pilots there have produced rich relevant content in their national languages; Lithuanian, French and English.

The questionnaire has been constructed to assess four different axes as follows:

A. Tool and technology axis. It examines AV platform's usability and ease of use.

B. Process axis. It examines AV platform's position in the policy making process.

C. Topic axis. It focuses on the selection of the climate change topic and the potential to use the AV platform for other policy topics.

D. Contact and sustainability axis. It examines users' contact and interaction with the AV platform as well as potential for future use.

Additionally, the questionnaire includes items examining users' demographics for sample profiling purposes. The full user questionnaire is provided in Table 1 below depicting both questionnaire items and pre-defined answers (in italics) where available. It should be noted that all items with pre-defined answers allow only one choice, except from metric 12 which allows choosing one or more answers.

We should note here that Momentum's user evaluation questionnaire proposes the same four axes and is longer than the questionnaire used here. Additionally, most of Momentum's questions have been revised in our questionnaire. We found this

necessary in order to include specific metrics relevant to our research (e.g. AV tools) while at the same time keeping the overall questionnaire short for users' convenience.

Table 1. User evaluation questionnaire

Metric	*Questionnaire item and possible answers*
	User characteristics
M 1	Country (*Answer given by selecting from a dropdown list)*
M 2	Gender (*Male / Female)*
M 3	Age (*Under 20 / 21-30 / 31-40 / 41-50 / 51-60 / Over 60)*
M 4	Education (*Primary / Secondary / Higher education)*
M 5	In your job, do you principally: (*Select one of the following: Develop policies / Implement policies / Carry out research or consult policy makers / Teach or train / Work for the media / Self-employed / Other)*
M 6	How experienced are you in using the Internet? (*No experience / Basic skills (internet browsing) / Advanced skills (word processing, spreadsheets, presentations, databases) / Professional skills (software developer, systems engineer, network designer, etc.))*
	Tool and technology
M 7	Do you think the platform (tools and guidance) provided online is easy to use? (*Yes, very easy / Yes, fairly easy / No, not that easy / No, very difficult)*
M 8	Were there any elements that caused confusion? (*Yes / No)* If yes, please describe which ones and why *(text field)*
M 9	Considering what you have seen on the web site, what was the best feature? *(text field)*
M 10	Considering what you have seen on the web site, what was the worst feature? *(text field)*
	Process
M 11	In your view, does the WAVE platform help you better understand the issues under discussion? (*Yes / No)*
M 12	In your view, the WAVE platform mostly helps to: (*Select one or more of the following: Understand complex legislation / express opinions / measure public opinion / engage with peers and form communities / increase your participation in the democratic process / allows you to make informed decisions*)
M 13	After participating, what kind of feedback would you like to receive from the platform or other users? *(text field)*
	Topic
M 14	Do you find the climate change topic discussed in the platform appealing and interesting? (*Yes / No)* If not, why not? *(text field)*
M 15	Do you feel sufficiently informed about climate change after using WAVE? (*Yes / No)* If not, why not? *(text field)*
M 16	Does the platform provide easy understandable information to engage in the online discussion of the topics? (*Yes / No)* If not, why not? *(text field)*
M 17	Would you be interested to start or participate in another discussion (apart from the environment) via the WAVE platform? (*Yes / No)*

Table 1. (*Continued*)

	Contact and sustainability
M 18	How did you learn about the WAVE platform? (*Invitation / Internet /* WAVE *newsletter /* WAVE *Facebook group or Twitter feeds / Personal Contact / Conference or workshop / Other)*
M 19	How often did you visit the WAVE platform? (*Never / 1 time / 2 times / 3-4 times / 5 times or more)*
M 20	How often did you contribute, e.g. by posting, rating, participating in an opinion poll, etc.? (*Never / 1 time / 2 times / 3-4 times / 5 times or more)*
M 21	Please indicate on the scale the extent to which you found this site of interest (*Found it extremely interesting / High interest / Neutral / Low interest / Not interesting at all)*
M 22	Would you consider participating again after the project terminates? (*Yes / No)*
M 23	Would you recommend this platform to other people? (*Yes / No)*
M 24	Is this the first time you are using an eParticipation platform? (*Yes / I have used one eParticipation platform before / I have used several eParticipation platforms before / I am a regular user)*
M 25	Do you consider registration an obstacle for use? (*Yes / No)*

4 Results

Overall, 319 filled-in questionnaires were gathered. Respondents originate from eleven EU countries – Belgium, Czech Republic, Denmark, Finland, France, Greece, Lithuania, the Netherlands, Poland, Slovakia and the UK – with the majority coming from Lithuania (56.4%) and France (39.2%). 54.8% of respondents were male and 45.2% female. Most respondents are in their twenties (61.8%) and thirties (26.3%); 6.3% are over forty, 2.5% are over fifty and only 0.3% over sixty years old; 2.8% are under twenty years old. Most respondents are of higher education (64.3%); 32.6% hold a secondary degree and only 3.1% are of primary education. 1.6% and 6.6% respectively develop and implement policies as their primary job, whereas 2.2% are researchers or consultants for policy makers. We also had 8.2% teachers/trainers and another 8.2% media professionals. Regarding familiarisation with technology, most respondents reported basic and advanced internet skills (38.3% and 45.9% respectively), 5.7% reported professional internet skills and 10.1% no internet skills.

Tool and Technology Axis. Most respondents found the AV tool fairly easy to use (59.6%), whereas 27% found it not that easy to use, 11.6% very easy to use and only 1.9% reported the tool as very difficult to use. 67.4% reported no confusion in the AV tool's operation. However, the rest 32.6% reported different elements that caused them confusion: they found the argument map difficult to understand and difficult to add new elements at as they did not easily grasp the different idea types (e.g. issue, position, argument) and their conceptual differences. Moreover, when the map was too crowded with ideas it became difficult for users to read the ideas and navigate through them (highlighting thus the important role of moderation). Also, users were confused by the lack of 'forum-like' functions like general quick responses and comments. Users also reported the best and worst features of the platform according to

their own opinion; answers have been partly contradicting. Users reported the argument map, the selected topic and debates and the ability to create polls and groups as best features. They liked viewing the arguments per topic in a structured way (for and against arguments separated) and they liked that the overall interface was colourful, simple and playful. On the other hand, users also reported the argument map as one of the worst features; they found it complicated at least in the beginning and difficult to navigate and participate to, as it is difficult ensuring that contributed ideas are not similar to the ones already appearing on the map. Also, users did not like the lack of social features (e.g. linking with friends). The aspect of authorship is another contradicting point as some users did not like the publicly available activity list, which depicts latest actions and actor's user name, whereas other users reported that they would like to see more authorship details per debate idea.

Process Axis. Nearly all respondents (95.6%) agreed that the platform does help them to better understand the issues under discussion. More specifically, users reported that the AV platform mostly helps to:

- Express opinions (48.7%)
- Make informed decisions (33%)
- Measure public opinion (31.35%)
- Engage with peers and form communities (29.5%)
- Understand complex legislation (25.7%)
- Increase participation in the democratic process (17.9%)

Considering that this was the only multiple-answer metric, the percentage results are too low implying a high dispersion among answers. Regarding the kind of feedback they would like to receive, most users referred to summaries of debates, new ideas and new information, and statistical data especially in regard to the ones they already contributed to (e.g. new additions to the map the user contributed to, poll results of the polls the user participated in). They would like to see more network creation options (e.g. suggesting people with same ideas) and new thematic within the environment topic but also beyond. Of course, many users mentioned that they would like to get information whether the opinions and ideas of the map have contributed to decision making, if some of them have been actually implemented and in what ways.

Topic Axis. Users' vast majority (94.7%) found interesting the climate change topic for this platform. 92.8% reported that the platform provides easy and understandable information for climate change in order to engage them in the online discussion, and 87.2% feel sufficiently informed about climate change after using the AV platform. However, users also commented that climate change already receives broad attention from other information sources (e.g. the media). For this reason some users felt that they were already sufficiently informed before using the platform and that more information and more discussion online is needed. A few users also mentioned that they would like to see more factual information and sources as it is difficult to fully trust the information of a platform that is collectively shaped by users. Nevertheless, 88.7% of respondents said that they would be interested in participating in another discussion apart from climate change through this platform.

Contact and Sustainability Axis. Users reported that they heard about the platform through their personal contacts (23.8%), a friend invitation (18.2%), a conference or

workshop (15.7%), and via the internet (15.4%). Most respondents visited the platform quite a few times; 30.1% paid one visit, 20.7% two visits, 15.4% three to four visits, and 28.2% five visits or more. The rest 5.6% reported other answers. Roughly ¼ (23.2%) of respondents never contributed to the platform, another ¼ (25.7%) contributed once and the rest ½ contributed two times or more (17.2% two times, 15.7% 3 to 4 times, and 18.2% fives times or more).14.7% of respondents found the website extremely interesting, 49.8% found it of high interest, 7.5% of low interest and only 1.3% not interesting at all; 26.7% had a neutral positioning. However, 87.2% stated that they would participate again after the project terminates and another 91.2% would recommend it to other people. For the majority of users (62.1%) this has been the first time they used an eParticipation platform; 24.5% had previously used another platform, 10.2% have previously used several eParticipation platforms and only 3.2% are regular users of eParticipation platforms. Finally, most users (62.7%) do not see registration as an obstacle for use, although the rest 37.3% is still a high percentage that can not be easily neglected.

Correlation Analysis. Applying correlation analysis on the gathered input of the evaluation survey, we were able to deepen into users' feedback. Correlation analysis has been performed in SPSS 19 software; all correlations reported here are according to Spearman' rho correlation testing significant at the 0.01 level (2-tailed).

As far as users' demographic data is concerned, correlation testing revealed that the older the users the more interesting they found the platform (.152**) and that the more educated the users the easier they found the platform (.201**). Moreover, higher internet experience on behalf of users accounts for highest frequency of visits and highest frequency of contributions to the platform (.382** and .302** respectively).

Interesting results were also revealed as regards users' interaction with the platform and sustainability: users who frequently used the platform reported less confusion in its usage (.157**) and a higher probability of frequent contributions (.596**).

Users who did not regard the registration process as an obstacle for use, provided more frequent contributions to the platform (.195**) and found the site to be of higher interest (.163**) than the users who were negatively positioned to registering.

Users who found interesting the site and the topic and reported that they will come back to the site after project termination, also reported that they would recommend to other people (.310**, .321** and .510** respectively). The same attitude towards further recommending the site comes from users who reported that the platform helps to understand the issues under discussion (.366**) and that they feel sufficiently informed after using the platform (.311**). Additionally, users who believe that the platform helps to understand the issues under discussion (.284**) and to engage with peers and form communities (.187**) reported that they would come back to the platform after the project ends.

Respondents who are frequent users of eParticipation websites seem to agree more that the platform contributes to understanding complex legislation (.209**), to making informed decisions (.204**), and to increasing participation in the democratic process (.206**).

Correlation analysis showed strong relations between all metrics of the Topic axis as well as between these and metrics M21 and M22 ("the extent to which the site is interesting" and "whether they would participate again after the project terminates"). These correlations are depicted in Table 2. On the contrary, only loose correlations

are observed between the metrics of the Process axis, as depicted in Table 3. This strengthens the observation mentioned previously for a high dispersion among users' answers in Metric 12.

Table 2. Correlation results for the metrics of the Topic axis. (M14: climate change interesting, M15: sufficiently informed, M16: understandable information to engage, M17: interested to participate in another discussion, M21: site interesting, M22: come back after termination).

		M14	M15	M16	M17	M21	M22
M14	Correl. Coeff.	1,000	,326**	,204**	,268**	,291**	,326**
	Sig. (2-tailed)	.	,000	,000	,000	,000	,000
M15	Correl. Coeff.	,326**	1,000	,255**	,159**	,310**	,272**
	Sig. (2-tailed)	,000	.	,000	,004	,000	,000
M16	Correl. Coeff.	,204**	,255**	1,000	,169**	,186**	,183**
	Sig. (2-tailed)	,000	,000	.	,003	,001	,001
M17	Correl. Coeff.	,268**	,159**	,169**	1,000	,251**	,277**
	Sig. (2-tailed)	,000	,004	,003	.	,000	,000
M21	Correl. Coeff.	,291**	,310**	,186**	,251**	1,000	,331**
	Sig. (2-tailed)	,000	,000	,001	,000	.	,000
M22	Correl. Coeff.	,326**	,272**	,183**	,277**	,331**	1,000
	Sig. (2-tailed)	,000	,000	,001	,000	,000	.

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3. Correlation results for the metrics of the Process axis. (M11: understand issues under discussion, M12a: complex legislation, M12b: express opinions, M12c: measure public opinion, M12d: engage with peers and form communities, M12e: increase participation, M12f: informed decisions)

		M11	M12a	M12b	M12c	M12d	M12e	M12f
M11	Cor. Coeff.	1,000	-,014	-,128*	,013	,105	-,060	,020
	Sig.(2-tail)	.	,803	,022	,820	,061	,286	,718
M12a	Cor. Coeff.	-,014	1,000	-,129*	,128*	,108	,156**	,228**
	Sig.(2-tail)	,803	.	,021	,022	,055	,005	,000
M12b	Cor. Coeff.	-,128*	-,129*	1,000	-,227**	-,101	,086	,054
	Sig.(2-tail)	,022	,021	.	,000	,071	,128	,342
M12c	Cor. Coeff.	,013	,128*	-,227**	1,000	-,051	,143*	-,043
	Sig.(2-tail)	,820	,022	,000	.	,360	,010	,440
M12d	Cor. Coeff.	,105	,108	-,101	-,051	1,000	,058	,034
	Sig.(2-tail)	,061	,055	,071	,360	.	,306	,549
M12e	Cor. Coeff.	-,060	,156**	,086	,143*	,058	1,000	,265**
	Sig.(2-tail)	,286	,005	,128	,010	,306	.	,000
M12f	Cor. Coeff.	,020	,228**	,054	-,043	,034	,265**	1,000
	Sig.(2-tail)	,718	,000	,342	,440	,549	,000	.

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

5 Discussion

It is worth commencing this discussion with the observation that the sample of our questionnaire evaluation has been a relatively 'good' one, skewed towards producing positive results for the AV platform. In specific, our sample consists mainly of young, educated and computer-literate people; 90% of respondents are under forty years old and have at least basic internet skills, and 64% have a higher education degree. Moreover, most respondents have been active users of the platform; 64% visited the platform two times or more, and 77% contributed at least once to the platform. As shown also from correlation testing, age, education and internet literacy play a significant role in users' perception of platform's interest and easiness and in user's frequency of interactions with the platform. We are therefore inclined to believe that evaluation results stemming from this ideal population sample must be relatively skewed towards the positive side of the metrics as opposed to potential results from a representative sample of the whole population.

Having said that, we could argue that received feedback has been very positive. Most users found the platform and topic interesting and understandable, and they felt that the platform contributed to their sufficient informing and better understanding of climate change. Additionally, most users stated that they would use the platform again in the future regardless of topic, and that they would recommend it to other people.

However, negative feedback has also been received, mostly things that frustrated users and suggestions for improvement. A core issue is that users experienced problems with the overall philosophy of structured argumentation. It seems that navigating an argumentation map and having to contribute in terms of positions, arguments, etc. is clearly much more difficult than forum-like participation requiring extra time and attention from users. And it gets more difficult in the case that "too much" participation occurs; heavily loaded argumentation maps become unclear and tiring to read. We believe that such difficulties are inherent in all AV tools, not only the specific one used in this platform (Debategraph), thus the issue is raised whether AV tools can be actually and efficiently massively utilised.

Ambiguous feedback has been received from users regarding authorship of contributions. Similarly to other AV tools, the platform does not provide author details per map element. It does, however, provide a stream of latest actions and actors. Users' feedback suggests as a weak point of the platform the lack of authorship details; this causes to citizens a feeling of non-trustworthy debate information. Therefore, they would prefer to know the author of each information piece and to have more factual information offered. However, there are also users who were against publicising users' authorship details even in the latest action stream. We believe this is directly related to users' feedback on whether registration to the platform is considered as a barrier for participation; it seems that many users regard registration as a barrier and correlation analysis also showed that users who found the site interesting and did contribute frequently were the ones who did not regard registration as an obstacle. In this trade-off between transparency and privacy it is certainly not clear from the received feedback which should be the most preferred solution for such a platform.

Additionally, users' feedback has shown how much they value relationship and community building. Although the group function of the platform was appreciated, users seek for even more networking options and forming of relationships online. It is not clear however, to what degree this functionality is really needed or whether it is requested due to the users' being accustomed to see social features in most of the online platform they use.

Furthermore, users want to receive feedback and updates from such an eParticipation platform such as debate summaries, new opinions and ideas. Of course, and similarly to any other eParticipation platform, feedback should also include information whether the opinions and ideas of the map have contributed to decision making and even better if some of them have been actually implemented and in what ways. However, it seems that users will not be easily satisfied by receiving any type of mass updates and feedback. They placed emphasis on personalised type of feedback; for example receiving updates only on the topics they had shown interest at (i.e. they have contributed to).

6 Conclusion

In this paper we present citizens' evaluation of an AV platform utilised for eParticipation. The evaluation was conducted in four different axes: platform's usability and ease of use; position in the policy making process; selection of topic debated; and potential for future use. Overall, user evaluation has been very positive withstanding the fact that the respondents have been a relatively 'ideal' sample: young, educated, computer-literate persons. Nevertheless, user evaluation results also suggest that there is room for improving the usability of the AV tool.

In this paper we based our evaluation in a particular AV platform, however we believe that the results can, to some extent, apply to other AV platforms and tools as well. This is due to the maturity and stability of the selected AV tool (Debategraph) which may also be regarded as a fair representative sample of AV tools. Furthermore, it is also due to the fact that our evaluation methodology put emphasis on general issues relevant to AV as opposed to specific platform characteristics. Nevertheless, we should highlight that the evaluation results are not directly applicable to all AV tools and to all different contexts where such tools may be used.

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References

1. Schyns, P., Koop, C.: Political Distrust and Social Capital in Europe and the USA. Social Indicators Research 96(1), 145–167 (2010)
2. European Commission, Better Regulation – Simply explained, `http://ec.europa.eu/governance/better_regulation/documents/brochure/br_brochure_en.pdf`

3. European Commission, Smart Regulation in the European Union, COM, 543 final (2010)
4. Panopoulou, E., Tambouris, E., Tarabanis, K.: eParticipation initiatives: How is Europe progressing? European Journal of ePractice No. European Journal of ePractice (7), 15–26 (2009)
5. DEMO-net Deliverable D5.2: eParticipation: The potential of new and emerging technologies (2007)
6. Shum, S.B.: Cohere: Towards web 2.0 argumentation. In: Hunter, A. (ed.) Proceedings of the 2nd International Conference on Computational Models of Argument (COMMA). IOS Press, Amsterdam (2008)
7. Van den Braak, S.W., Vreeswijk, G.A.W.: AVER: Argument visualization for evidential reasoning. In: Legal Knowledge and Information Systems, JURIX 2006: The Nineteenth Annual Conference, Amsterdam, The Netherlands, pp. 151–156 (2006)
8. Atkinson, K., Cartwright, D.: Political Engagement through Tools for Argumentation. In: Proceedings of COMMA 2008, pp. 116–127 (2008)
9. Lee, D., Menda, Y.P., Price, D., Tambouris, E., Peristeras, V., Tarabanis, K.: Platforms To Facilitate Online Political Debates: The Wave Platform. In: Chappelet, J.L., Glassey, O., Janssen, M., Macintosh, A., Scholl, J., Tambouris, E., Wimmer, M.A. (eds.) Electronic Government and Electronic Participation: Joint Proceedings of Ongoing Research and Projects of IFIP EGOV and ePart 2010, Trauner Duck, pp. 303–310 (2010)
10. Rowe, G., Frewer, L.J.: Public Participation Methods: A framework for Evaluation. Science Technology Human Values 25(3) (2000)
11. DEMO-net D13.3 DEMO-net booklet: eParticipation Evaluation and Impact (2008)
12. MOMENTUM Deliverable D2.5: e-participation projects evaluation methodology (2008)
13. Loukis, E., Xenakis, A., Charalabidis, Y.: An evaluation framework for e-participation in parliaments. International Journal of Electronic Governance 3(1), 25–47 (2010)
14. Henderson, M., Hogarth, F., Jeans, D.: Evaluation Framework for Assessing E-Democracy Policy. Encyclopedia of Digital Government (2007)
15. Whyte, A., Macintosh, A.: Analysis and evaluation of e-consultations. e-Service Journal 2(1), 9–34 (2003)
16. European eParticipation Deliverable 4.1b Framework for eParticipation Good Practice (2008)

PolicyCommons — Visualizing Arguments in Policy Consultation

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Abstract. PolicyCommons is a computer supported argument visualization tool to facilitate online deliberation on public policy. As such it supports the work of stakeholders by enabling them to navigate through arguments contained in relevant consultation and policy documents. These stakeholders include policy analysts, interest groups and the public. Specifically, PolicyCommons displays arguments about policies as browsable debate maps. Users can browse these debate maps and follow links from the visual summaries of the arguments back to the original policy documents. Thus, PolicyCommons is designed to help users make sense of the range of publicly expressed opinions about public policies. The major challenges we face in using argument visualization tools for online consultations can be clustered around the four main concepts of transparency, sense-making, readability and scalability, in this paper we show how we are addressing these challenges.

Keywords: e-participation, online policy-deliberation, argument visualization, argument mapping.

1 Introduction

One pressing challenge faced by e-participation scholars and practitioners has been presenting complex argumentation to citizens to enable better informed public debate about political issues[1]. Those who aim to see the Internet and other digital technologies transform our democracy and governance for the better have suggested that there is a need for radical new tools and techniques for presenting overviews of large-scale political discussions so that citizens can better make sense of and reflect on the opinions of each other[2]. Taking up this challenge, an agenda for research at the intersection of e-participation and computer-supported argument visualization (CSAV) has been set out in [3]. That agenda has given priority first, to investigating a methodology for design of interactive Web-based argument visualizations to allow various stakeholders navigate the complex issues in a policy-consultation; and second, to applying these methods and an associated application to interpreting models of policy-arguments at a level of granularity meaningful to various stakeholders.

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This paper describes recent steps towards implementing the aforementioned research agenda. It introduces research and development on a prototype Web-based tool, PolicyCommons, which is used for visualizing arguments about policy proposals as browsable debate maps. Our research is aimed at the specific case where government, or a government agency, has published a green/white paper containing policy proposals and has invited comments on specific issues raised in the green/white paper. In our research, we are investigating how PolicyCommons can be used to support this type of policy consultation where documents are central to the process.

In this paper we first provide an overview of the requirements which form the basis for the design of PolicyCommons along with the inherent challenges facing such a design (Section 2). In Section 3 we briefly describe the underlying technical platform and in Section 4 we describe how we have extended this to progress the state-of-the-art. In the final section we present our conclusions.

2 Argument Visualization for Making Sense of Policy-Consultation

PolicyCommons supports the work of relevant stakeholders by enabling them to navigate through arguments contained in consultation documents - that is the green/white paper provided by government and the consultation response documents provided by other stakeholders. Stakeholders include policy analysts (who facilitate the policy consultation process) and general users such as interest groups (e.g. trade unions, umbrella organizations, academics, etc.) and the general public. Basically, PolicyCommons displays arguments about policies as browsable debate maps where users can browse the maps and follow links from the visual summaries of the arguments back to the source consultation documents. PolicyCommons has been designed to help users make sense of the range of stakeholder expressed opinions about public policies, as such, it is part of the class of tools often referred to as "sense-making" tools [4].

PolicyCommons is one of a set of tools being developed within the EU-funded IMPACT project[1]. In addition to this argument visualization tool, IMPACT is developing and integrating three other argumentation-based tools relating to the following tasks:

- *Argument reconstruction*: investigating how and to what extent arguments can be extracted and reconstructed from natural language documents.
- *Policy modeling and analysis*: using techniques from the field of AI and Law to allow stakeholders to simulate the legal effects of policy proposals.
- *Structured consultation*: using argumentation schemes to generate focused surveys to solicit public agreement/disagreement to policy proposals.

The specific requirements for PolicyCommons were derived during the first step in the IMPACT project by consortium partners holding workshops and interviews with

[1] IMPACT stands for Integrated Method for Policy making using Argument modeling and Computer assisted Text analysis: `http://www.policy-impact.eu`

stakeholders involved in public-policy consultations. These requirements were then detailed as IMPACT project usage scenarios from the different stakeholders' perspectives. The scenarios for PolicyCommons can be summarized as:

The *Policy Analyst* should be able to:

- construct argument maps by assigning specific argumentation schemes, coding statements as elements of the argumentation scheme and labelling relationships between statements;
- publish debate maps on the web so as to enable general stakeholder interaction with them;
- support facilitation of the consultation by being able to view where arguments are missing or where conflicting arguments arise;
- at the end of a consultation period, close debate maps and generate outline consultation report based on the information in the maps.

The *General Stakeholder* should be able to:

- gain an overview of the green/white policy paper and an appreciation of the arguments contributed so far in response to the specific issues raised;
- navigate through the debate maps from high level to deeper level of detail;
- zoom in and out of specific arguments showing more or less detail;
- gain an appreciation of the underlying evidence for the arguments;
- trace back to and view the source document where an argument is located.

Online consultations on complex policy issues can involve a large number of stakeholders providing contributions. Many of these contributions can be complex documents in their own right. The scalability, understandability and transparency of use are major challenges that need to be addressed [1]. Furthermore, a specific challenge we face in using argument visualization tools to support online consultation is their current poor readability when displaying large-scale argument maps. As [5] indicates, reading argumentative structures, whether in text or in graphical form has always been a difficult skill to acquire. This is because making sense of argumentation requires both having a sense of the detail as well as having a sense of the whole.

The remainder of this paper describes in more detail how we are meeting the above requirements and challenges of scalability, understandability, readability and transparency, thus advancing the state-of-the-art in the use of computer-supported argumentation for e-participation and online policy-deliberation. But first, in the next section, we briefly describe the technical platform on which the PolicyCommons application is built.

3 Technical Platform

3.1 Reusing an Existing Open-Source Platform

Very early on in the conceptual phase of our work, we made a design-decision that rather than develop PolicyCommons from scratch we would reuse an existing CSAV platform and build on it to extend the state of the art. In particular, we decided to

reuse the Cohere platform developed at the Open University [6]. Cohere is a state-of-the-art, open source, Web2.0 tool for argument analysis and argument visualization, which provides a platform for online collaborative deliberation using the familiar standard Issue-Based Information System (IBIS) framework [7]. IBIS was developed by Kunz & Rittel [8] as an information system for investigating the use of argumentation to help solve ill-structured design and planning problems. This work then evolved into a general approach to solving what the authors called "wicked problems", a class of problems into which policy development falls [9]. This term was introduced so as to distinguish the kinds of problems that social-policy planners deal with from the kinds of problems that scientists encounter—the key distinction being that in science you can prove whether your solution is correct, whereas in matters of social policy, you cannot prove that a solution or decision is the correct one; rather you can only try to persuade, through argumentation, that it is the best solution given the constraints.

The choice to use Cohere came after a review of the suitability of a number of argument visualization tools for the IMPACT project – the details of this review and rationale are given in [3].

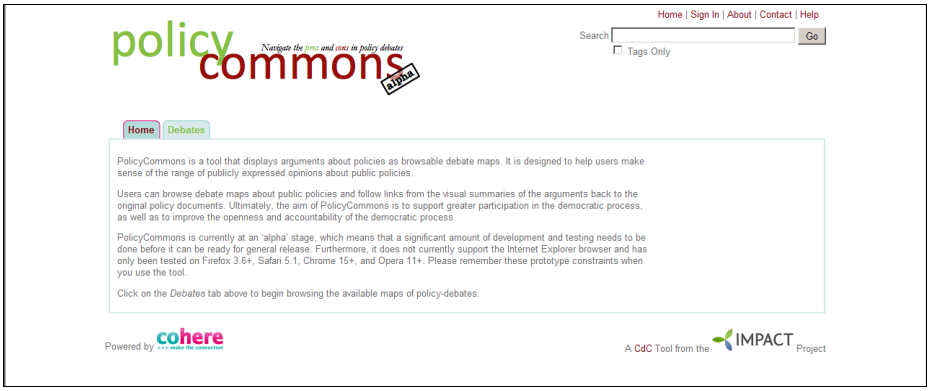

Fig. 1. A screenshot of the current public PolicyCommons prototype developed on top of the Cohere platform

Figure 1 shows a screenshot of the PolicyCommons prototype, which was launched online in September 2011. There were three objectives for doing this. Firstly we wanted the stakeholders in the project to be able to see the current state of development. Secondly, we wanted to have a publicly available tool to populate with corpus data. Thirdly, we wanted to be able to start evaluation as soon as possible. However, even as we reuse and build on an existing CSAV platform, our aim in the research and development of PolicyCommons is to advance the state-of-the-art in computer-supported argumentation – particularly CSAV – in its application to the domain of e-participation and online policy-deliberation.

3.2 Adhering to Web Standards

With respect to the underlying technology for implementing the argument visualizations, we decided to adhere as far as possible to Web standards. For sophisticated visualizations this means a solution based on one or more of HTML5, JS, CSS, and SVG technologies. In order to accomplish this task we reviewed a number of existing libraries for data and information visualization that use Web standards. The important criteria we considered were: open source license, size of user community, adequacy of API documentation, extendibility, and support for popular browsers. We reviewed a number of leading visualization libraries, including: Canviz, D3, JavaScript InfoVis Toolkit, ProcessingJS, and Raphaël JS. Here we briefly describe the review of each library in turn.

Canviz[2] is a JavaScript library for drawing graphs to the HTML5 <canvas> element using the layout engines implemented in the Graphviz software. Graphviz itself is a popular library for laying out graphs – e.g. the popular graph-drawing program OmniGraffle uses the Graphviz engine for automatically laying out its graphs. Unfortunately using Canviz would require that the Graphviz engine is running in the background, adding another dependency to our platform. Furthermore, Graphviz does not work in a dynamic way and the visualizations are not interactive, both of which are important features for Web-based argument visualization. Canviz is distributed under an MIT license.

D3[3] is a JavaScript library for creating SVG visualizations, which has evolved from the earlier Protovis library. D3 includes many standard types of data and information visualization layouts. Furthermore, it provides mechanisms for including interactive behaviors such as "zooming" and "panning" of visualizations. In terms of license, the D3 project is distributed under a BSD license.

The JavaScript InfoVis Toolkit (JIT)[4] is a library designed specifically for creating information visualizations. The JIT uses the HTML5 <canvas> element for plotting and animating graphs.

ProcessingJS[5] is a JavaScript implementation of the Processing language for data visualization (before this, there was only a Java implementation). ProcessingJS uses the HTML5 <canvas> element to render the visualizations and provides an API for drawing shapes and manipulating them on the canvas. ProcessingJS is distributed under an MIT license.

Raphaël JS[6] is a library for working with vector graphics on the Web. Raphaël JS is one of the better-known SVG libraries. However, it does not seem to be used extensively for data/information visualization projects. Raphaël JS is distributed under an MIT license.

Based on the PolicyCommons requirements and the current state of Cohere we have implemented the new visualization based on **D3** [10], using the built-in layout algorithms from the D3 library for generating the argument network visualization.

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[2] http://code.google.com/p/canviz/
[3] http://mbostock..github.com/d3/
[4] http://thejit.org/
[5] http://processingjs.com/
[6] http://raphaeljs.com/

4 Advancing the State-of the Art in Computer-Supported Argumentation for e-Participation

4.1 Interpreting a Formal Model of Policy-Argumentation

All the IMPACT tools are based on the same computational model of argumentation using a number of predefined argumentation schemes. These argumentation schemes determine the structure of the arguments displayed in PolicyCommons. Argumentation schemes are patterns of arguments determined by the analysis of their structure and content as reconstructed from natural language texts [11]. As explained in [1] they are useful for guiding the reconstruction of arguments put forward by contributors to a debate and thus opening the arguments up to critical analysis and evaluation and also for constructing fresh arguments to put forward in support of one's own point of view, or to counter the arguments of others. All these uses are clearly relevant to supporting deliberative participation in policy consultation and supporting transparency.

The IMPACT project has, to date, focused on two argumentation schemes, – arguing from *practical reasoning* and arguing from *credible source*. The rationale for choosing these schemes and the work to determine the computation models can be found in [12, 13] which builds on earlier research into an argumentation-based tool for supporting e-participation[14]. By using these argumentation schemes, we are able to systematically address appropriate critical questions and therefore display the justification for arguments put forward in the policy-deliberation. Critical questions supported by the system reflect issues such as:

- the circumstances upon which the action is based;
- the consequences of the action;
- the social values promoted by these effects;

all of which aim to facilitate sense-making and transparency, thus supporting the general stakeholder

Similarly, the scheme 'Arguing from Credible Source' provides critical questions which reflect issues such as, 'is the expert biased?' which helps determine biased as opposed to impartial contributions to the debate.

In order to accommodate the formal models of policy-argumentation we have had to align the original PolicyCommons data model – which it inherited from the Cohere platform on which it is built – with the IMPACT model of argument. The main elements of the inherited Cohere data model are *Nodes* and *Links* (which connect two Nodes). A Node consists of free text and is assigned a type such as *Idea*, *Data*, or *Theory*, just to list some examples. Similarly, a Link can be assigned a type such as *refutes*, *supports*, or *addresses the problem*, again just to list some examples. However, Cohere provides a flexible mechanism of adding, deleting, and modifying node- and link-types while simultaneously avoiding any changes to the fundamental underlying data model or data-access API. This has been a very important feature for our ability to rapidly prototype the PolicyCommons tool. PolicyCommons is about allowing users to visualize and browse debates of policies. It is within the context of a debate that issues are raised, responses are given, and arguments are made and

connected—resulting in the notion of a debate containing all of these elements of policy-argumentation. However, as stated above the original Cohere data model only comprises nodes and links— i.e. it does not have the concept of elements being grouped together in a container. As a solution, we have introduced *Debate* as a new PolicyCommons node-type and *contains* as a special link-type which is used to connect *Debate* nodes to other nodes (such that, e.g., a *Debate* contains an *Issue*). Now, when the visualization module of PolicyCommons retrieves nodes with type "Debate", they are treated differently, purely in terms of visualization, to any other node-type, even though the fundamental data model and data access API remain unchanged (examples of these different types of visualizations are given in the remainder of this section).

In addition to this concept of Debates as containing elements, to account for modeling the detailed structure of arguments we have introduced new node-types *Argument* and *Statement* (which represents the individual parts of an argument). Finally, inspired by the Practical Reasoning approach of [12–14] and to account for the model of argumentation schemes used by the rest of the IMPACT tools we have introduced the additional link-types *circumstance*, *consequence*, *goal*, and *value*, which are used to present the practical reasoning argumentation scheme.

4.2 Issue Maps – A Special Type of Information Visualization

This section concerns viewing and browsing the potentially large amounts of information contributed during a consultation. In order to allow users to get an overview of the vast amount of information and to be able to appreciate how much

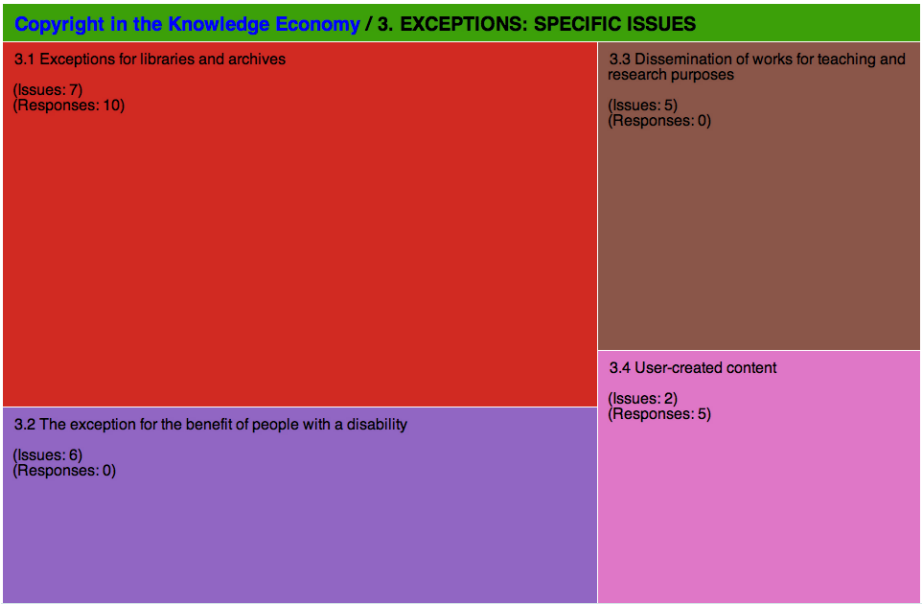

Fig. 2. A map of sub-topics of debate that group issues in the policy-consultation

debate is associated with issue we have adapted a special kind of visualization called the "treemap", which has been pioneered by Ben Shneiderman [15] in the field of Information Visualization. Work in the Information Design and Information Visualization field investigates the use of visual techniques for displaying information, with suitable visual cues for helping the user to read and understand information, in much the same way that natural language has evolved linguistic cues to help readers understand narrative structure and make sense of a piece of text.

Adapting this technique, we have created *Issue Maps* which use color-coded rectangular blocks to depict issues within the debate. The different sizes of the rectangles indicate the comparative number of arguments associated with each issue.

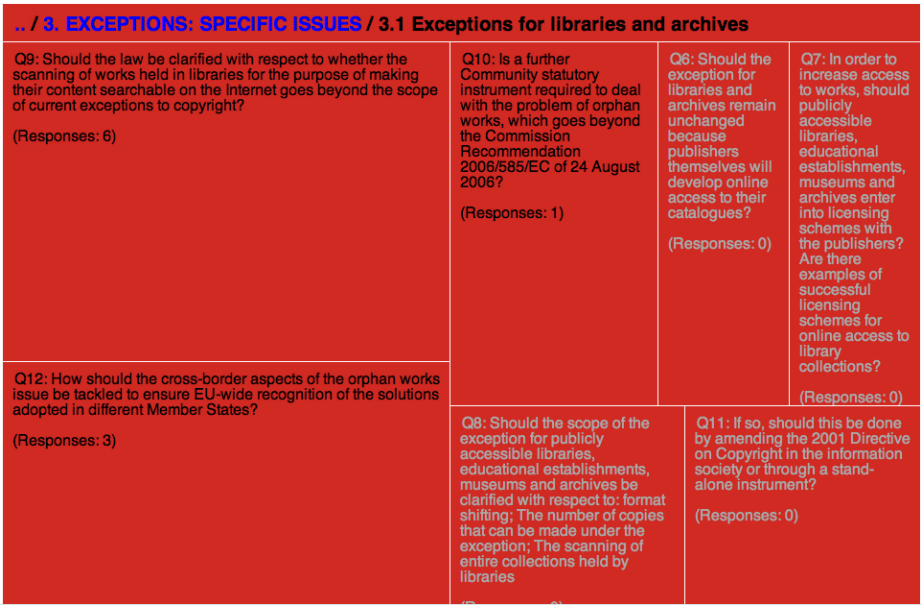

Fig. 3. An Issue-Map visualization showing one group of issues in a policy-deliberation

Getting an appreciation of the size of the debate around the different consultation questions provides guidance to the general stakeholder who can immediately get a sense of where all the 'talk' is happening but also important for the policy analysts as it allows them to appreciate where there is a lack of contributions and therefore where facilitation is required. Users move further into the debate by clicking on a rectangle taking them to the arguments addressing that issue. Figure 2 provides a screen shot of this new type of visualization. The Figure shows how issues are grouped into particular sub-topics of debate. As explained earlier, the size of each rectangular region on the map corresponds to the relative number of responses made by stakeholders. From this view, users can click through to see the issues raised in that particular area of debate. Figure 3 shows the visualization of issues in the area of policy-deliberation dealing with "Exceptions for libraries and archives", which the user clicks from the previous view. The color-coding allows the user to see that these

issues relate to the same sub-topic. Each Issue region (except those Issues without responses) is clickable, so that users can click through to view the responses and arguments made on those Issues which are of interest to them. Clicking on an Issue generates a different visualization, which we describe next.

4.3 Argument Network Maps

We have extended Cohere's capability to manipulate the layout of argument maps, particularly through the use of sophisticated layout algorithms for what are called *Argument Network Maps.* This visualization shows issues and responses as graphical text-boxes connected by labeled lines. Since these types of visualizations quickly become graphically unmanageable, we have enabled interactions typical of modern Web-based visual interfaces—e.g. interactions such as zooming, panning, and showing/hiding certain parts of the visualization.

An example of this new argument network visualization is shown in Figure 4. The Figure shows the issue, which the user is currently focusing on in a different color to the other nodes in the visualization. Clicking on the summary text in any of the boxes takes the user to the source material. Figure 5 then shows the view when the user has clicked to see the structure of the argumentation for one of the responses. Here the text-box expressing the proposed action is linked to the other text-boxes expressing the justification of the argument, where the link labels are consequence, circumstance, and value—the instantiated components of the relevant argumentation scheme.

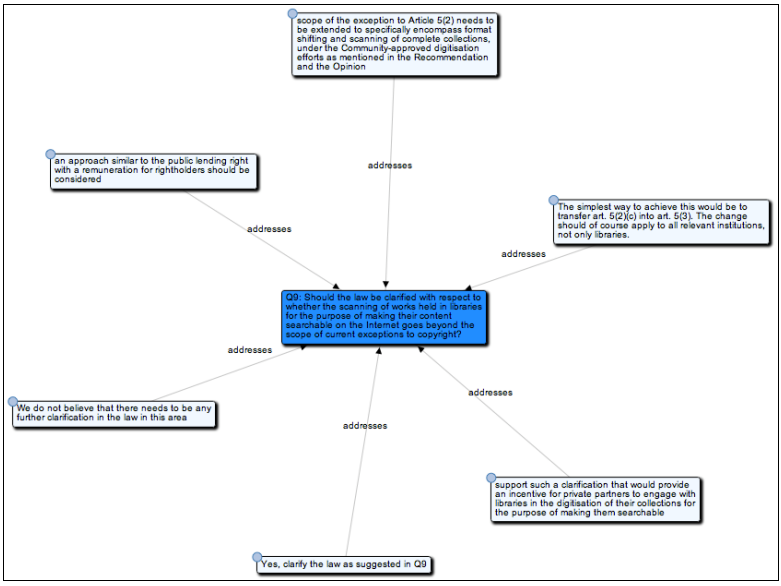

Fig. 4. An example Argument-Network Visualization showing the arguments addressing a particular issue in the policy-deliberation

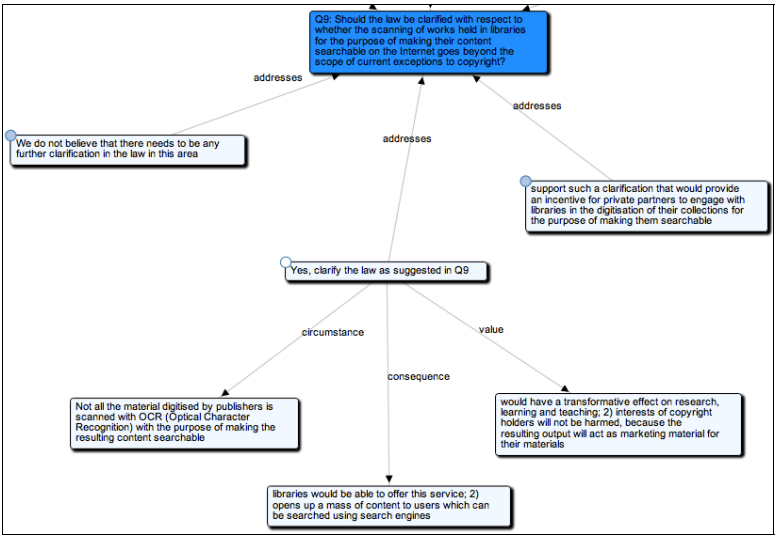

Fig. 5. Zooming in to see the detailed structure of an argument responding to a policy-issue

5 Discussion: Addressing the Challenges of Computer-Supported Argumentation in Policy-Consultation

The paper began by highlighting the four major challenges facing online consultation through computer-supported argumentation as being: transparency, understandability, readability and scalability. Now we turn to discussing more explicitly how the techniques introduced and described thus far in the paper start to address these challenges. Figure 6 summarizes how the challenges are being addressed, through our approach of Issue-Map and Argument-Network visualizations, all underpinned with a notion of *document-centricity*.

The document-centricity is important since the policy-consultation document is central to our underlying objectives of achieving transparency and understanding in the argument map. The main IMPACT usage scenario involves an organization publishing a green/white policy document in order to solicit feedback from relevant stakeholders. Thus, the argument network maps generated by PolicyCommons have to be anchored in this policy paper, and all arguments generated by stakeholders are entered into the argument network maps with links to the original issue raised in the policy paper and link back to the source material from where they were derived. In this way all visualized data in PolicyCommons are centered on the consultation documents.

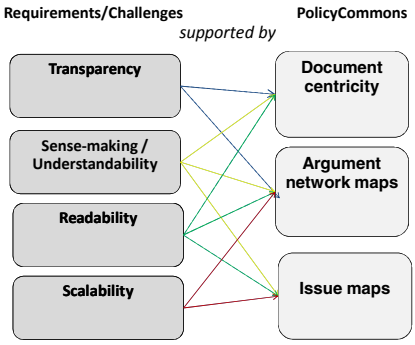

Fig. 6. Summary of how the four main challenges are being addressed

Furthermore, this document-centricity promotes sense-making for general stakeholders joining at any time during a lengthy consultation period as they can see how their arguments fit within the ongoing policy-deliberation process consultation. Finally, this document-centricity gives confidence to the policy-makers that the contributions provided by stakeholders are on-topic and relevant.

The combination of issue maps and argument network maps is a unique way of addressing all these challenges. In particular, the argument network map aids scalability through its layout manipulation and zooming capabilities. It supports transparency and sense-making by linking arguments not only to their source text but also back to the issue they address in the consultation document. The issue map supports the scalability and readability of large consultations by providing a realistic entry point for new users so that they can quickly gain an overview of the issues and contributions so far submitted, providing the ability to browse maps at different levels of granularity.

6 Conclusion

This paper has introduced and described our current research and development on a prototype Web-based tool, PolicyCommons, which is used for visualizing arguments about policies as browsable debate maps.

With regard to evaluation, we have adopted a scenarios-based workshop approach. The scenarios use short narrative clips to convey how we intend the prototype to be used by its intended users. As a general evaluation approach the scenarios have stimulated discussion about the feasibility and desirability of any envisioned changes or other claims made about the prototype's impact. Although evaluation is on-going, preliminary results are encouraging. It is our intention to report on the full evaluation as a separate paper elsewhere.

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References

1. Macintosh, A., Gordon, T.F., Renton, A.: Providing Argument Support for E-Participation. Journal of Information Technology & Politics 6, 43–59 (2009)
2. Coleman, S., Blumler, J.G.: The Internet and Democratic Citizenship. Cambridge University Press (2009)
3. Benn, N., Macintosh, A.: Argument Visualization for eParticipation: Towards a Research Agenda and Prototype Tool. In: Tambouris, E., Macintosh, A., de Bruijn, H. (eds.) ePart 2011. LNCS, vol. 6847, pp. 60–73. Springer, Heidelberg (2011)
4. Bex, F., Prakken, H., Reed, C., Walton, D.: Towards a formal account of Reasoning about Evidence: Argument Schemes and Generalisations. Artificial Intelligence & Law 11, 125–165 (2003)
5. Kolb, D.: The Revenge of the Page (presented at the June 2008)
6. Buckingham Shum, S.: Cohere: Towards Web 2.0 Argumentation. In: 2nd International Conference on Computational Models of Argument (COMMA 2008), pp. 97–108. IOS Press, Toulouse (2008)
7. De Liddo, A., Buckingham Shum, S.: Capturing and Representing Deliberation in Participatory Planning Practices. In: De Cindio, F., Macintosh, A., Peraboni, C. (eds.) From e-Participation to Online Deliberation, Proceedings of the Fourth International Conference on Online Deliberation (OD 2010), Leeds, UK, pp. 27–40 (2010)
8. Kunz, W., Rittel, H.W.J.: Issues as Elements of Information Systems (1970)
9. Rittel, H.W.J., Webber, M.M.: Dilemmas in a General Theory of Planning. Policy Sciences 4, 155–169 (1973)
10. Bostock, M., Ogievetsky, V., Heer, J.: D3: Data-Driven Documents. In: IEEE Trans. Visualization & Comp. Graphics, Proc. InfoVis (2011)
11. Walton, D., Reed, C., Macagno, F.: Argumentation Schemes. Cambridge University Press (2008)
12. Atkinson, K., Bench-Capon, T., Cartwright, D., Wyner, A.: Semantic models for policy deliberation. In: Ashley, K.D., van Engers, T.M. (eds.) Proceedings of the Thirteenth International Conference on Artificial Intelligence and Law (ICAIL 2011), Pittsburgh, PA, USA, pp. 81–90 (2011)
13. Wyner, A., Atkinson, K., Bench-Capon, T.: Towards a Structured Online Consultation Tool. In: Tambouris, E., Macintosh, A., de Bruijn, H. (eds.) ePart 2011. LNCS, vol. 6847, pp. 286–297. Springer, Heidelberg (2011)
14. Cartwright, D., Atkinson, K.: Using computational argumentation to support e-participation. IEEE Intelligent Systems 24, 42–52 (2009)
15. Shneiderman, B.: Tree visualization with tree-maps: 2-d space-filling approach. ACM Trans. Graph. 11, 92–99 (1992)

Structuring Japanese Regional Information Gathered from the Web as Linked Open Data for Use in Concern Assessment

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Abstract. We are developing an eParticipation web platform based on Linked Open Data that targets regional communities in Japan. To increase transparency and public participation, we aim to utilize web contents related to target regions for sharing public concerns among citizens, government officials, and experts. We have designed a Linked Open Data set called SOCIA (Social Opinions and Concerns for Ideal Argumentation) to structure regional web contents (e.g. regional news articles, microblog posts, and minutes of city council meetings) and utilize them for eParticipation and concern assessment. The web contents are semi-automatically structured by our text mining system, Sophia, on the basis of regions and events extracted from news articles on the web. Minutes of city council meetings stored in SOCIA are annotated with discourse salience in order to visualize topic transitions in a meeting transcript. We also developed a prototype debate support system called citispe@k that uses SOCIA to help citizens share their concerns. Users can submit agendas, ideas, questions, and answers by referencing the structured regional information in SOCIA. Moreover, they can annotate SOCIA data with tags representing criteria for assessing concerns or utterance intentions.

Keywords: Linked Open Data, concern assessment, information structuring, public involvement.

1 Introduction

In addition to having endured huge earthquakes and a nuclear catastrophe, Japanese regional communities face ongoing social issues. Besides, the issues and risks have become diversified: radiation pollution, climate changes, financial problems, aging population, welfare problems, etc. Public involvement, i.e. citizen participation in deciding public policy, has thus become more important, especially in regional communities. Although public involvement is characterized as an interactive communication process among stakeholders[1], stating opinions is not easy for Japanese citizens because they tend to be reticent, and are not experts about the diversified social issues. To facilitate public involvement, we

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are developing an eParticipation web platform, O_2,[1] based on Linked Open Data (LOD).

LOD, semantically connected data with universal resource identifiers (URIs) and the resource description framework (RDF) can be used for supporting citizens' deliberation because the LOD mechanism enables sophisticated information provision with semantic links [2]. Our platform aims to increase transparency, participation, and collaboration in Japanese regional communities. We focus on transparency and participation by using web contents as background information related to regional concerns.

To increase transparency and participation in regional communities, it is important to share public concerns among citizens, government officials, and experts. Background information should be structured and open in order to facilitate assessing and sharing public concerns. We have developed an LOD data set called SOCIA (Social Opinions and Concerns for Ideal Argumentation) that consists of Japanese regional news articles, microblog posts, and minutes of city council meetings. SOCIA is designed to be used for supporting concern assessment. It is semi-automatically structured by our text mining system, Sophia, on the basis of regions and events extracted from news articles on the web. Minutes of city council meetings stored in SOCIA are annotated with discourse salience in order to visualize topic transitions in a meeting transcript.

Sophia is a mining and intelligent pre-processing platform that classifies and clusters news articles and tweets. SOCIA is a data set desined for structuring public debate and regional information. Citispe@k is a web application that supports public debate related to regional issues identified by Sophia using SOCIA.

2 Literature Review

2.1 Linked Open Data for Open Government

LOD plays an important role in fostering open government [3]. There are over 20 international open data platforms in the open government community: Data.gov, Data.gov.uk, Data.gov.au, data.gouv.fr, India.gov.in, etc.[2] Data.gov and India.gov.in are in progress on making their open data platform Data.gov open source [4]. Joinup,[3] a collaborative platform in Europe, proposes Asset Description Metadata Schema (ADMS), which describes semantic assets, that is, a collection of highly reusable metadata and reference data [5]. In Japan, Ministry of Economy, Trade and Industry (METI) operates a web site called "Open Government Laboratory"[4] as an experimental web site towards realizing eParticipation and eGovernment. It also launched the "Apps for Japan" project, which utilizes various type of data for tackling the unprecedented damage wrought by the Great East Japan Earthquake [6].

[1] http://open-opinion.org/ (in Japanese)

[2] http://www.data.gov/, http://data.gov.uk/, http://data.gov.au/, http://www.data.gouv.fr/, http://india.gov.in/, etc.

[3] https://joinup.ec.europa.eu/

[4] http://openlabs.go.jp/ (in Japanese)

There are several competitive challenges designed to promote the use of LOD: Challenge.gov and the New York City Challenge in the U.S., the Open Data Challenge in Europe, and the LOD Challenge in Japan. SOCIA and citispe@k, which we developed, received the ChallengeDay Award at LOD Challenge Japan 2011.[5]

2.2 Supporting Analysis of Public Debate

Providing background information related to public debate is impotant in order to support concern assessment. In view of this, argument visualization is an effective approach for supporting eParticipation [7]. Jeong et al. visualized the difference in cognition for several topics among participants in public debates using the co-occurrence of terms [8]. Visualizing an overview of public debate is also effective for grasping the background. Several argument visualization tools currently exist [9]: Compendium [10], Cohere [11], MIT Deliberatorium [12], Araucaria [13], Discourse Semantic Authoring [14,15], etc. Typically, these tools produce "box and arrow" diagrams in which premises and conclusions are formulated as statements [16]. We have developed a method for visualizing the transitions of a topic [17] because understanding discussion flow requires overviewing the whole transition of a long meeting rather than local diagramming.

3 Designing Platform and Ontology

3.1 O_2: eParticipation Web Platform

O_2, an abbreviation for Open Opinion, is a web platform for citizen participation in debates about regional issues. As shown in Fig. 1, the O_2 platform has

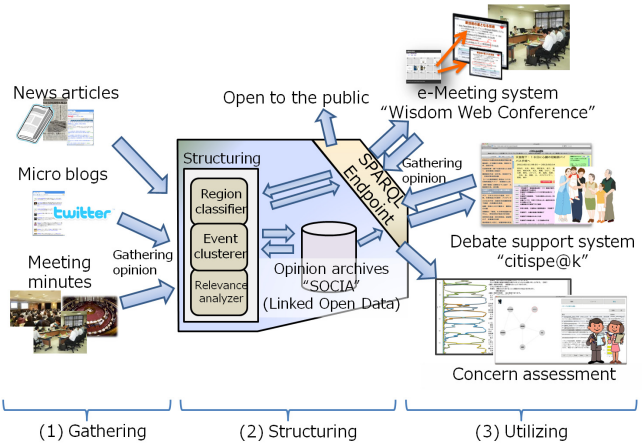

Fig. 1. Outline of O_2, eParticipation Web Platform

[5] http://lod.sfc.keio.ac.jp/challenge2011/result2011.html (in Japanese)

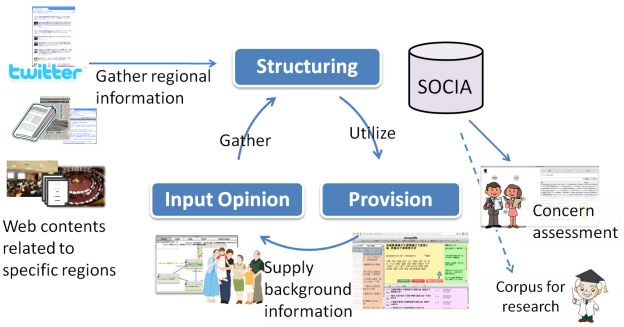

Fig. 2. Cycle of utilizing regional information for eParticipation

three stages. In stage (1), the mining and pre-processing system, Sophia, crawls the web and gathers information from news articles, microblogs, and meeting minutes that can be used for debates. In stage (2), the system geographically classifies the gathered contents and clusters them by event. Relevant information is then structured and stored in the SOCIA data set in accordance with the SOCIA ontology as openly published Linked Open Data. In stage (3), the structured information is used for debate support, e-Meeting, and concern assessment. In this paper, we focus on the eParticipation system for supporting debates using web contents related to specific regions structured in SOCIA.

3.2 SOCIA: Linked Open Data Set for eParticipation

The cycle of utilizing regional information in SOCIA for eParticipation is illustrated in Fig. 2. To help citizens understand public concerns and exporess their opinions, background information needs to be provided because most citizens are not experts about diversified public concerns. The opinions expressed can also be utilized as background information after being structured in SOCIA. For web contents (e.g. news articles, blogs, and tweets) to be used as background information, they need to be classified by region and then presented to citizens in an understandable way. Our platform and ontology can be used to structure news and opinions and then link them with regional issues. The data is openly published on the web using the SOCIA ontology,[6] designed using tWeb Ontology Language (OWL) as shown in Fig. 3. Through this process, eParticipative data becomes re-usable and transparent.

Text mined from the web is structured in the form of events by region, which are then used as discussion seeds to further build SOCIA. Citizens then create discussion topics out of each seed, e.g., a cluster of news articles related to the same event, and input their opinions by using the system, among other functionalities.

[6] http://data.open-opinion.org/socia-ns

Fig. 3. Core classes for structuring regional information in SOCIA ontology

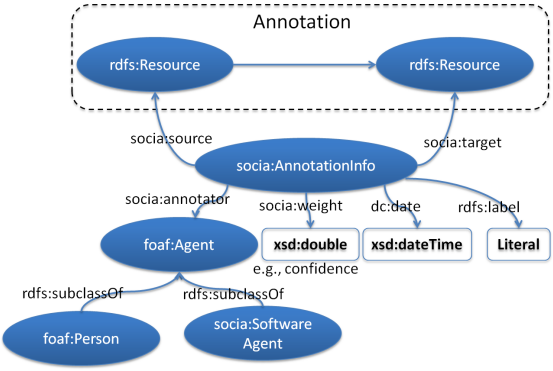

Fig. 4. AnnotationInfo: meta-context information related to property annotation

To improve the structuring accuracy, the history of how the LOD properties were annotated (e.g., which algorithm, which parameter, by whom is needed) because the automatic structuring by Sophia has an inherent error of a few percent. To maintain the annotation history, we defined the AnnotationInfo class, as shown in Fig. 4. Such meta-context information is necessary when the data set is used as a corpus for research on natural language processing.

4 Structuring Regional Information on the Web

The system first collects news articles, microblog posts (in this work, tweets), and minutes of city council meeting from the web along with necessary metadata (dates, emission sources, etc). It then classifies this crawled web contents by region and filters out contents unrelated to the interests of regional communities or to current events. Next, the system extracts target events from the news articles and microblogs, and links them using the ontology.

Citizens can then add further links to events, news articles, and microblogs, by creating relevant topics and can debate them by inputting their opinions, polling, or sharing further resources. Those resources and new links are also incorporated in the data set, as are the opinions and the discussion. This creates a virtuous cycle in which the intelligent platform, by creating understandable and relevant discussion seeds, involves citizens in eParticipation. The citizens add further data to the data set, making it grow over time, and this data can be used as input again (e.g. for training better learning models and developing better ontologies).

4.1 Classification by Region

After the mining, the gathered news articles and tweets are classified geographically (by the 47 prefectures of Japan). To this end, we use Transformed Weight-normalized Complementary Naive Bayes (TWCNB) algorithm [18]. In the classification, the feature vectors for each document consist of the TF*IDF value of morpheme bi-grams. To decide whether contents should be filtered out or not, we use a confidence threshold where the confidence value is defined as the difference between log scores of the highest-ranked class and that of second-ranked class.

We conducted a classification experiment through varying threshold of confidence value, using 8,811 news articles related to Japanese prefectures crawled from Yahoo! Japan News[7] during Jun. 13 to Jul. 12, 2011, and 1,133 ones that do not related to any prefectures. The experimental result showed that the precision is 98.2% and the recall is 98.0% for the optimal threshold [19,20].

4.2 Clustering by Events

SOCIA stored 54,854 news articles, with about 13,000 ones classified as related to a prefictures.[8] The events are extracted as clusters of similar news articles [20]. The similarity between news articles are calculated as a cosine similarity which is weighted by a window function determined by for considering dates/times the news articles were published. As shown in Fig. 5, about 35,000 events were extracted through the clustering of these articles.

4.3 Analyzing Topic Transition in Transcript of City Council

For promoting the participation of young citizens in public debates, the use of smartphones is important tool. Browsing the long transcript of a public debate with a smartphone requires a lot of time and effort because the semantics essentially depends on the preceding context. The system automatically analyzes the topic transitions in the minutes of city council meetings stored in SOCIA. The

[7] http://headlines.yahoo.co.jp/hl?c=loc

[8] The number of news articles stored in SOCIA was counted on Mar. 16, 2012. It has been constantly increasing.

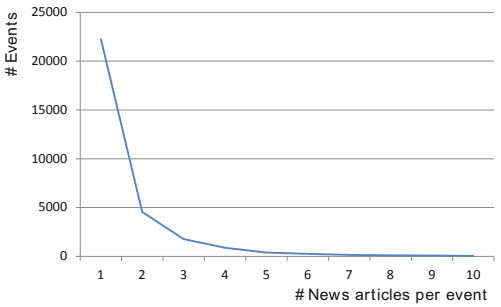

Fig. 5. Distribution of news article counts per event

analysis is based on our proposed metric for discourse salience, that is, reference probability [21].

The use case we consider is browsing past meeting minutes or related documents while attending a public meeting. In public meetings, participants sometimes reference a statement in a past meeting. Trying to find the referenced statement from the long meeting minute in order to confirm it on site would increase the cognitive load due to the need to grasp the topic transitions in a long discourse.

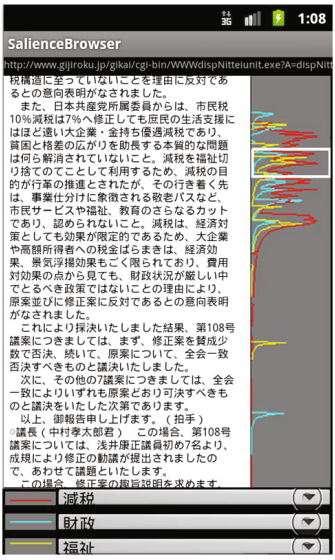

Fig. 6. Visualization of topic transition in a transcript of city council meeting

The topic transitions in a transcript of Nagoya city council[9] on a smartphone can be visualized as shown in Fig. 6. The user can grasp the topic transitions from "SalienceGraph" shown on the right of the user interface. The horizontal axis corresponds to discourse salience, that is, the degree of focus on each term or latent topic. The vertical axis represents each sentence in the target discourse.

The GUI for the visualizer was designed in accordance with Shneiderman's *Visual Information-Seeking Mantra*, that is "overview first, zoom and filter, then details-on-demand" [22]. After getting the overview of the topics, users may either browse the salience dynamics of a particular latent topic, or inspect the discourse at a particular point by consulting the record.

5 Citispe@k: Debate Support System Using SOCIA

Citispe@k is a prototype web application that supports public debate by utilizing SOCIA. It provides mobility and reach by supporting web browsers running on smart phones and tablets. The term citispe@k is based on the idea that citizens speak about social issues and current events of the regions in which they live. Users can discuss and sort out regional issues by referencing news articles, tweets, or other relevant resources on the web by using citispe@k. By creating discussion topics or inputting opinions into the system, those topics and opinions are also stored as Linked Open Data in SOCIA.

Fig. 7 shows a screenshot of citispe@k. The screenshot has lists of events or related information. Events recently updated are listed on the left of the screenshot. The system initially shows all events. The user can then limit the list to show only events related to a region. When the user selects an event from the list, information about the event is shown on the right side of the screenshot. Information consists of news articles, tweets, and events related to the event. Those resources can be easily shown and visualized in an iFrame without leaving the system. Users can append comments, e.g. ideas, questions, and answers, by selecting specific content provided by citispe@k. A comment can also be posted to Twitter (via @citispeak for now) to further its reach and be stored in SOCIA.

Users can create discussion topics related to events, news articles and tweets. The "View related topics" button (Fig. 8) is used to see topics related to the event being viewed. Users can create a new discussion topic about the event by clicking the "Make a new topic" button. The cycle of the discussions in citispe@k is that users browse events, get topics related to an event, and add their opinion to a topic of interest. The system supports adding web contents to topics as information sources for discussion as well as adding opinions to topics.

Citispe@k also has a function supporting concern assessment. The system aim to support the analysis of the trends in citizens' awareness, its background information, and the anxiety about social issues. For example, a committee for scientific verification of road construction in Aioiyama-Ryokuchi Park in Nagoya

[9] http://www.gijiroku.jp/gikai/c_nagoya/index.html

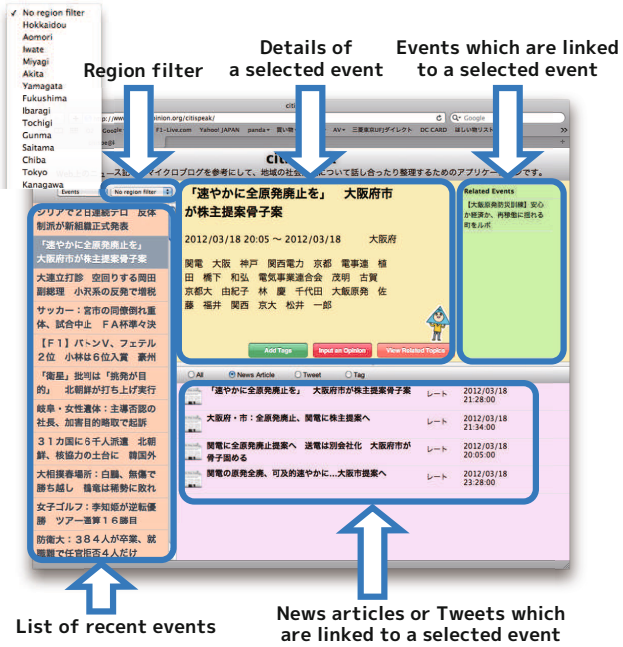

Fig. 7. Screenshot of citispe@k

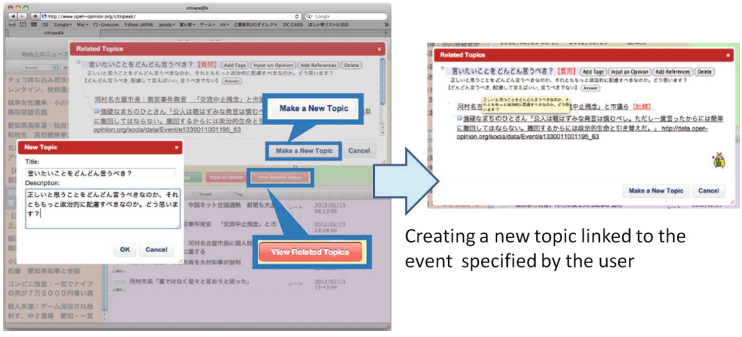

Fig. 8. Creating a new discussion topic

City analyzes road construction.[10] A report on their analysis was made based on several criteria: "economic chance", "life, educational or cultural chance", "safety, security", etc. Thus, classifing opinions on the basis of criteria is effective for concern adjustment. Citispe@k provides tags for such criteria. Users can add tags composed of criteria and polarity, such as "Environment +" or

[10] http://www.city.nagoya.jp/shisei/category/53-3-7-4-0-0-0-0-0-0.html (in Japanese)

Fig. 9. Annotating selected event with tags representing criteria

"Environment -". Citispe@k also provides tags that can be used to express the intention of an utterance, like "Question", "Idea", and "Refutation". If events or news articles have many such tags, the tags can be used to support the analysis of concerns. Fig. 9 shows an example of tagging an event. We designed the tags by referencing the QOC model [23] and the Deliberatorium [12] for supporting concern assessment through public debates using citispe@k and the contents in SOCIA.

6 Conclusion

We are developing an eParticipation web platform called O_2 with the aim of increasing transparency and participation in Japanese regional communities. Our Sophia text mining system automatically structures news articles, microblog posts, and transcripts of city council meetings and stores them in SOCIA, an LOD dataset designed for supporting concern assessment. Our Citispe@k web application helps citizens debate issues by utilizing regional information structured in SOCIA. It also enables assessment of public concerns through manual annotation of criteria tags. As the next step, personal data will be incorporated into SOCIA to facilitate collaboration among citizens.

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References

1. Jeong, H., Hatori, T., Kobayashi, K.: Discourse analysis of public debates: A corpus-based approach. In: Proceedings of 2007 IEEE International Conference on Systems, Man and Cybernetics, pp. 1782–1793 (2007)
2. Heath, T., Bizer, C.: Linked Data: Evolving the Web into a Global Data Space. Morgan & Claypool (2011)
3. Höchtl, J., Reichstädter, P.: Linked Open Data - A Means for Public Sector Information Management. In: Andersen, K.N., Francesconi, E., Grönlund, Å., van Engers, T.M. (eds.) EGOVIS 2011. LNCS, vol. 6866, pp. 330–343. Springer, Heidelberg (2011)
4. Howard, A.: White house to open source data.gov as open government data platform (2011), http://radar.oreilly.com/2011/12/data-gov-open-source.html
5. ISA: Improving semantic interoperability in european egovernment systems (2011), http://ec.europa.eu/isa/documents/isa_action1-1.pdf
6. METI Japan: Open government laboratory to launch the "apps for japan" project (2011), http://www.openlabs.go.jp/apps4japan
7. Benn, N., Macintosh, A.: Argument Visualization for eParticipation: Towards a Research Agenda and Prototype Tool. In: Tambouris, E., Macintosh, A., de Bruijn, H. (eds.) ePart 2011. LNCS, vol. 6847, pp. 60–73. Springer, Heidelberg (2011)
8. Jeong, H., Shiramatsu, S., Hatori, T., Kobayashi, K.: Discourse analysis of public debates using corpus linguistic methodologies. Journal of Computers 3(8), 58–68 (2008)
9. Kirschner, P., Shum, S., Carr, C.: Visualizing Argumentation: Software Tools for Collaborative and Educational Sense-Making. Springer (2003)
10. Selvin, A., Shum, S.: Hypermedia as a productivity tool for doctoral research. New Review of Hypermedia and Multimedia, Special Issue on Scholarly Hypermedia 11(1), 91–101
11. Liddo, A.D., Shum, S.B.: Cohere: A prototype for contested collective intelligence. In: Workshop on Collective Intelligence in Organizations: Toward a Research Agenda. ACM Computer Supported Cooperative Work (2010)
12. Iandoli, L., Klein, M., Zolla, G.: Enabling online deliberation and collective decision making through large-scale argumentation: A new approach to the design of an internet-based mass collaboration platform. International Journal of Decision Support System Technology 1(1), 69–92 (2009)
13. Reed, C., Rowe, G.: Araucaria: Software for argument analysis, diagramming and representation. International Journal of AI Tools 13(4), 961–980 (2004)
14. Kamimaeda, N., Izumi, N., Hasida, K.: Evaluation of Participants' Contributions in Knowledge Creation Based on Semantic Authoring. The Learning Organization 14(3), 263–280 (2007)
15. Hasida, K.: Semantic Authoring and Semantic Computing. In: Sakurai, A., Hasida, K., Nitta, K. (eds.) JSAI 2003. LNCS (LNAI), vol. 3609, pp. 137–149. Springer, Heidelberg (2007)
16. van den Braak, S.W., van Oostendorp, H., Prakken, H., Vreeswijk, G.A.W.: A critical review of argument visualization tools: Do users become better reasoners? In: Workshop Notes of the ECAI 2006 Workshop on CMNA, pp. 67–75 (2006)
17. Shiramatsu, S., Komatani, K., Ogata, T., Okuno, H.G.: SalienceGraph: Visualizing Salience Dynamics of Written Discourse by Using Reference Probability and PLSA. In: Ho, T.-B., Zhou, Z.-H. (eds.) PRICAI 2008. LNCS (LNAI), vol. 5351, pp. 890–902. Springer, Heidelberg (2008)

18. Rennie, J., Shih, L., Teevan, J., Karger, D.: Tackling the poor assumptions of naive bayes text classifiers. In: Proceedings of the 20th International Conference on Machine Learning, pp. 616–623 (2003)
19. Swezey, R., Sano, H., Shiramatsu, S., Ozono, T., Shintani, T.: Automatic detection of news articles of interest to regional communities. To appear in: International Journal of Computer Science and Network Security 12(6) (2012)
20. Swezey, R., Sano, H., Hirata, N., Shiramatsu, S., Ozono, T., Shintani, T.: An e-participation support system for regional communities based on linked open data, classification and clustering. To appear in: Proceedings of the 11th IEEE International Conference on Cognitive Informatics & Cognitive Computing (2012)
21. Shiramatsu, S., Komatani, K., Hasida, K., Ogata, T., Okuno, H.G.: A Game-Theoretic Model of Referential Coherence and Its Empirical Verification Using Large Japanese and English Corpora. ACM Transactions on Speech and Language Processing 5(3), Article 6 (2008)
22. Shneiderman, B.: Designing the User Interface: Strategies for Effective Human-Computer Interaction, 3rd edn. Pearson Addison Wesley (1998)
23. MacLean, A., Young, R., Bellotti, V., Moran, T.: Questions, options, and criteria: elements of design space analysis. Human Compututer Interaction 6(3), 201–250 (1991)

Using Online Carbon Calculators for Participation in Local Climate Initiatives

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Abstract. The paper reviews various eco-feedback systems including carbon calculators and discusses how different disciplinary approaches conceptualise and explain anticipated impacts of these systems. The European collaborative research project e2democracy investigates how citizen participation combined with long-term CO_2 monitoring and feedback can contribute to achieve local climate targets. Empirical results from local climate initiatives in Austria, Germany and Spain show positive effects in terms of learning about CO_2 impacts, increased awareness, enhanced efforts and guidance as well as individual empowerment leading to slightly reduced CO_2 emissions. The findings highlight that a combined approach integrating eco-feedback and (e-)participation is promising to foster sustainability.

Keywords: citizen participation, climate protection, carbon calculator, eco-feedback, environmental impacts.

1 Introduction

Citizen participation has become an important issue of sustainability policy as the concept "environmental democracy" indicates [1]. Access to environmental information and the integration of all stakeholders in decision-making processes are acknowledged principles of environmental democracy. The urgency of actions further suggests public participation as a strategic resource and practice in fighting climate change. Accordingly, various forms of citizen engagement in climate issues are spreading [2, 3, 4]. However, citizen participation in climate policies, particularly via electronic means, is still largely unexplored. Viewed from a functional perspective such a participation approach holds potential, which ranges from information sharing, awareness raising and mobilisation of collective effort to collaborating on policy decisions, their implementation, and thus, enhanced problem solving.

Recent developments in the field of ecological-feedback technologies offer potential synergies with participatory approaches. Eco-feedback provides various sorts of information, which enhance the understanding of one's patterns and impacts of energy consumption, with the intended effect to stimulate a rethinking of habits and change to pro-environmental behaviour [5]. Carbon calculators are of special

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relevance for climate protection strategies as they inform about the "carbon footprint" of individuals, households or businesses. Existing reviews acknowledge the value of such devices but suggest improvements with regard to accuracy, transparency, meaningful guidance and feedback and opportunities for connecting with other users [6, 7]. The Internet offers advantages to make these tools effective information and learning systems, in particular in combination with a citizen participation approach.

This paper aims at exploring the potential of eco-feedback in participatory approaches of local governments. The European collaborative research project "e2democracy" (environmental electronic democracy; http://www.e2democracy.eu) provides empirical results from a survey among citizens who participated in climate initiatives in six cities. In this paper our research questions are: Do citizens use the information offered? How do they assess the value of eco-feedback? To what extent does the participatory setting support individual motivations and collective efforts? What are the impacts regarding local climate targets? The subsequent sections introduce eco-feedback systems (2); describe the empirical setting of citizen participation and the role of the online carbon calculator (3); sketch the research methods (4); present the findings (5) and summarise the conclusions (6).

2 Electronic Eco-Feedback Systems

Eco-feedback systems collect data on individual or group behaviours from a variety of domains including energy consumption, water usage, transportation, garbage and recycling behaviours and product purchases. Electronic forms range from energy monitoring and ambient energy awareness technologies[1] to theme-specific edutainment applications and social websites.[2] New tools include sensing systems for activities such as power consumption or waste behaviour which feedback data e.g., via mobile phones[3] and smart meters that provide (near) real-time data on electricity, gas and water usage. Darby [11] discerns various forms and contents of feedback, including raw data such a as meter-data or data from cost plugs ('direct feedback'), processed data such as bills that integrate comparative information or detailed energy reports ('indirect feedback'), and information integrating different data sources by using software such as carbon calculators ('energy audits'). Froehlich et al. [12] distinguish between 'low-level feedback' providing details about how to improve specific consumption behaviours, and 'high-level feedback', which is summative and supports the improvement of one's performance towards a specific goal or in comparison to other users. At large, eco-feedback intends to offer a sort of learning tool which enables users to reflect on their energy consumption behaviours, underlying value-systems and environmental impacts through feedback and experimentation.

[1] E.g., 'WaterBot', a water tap which provides information feedback on water usage [8].
[2] E.g, 'BinCam' monitors food waste and recycling behaviour [9].
[3] E.g., 'UbiGreen' senses and feeds back data to encourage green transportation habits [10].

2.1 Theoretical Background

Integral aims of eco-feedback are enhanced control over energy usage, consumption-related awareness [11, 13] and support in making energy practices accountable. Darby [11] suggests a combination of different feedback approaches, in particular historic feedback on previous consumption periods, may contribute to achieving learning effects and creating "tacit knowledge".

Research in human-computer interaction and ubiquitous computing links such approaches to the question how a technology should present relevant information and how it should interact with people to encourage sustainable lifestyles [14, 15]. A crucial point is whether and how such systems succeed in transforming individual and shared responsibility for environmental issues into the ability to implement appropriate measures and to change related behaviours (despite the evidence of a 'value-action gap') [16]. Focussing on the ability to act on the basis of better information presupposes that knowledge and related values do translate into action. However, relevant capacities are tied to personal and household behaviours as well as to structural and material conditions in which individual and community practices are embedded and with which they co-emerge [17].

According to Froehlich et al. [12] eco-feedback technology is based on the assumption that raising awareness and knowledge about the way everyday routines affect the environment may bridge the "environmental literacy gap" and lead to behavioural changes. Based on a survey of 89 papers from environmental psychology the authors identify two basic models of pro-environmental behaviour: *rational choice models*, which consider environmental behaviour mainly as driven by self-interest, and *norm-activation models*, which take social motives as central basis for action. Under rational choice models, the authors subsume various models which suggest that (1) favourable attitudes translate into respective behaviours, that (2) issue knowledge and information on appropriate actions are crucial for attitudes to actually trigger favourable behaviours, and finally, that (3) consumers adopt sustainable behaviours that are economically advantageous and discount factors such as convenience, habit and social norms. In contrast, norm-activation models highlight the importance of moral or personal norms and suggest that recognising the way in which one's environmental behaviours affect community goods and future generations, can activate moral obligations which may outplay individual perceptions of utility.

2.2 Impacts of Eco-Feedback and Their Limits

Recent studies in the smart metering context [e.g. 18, 19, 20] report energy savings in the ranges of 1.5-15% due to feedback technologies. The large span indicates limited comparability of findings though [18]. In general, higher figures result from small-scale studies with extremely motivated participants; also, evidence on the duration of savings is mixed but, in general, mostly positive.

Thaler/Sunstein [21] propose a behavioural economics perspective that directly addresses the relation between behaviour change and sustainable practices: it suggests offering a suitable "choice architecture" through appropriate information feedback

that is to give "gentle nudges" in the direction of desired behaviours. The authors describe those decisions as most difficult, which have uncertain or delayed effects, provide little feedback or are ambiguously related with practical experience; a situation typically encountered in the context of energy consumption. Offering households information on their individual energy consumption, compared to previous periods and to the average consumption of their neighbourhood, together with positive and negative emoticons, showed positive effects on behaviour: households consuming above average decreased their consumption level, but below-average consumers increased their energy use significantly. Aside from this unintended "boomerang effect" the feedback of information and the opportunity for making comparisons seem to have served as a positive nudge at large.

However, there are also serious objections against the focus on pro-environmental behaviour change through information feedback and its viability. Criticising "the dominant paradigm of 'ABC'- attitude, behaviour, and choice", Shove [22] identifies blind spots of models which focus on the concept of choice and individual behaviour. This framing marginalises other possible approaches grounded in *social theories of practice and transition*. Theories of transition suggest calling into question the status quo: … "relevant societal innovation is that […] in which more sustainable regimes of technologies, routines, forms of know how, conventions, markets, and expectations take hold across all domains of daily life" [22, p. 1278]. In contrast to rational choice models and norm-activation models, theories of practices focus on the enactment of practices in specific social and temporal contexts and the emergent outcomes of such practices. In this spirit, approaches for assessing environmental practices of individuals need to consider how these practices co-emerge with socio-ecological systems and collective practices.

Stressing the complexity of behavioural issues in a similar way, ecological economists disapprove of the rational-choice approaches that widely dominate the literature in their community. Garmendia and Stagl, for example, highlight *social learning* as a key element of the route to sustainability – "a process that is going beyond the acquisition of mere factual knowledge" and that entails a "need to look beyond individual actors" [23, p. 1714]. According to the authors, relevant social learning processes include deliberation and should overcome individual and predefined interests and values to "create opportunities for a shared understanding and joint action" [23, p. 1713]. This perspective suggests that eco-feedback systems would gain from incorporating a mode of consumer or citizen participation that encourages the development of collective effort, of solidarity with a group and, in consequence, the adoption of collective interests as one's own.

3 Case Study: Citizen Participation in Local Climate Policies

The research project "e2democracy" has been studying a set of similar forms of citizen participation in climate policies at local government level in Austria, Germany and Spain. These climate initiatives allow us to analyse potentials and limits of eco-feedback in the context of a participatory design.

3.1 Common Organisational Characteristics

All seven initiatives comprised similarly organised participation processes in different cities and regions: Bregenz and Mariazellerland (Austria); Bremen, Bremerhaven and Wennigsen (Germany); Zaragoza and Pamplona (Spain). The sites include small and large cities as well as rural communities, but share some common core elements: at each site local government, local companies and citizens agreed on the target to reduce CO_2 emission levels by at least 2% per year; the participation process was carried out by a citizen panel working with local government on achieving or exceeding the agreed target; participation was projected to last up to two years; a common carbon calculator was used for individual CO_2 balancing as a key tool; free choice of the mode of participation was practised – via traditional means (in person, via mail, telephone etc.) or via e-participation. Moreover, large-scale information measures via local media and kick-off events took place to spread invitations to all citizens plus project-related telephone surveys among the population to raise the awareness of the opportunity to participate.

Three types of interaction constituted the participation process: (1) provision of and access to information offering guidance on climate-friendly behaviour (regular newsletters, information via project website or on paper); (2) documentation of individual consumption data (via an online carbon calculator with instant production of individual CO_2 balances, or via a personal "CO_2 household book" on paper with subsequent calculation and transmission of CO_2 balances by support staff); (3) various forms of theme-oriented meetings and exchange (e.g. group meetings with expert talks, group excursions, chats with experts, discussion platforms).

Providing participants with the possibility to individually monitor their energy consumption, get feedback and additional information, as well as exchange activities over a longer time period was meant to stimulate informed choices and to support responsible behaviour leading to reduced CO_2 emissions. Depending on local agendas the participation processes started at different points in time.[4] By April 2012 they lasted for two full years in Bremen, and for nearly two years in Austria and Spain.

3.2 Common Features of Eco-Feedback via Carbon Calculator

Most of the existing carbon tools break down the calculation by activity but estimate emission impacts only on an annual basis. The local climate initiatives studied by the e2democracy project employed an advanced carbon calculator adapted for regular bi-monthly measurements over longer time periods. The calculator was an online tool for gathering, processing, storing and managing individual energy consumption data, and provided additional functionalities. Participants accessed the tool via the e2democracy portal, which allowed them to enter, process, calculate and continuously handle their individual CO_2-balances. Additional functions included access to different kinds of information about regional organisation units, newsletters, hints for energy saving etc.

[4] Bremen started the initiative in January 2010; Austrian and Spanish cities followed between April and autumn 2010, and the remaining two German cities began even later (Wennigsen, not yet included in the results, started last, in May 2011).

Via a web forum, users were able to gain support for using the tool and discuss experiences with other users.

The calculator was based on four main activities (energy supply – including electricity and heating, mobility, nutrition, consumption). Corresponding data were entered bi-monthly. Help texts provided calculation examples and guided users through the application. As a starting point for managing and maintaining their balance, users entered their consumption data and behavioural patterns based on the previous year to create the baseline measurement. This was the reference point for the first entry of actual data two months later. In the subsequent bi-monthly measurements users were able to carry over data from previous rounds to speed up data entry and reduce overall effort. Individual feedback allowed users to reflect on their own behaviours and inherent energy consumption routines. Opportunities for self-reflection were enhanced by particular forms of presenting feedback information to allow participants to alter their behavioural patterns and develop more climate-friendly ways of life. The tool provided four major features:

a) *Individual feedback:* for each period entered, users got instant feedback on their corresponding CO_2-balance (visualised by an interactive chart) broken down by activity and compared to the national average (see Figure 1);
b) *Comparative feedback over time:* changes of the CO_2-balance (in total and per item) were visualised in different charts and tables (see Figure 2);
c) *Comparative feedback with other groups:* the line-chart showed the individual curves compared to regional panels and similar households; bar-chart and table showed individual values plus emoticons by activity over time.
d) *Supporting information and learning opportunities:* information on options for energy-saving; options for interactive experimentation with individual reduction targets; feedback on how this affected the balance (e.g. calculating the amount of CO_2-reduction when saving 200 km per car or similar).

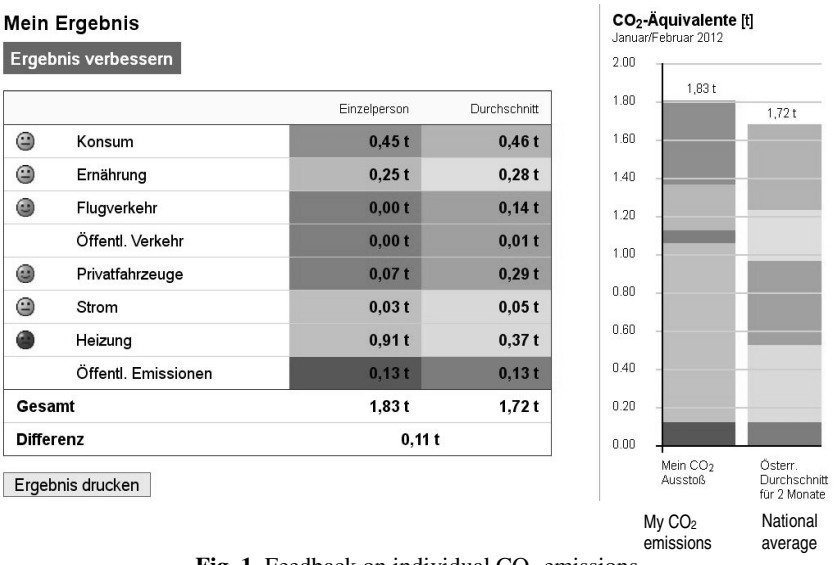
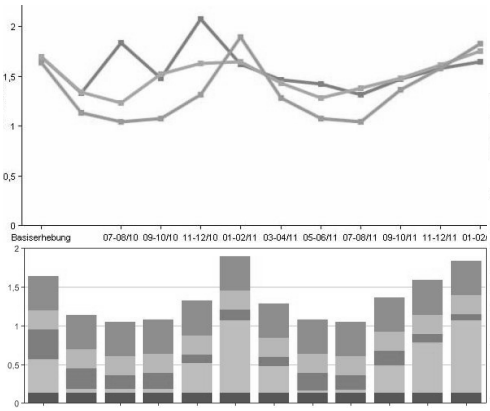


Fig. 1. Feedback on individual CO_2 emissions



	Konsum	0.45	0.45		0.45		0.45		0.45		0.45	
	Ernährung	0.25	0.25		0.25		0.25		0.25		0.25	
	Unterwegs	0.38	0.27		0.18		0.21		0.11		0.13	
	Privat-fahrzeuge	0.24	0.27		0.18		0.21		0.11		0.13	
	Öffentlicher Verkehr	0	0		0		0		0		0	
	Flugverkehr	0.14	0		0		0		0		0	
	Zuhause	0.44	0.05		0.05		0.05		0.39		0.94	
	Strom	0.03	0.02		0.02		0.02		0.04		0.03	
	Heizung	0.41	0.03		0.03		0.03		0.35		0.91	
	Öffentliche CO2-Emissionen	0.13	0.13		0.13		0.13		0.13		0.13	
	Gesamtemission	1.64	1.13		1.05		1.08		1.32		1.89	
	Wasserverbrauch pro Person (m^3)	6.67	6		6.5		5		6.5		5	

Fig. 2. Progression of individual CO_2 balance in comparison to others
Note: The tool in Spain did not provide line-charts, emoticons and recall at any time

4 Research Methods

The empirical results in the next section stem from a survey among the citizen panels in six locations: Zaragoza, Pamplona, Bremen, Bremerhaven, Bregenz and Mariazell region. The surveys took place after eight rounds of the bimonthly measurements of consumption records (mainly in late autumn 2011). The majority was carried out online; "offliners" got postal questionnaires. A total of 286 valid replies were received which split into 70% onliners and 30% offliners. The distribution by country was as follows: Austria: 14%; Germany: 29%; Spain: 57%.

An additional source was data on consolidated CO_2 balances from the carbon calculator. This data was used for an overview on effects in terms of individual changes of CO_2 balances over time and achievements of local climate targets. This analysis only included data from Austria and Germany to be able to consider participation processes of comparable long-term duration. By March 2012, 222 participants in Austria and Germany (i.e. 45% of a total of 496 initially registered) continuously participated and delivered data for the CO_2 measurements; over nearly two years altogether.

5 Empirical Results

5.1 Do Participants of Climate Initiatives Use the Eco-Feedback Offered?

The first research question investigated the actual use of information feedback provided by the carbon calculator. Participants were asked "How often do you take a look at the results of your personal CO_2 balance?" Table 1 shows the results which confirm the expectation that the participants of climate initiatives show interest in this sort of eco-feedback and used the information offered.

Table 1. Frequency of viewing personal CO_2 balance

			Never	Seldom	Frequently/ after each entry	Significance of differences
		N		Percentages		
Total		286	16	26	58	
Country	Austria	43	9	21	70	***
	Germany	81	2	11	86	
	Spain	162	25	35	41	
Medium	Offline	88	0	10	90	***
	Online	198	23	33	44	
Gender	Women	132	14	29	57	
	Men	145	16	23	61	
Age	below 40	54	39	26	35	***
	40 +	231	11	26	63	
Education	low	76	12	18	70	*
	high	198	17	27	56	

Notes: Chi square test, significance levels: ***: $p<0.001$; *:$p>0.05$

Overall a clear majority of panellists made use of the opportunity to inspect their CO_2 balances, at least from time to time; 58% even frequently or after each data entry. However, a closer inspection reveals significant differences by country, medium and age. Participants in Spain, particularly the onliners among them, viewed their personal balances less frequently than users in Austria and Germany. A similar difference concerns the participation medium: offliners reported much more frequent inspection (90%) than onliners (44%). The explanation seems to be twofold, pointing to the importance of effort and information presented: Offliners got a pro-active feedback via mail from support staff whereas onliners had to initiate the generation of their CO_2 balances themselves. The graphical presentation of feedback information offered by the Spanish calculator was more limited. Users were not able to view the graphic representation online at any time, but had to print or save it for the records; and it lacked historic feedback over the complete monitoring period. Another difference concerns the significantly higher rate of frequent viewing of CO_2 balances among older participants (63%) compared to the younger ones (35%). This is clearly linked to the medium effect explained and largely owed to the fact that older panellists were mainly offliners. The same explanation holds for a higher usage rate among participants with lower education. By contrast, men and women did not differ in their use of carbon-related eco-feedback.

5.2 How Do Participants Assess Effects of Eco-Feedback?

The survey results also offer information on self-assessments by citizen panellists on hypothesised effects of regular eco-feedback. Having practised regular personal CO_2 balancing for more than one year, panellists were well equipped to reflect and report on their views on effects discussed in the literature. The results offer a rather positive picture (Table 2). The vast majority of users confirmed learning effects (86%), awareness raising (89%) and valuable guidance on points for improvement (82%).

Table 2. Participants' assessments of effects of regular feedback on personal CO_2 balance

		"not at at all / to a little extent"	"to a great or very great extent"
	N	Percentages	
Learning about CO_2 impacts of own behaviour	281	14	86
Showing importance of own behaviour	282	11	89
Helpful guidance on improving own CO_2 balance	277	18	82
Comparison with others strengthens own efforts in climate protection	274	44	56
Comparison with others shows own efforts can be lessened	275	59	41

The opportunity to compare one's balance with others (panellists in the same region or country) was somewhat less appreciated. A slight majority (56%) confirmed the presence of an effort enhancing effect. However, there were also clear indications of the boomerang effect reported elsewhere [21]: 41% of the respondents largely admitted that the results of comparing their personal CO_2 balances to others led to the effect of lowering their own efforts.

5.3 How Far Does the Participatory Setting Support Individual Eco-Feedback?

An important test of the assumption that individual eco-feedback would be more effective when embedded in a collective participatory process is looking at the results of the participants' views on some aspects of this. One related finding is that more than two thirds of the panellists reported feelings of a community experience. Having been asked about specific effects of being part of a collective initiative, panellists confirmed most of them (Table 3): three quarters of participants agreed that the collective process alleviated barriers encountered at an individual level and that it strengthened individual efforts to change climate-related habits. The negatively formulated statement on the effect on one's personal CO_2 reduction conveyed no clear result and will thus be compared to carbon calculator results later.

Table 3. Participants' assessments of effects of engagement in collective effort

		"not at all / to a little extent"	"to a great / very great extent"
	N	Percentages	
Alleviates individual barriers	268	24	76
Has been irrelevant for own CO_2 reduction	269	46	54
Strengthens change of individual habits	268	25	75
Believe in importance of further initiatives	273	5	95

Another consequence of participating in the collective climate initiative, on which the panellists agreed the strongest (95%), was a shared belief in the importance of further common activities for climate protection. The interesting and significant relationship between community experience and the above reported effects additionally confirms for the beneficial role of the collective participation process: the presence of the effects tends to be higher, the stronger the community experience.

5.4 What Are the Impacts Regarding Local Climate Targets?

The initial aim of the citizen participation process was to trigger changing behaviours to achieve local climate targets. Our data on CO_2-balances are a valuable source, in addition to assessments by participants, to examine whether this goal has been reached. Figure 3 reveals an ambivalent picture:

Around two-thirds of the participants show a reduced carbon footprint after nearly two years. Individually this group has achieved the local targets and the panel as a whole saved about 0.036 tons of CO_2 per person within a two month period. This corresponds to the assumed positive effects of feedback. However, opposed to the improvements, there are also significant increases in CO_2 emissions among the remaining third. While CO_2 emissions decreased by 15% on average among the 146 cases with improved balances, they increased by 24 % among the 76 cases with worsened balances. In effect, the smaller number with negative trends caused 0.15 tons more CO_2 than the twice as big group with improved balances saved. Although the CO_2 emissions were reduced in total, this triggered a significant rebound.

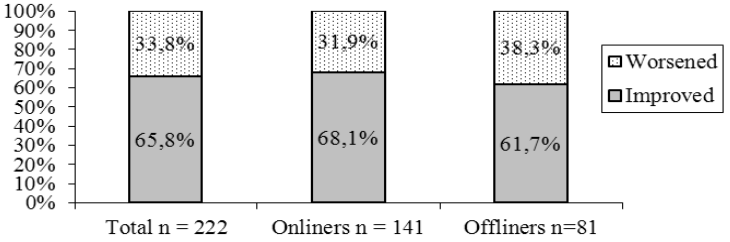


Fig. 3. Changes of individual CO2-balances over time

One reason is the lack of influence on individual energy consumption in one or more domains (e.g. no alterative transport options or no possibility to change heating system), which limits the capability to change behaviours and reduce energy usage. These results point to the complexity of behavioural patterns and social practices being shaped by a variety of factors.

6 Summary and Conclusions

As discussed in section 2, eco-feedback systems aim at inducing pro-environmental behaviour on individual levels based on two different rationales, i.e. rational choice or

norm activation models. Pointing to limitations of individual choice, theories of social practices and system transition to sustainability cast such a focus into doubt. Ecological economists suggest participatory approaches allowing for social learning, deliberation and joint action to further sustainable development. Our empirical results from six European cities confirm synergies of eco-feedback and (e-)participation approaches built on information sharing, CO_2 balancing and various forms of exchange offered by local governments collaborating with citizen panels on climate targets. In combination these three strands of (e-)participation establish collective social action which provides an important backing to individual efforts. The findings are encouraging but revealed certain limits as well:

Participants make use of eco-feedback via a carbon calculator if it is informative in a number of respects and available at any time. A strong majority of users reports effects from regular CO_2 balancing exercises, such as learning about impacts, awareness raising and guidance for reducing emissions. The strategy of comparing one's own energy balance to others is less sweeping since it brings many users to abating their endeavours. Results though confirm the crucial role of community experience to enhance individual efforts and empowerment. This substantiates assumed potentials of participation approaches in contrast to individually practised eco-feedback. However, this evidence is based on participants' own assessments. Regular measurements of behaviours are additionally needed to be able to seriously assess impacts on climate targets. These data show that assumed positive effects of feedback are strongly dependent on individual conditions of living. Changing behaviours towards more sustainable life-styles is not a linear process because energy consumption levels oscillate due to the interplay of various factors that complicate individual attempts to alter routines (ranging from seasonal peculiarities to limited controllability of energy supply, transport services, household equipment, etc.). This supports the criticism of rational-choice focused eco-feedback approaches as they neglect important factors and social practices. Currently most of these systems have a clear focus on triggering behavioural changes on an individual level. However, altering social practices not merely rests upon adapting individual behaviour but is closely entangled with value systems and structural constraints. Sustainability as a normative concept implicates joint action. Hence, the combination of eco-feedback and (e-)participation including modes of collaborative action reveals a strong and yet unexploited potential to strengthen sustainable citizenship.

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References

1. Hazen, S.: Environmental democracy. Our Planet 8(6) (1997)
2. Edwards, P., Hindmarsh, R., Mercer, H., Bond, M., Rowland, A.: A Three-Stage Evaluation of a Deliberative Event on Climate Change and Transforming Energy. Journal of Public Deliberation 4(1), Article 6 (2008)

3. Carson, L.: Growing up politically: conducting a national conversation on climate change. Australian Policy Online (2010), http://apo.org.au/commentary/growing-politically-conducting-national-conversation-climate-change
4. Bechtold, U., Ornetzeder, M., Sotoudeh, M.: WWViews in Austria – reflecting a citizen consultation project from a Technology Assessment perspective. In: Rask, M., Worthington, R., Lammi, M. (eds.) Citizen Participation in Global Environmental Governance, pp. 107–122. Earthscan Publications, London (2012)
5. Spagnolli, A., Corradi, N., Gamberini, L., Hoggan, E.E., Jacucci, G., Katzeff, C., Broms, L., Jönsson, L.: Eco-Feedback on the Go. IEEE Computer 44(5), 38–45 (2011)
6. Bottrill, C.: Internet-based carbon tools for behaviour change. Environmental Change Institute. University of Oxford (2007)
7. Padgett, J.P., Steinemann, A.C., Clarke, J.C., Vandenbergh, M.P.: A comparison of carbon calculators. Environmental Impact Assessment Review 28, 106–115 (2008)
8. Arroyo, E., Bonanni, L., Selker, T.: Waterbot: exploring feedback and persuasive techniques at the sink. In: Proc. CHI 2005, pp. 631–639. ACM Press (2005)
9. Thieme, A., Lawson, S., Weeden, J., Olivier, P., Kraemer, N.: BinCam: Waste Logging for Behavioural Change. In: Proc. CHI 2011, Vancouver, BC, Canada (2011)
10. Froehlich, J., Dillahunt, T., Klasnja, P., Mankoff, J., Consolvo, S., Harrison, B., Landay, J.A.: UbiGreen: Investigating a Mobile Tool for Tracking and Supporting Green Transportation Habits. In: Proc. CHI 2009, pp. 1042–1052 (2009)
11. Darby, S.: The effectiveness of feedback on energy consumption. A review for DEFRA of the literature on metering, billing and direct displays. University of Oxford, Oxford (2006)
12. Froehlich, J., Findlater, L., Landay, J.: The Design of Eco-Feedback Technology. In: Proc. CHI 2010, Atlanta, Georgia, pp. 1999–2008 (2010)
13. Pierce, J., Schiano, D.J., Paulos, E.: Home, Habit, and Energy: Examining Domestic Interactions and Energy Consumption. In: Proc. CHI 2010, pp. 1985–1994 (2010)
14. Patel, S.N., Gupta, S., Reynolds, M.S.: The design and evaluation of an end-user deployable, whole house, contactless power consumption sensor. In: Proc. CHI 2010, pp. 2471–2480. ACM Press, New York (2010)
15. Betz, M., Schwartz, T., Ramirez, L.: Energy Awareness and Conservation through Pervasive Applications. In: Workshop at Pervasive 2010, Helsinki, Finland (2010)
16. Blake, J.: Overcoming the 'value-action gap' in environmental policy: tensions between national policy and local experience. Local Environment 4, 257–278 (1999)
17. Pyrko, J., Darby, S.: Conditions of behavioural changes towards efficient energy use – a comparative study between Sweden and the United Kingdom. In: ECEEE Summer Study 'Act! Innovate! Deliver! Reducing Energy Demand Sustainability, pp. 1791–1800 (2009)
18. Gupta, R., Darby, S.: Action research approach for gaining, and providing, feedback on domestic energy use to understand occupant behaviour, perceptions and expectations. In: Proc. Energy and People: Futures, Complexity and Challenges, Oxford (2011)
19. Lanzarone, G.A., Zanzi, A.: Monitoring gas and water consumption through ICTs for improved user awareness. Information, Communication & Society 13(1), 121–135 (2010)
20. Schleich, J., Klobasa, M., Brunner, M., Gölz, S., Götz, K., Sunderer, G.: Smart metering in Germany and Austria – results of providing feedback information in a field trial. Working Paper Sustainability and Innovation, no. S 6/2011. Fraunhofer ISI, Karlsruhe (2011)
21. Thaler, R.H., Sunstein, C.R.: Nudge – Improving Decisions about Health, Wealth, and Happiness. Yale University Press, New Haven (2008)
22. Shove, E.: Beyond the ABC: climate change policy and theories of social change. Environment and Planning A 42(6), 1273–1285 (2010)
23. Garmendia, E., Stagl, S.: Public participation for sustainability and social learning: Concepts and lessons. Ecological Economics 69, 1712–1722 (2010)

Reference Process Model for Participatory Budgeting in Germany

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Abstract. Participatory budgeting has become a popular application of e-participation in Germany. About one hundred local governments have executed participatory budgets in the last year. Citizen participation in public budget planning is not formally requested by law in Germany. Also, the legal procedures to settle the budget of a local governments are not defined in detail. In consequence, different procedures exist, which lead also to different implementations of procedures in participatory budgeting. In this contribution, process models for (participatory) budgeting are investigated and a reference process model for traditional budget planning and online participatory budgeting is developed. Reference process models support cities and municipalities to assess the added value and to estimate the human and financial resources to execute participatory budgeting. Hence, comprehensive reference process models are helpful instruments for local governments to decide whether to perform participatory budgeting or not. They are also contributing to successful e-participation endeavors by providing conceptual models (blueprints) for scoping the activities to engage with citizens from the beginning of planning till the evaluation of impact and outcomes.

Keywords: E-participation, Participatory Budgeting, Process Model, Reference Model.

1 Introduction

Interest in local participatory budgeting in Germany arose in the late 1990s. During this time, the first municipalities in Germany started to let their citizens take part in the annual budget planning to the extent permitted by law. Since then, the engagement of citizens in local participatory budgeting has increased, especially through the support of foundations, ministries and local government organizations [17]. At present, 106 German municipalities are running participatory budgeting projects and further 9 municipalities have made a formal decision to introduce participatory budgeting in their local environment[1].

[1] See 5th status report available under http://www.buergerhaushalt.org/category/grundlagen/ and overview of municipalities with their status of decision or discussion under http://www.buergerhaushalt.org/status (last accessed 21st June, 2012)

E. Tambouris, A. Macintosh, and Øystein Sæbø (Eds.): ePart 2012, LNCS 7444, pp. 97–111, 2012.

Investigations in legal grounds have unveiled that participatory budgeting is not regulated by law. Legal grounds for municipal budgets in Germany only regulate the formal procedures within the public administration and the municipal council. Procedures to involve citizens in settling budgets of municipalities are not foreseen in the traditional budget planning procedures in Germany. However since the increased diffusion of the Internet, web platforms for online participatory budgeting have become popular. The participatory budgeting offers in German municipalities involve numerous ways of information and different levels of engagement as we will introduce later on. In earlier works, we argued that the successful introduction of e-participation requires the adaptation of given processes or even the introduction of new processes in the dialogue among citizens and politicians and/or local government officials when introducing online means [33]. Due to the lack of regulatory grounds, the procedures and extent of engaging citizens in on- and offline participatory budgeting offers differ widely.

Millard advocates the development of concrete practical recommendations for e-participation in a study for the European Commission [21]. Currently, publicly available and scientifically grounded guidelines barely exist for how to successfully introduce participatory budgeting in local governments. In Germany, administrations are therefore often consulted by private companies to introduce participatory budgeting. The lack of publicly available reference models guiding governments at local level to introduce e-participation offers resulted in many different approaches, which are in most cases kept confidential due to the business models of private firms. Municipalities, which intend to introduce e-participation, have difficulties to assess the implications and (financial and human) resources needed to introduce e-participation offers. Since the planning, organization and running of a participatory budget does mean big efforts for a city or municipality, this paper investigates and develops a reference process model for participatory budgeting procedures and therewith extends the reference procedural model (see [33,34]) with particular reference process models for participatory budgeting.

The remainder of the paper is as follows: next section introduces the theoretical background on public and participatory budgeting at local level in Germany. Section 3 provides a basic understanding of reference process models in literature. An investigation of related work in terms of reference process modeling in e-participation in section 4 concludes the analytical part of the paper. Section 5 describes the research design for developing the reference process models in participatory budgeting. The process model for traditional budgeting at municipal level is introduced in section 6, while the reference process model for participatory budgeting is presented in section 7. We conclude with a discussion of reference process modeling and the added value thereof in e-participation (see section 8).

2 Budgeting in Germany

2.1 Traditional Communal Budgeting in Germany

The German Constitution regulates in its art. 28 (2) the autonomy of local governments (municipalities and cities). This includes independence and self-

responsibility in financial aspects. The municipalities are authorized by the budget bye-law of each particular German State to enact a budget bye-law for each fiscal year [1,2]. Bye-laws of the German States incorporate formal procedures to establish the budget plans of a city or municipality for the upcoming year. Based on this legal ground, local governments build up their annual budgets according to their individual bye-laws (Gemeindehaushaltsverordnung - GemHVO of each city or municipality).

Through communal budgeting and the setting of revenues and expenses involved, the local capacity to act in the following year is determined. The most comprehensive part of the budget bye-law is the budget. The communal budget governs the financial resources for the obligatory tasks (as e. g. police and school), optional tasks (as e. g. sport and cultural offers) as well as internal tasks (as e. g. controlling, administration) of the municipalities. The budget has impact on the citizens and companies within the territory, in some cases also on visitors (as e. g. tourists, commuters).

The process to draft the communal budget is not explicitly defined in the bye-laws of the German States, so that each municipality can arrange the process according to its own preferences and practices. All bye-laws contain the regulation that the budget bye-law is to be deliberated and decided only by the municipal council in a public session [2].

In general, the traditional procedure to set up a budget for the year to come does not foresee any involvement of citizens in the planning of the budget. Direct influence of citizens on the budget bye-law and thus on the budget (e. g. through citizens' decisions or petitions for a referendum) is even forbidden by law in German States, except in Berlin, North Rhine-Westphalia, and Saxony. In these States, statutory provisions in the bye-laws entitle citizens to get access to the draft budget plans (before enacting) and allow them to raise objections in written form. These objections need to be debated in a public session of the council. After the bye-law is in force, no objections can be raised formally any more. The bye-laws of the other 13 German States do not contain any statutory provisions for a right of access or objections. Since municipalities are autonomous, they are allowed to entitle citizens to participate in the budget planning (as this is not forbidden in the bye-laws). To conclude the legal investigations, citizens' participation is generally possible at municipal level, as the bye-laws do not preclude this.

As a consequence of complex budgeting procedures in German local governments, only a very limited number of municipalities or cities applies currently participatory budgeting (less than 1 % of German cities and municipalities). Since the budget of local governments has an impact on the interests and the living quality of citizens and firms settled in the territory, this is quite astonishing. The main question for the investigation at hand is therefore to understand how the process of preparing a municipal budget is formed, which participation possibilities exist for citizens and how to integrate a participatory budget in the traditional process of municipal budget planning. We argue that reference

process models and guidelines to perform participatory budgeting online and offline can support successful implementation of local budgeting procedures.

2.2 Participatory Budgeting

Porto Alegre (Brazil), which implemented the first participatory budget in 1989 to fight corruption in administrations [35,36], is one of the most studied cases in the field of participatory budgeting (see e. g. [4,15,22]). Participatory budgeting in Porto Alegre is running throughout the year and composed of four main phases [15, p. 54]: (1) prioritizing topics through citizenship, (2) elaborating the budget proposal, (3) enacting the budget in city council and (4) elaborating, implementation and control of the investment plan.

Turning focus onto the German territory, participatory budgeting is implemented since the late 1990s on communal level. Participatory budgets in Germany aim at providing citizens the possibility to have influence on the prioritization of distributing public budget to particular communal tasks and duties. Participatory budgeting in Germany is not a form of direct democracy, because the budget law rests with the municipal and city councils. The implementation of participatory budgeting varies broadly on how citizens can express their ideas and proposals and how these can be integrated and considered in the budget [8,16,13,12]. Below, the aims, target groups, criteria for participatory budgets, phases of, and cycle for participatory budgeting are summarized:

Aims. [8, p. 9], [9, p. 10], [16, p. 5] and [24] affiliate the following aims with participatory budgets:

- *Acceptance.* Increase citizens' acceptance and legitimacy in the realization of local political decisions and political aims.
- *Accountability.* Reinforce accountability of local and regional governments.
- *Efficiency.* Support administrations in their tasks.
- *Decision support.* Provide decision support for politicians through consultation with citizenship.
- *Transparency.* Provide transparent budgets and budgeting procedures to citizenship.
- *Democratization.* Reduce disenchantment with politics and democracy through citizens' participation.
- *Solidarity.* Support citizens among each other in their concerns.

Target groups. In general, no specific target group is specified for participatory budgeting. All citizens — independent from age and education — should have the opportunity to provide their suggestions to drafts of public budgets. As the Internet enables access from anywhere and by everybody, some discussion is recognized about whether contributors to participatory budgeting discourses should be limited to citizens living in the territory of the local government. Particular investigations of this issue could not be found in literature, though.

Criteria for participatory budgets. Since no particular regulations exist for participatory budgets, a set of criteria is put forward in [27, p. 13] to determine whether citizens' participation in budgeting is a participatory budgeting:

1. *Focus.* The focus of citizens' participation in the budget lays on financial issues with limited resources.
2. *Scope.* The participation takes place in a whole city or a district with own political and administrative competences and with it's own administration.
3. *Regular effort.* It is a question of a lasting and repeated procedure. A one-time open council concerning financial issues is not a participatory budget.
4. *Public debate.* The process of participatory budgeting bases on independent public debates, whereby the medium (e. g. Internet, councils) can be chosen freely. Written-only surveys on budget financing or a public council meeting are not considered as participatory budgets.
5. *Accountability publicly accessible.* Statements of account about the results of the participation phase must be available and accessible to the general public.

Phases of participatory budgeting. Communal budgeting phases — and participatory budgeting alike —, can vary, because no statutory provision is in place. [8, p. 14], [14, p. 77 ff], [16, p. 9 ff.] and [20, p. 36] suggest five phases:

1. *Initiation and Design.* Initiation of the project includes the decision on the implementation of the participatory budgeting project, and formulation of objectives. It also includes the draft of the budget, in which the council is elaborating the conditions of the budget.
2. *Preparation.* Design of the project including design of participation processes and selection of technical tools.
3. *Implementation.* Implementation and preparation of the project including implementation of technical components, preparation of documents, and marketing strategy.
4. *Realization.* Realization of participatory budgeting with the following subphases:
   – Information. Citizens are informed through different channels about the budget, the content and procedure of the budgeting.
   – Participation. Citizens' participation in budgeting with focus on the development and rating of proposals.
   – Decision-making. The panel (usually a city or municipal council) debates the proposals of the participation endeavor and their implementation.
   – Accountability. To ensure the plausibility and acceptance of participatory budgets, account for budget decisions and their implementation is to be given by the city or municipal council.
5. *Evaluation.* Evaluation has twofold purposes: (a) evaluation of the participatory budgeting project against its objectives in regards to expectations and impact achieved; and (b) evaluation of needs for improvement in a next iteration of participatory budgeting.

Above synthesis of literature indicates the existence of general recommendations and guidelines for performing participatory budgeting at municipal level in Germany. The form of documentation is usually in text format. Reference process models could not be found in the sources investigated. Based on the aims of the paper, next section provides an understanding of reference process modeling from literature.

3 Reference Process Modeling

A reference model is a conceptual model that can be reused in a multitude of ways. Many definitions exist for reference models [30,7,38,10]. [10] distinguish three features of reference models, which the authors extracted from literature (p. 4): (a) a reference model provides recommended or best practices; (b) a reference model does not represent a particular enterprise, but a class of domains and is valid for this; and (c) reference models can be understood as blueprints for information systems development. [10] argue that not all of these characteristics are in agreement with other authors. [39] focuses for example on the aspect that a reference model is used to support the "construction of other models" (p. 491), i.e. as blueprint for the development of other models. The "Design by Reuse Paradigm" of reference modeling is also used e. g. in [19,28]. Reference models, which are used as blueprints for the construction of other models or as "model patterns" [11], usually need to be adapted to the particular application case [28]. However, the reuse of existing conceptual models facilitates and usually speeds up the development of an information system environment as is strongly recommended in enterprise architecture literature (see e.g. [32]).

The research in this paper bases on the "Design by Reuse Paradigm" for reference models. The aim is to base the reference models on recommended practices of participatory budgeting and to provide a reference process model of a "participation process" view as blueprint, which is commonly practiced in information systems development [39,11,28,32]. Thereby, a visual business process model serves as a formal presentation of the participatory budgeting procedure in order to minimize the possibility for different interpretations of the same model (as argued in [3]). Visual presentations support the stakeholders in understanding the models (ibid). Van der Aalst et al use the term business process modeling "to characterize the identification and (typically rather informal) specification of the business processes at hand" [3, p. 8]. The authors include the "modeling of activities and their causal and temporal relationships as well as specific business rules that process executions have to comply with" in this definition [3, p. 8]. Our understanding of designing and using reference process models for participatory budgeting is based on this concept of business process modeling.

4 Related Work

Reference models and reference process models for e-government exist for a while (see e. g. [6,29]), but only a few target e-participation. Based on the participatory

budgeting approach in Cologne and other German cities, [20] propose a guideline for communal e-participation projects, which includes a business process modeling for parts of the participatory budgeting procedure. The authors use event-driven process chains (EPC) as notion for the process model. The process models in [20] do not detail the participation phase, though.

Comparable with a reference process model language for e-participation is the approach of Ali et al, which proposes a collaboration pattern language to design architectures for e-participation systems [5]. The aim of their approach is to provide guidance to help the designers of e-participation systems to choose suitable collaborative technologies. The proposed pattern language is based on the work in the areas of collaboration engineering and software engineering. The main tasks proposed in the approach focus on the selection of adequate collaboration patterns [5]: develop a high-level participation description; develop a use context diagram; identify collaborative participation family; select relevant atomic collaboration patterns; and map collaboration patterns onto technology patterns. The approach focuses on the design phase of an e-participation project. It does not present any particular participation process model in terms of a business process model for e-participation.

The investigations on reference process models for e-participation have unveiled that process models for e-participation barely exist as general reference process models. We therefore develop a reference process model for participatory budgeting in Germany. Next section introduces the underlying research design, while the reference process models are presented thereafter.

5 Research Design

The research design to develop reference process models for e-participation started with a literature study. The research involved investigation of reference process models in different e-participation areas (including the e-participation domains consultation, urban planning, lobbying, petitioning and participatory budgeting). For the sake of space, this paper focuses solely on the domain of participatory budgeting. The literature investigation resulted in an insight into the procedures and respective legal grounds of budgeting at communal level in Germany (cf. sections 2.1 and 2.2). It unveiled the lack of reference process models for the domain (cf. summary in section 4 for the related work). Subsequently, case analysis of existing participatory budgeting projects (including completed and running projects) in Germany was conducted. A selection of participatory budgeting projects was chosen for the investigation of process models to derive a reference process model. The selection is based on a list of criteria, including actuality of the project, impact reached, quality of the processes, results and the platform. As a result, three German participatory budgeting projects have been selected for analysis: Cologne[2], Hilden[3], and Berlin-Lichtenberg[4].These cities

[2] https://buergerhaushalt.stadt-koeln.de, see also [37]
[3] http://www.hilden.de/online/board/index.php, see also [8]
[4] http://www.buergerhaushalt-lichtenberg.de, see also [18]

implement participatory budgeting for several years and have frequently advanced the projects. In addition, they pursue different approaches regarding type of proposed topics, rating of proposals, use of the participation platform and the Internet, so that the source of information for the reference process model is sufficiently large and suitable for developing a reference process model.

The development aimed at deriving a reference process model for the traditional public budgeting procedure as well as one for the (online) participatory budgeting procedure at local level in Germany. First, the traditional budgeting process has been designed and modeled. Then, the models for the participatory budgeting process supported by e-participation platforms has been elaborated. Modeling of processes is performed in Business Process Modeling Notation (BPMN). This notation was chosen because of its expressive power [23], which supports modeling of typical business processes [26]. BPMN is used for process documentation and optimization, communication among stakeholders and business analysts as well as for technical purposes (as e. g. process simulation) [25]. BPMN was favored over other modeling notations (e. g. event-driven Process Chains (EPC) [31]), because it is standardized and widely known on international scale. Besides being an international standard notion and having wider expressiveness, BPMN was also selected as it offers the possibility to declare process ownerships represented in pools with swim-lanes.

6 Process Model for Traditional Participatory Budgeting

The traditional process refers to the procedure of communal budgeting as described in section 2.1. The phases have the following structure and content:

Preparation of the budget. In this phase, the preparation of the budget starts based on usual bottom-up budgeting, in which the chamberlain asks the administrative offices for notifications of demand. After preparation of a first administrative draft, the chief officers and mayors are consolidating this draft. Following, the chamberlain prepares the draft of the budget bye-law.

Debate. In this phase, the expert and finance committees are debating the budget bye-law to prepare it for the final agreement and Enactment. In the cases where citizens are entitled to take opposition against the budget, the budget is laid open to public inspection for a given period. During this phase (usually 14 days), citizens can raise a plea in written form. The public inspection needs to be announced based on the bye-law in the customary proedures in a place. The arguments handed in during the public inspection phase are discussed by the expert and finance committee and included in the draft budget bye-law if relevant and reasonable.

Enactment. The focus in this phase lays on the public session of the municipal council, in which the draft budget bye-law and herewith the budget itself is decided. This session is regulated by law in all States in Germany. If citizens raised pleas, these are consolidated in the public session of the council. The

citizens have no right of co-determination in the budget bye-law and therewith also not for the budget. The result of the public session is the decided budged bye-law.

Financial control and entry into force. The budget is controlled by the regulatory authority in the case this is regulated by law. Finally the decided budget is laid open to public inspection for usually 7 working days and the budget bye-law comes into effect by the first January of the next year.

Monitoring and accountability. In the last phase, the budget bye-law enacted is monitored and controlled along and after the end of the year it was in force. The audit court may inspect the implementation of the bye-law and in any case, the mayors have to give account for the spending of the past year in subsequent council meetings. Any conspicuous features have to be explained and resolved. Lessons from the penultimate year feed into the budget planning of the next year, starting again with phase 1.

The reference process model for the traditional procedure is visualized in Figure 1, lower stream of the process model. The model describes the coarse-grained view of the reference process model for both, traditional (lower part) and participatory budgeting (upper part). The tasks of each phase of budgeting are decomposed into more detailed models in a subsequent step. For the sake of space, these modes are omitted in this publication.

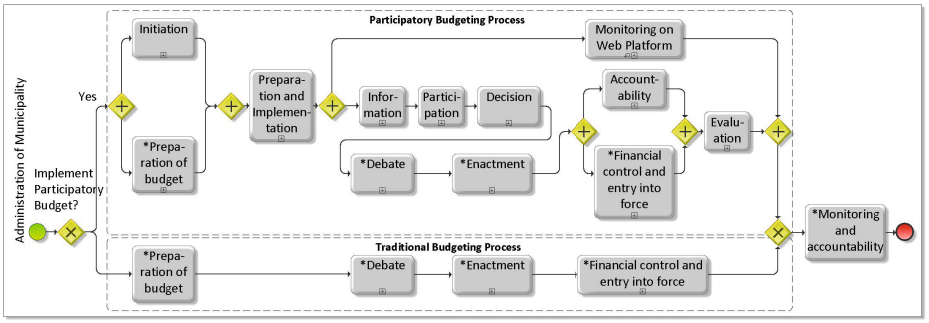

Fig. 1. Reference process model for annual public budgeting (lower part) and participatory budgeting (upper part) at communal level in BPMN notation. The * indicate steps regulated by law.

7 Reference Process Model for Participatory Budgeting

The reference process model for participatory budgeting with e-participation is visualized in Figure 1 (upper part). The model visualizes the steps grounded in law with an asterisk (*). In addition to the traditional process phases as described in section 6, the model accommodates the following phases (or revises/extends traditional phases) for participatory budgeting:

Initiation. In addition to the traditional preparation phase, the organizational structures for the implementation of the participatory budget are to be settled. Also, planning tasks for the online participation as e. g. instruments, contents, deadlines, public relations, marketing etc. are to be coordinated and initiated. Parallel to this phase, budget consultations are taking place inside the local administration (see task "*Preparation of budget" in section 6).

Preparation and implementation. First part in this phase is to set up the web platform and other technical means. Besides that, the topics of the participatory budgets are decided. The latter may involve citizens. However, the experiences from the three projects analyzed indicate that settling the topics to be discussed in the participatory budgeting by administrations is accepted by citizens. Hence, the reference process model does not foresee a collaborative step to determine the topics of discussion in participatory budgeting. This way, also time is saved in the preparatory phase. Another task in this phase is the preparation of media material as e. g. printing of brochures, contacting media.

Information. This phase aims to reach all citizens with different channels with the purpose to inform them and invite them to participatory budgeting. In many cases, a kick-off is held as an opening session, where citizens get all necessary information about cycle, aims, participation methods etc. of the participatory budgeting initiative. Information about the budget and the corresponding financial dependencies are to be presented in a transparent and easy understandable manner. The preparation and dissemination of information needs to ensure that all relevant target groups are addressed, including underrepresented groups. Plurality in media is important to inform all citizens likewise. Thereby, limited time as well as receptiveness of citizens is to be kept in mind.

Participation. This phase tackles the real participation of citizens. It has to be transparent and traceable and is divided into two sub-processes: (a) enable citizens to provide proposals, and (b) citizens rate and comment proposals. The means to express comments and proposals must enable different channels and ways. The central point is the participation platform, which usually embodies different e-participation tools such as discussion forum, wiki, etc. Citizens are invited to post their proposals through the online platform. Other possibilities to submit proposals are oral or written interventions at consultation hours or inputs provided during public sessions, submission of proposals by phone or by post. All proposals submitted through alternative ways are transferred to the participation platform by editorial staff and can be viewed by all citizens. To ensure that all citizens have the same participation opportunities, PCs with internet access can be provided free of charge in public buildings. In the second sub-process, the option to submit further proposals is closed. Submitted proposals can be commented and rated. The result of the overall participation phase is a ranking list, which contains the best ranked proposals. A moderator accompanies the participation and sums up the contributions from citizens. Figure 2 visualizes the corresponding detailed reference process model for the participation phase.

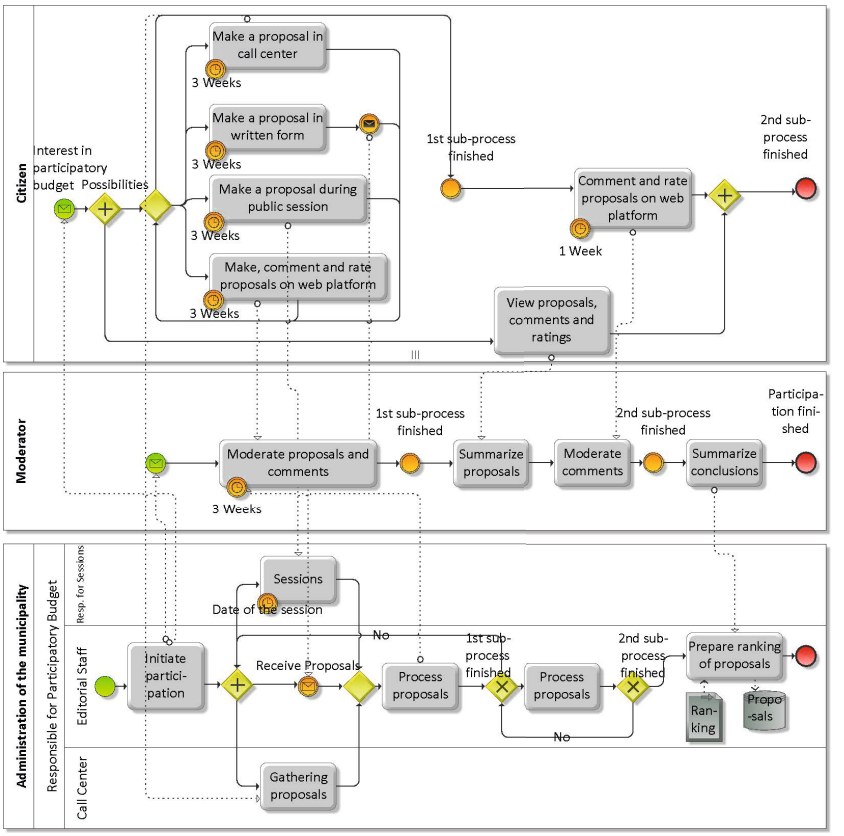

Fig. 2. Detailed process model for the participation phase of the overall reference process model of participatory budgeting (see upper part of Figure 1)

Decision. The results from the participation phase must be taken into account by the local council. In the decision phase of the participatory budgeting, the ranked proposals from the deliberation are discussed in a committee — usually set up by the city or municipal council. This committee advises on the inclusion of the proposals in the public budget and their implementation. Affiliated costs and plans for implementing the proposals through the administration are to be prepared transparently. The results of the consultation are to be made available to citizens on the web platform.

Accountability. Here, account is given about accepted and refused proposals. Accounts have to be formulated in a comprehensible way and must be easily available to all citizens. A time frame regarding the implementation of accepted proposals is to be included. Citizens are informed through the media already used in the information phase as these are familiar to them.

Evaluation. The evaluation phase concludes the participatory budgeting endeavor. Evaluation analyzes limitations and problems of the participatory budget and the affiliated process of citizen participation. It also assesses impact of, and transparency in the public participation through different means. Insights from evaluation help to avoid similar problems and issues in the next iteration of participatory budgeting. The evaluation has to directly incorporate citizens with questionnaires, in which they can report the pros and cons of the participatory budget. In addition, an independent organization can perform an assessment of the endeavor in regards to its objectives, process and principles followed along the participation process.

The phases of traditional public budgeting have already been described in section 6 and are not repeated here. Next section discusses the differences and added value of reference process models as conceptual models for e-participation.

8 Discussion and Added Value of Reference Process Models for E-Participation

The reference process model in Figure 1 shows differences between traditional and participatory budgeting: while the traditional process looks more straightforward and tiny, the participatory budgeting process contains more phases, as the participation steps need to be integrated in the traditional process. The participation process is detailed in Figure 2. The reference process model shows that participatory budgeting requires careful planning and investment of resources to perform such an endeavor successfully. The research indicates that involving citizens in the budget planning calls on the one hand for more time in the overall process, and resources (financial and human) to deal with the inputs from citizens through a multitude of channels. Also, independent third parties play an important role when it comes to moderate and sum up proposals from citizens for the final rating thereof. If the latter would be performed by the local administration, it would be perceived as intervention from the local government and would therefore not be considered neutral any more. On the other hand, participatory budgeting enables citizens to propose and influence local politics in regards to where taxpayers' money is to be invested. The endeavor also brings more transparency and insight of citizens into the annual budget planning, which in turn may result in a better relation between citizens and local politics. The local administration is thereby considered a supportive body that provides the facilities and implements the participatory budgeting.

The reference process models developed serve as blueprint for local governments to understand the implications of setting up participatory budgeting in their local environments. So far, it has been difficult for local governments to get such understanding without the efforts of external consultancy. The target users of the reference process models as presented here are local public administrations and other interested institutions, which aim at introducing participatory budgeting in their environment. The reference process models are focusing on the German budgeting procedures and legal grounds.

The reference participation process models such as the ones introduced in this paper complement the e-participation reference framework (see [34]) with a library of blueprints of process models. This way, the reference framework is enriched with concrete instances of model artifacts targeting the process view.

Further research is planned in three directions: first, the reference process model for participatory budgeting is to be analyzed and extended for fitness on international scale. Second, reference process models for other e-participation areas are planned to be added to the library. Third, evaluation of the models in practice will evidence their applicability and and usefulness in practice. Thereby, issues such as actuality and simplicity (vs. sometimes too complex models that contain too much information) of models will be investigated.

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References

1. Der kommunale Haushaltsplan, 1. Teil - Allgemeine Einleitung und Begriffsdarstellungen. Wegbeschreibung für die kommunale praxis, Friedrich-Ebert Stiftung and Arbeitsgruppe Kommunalpolitik (2003)
2. Der kommunale Haushaltsplan, 6. Teil - Die Aufstellung und Ausführung des Haushaltsplans. Wegbeschreibung für die kommunale praxis, Friedrich-Ebert Stiftung and Arbeitsgruppe Kommunalpolitik (2003)
3. van der Aalst, W.M.P., ter Hofstede, A.H.M., Weske, M.: Business Process Management: A Survey. In: van der Aalst, W.M.P., ter Hofstede, A.H.M., Weske, M. (eds.) BPM 2003. LNCS, vol. 2678, pp. 1–12. Springer, Heidelberg (2003)
4. Abers, R.: Learning democratic practice: distributing government resources through popular participation in Porto Alegre, Brazil. In: Freire, M., Stren, R. (eds.) The Challenge of Urban Government: Policies and Practices, vol. 130. World Bank Publications (2001)
5. Ali, H., Macaulay, L., Zhao, L.: A Collaboration Pattern Language for eParticipation: a Strategy for Reuse. In: Proceedings of the 9th European Conference on e-Government, pp. 29–38. Academic Publishing International, London (2009)
6. Becker, J., Algermissen, L., Delfmann, P., Niehaves, B.: Konstruktion konfigurierbarer Referenzmodelle für die öffentliche Verwaltung. In: Dittrich, K.R., König, W., Oberweis, A., Rannenberg, K., Wahlster, W. (eds.) INFORMATIK 2003 - Innovative Informatikanwendungen, Band 1, P-34, pp. 249–253. Koellen-Verlag for Gesellschaft für Informatik, Bonn (2003)
7. Becker, J., Niehaves, B., Knackstedt, R.: Bezugsrahmen zur epistemologieschen Positionierung der Referenzmodellierung. In: Beckeer, J., Delfmann, P. (eds.) Referenzmodellierung: Grundlagen, Techniken und domänenbezogene Anwendung, pp. 1–18. Physica-Verlag, Heidelberg (2004)
8. Behrens, F., Pröhl, M.: Kommunaler Bürgerhaushalt: Ein Leitfaden für die Praxis. Innenministerium des Landes Nordrhein-Westfalsen, Bertelsmann Stiftung (2004)

9. Bogumil, J., Holtkamp, L.: Bürgerkommune konkret: Vom Leitbild zur Umsetzung; ein Leitfaden für die kommunale Praxis. Friedrich-Ebert-Stiftung, Stabsabt (2002)
10. Fettke, P., Loos, P.: Perspectives on Reference Modeling. In: Fettke, P., Loos, P. (eds.) Reference modeling for business systems analysis, pp. 1–21. IGI Global (2007)
11. Fettke, P., Loos, P.: Classification of reference models: a methodology and its application. Information Systems and E-Business Management 1, 35–53 (2003)
12. Franzke, J., Kleger, H.: Bürgerhaushalte: Chancen und Grenzen, vol. 36, edition sigma (2010)
13. Ganuza, E.: Bürgerhaushalte in Spanien: Mobilisierung von Bürgerinnen und Bürgern. In: Dokumentation - Internationaler Kongress zu Modellen des Bürgerhaushalt Modelle Bürgerhaushalte, pp. 30–34 (2010)
14. Günther, A.: Der Bürgerhaushalt: Bestandsaufnahme - Erkenntnisse - Bewertung. 1. auflage edn. Boorberg (2007)
15. Herzberg, C.: Der Bürgerhaushalt von Porto Alegre, vol. 9. LIT Verlag, Münster (2002)
16. Herzberg, C.: Bürgerhaushalt in Grossstädten. Bundeszentrale für politische Bildung (2005)
17. Kersting, N.: Politische Beteiligung: Einführung in dialogorientierte Instrumente politischer und gesellschaftlicher Partizipation. Bürgergesellschaft und Demokratie. VS Verlag für Sozialwissenschaften (2008)
18. Klages, H., Daramus, C.: Bürgerhaushalt Berlin-Lichtenberg: Partizipative Haushaltsplanaufstellung, -entscheidung und -kontrolle im Bezirk Lichtenberg von Berlin. Abschlussbericht zur begleitenden Evaluation. Deutsches Forschungsinstitut für Öffentliche Verwaltung (2006)
19. Lee, H., Irani, Z., Osman, I.H., Balci, A., Ozkan, S., Medeni, T.D.: Research note: Toward a reference process model for citizen-oriented evaluation of e-Government services. Transforming Government: People, Process and Policy 2, 297–310 (2008)
20. Märker, O., Wehner, J., Gölz, S.: Leitfaden für kommunale E-Partizipations-Verfahren. Technical report, Fraunhofer IAIS, Zebralog (2009)
21. Millard, J.: eParticipation recommendations - focusing on the European level. Deliverable 5.1, Study and supply services on the development of eParticipation in the EU (2009)
22. Novy, A., Leubolt, B.: Participatory budgeting in Porto Alegre: social innovation and the dialectical relationship of state and civil society. Urban Studies 42, 2023–2036 (2005)
23. OMG: Business Process Modeling Notation, V2.0. Omg available specification. Object Management Group (OMG) (2011), www.omg.org/spec/BPMN/2.0/
24. Peixoto, T.: Beyond Theory: e-Participatory Budgeting and its Promises for eParticipation. European Journal of ePractice 7, 1–9 (2009), http://www.epractice.eu/files/7.5.pdf
25. Recker, J.: BPMN Modeling–Who, Where, How and Why. BPTrends 5, 1–8 (2008)
26. Recker, J., Indulska, M., Rosemann, M., Green, P.: How Good is BPMN Really? Insights from Theory and Practice. In: Ljungberg, J., Andersson, M. (eds.) Proceedings 14th European Conference on Information Systems (2006)
27. Röcke, A., Herzberg, C., Bloch, M.: Verfahren und Modelle des Bürgerhaushalts und ihre Umsetzung in Deutschland. In: Dokumentation - Internationaler Kongress zu Modellen des Bürgerhaushalt, pp. S.13–S.21, 13–16 (2010)
28. Rosemann, M., van der Aalst, W.M.P.: A configurable reference modelling language. Information Systems 32, 1–23 (2007)

29. Schaffroth, M.: R014 - Referenzmodell eGovernment-Portale. Referenzmodell. Informatikstrategieorgan Bund (2006)
30. Scheer, A.W.: ARIS - House of Business Engineering: Konzept zur Beschreibung und Ausführung von Referenzmodellen. In: Becker, J., Rosemann, M., Schütte, R., (eds.): Referenzmodellierung: State-of-the-art und Entwicklungsperspektiven, pp. 2–21. Physica-Verlag (1998)
31. Scheer, A.W.: ARIS - Modellierungsmethoden, Metamodelle, Anwendungen, vol. 4. Springer, Berlin (2001)
32. Schekkerman, J.: Enterprise Architecture Tool Selection Guide, vol. Version 6.3. Institute For Enterprise Architecture Developments (2011), http://www.enterprise-architecture.info/Images/EA%20Tools/Enterprise%20Architecture%20Tool%20Selection%20Guide%20v6.3.pdf
33. Scherer, S., Wimmer, M.A.: Reference Framework for E-participation Projects. In: Tambouris, E., Macintosh, A., de Bruijn, H. (eds.) ePart 2011. LNCS, vol. 6847, pp. 145–156. Springer, Heidelberg (2011)
34. Scherer, S., Wimmer, M.A.: E-participation and Enterprise Architecture Frameworks: An Analysis. Information Polity 17(2) (2012)
35. de Sousa Santos, B.: Participatory budgeting in Porto Alegre: toward a redistributive democracy. Politics and Society 26, 461–510 (1998)
36. Souza, C.: Participatory budgeting in Brazilian cities: limits and possibilities in building democratic institutions. Environment & Urbanization 13, 159–184 (2001)
37. Taubert, N., Krohn, W., Knobloch, T.: Evaluierung des Kölner Bürgerhaushalts. Tech. rep., University of Bielefeld for the City of Cologne. Technical report (September 2010)
38. Thomas, O.: Das Referenzmodellverständnis in der Wirtschaftsinformatik: Historie, Literaturanalyse und Begriffsexplikation. Institut für Wirtschaftsinformatik im DFKI 187, 5–32 (2006)
39. Thomas, O.: Understanding the Term Reference Model in Information Systems Research: History, Literature Analysis and Explanation. In: Bussler, C.J., Haller, A. (eds.) BPM 2005. LNCS, vol. 3812, pp. 484–496. Springer, Heidelberg (2006)

Getting Teenagers to Participate: A Survey of the Youth Council of the City of Lausanne

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Abstract. This paper discusses the results of a survey on a concrete case of eParticipation, i.e. a campaign to get teenagers to participate in the Youth Council of the City of Lausanne. We analyse both the traditional tools (billboard ads, newspapers, official communication through schools) and the online tools (Web page, Facebook, YouTube). During our survey we used mixed methods: an online questionnaire (1360 respondents), documentary analysis of the Youth Council candidates' application files, and interviews. We then analysed the impacts of the campaign in terms of participation under different angles, amongst other diffusion channels and use of humour.

Keywords: eParticipation, social media, youth council, persona, campaigning, survey, channels.

1 Introduction

eParticipation is a research domain that is growing but where concrete surveys are not so numerous. This paper is reporting on one such survey, where we analysed a campaign that aimed at raising applications for the Youth Council of the City of Lausanne. This campaign used traditional communication channels (billboard ads, newspapers), as well as Internet, Facebook and YouTube. Indeed the person in charge of the Youth department of the City of Lausanne staged an online campaign playing with clichés on civil servants and tried to raise a buzz around the Youth Council.

We used an online questionnaire that was sent through a job market website for teenagers and students. We received a surprising high number of answers (1360). Furthermore we were able to analyse the applications files of all candidates and we conducted a set of interviews with five candidates that were elected to the Youth council. We studied the impacts of the campaign under different angles, such as diffusion channels, or use of humour.

1.1 Youth Council of the City of Lausanne

In 2004 a member of the Parliament of the City of Lausanne asked for the creation of Youth Council for the City of Lausanne, as well as for the surrounding municipalities.

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In 2009 the city government presented a report that defined the legal framework for such a project. It was based of the Swiss Federal Constitution that recognises the rights of the youth to participate and to express their ideas and their needs, and on the Constitution of the Canton of Vaud that states that the Canton and the municipalities should prepare kids and teenagers for their future citizen rights, by supporting various forms of participative experiences.

The Youth Council comprises 60 members between 13 and 25 years old, living, working or studying in Lausanne

- 4 seats for University students;
- 12 seats for professional schools;
- 13 seats for high schools;
- 13 seats for secondary schools;
- 18 seats for various representatives of the city's life and associations.

The Youth Council has an annual budget of CHF 100'000.-, amongst which 30'000 to support projects launched by young people, 50'000 to celebrate those who become of voting age (a book is sent to all residents turning 18) and 20'000 for the operating budget. The members of the Youth Council do not have any reimbursement.

1.2 Recruiting Campaign

The City's delegate of youth affairs wanted to create a persona to be able to relate more directly with young people. "*We did not want a super-hero, it was quite the opposite. We wanted a persona that would look like a classical civil servant. (…) We wanted to talk to the youths, but they are not uniform. We were looking for something funny and off the beaten path, in order to show that the City was not too serious and that the Council was not a thing for old people."* The delegate, assisted by a communication agency, created a persona called "Jean-Michel Utile" (aka John-Michael Useful). The persona has thick glasses, a very old fashioned suit and a worn-out briefcase. At first they wanted to recruit a model, but eventually it was the delegate himself that played the role, due to lack of time to find one.

Posters were created (Fig. 1) and they were placated both on standard advertising billboards and on dedicated locations for political campaigns. These locations are usually reserved for candidates and parties, but the City of Lausanne authorized their use for the recruiting campaign.

The delegate and the communication agency soon realized that it would probably not be enough to get the youths interested. On July 27th 2010 they launched an online campaign, by using Facebook and YouTube videos. During one month, they posted one video a day on YouTube. These clips showed John-Michael Useful in various surroundings (a football field, a skate park, a diving board at the swimming pool, etc.) and each time Mr Useful would be hopelessly ridiculous. Each clip would end with our hero saying "Make yourself useful too, come and join John-Michael Useful" with a link to a dedicated website. No video ever mentioned the Youth Council or the City of Lausanne, until the last clip where John-Michael Useful explained the concept and asked the youth to send their application for the Youth Council. The deadline was set to September 30th, 2010.

Fig. 1. The John-Michael Useful billboard ad, asking the youth to apply for the Youth Council

A Facebook profile was also created for John-Michael Useful, where he would post regularly and gather about 500 friends during the campaign. What is worth mentioning is that City of Lausanne blocks the use of Facebook by its employees, and that they had to ask for an exception to the Municipal Council (i.e. the executive branch of the local government). A dedicated machine with a separate Internet access had to be set up. This is not only an anecdote, but it shows how far certain public administrations can be from using social media for their official communication and for opening a dialogue with the people.

Those who were interested in becoming members of the Youth Council had to turn in an application file. They were not elected by the young people of Lausanne, but selected by a committee headed by the City's delegate of youth affairs.

1.3 eParticipation

Governments seek to encourage participation in order to improve the efficiency, acceptance, and legitimacy of political processes [1]. Various information and communication technologies (ICTs) are available for eParticipation: discussion forums, electronic voting systems, group decision support systems, and web logging (blogs). [2] describes eDemocracy as the use of information and communication technologies to engage citizens, to support the democratic decision-making processes and to strengthen representative democracy. [3] defines eParticipation as the use of

ICTs to support information provision and "top-down" engagement, i.e. government-led initiatives, or "ground-up" efforts to empower citizens, civil society organizations and other democratically constituted groups to gain the support of their elected representatives. There are many examples of surveys on eDemocracy, such as [4] who take the case of Switzerland where citizens are often called to the polls either to vote for parties and candidates or, even more often, to decide on direct-democratic votes at the three different political levels. Even if eParticipation is a relatively new research field, projects and tools are increasing thanks to governmental support [5], such as Demo-Net.org. Finally the young people are a target of eParticipation that are specifically studied by authors such as [6, 7, 8].

This paper does not aim at contributing theoretically to the analysis of eParticipation. Its goal is rather to take a concrete case of use of ICTs in the domain of youth participation and to explore a few topics pertaining to the domain of participation.

2 Survey

Three sources of survey were mobilized (see Table 1) in order to assess (i) the *impacts* of the recruiting campaign (did the young people see it?); (ii) the *effectiveness* of the campaign (i.e. did it engage young people to be candidate?).

We set up an online questionnaire using SurveyMonkey and we sent a link via email to all members of an online job market website developed especially for people under 22. The questionnaire comprised five parts:

- Independent variables: age, gender, place of residence, activity, etc.
- Dependant variables (closed questions):
  - Visibility of the campaign;
  - Impacts of the campaign;
  - Contents of the campaign;
- Conclusions and general remarks (open questions).

Table 1. Survey sources

Source	Description
Online questionnaire	26'000 questionnaires sent via email; 1'361 valid responses.
Document analysis	Analysis of motivations for becoming a member of the Youth Council; 82 application files, amongst them 62 useable.
Semi-direct interviews	Interviews with 5 elected members of the Youth Council.

We were able to have access to the application files of the candidates. As most of them contained a motivation letter, we were able to analyse these. Furthermore three additional questions where sent via email to the members of the Youth Council (amongst them how did you first hear about the youth council?) and 29 of them

answered. Finally 5 members of the Youth Council were interviewed, mostly on their motivations to participate.

The questionnaire used the conditional branching features of SurveyMonkey to skip questions, e.g. if respondents had not seen the video clips then no questions were asked about them. If respondents remembered having seen or heard about John-Michal Useful, they would be asked questions such as: did you visit the website? Did you forward links on the campaign? Did you get the message? Did you find it funny? They were of course also asked if they had applied to be candidate for the Youth Council.

3 Main Results

Fist let us mention that most respondents were over 18 (76.4%) and this is certainly due to the communication channel used to send the questionnaire, i.e. a job market website that would probably attract more people over 18 than under that age. A more intriguing result was the over-representation of girls (69%), whereas a study made by [9] indicated that boys do have more interest for political topics than girls. We do not however have any clear indication on why such a difference appeared. Last, there were more students in the sample than in the general population of the City of Lausanne and its surrounding municipalities. We took the bias into account for the exploitation of our results.

Regarding the visibility of the campaign, let us mention that 29% of the online questionnaire respondents did remember the John-Michael Useful campaign. However most of them did hear about it through traditional channels. Moreover the impacts of the YouTube videos were very limited (Fig. 2). It seems that the online campaign did not create the buzz it had hoped for.

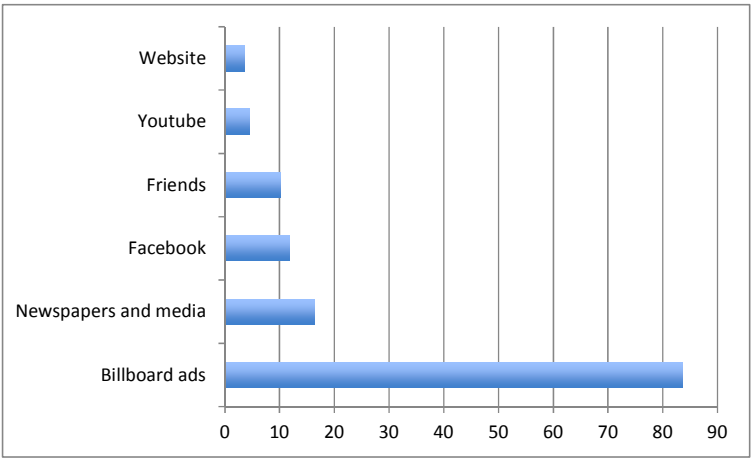

Fig. 2. How did you hear about John-Michael Useful (in %, several answers possible)?

Billboard ads are most frequently mentioned amongst all age categories, but people aged 18-25 did mention them more than the 13-17 age category (+ 8.6 points). Newspaper and media were listed equally by the 13-17 and 18-25 age category. Gender did not have any notable influence on these results. On the other hand, Facebook was mentioned more frequently amongst the 13-17 age category than the 18-25 (+ 10 points). Furthermore younger people seem to have forwarded links or discussed the campaign more: 32% of the 13-17 respondents against 24% for the 18-25 age category. This is consistent with the work of [10] on eParticipation in Cataluña, who showed that the younger the participants are, the more they enjoy online participation.

Here we cannot conclude from a quick look of Fig. 2 that generally billboard ads and traditional media are more efficient in reaching their audience than social media. Indeed there is certainly also the fact that public administrations (along with their communication agencies) usually master the traditional communication channels rather well, whereas they seem to have more difficulties with social media. The difference of impact between traditional channels and social media could also be linked to the quality of the campaign. Of course we cannot prove this but some indications are given by the answers given by the respondents on the effectiveness of the campaign. Indeed a majority of them did not find the campaign effective (69% of them found the campaign to be rather or very ineffective), although a short majority of them found it clear (Fig. 3). Regarding the use of humour, a very small majority of respondents found it funny, but with more positive feedback for the 13-17 age category (54%) than the 18-25 (48%). Let us also mention for some the humour probably got lost, as about 10% of the respondents answered that "John-Michael Useful" does really exist.

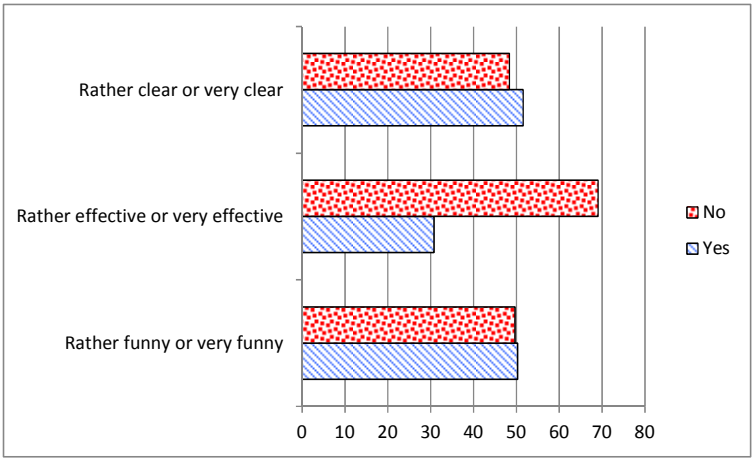

Fig. 3. What did you think about the campaign (in %, aggregated answers)?

The analysis of the application files was of course not focused on the campaign, but rather on the motivations for the youths to participate. We will not go into the details, but there were three mains topics that came out:

- *Local*: half of the candidates mentioned their ties with the City of Lausanne in their motivation letter and said they wanted to participate and exchange with others in order to make it a better place for the youth.
- *Family*: several candidates indicated that they hear about politics at home, that they discuss politics with their parents, or that members of their family are politically active and that they want to follow their path. This finding goes along the lines of the statement of [11] who wrote in 1996 that politics was one of the tops values transmitted by parents to their kids.
- *Engagement*: about one third of the candidates have previous experience in participation, either in their schools, in associations, or even in youth sections of local political parties. They see the Youth Council as a place to discuss topics of interests for them, to learn, and to "*try out things without having too much pressure to decide or to impose things*".

During the interviews, motivations of candidates were also touched upon, but other topics such as the use of online campaigning and the use of humour were discussed. The use of Facebook during the campaign did not seem to fully convince the interviewed candidates. One of them said that, although he was "friend" with John-Michael Useful, he would still use the phone to contact him. Moreover, none of them have posted on his wall. Regarding the video clips, the interviewees seem to consider them as failures. One of them, who saw the videos only after having applied for the Youth Council, even told us that he thought "*what am I doing here? This is not the image I want to give for the City of Lausanne*". The expected buzz was not met, and the use of humour does not seem to have been successful in engaging the youth. This would go along the conclusions of [12] who write that in most cases humour is useful to raise attention, but that teachers or politics should look serious and use sound argumentations.

4 Conclusion

The analysis John-Michael Useful campaign shows that the use of ICTs and more specifically of online tools such as social networks do not automatically enhance participation. This is consistent with previous work of [13] in Switzerland, where the main results showed that traditional channels for participation were still mainly used, rather than eParticipation tools.

Furthermore our survey indicates that the reasons to participate are also rather traditional (local engagement, family, previous participatory experiences), and that trying to create the buzz with a type of viral marketing campaign did not seem to be successful in raising participation. On the other hand, the strength of the campaign was that it did have good impacts in terms of visibility. It did reach different age and activity categories and it was able to raise awareness about the Youth Council. However the traditional channels (ads and newspapers) were again the ones that were most frequently remembered by the respondents.

Let the delegate of youth affairs of the City of Lausanne have the final words (on the use of social media for which he was directly responsible): "*We thought that it*

would come along naturally, which was not the case. We should have had more follow-up, by people who master both the technical aspects and the etiquette of this platform". In addition to this comment, the communication agency estimates the time required to properly maintain such a Facebook profile at about one to two hours a day. This would certainly lead us to think that setting up a Facebook account or publishing videos on YouTube is far from being sufficient to enhance eParticipation, and that resources must be planned in order to sustain the dialogue with the participants.

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References

1. Sanford, C.S., Rose, J.: Characterizing eParticipation. International Journal of Information Management 27, 406–421 (2007)
2. Macintosh, A.: Characterizing e-Participation in Policy-Making. In: Proceedings of the 37th Annual Hawaii International Conference on System Sciences, HICSS-37 (2004)
3. Macintosh, A., Whyte, A.: Evaluating how eParticipation changes local democracy. In: Irani, Z., Ghoneim, A. (eds.) Proceedings of the eGovernment Workshop. Brunel University, London (2006)
4. Ladner, A., Felder, G., Schädel, L.: From e-voting to smart-voting – e-Tools in and for elections and direct democracy in Switzerland. IDHEAP Working Paper 4/2008 (2008)
5. Tambouris, E., Liotas, N., Tarabanis, K.: A Framework for Assessing eParticipation Projects and Tools. In: Proceedings of the 40th Annual Hawaii International Conference on System Sciences, HICSS-40 (2007)
6. Coleman, S.: Digital Voices and Analogue Citizenship: Bridging the Gap between Young People and the Democratic Process. Public Policy Research 13(4), 257–261 (2006)
7. Banaji, S., Buckingham, D.: Young People, the Internet, and Civic Participation: An overview of key Findings from the Civicweb Project. International Journal of Learning and Media 2(1), 15–24 (2010)
8. Taylor-Smith, E., Kimpeler, S., Pruulmahnd-Vengerfeldt, P.: Distributed Discussion: an Integrated eParticipation Model for Engaging young People in Technology Policy. In: Charalabidis, Y., Koussouris, S. (eds.) Empowering Open and Collaborative Governance. Springer, Germany (2012)
9. Oser, F., Biedermann, H.: Jeunesse sans politique? Résultats de l'étude IEA 2003 relative aux connaissances politiques, à la compréhension de la démocratie et à l'engagement social chez les jeunes en Suisse et en comparaison avec 27 autres pays. Editions Loisirs et Pédagogie (2004)
10. Colombo, C.: e-Participation Experiences and Local Government in Catalonia: An Explanatory Analysis. In: Tambouris, E., Macintosh, A., Glassey, O. (eds.) ePart 2010. LNCS, vol. 6229, pp. 82–94. Springer, Heidelberg (2010)
11. Muxel, A.: Les jeunes et la politique. Hachette Livre, Paris (1996)
12. Graby, F.: Humour et comique en publicité. Editions EMS, Paris (2001)
13. Glassey, O.: A Survey on Participation at Geneva"s Constituent Assembly. In: Tambouris, E., Macintosh, A., Glassey, O. (eds.) ePart 2010. LNCS, vol. 6229, pp. 151–161. Springer, Heidelberg (2010)

Model Based Critique of Policy Proposals

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Abstract. Citizens may engage with policy issues both to critique official justifications, and to make their own proposals and receive reasons why these are not favoured. Either direction of use can be supported by argumentation schemes based on formal models, which can be used to verify and generate arguments, assimilate objections etc. Previously we have explored the citizen critiquing a justification using an argumentation scheme based on Action-based Alternating Transition Systems. We now present a system that uses the same model to critique proposals from citizens. A prototype has been implemented in Prolog and we illustrate the ideas with code fragments and a running example.

1 Introduction

Citizens contact their representatives about policies with a number of objectives. They may be seeking a justification of a current or proposed policy; they may wish to object to a current or proposed policy; or they may wish to make policy proposals of their own. Argumentation can support e-participation systems designed to meet any of these [8]. In the first case a simple statement is all the response that is needed. For the second case it is necessary to identify, make precise, and attempt to meet, these objections. These situations are addressed in work such as [7]. The third case is, however, different. Here what is needed is to obtain a precise, well formulated proposal from the citizen and then to identify its flaws and explain why the current policy is preferred. It is this situation that we will address in this paper. Our approach makse use of argumentation schemes, which hail from the informal logic literature and capture stereotypical patterns of reasoning that can be expressed as arguments. Every argumentation scheme is associated with a set of characteristic critical questions, that are used to identify possible challenges to instantiations of the argumentation scheme. Such challenges can be made against the different elements of the argumentation schemes and the relations between them. The particular argumentation scheme [1] that is of relevance to our prototype is one that enables reasoning about, and justification of, actions. Some examples of the critical questions related to the argumentation scheme for practical reasoning are: *Are the current circumstances as stated? Does the action have the consequences stated? Does the goal promote the value?*

We will describe how the argumentation scheme and critical questions of [1] can be used as the basis of a system to help a citizen to form a justification of

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a policy proposal and automatically provide a systematic and thorough critique of that position. The proposed system will be complementary to previous work using this argumentation scheme, notably [7] and [11], in which the system proposed a justification and requested a critique from the user. In this paper the roles are reversed, so that we solicit a justification from the user and the system will provide the critique. We will illustrate our approach with a running example, relating to the use of speed cameras originally developed in [2], and some fragments of a Prolog program that we have produced to make our definitions operational.

The argumentation scheme in [1] proposes an action based on an understanding of the current situation, the consequences of actions and the desire to promote particular social values. These social values exist in a preference order that may vary from person to person according to their tastes and aspirations. The scheme is stated in [1] as the practical reasoning argument scheme labelled *AS1*:

Premise 1: In the current circumstances S (source)
Conclusion: We should perform action A
Premise 2: Which will result in new circumstances R (result)
Premise 3: Which will realise goal G
Premise 4: Which will promote some value V.

In this scheme, S is what is true before the action A, R is what is true after the action, G is the desirable consequence and V the reason why G is desirable.

In [1] seventeen critical questions, which can be used as a basis to attack justifications using *AS1*, are given. A dialogue protocol based on this scheme will be very complicated, as demonstrated by the protocol for a similar scheme using sixteen of the critical questions given in [3]. As is noted in that paper, the protocol offers too much choice to be effective in practice. We must therefore look for a simpler way of proposing, defending and critiquing such justifications. Moreover, in addition to deploying the variety of available moves, difficulties can also arise when interpreting the critical questions. Although they can be understood informally, with the reader supplying an appropriate context, they are not always entirely precise. For example, one critical question against AS1 is whether the current circumstances hold. As we will see in section 3, this may be asked either because the questioner believes the action not to be currently possible, or because the questioner believes that the action will have different consequences given the circumstances that are actually currently true. To resolve these problems of vagueness and ambiguity, it is necessary to anchor the questions in a well defined semantical structure. This was done in [1], which used Action-based Alternating Transition Systems (AATS) [10] for this purpose.

Presenting justifications based on this scheme and receiving critiques was the subject of [11]. Here we will describe how an AATS and the argumentation scheme and critical questions of [1] can be used to *accept* a justification and then automatically *provide* a critique. We believe allowing citizens to express their own ideas, and to receive feedback on possible problems with them, is an important part of engaging citizens in policy debates, and an important

supplement to justifications of actual policy. Interacting with policy proposals in this way will help citizens to better understand why certain proposals were adopted and others rejected.

Section 2 will define an AATS, give a concrete instantiation of the AATS for our example, and give the Prolog predicates required to realise it. Section 3 will explain how the justification is elicited from the user, and the various steps of the critique. Section 4 will give an illustration using our example. Section 5 will give a brief discussion and some concluding remarks.

2 Model

An AATS is a formal structure that enables representation of states in an agent system and actions that cause transitions between states. Due to their precise formalisation, AATSs can be used in automated systems where agents need to have an explicit representation of states, actions and transitions. AATSs are useful for our tool because they enable us to map out in precise detail the space of a policy debate. As defined in [10], the AATS made no reference to values. In order to adapt it for use with AS1, [1] extended the structure to include labels on the transitions indicating which values are promoted and which demoted by following a transition. The extension of the original specification of an AATS to accommodate the notion of values is an *Action-based Alternating Transition System with Values* (AATS+V), defined as a $(n + 9)$ tuple $S = \langle Q, q_0, Ag, Ac_1, \ldots, Ac_n, \rho, \tau, \Phi, \pi, V, \delta \rangle$, where:

- Q is a finite, non-empty set of *states*;
- $q_0 \in Q$ is the *initial state*;
- $Ag = \{1,...,n\}$ is a finite, non-empty set of *agents*;
- Ac_i is a finite, non-empty set of actions, for each $i \in Ag$ where $Ac_i \cap Ac_j = \emptyset$ for all $i \neq j \in Ag$;
- $\rho : Ac_{Ag} \rightarrow 2^Q$ is an *action pre-condition function*, which for each action $\alpha \in Ac_{Ag}$ defines the set of states $\rho(\alpha)$ from which α may be executed;
- $\tau : Q \times J_{Ag} \rightarrow Q$ is a partial *system transition function*, which defines the state $\tau(q, j)$ that would result by the performance of j from state q – note that, as this function is partial, not all joint actions are possible in all states (cf. the pre-condition function above);
- Φ is a finite, non-empty set of *atomic propositions*; and
- $\pi : Q \rightarrow 2^\Phi$ is an interpretation function, which gives the set of primitive propositions satisfied in each state: if $p \in \pi(q)$, then this means that the propositional variable p is satisfied (equivalently, true) in state q.
- V is a finite, non-empty set of values.
- $\delta : Q \times Q \times V \rightarrow \{+, -, =\}$ is a *valuation function* which defines the status (promoted (+), demoted (–) or neutral (=)) of a value $v_u \in V$ ascribed to the transition between two states: $\delta(q_x, q_y, v_u)$ labels the transition between q_x and q_y with one of $\{+, -, =\}$ with respect to the value $v_u \in V$.

AATSs are particularly concerned with the joint actions of the set of agents. j_{Ag} is the joint action of the set of k agents Ag, and can be represented as a tuple $\langle \alpha_1,...,\alpha_k \rangle$, where for each α_j (where $j \leq k$) there is some $i \in Ag$ such that $\alpha_j \in Ac_i$. Moreover, there are no two different actions α_j and $\alpha_{j'}$ in j_{Ag} that belong to the same Ac_i. The set of all joint actions for the set of agents Ag is denoted by J_{Ag}, so $J_{Ag} = \prod_{i \in Ag} Ac_i$. Given an element j of J_{Ag} and an agent $i \in Ag$, i's action in j is denoted by j_i.

2.1 Instantiating the AATS

In this paper we will use the same example as [2], and use the AATS+V developed there. To fully describe a model using the AATS+V we need to specify the various components of the structure. We need the set of propositions Φ, combinations of which make up the possible member states of Q. Given Φ, we can constrain the size of Q by identifying logical relationships between members of Φ, such that for p_1, $p_2 \in \Phi$, $\neg(p_1 \wedge p_2)$: states containing such combinations will then be impossible and so not be in Q. We need to give the set of agents, Ag and the actions they can perform. We need the set of values that may be promoted and demoted by the movement from one state to another. Finally, we need a transition matrix expressing ρ, τ, and δ. This matrix comprises a row for each state in Q and a column for each joint action in J. An entry in a cell indicates that the preconditions for the joint action are satisfied. Such entries comprise a triple consisting of the state reached if that joint action is executed, the set of values promoted, and the set of values demoted. These transitions are a reflection of a causal theory, which explains the effects of various actions, and an evaluative theory, which tells us when values are promoted and demoted.

Our example is an issue in UK Road Traffic policy, modelled in [2] and used before that as an e-participation example in [7] and [4]. The number of fatal road accidents is an obvious cause for concern, and in the UK there are speed restrictions on various types of road, in the belief that excessive speed causes accidents. The policy issue that we will consider is how to reduce road deaths. One suggestion would be to deter motorists from speeding by introducing speed cameras, which would greatly increase detection and punishment of speeding offences. Points that might be contested are whether fines are sufficient to deter, and whether speeding is an important factor in road accidents. Additionally there are civil liberties issues associated with the loss of privacy resulting from the increased surveillance. One, more expensive, alternative to speed cameras would be to have a programme of education for motorists that could make them more aware of the dangers of speeding, better able to control their vehicles at speed, or both. This gives the set of propositions as:

> $\Phi = \{R, S, P\}$, where R is that there are excessive road accidents, S is that there is excessive speeding and P that the intrusions on privacy are excessive.

These three propositions give rise to, potentially, eight states. We may, if we wish, exclude one or more of these as impossible. For example if we believe that

it is impossible that there should be a reduction in road deaths without a reduction in speeding, no state with $\neg R$ and S would be possible and so such states would not appear in Q. We also need to identify the current state, q_0, which we take to be $\{R \wedge S \wedge \neg P\}$. The main agents involved are the *Government*, and *Motorists*, considered as a body. In some cases the consequences of an action are indeterminate (or at least cannot be determined using the elements we are modelling). To account for this we introduce a third agent, termed *Nature*. The action ascribed to Nature determines the outcomes of the actions of the other agents, where these outcomes are uncertain or probabilistic. The Government has three actions: introducing speed cameras, educating motorists, or doing nothing. Motorists may reduce their speed or do nothing. Nature has two actions according to which fatal accidents are or are not reduced as a result of the Government and motorist actions. For values we consider, the cost in terms of human life (L), compliance with the law (C), the financial cost to the Government (B for budget) and the impact of civil liberties (F for freedom). Figure 1 shows the transitions from the current state for the six possible joint actions:

j_0 Government does nothing, motorists do nothing and nature does nothing.
j_1 Government introduces cameras, motorists do nothing and nature does nothing.
j_2 Government introduces cameras, motorists reduce speed and nature reduces accidents.
j_3 Government introduces cameras, motorists reduce speed and nature does nothing.
j_4 Government educates motorists, motorists reduce speed and nature reduces accidents.
j_5 Government educates motorists, motorists do nothing and nature reduces accidents.

Accidents are always reduced when motorists are educated since either they do not speed, or can control their vehicles better.

2.2 Prolog Representation

To represent the AATS+V of Figure 1 in a Prolog program we state facts representing the propositions in Φ, the states in Q, the joint actions J and the transitions defined by τ. Propositions are in fact represented as pairs of literals to allow separate natural language forms for positive and negative occurrences.

```
%literal(id,positive or negative, english text, other text)
literal(1,1,[there,is,excessive,speeding],[]).
literal(2,0,[speed,limits,are, generally,obeyed],[]).
literal(3,1,[there,are,too,many, road,deaths],[]).
literal(4,0,[road,deaths,are,acceptable],[]).
literal(5,1,[there,are,unacceptable,intrusions,on, privacy],[]).
literal(6,0,[privacy,is,respected],[]).
```

```
%state(id, R, S, P). R S and P where the positive or negative
% literals hold in the state. 0 is the current state
state(0,1,3,6).   state(2,2,4,6).      state(3,1,4,6).
state(4,1,3,5).   state(5,2,4,5).      state(6,2,3,5).

%jointAction(id,government,motorist,nature).
jointAction(j0,[do,nothing],[do,nothing],[there,is,no,effect]).
jointAction(j1,[introduce,speed,cameras],[do,nothing],
                [there,is,no,effect]).
jointAction(j2,[introduce,speed,cameras],[reduce,speed],
                [there,are,fewer,accidents]).
jointAction(j3,[introduce,speed,cameras],[reduce,speed],
                [there,is,no,effect]).
jointAction(j4,[educate,motorists],[reduce,speed],
                 [there,are,fewer,accidents]).
jointAction(j5,[educate,motorists],[do,nothing],
                 [there,are,fewer,accidents]).

%transition(id, source state, target state,
%joint action, values promoted, values demoted).
transition(1,0,5,j2,[l,c],[f]). transition(2,0,0,j0,[],[]).
transition(3,0,4,j1,[b],[f]). transition(4,0,2,j4,[l,c],[b]).
transition(5,0,6,j3,[c],[f]). transition(6,0,3,j5,[l],[b]).
```

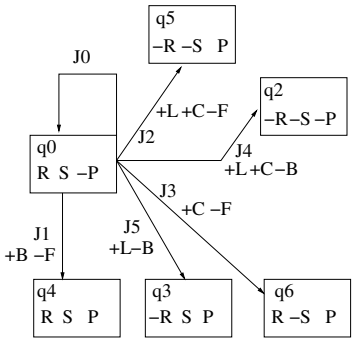

Fig. 1. Transitions from q_0

3 Critique

The process now is to solicit from the citizen a proposed action and a justification in the form of AS1, and to critique that proposal and its justification. The critique will proceed through a number of steps, each related to critical questions associated with AS1. In our e-participation setting, citizens will advocate a policy, either as part of a debate as to what should be done, or as an alternative to what the Government is currently doing. In response they will receive a

reply suggesting why their proposal is not acceptable to the Government. Some of these responses will indicate errors: the citizen may simply be wrong about a current fact. Others will indicate possible problems, perhaps that a particular value is demoted: the citizen should be alerted to this problem, but may choose to accept it as a price worth paying. Thus some responses will indicate errors, whereas others will provide warnings. The subsections below describe the elements of a critique that can be automatically constructed to provide an instant response to such proposals. Then in section 4 we will step through a complete example to show how these elements fit together to build into a comprehensive whole.

Getting the Justification. To provide a target for the system's critique, the citizen must first instantiate AS1, by giving an action, the current state, the target state to be reached by the action (which will typically assume particular behaviours from the other agents involved), and the values this will promote. To get this information the citizen is first presented with a list of the propositions in Φ and indicates which are true and which false using a menu. The user is then prompted for the action the Government should perform. The choice is entered through the use of a menu containing the options in Ac_{Gov}. The assumed consequences are obtained by presenting again the propositions in Φ with a menu. Finally the user is asked to give the most important value promoted by the action, using a menu with the elements of V.

Note that this form of justification can itself be generated from the Prolog progam using (with appropriate instantiations):

```
argumentPro(A,S,R,V):-
 transition(ID,S,R,J,X,_),member(V,X),jointAction(J,A,_,_),
 pp([government,should,A,in,S,to,reach,R,and,promote,V]).
```

where `pp` is simply a pretty print function. Note that if only `S` is instantiated in the query, `argumentPro` will generate every possible argument for actions from state `S`.

Thus using `transition(3,0,4,j1,[b],[f])` we can instantiate `A` to `[introduce, speed, cameras]`, `S` to `0`, `R` to `4` and `V` to `b` and so produce the argument *government should introduce speed cameras in 0 to reach 4 and promote b*. The presentation could further be improved by replacing the state numbers with the text versions of the literals they contain.

We now move through the particular points that make up a comprehensive critique of the justification. The critical question numbers refer to the critical questions presented in [1]: here we use appropriate natural language forms.

Is the Action Possible? (CQ1, CQ13). The first thing to check is whether the believed facts are agreed. Thus if the user's answer suggests that literals X, Y, and Z are believed in the current situation, they should make up the initial state, q_0 and so `state(0,X,Y,Z)` should be in the program. If this is not so, we have `state(0,X1,Y1,Z1)`, where one or more of $X1 \neq X$, $Y1 \neq Y$ and $Z1 \neq Z$. Thus the user believes we are in state q_U where `state(U,X,Y,Z)` is in the program. Any disagreement as to the current state should be reported to

the citizen. However, disagreement may or may not affect the justification. If `argumentPro(A,0,R,V)` succeeds, (where the user proposed to do A to reach q_R and promote V) the advocated action can still be performed in q_0, and so the disagreement is not material, since the preconditions of the proposed action remain satisfied. The user can therefore be informed that either *I believe the current facts to be X1, Y1 and Z1, but the action you propose is still possible* or *I believe the current facts to be X1, Y1 and Z1, and so the action you propose is not possible* depending on whether or not `argumentPro(A,0,R,V)` succeeds. For example the action *Do nothing* is possible in any state whatsoever.

At this point, if the action is not possible, it is necessary either to terminate the discussion, or to accept what the user says and change which state is taken to be q_0 (and so considered currently true) in the program accordingly. Possibilities also exist for presenting the user with a justification of our beliefs about the current state, perhaps even initiating discussion using a persuasion dialogue in the style of [9] to resolve the differences. We will not go further into these possibilities here, however.

Can the Action Have the Stated Effects? (CQ1, CQ2). Let the consequences claimed by the user be $X2$, $Y2$, and $Z2$, and $U2$ be the state where they hold. Now the actual consequences of action A will be given by a transition from state 0, so `argumentPro(A,0,U2,Value)` would need to succeed if the user's claimed consequences are correct. If this is so the disagreement on the current state does not affect the consequences of the action and so can be disregarded. For example *Introduce Cameras* will reach the same state whether or not privacy is currently respected. Otherwise the user must be informed that *Performing A will not result in X2, Y2, Z2*. Again we could stop here, offer reasons for our position, or engage in a dialogue in an attempt to convince the user of the true consequences of the action proposed.

Does the Action Promote the Value? (CQ4). Even if the action does have the consequences claimed, it may still not promote the desired value. For the citizens's justification to be acceptable, where the citizen claims V will be promoted, `argumentPro(A,0,U2,V)` must succeed. If this is not so, then the citizen must be informed that *Although performing A will bring about X2, Y2 and Z2, the value V will not be promoted*. For example, the citizen might claim that introducing cameras would reach q_5 and promote budget. Moving to q_5 does not, however, promote budget: that would require that S remained true.

Assuming, however, that `argumentPro(A,0,U2,V)` does succeed, the justification will have crossed the first hurdle, and represent an acceptable instantiation of AS1. The critique must now turn to whether the argument is acceptable when set against other objections.

Are There Negative Side Affects? (CQ8, CQ9). So far we have established that `argumentPro(A,0,U2,V)` succeeds. We need, however, to consider the other consequences of performing the action. Firstly it is possible that the action will demote some values as well as promoting V. Any such demotion would give

us an argument against performing A. Such arguments can be discovered from the program using

```
argumentCon(A,0,U2,W):-
 transition(ID,S,R,J,_,X), member(W,X),jointAction(J,A,_,_),
 pp([government,should,not,A,in,S,
     to,avoid,R,which,would,demote,W]).
```

If this succeeds with one or more values binding W we will have one or more grounds for objecting to the original justification. For example the demotion of f is an argument against reaching q_5 by introducing cameras. Whether the argument is decisive will depend on the user's preferences. Most serious is if $W = V$, since the action represents a self-defeating way of advancing this value. So the user would be informed that *You should not do A since this will demote the value you are trying to promote.* If, on the other hand, $W \neq V$, the user only needs to be warned about the side effects to consider whether V is still worth promoting, so the message would be *Performing A will demote values W1 ... Wn. Are you sure it is still worth promoting V?* In this way, an advocate of speed cameras can continue to hold that view, but now does so with the awareness that freedom will be reduced.

Are There other Ways to Promote the Value? (CQ7). If there is an action $B \neq A$ for which *argumentPro(B,0,Any,V)* succeeds, then it is possible to promote the desired value with a different action. This different action may be preferable to the chosen action, and so should be drawn to the citizen's attention. For example, if the citizen had suggested education as a way of promoting L, the critique could draw attention to the possibility of promoting the value by introducing cameras. Thus the system responds *Performing B may also promote V. Are you sure you still wish to perform A?*. This might cause the advocates of education to change their mind, particularly since they will have already been alerted to the fact that education will take them over budget.

Could other Values Be Promoted? (CQ11). If there is an action $B \neq A$ for which *argumentPro(B,0,Any,W)* succeeds with $W \neq V$, then performing A precludes promoting this other value. Moreover there may be several such values. For our current purposes, we will not object if performing A promotes V and other values as well, but we should object if there are values which can be promoted from state 0, but are not promoted by A taking us to the state proposed by the user. In this case the user should be warned: *If you perform A you will miss an opportunity to promote W1 ... Wn. Do you still want to perform A?*, so that the user is aware of this, possibly preferable, opportunity. Of course, the user may prefer V and be content with the original choice. For example, an advocate of education to produce better drivers and reach q_3 will be told that C can be promoted by introducing cameras and reaching q_5 instead, but they may choose to disregard this, if they do not regard C to be of sufficient importance.

Will the other Agents Do What They Are Supposed to Do? (CQ17). Finally, suppose that *argumentPro(A,0,U2,V)* succeeds with `jointAction(J,`

`A, O1, O2)` but there is also a transition such that `jointAction(J, A, O3, O4)` (where $O1 \neq O3$ or $O2 \neq O4$ or both) would move us from state 0 to some new state without promoting V. That is, our chosen action may fail to promote the desired value because one or more other agents do something other than what we had anticipated or hoped for. For example, if motorists do not modify their behaviour when cameras are introduced we will reach q_4 instead of the desired q_5. Thus in such cases the system should pose the final objection *Are you confident that O1 and O2 will be performed by the other agents?*

4 Example

We now put this all together in a full example. Suppose our citizen wishes to propose education as the solution. First the citizen is asked for an opinion on the truth of P, R and S. Suppose that the user agrees that there is excessive speeding and too many deaths and intrusions on privacy are not at an acceptable level. The citizen is then offered a choice of the three Government actions: suppose `educate motorists` is chosen. When asked for consequences, the user replies $\{\neg R, S, P\}$. The user does not believe that education will reduce speeding (which is seen as human nature), but does think that it will reduce fatalities. Finally the user is asked for the value promoted, and chooses b (budget). The system can now begin the critique.

The user believes the current state to be $\{R, S, P\}$, that is q_4. The proposed action is also possible in q_4, so the system reports:

> *I do not believe that there are unacceptable intrusions on privacy, but the action you propose is still possible*

Suppose that the citizen responds by modifying his original proposal, and concedes that the intrusions of privacy are currently not excessive. The effect of the action is also agreed to take us from q_0 to q_3. The value, however, produces a disagreement: the user believes that b will be promoted, whereas the program computes that b will be demoted. It therefore reports:

> *Although educate motorists will bring about there is excessive speeding, road deaths are at an acceptable level and privacy is respected, the value budget will not be promoted*

Moreover since b is actually demoted the system will add

> *You should not educate motorists since this will demote the value you are trying to promote*

There are, however, ways in which b can be promoted: we can try to reach $q4$ by introducing speed cameras. Thus we can say:

> *Introducing speed cameras may promote budget. Are you sure you still wish to educate motorists?*

Although the proposed action will promote l it fails to promote c. This value can be promoted by introducing speed cameras. The critique continues:

> *If you educate motorists you will miss an opportunity to promote compliance with the law by introducing speed cameras. Do you still want to educate motorists?*

The final perspective, reliance on other agents, is not a problem in this instance since the proposed action fails to promote the value anyway.

5 Discussion

The above critique covers nine of the seventeen critical questions of [1]. Some relate to the elements of the AATS+V: the propositions and actions included in the model cannot be questioned by the system. Rather we should expect the citizen to object that his position cannot be expressed. In such cases the system is not adequate for the citizen to provide his desired justification. But once the justification has been provided, consensus as to the propositions and actions can be presumed and so related critical questions will not arise. The other missing critical questions all concern goals, which are present in AS1, but have no obvious correspondence to the AATS+V. Such goals are probably best thought of as predicates defined in terms of the propositions in Φ. For example one might consider a society to be civilised if road deaths were not excessive and privacy respected, i.e $\neg R \wedge \neg P$. Thus the goal of a civilised society could be realised in state 0 by moving to state 2 or state 3. Thinking in terms of a set of basic propositions in Φ and a set of intensional definitions allowing for more complex aspirations to be expressed might be useful in a more complex domain. Here, however, we will, like [2], not include intensional definitions and goals in our current critique.

Policy proposals are based on a wide variety of different kinds of knowledge including: knowledge as to what is currently the case, knowledge of actions and their effects, awareness of the effect on values, knowledge of what other agents are likely to do and knowledge of preferences between competing values. This diversity is reflected in the range of perspectives from which an action justification can be critiqued. The use of an argumentation scheme such as AS1 enables the critique to systematically explore possible weaknesses with respect to all these aspects. What we have described above enables the systematic critique to be delivered, but while it raises questions, these are not argued for or resolved. We could easily provide simple textual justifications for the position we hold, but deeper exploration would require further argument and dialogue. This, however, would not be a simple extension. All the different kinds of knowledge that underlie the differences raised by the critique will require specific kinds of dialogues if these differences are to be resolved. Some of these dialogue types have been investigated: for example disagreements as to the current facts could be resolved using dialogues such as are presented in [9] and [6], but others have not. While there has been some very preliminary investigation of e.g. arguments between

agents with different preferences [5], much remains to be done for this topic and for dialogues disputing causal theories, agent behaviour and evaluative assessments. Techniques designed for straightforward arguments about the truth of a proposition are unlikely to be entirely suitable for these specialised topics.

The tool we have presented is based upon a precise formal model, but the front-end that the citizen interacts with uses only natural language. Many current tools for e-participation lack a formal and precise underpinning and as such offer little support for automated processes. Our contribution is that we have developed a program through which we can automatically elicit policy proposals and systematically generate a critique from our model. The formal model provides a level of support and consistency that takes our tool beyond the current state of the art. Nevertheless we see the system presented here as providing only the first step in a fully fledged critique system. What we have implemented so far provides organisation and breadth but lacks depth, since it uses, but does not justify, the model. In future work we shall explore support for the dialogue types required to open up these stubs.

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References

1. Atkinson, K., Bench-Capon, T.: Practical reasoning as presumptive argumentation using action based alternating transition systems. Artif. Intell. 171(10-15), 855–874 (2007)
2. Atkinson, K., Bench-Capon, T., Cartwright, D., Wyner, A.: Semantic models for policy deliberation. In: Proceedings of the 13th ICAIL, pp. 81–90 (2011)
3. Atkinson, K., Bench-Capon, T., McBurney, P.: A dialogue game protocol for multi-agent argument over proposals for action. Autonomous Agents and Multi-Agent Systems 11(2), 153–171 (2005)
4. Bench-Capon, T., Prakken, H.: A lightweight formal model of two-phase democratic deliberation. In: Proceedings of JURIX 2010, pp. 27–36. IOS Press (2010)
5. Black, E., Atkinson, K.: Choosing persuasive arguments for action. In: Proceedings of AAMAS 2011, pp. 905–912 (2011)
6. Black, E., Hunter, A.: An inquiry dialogue system. Autonomous Agents and Multi-Agent Systems 19(2), 173–209 (2009)
7. Cartwright, D., Atkinson, K.: Using computational argumentation to support e-participation. IEEE Intelligent Systems 24(5), 42–52 (2009)
8. Macintosh, A., Gordon, T., Renton, A.: Providing argument support for eparticipation. Journal of Information, Technology and Politics 6(1), 43–59 (2009)
9. Prakken, H.: Formal systems for persuasion dialogue. Knowledge Eng. Review 21(2), 163–188 (2006)
10. Wooldridge, M., van der Hoek, W.: On obligations and normative ability. J. Applied Logic 3(3-4), 396–420 (2005)
11. Wyner, A., Atkinson, K., Bench-Capon, T.: Towards a Structured Online Consultation Tool. In: Tambouris, E., Macintosh, A., de Bruijn, H. (eds.) ePart 2011. LNCS, vol. 6847, pp. 286–297. Springer, Heidelberg (2011)

Online Communities Support Policy-Making: The Need for Data Analysis

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Abstract. Policy decisions in governmental models are often based on their perception and acceptance in the general public. Traditional methods for harvesting opinions like telephone or street surveys are time intensive and costly and direct interaction between a governmental member and the population is limited. Social media harbor the chance to easily get a high number of opinions and proposals in form of poll participation or interactive debate contributions.

Especially debates about political topics can generate data which are hard to interpret because of its length and complexity. We propose a collection of methods to support a decision maker in gaining an overview over textual debates coming from several social media to save time and effort in manual analysis. Our approach enables an efficient decision making process by a combination of automatic topic clustering, sentiment analysis, filtering, and search functionalities aggregated in a graphical user interface. We present an implementation and a use case proving the usefulness of the proposed methodologies.

1 Introduction

Decision-making processes for policies and their outcomes are often based on their perception and acceptance in the general public. An approach to gain a more representative opinion for a focused theme as well as to acquaint the public with the topic and present it from several perspectives, is to build a platform in which a policy maker (e. g. a member of government) solicits contributions from the public for a specific topic. The core functionalities expected from such a framework are: structured polls, moderated debates, and the ability to provide access from as many social media sites as possible. Structured polls should support questions with multiple choice or free text answers. Moderated debates should allow the public to provide more detailed feedback while also being exposed to others' thoughts,

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enabling decision makers to learn about aspects and perceptions not thought of before. In order to gain access to many participants, the framework needs to provide access to people in social media like Facebook, Blogger, Twitter, and others.[1]

As these social media are very well inhibited, polls or debate questions can lead to a huge number of contributions. A decision maker cannot be expected to consume all comments, and thus the framework also needs to provide support for efficient sifting through long debates. The need and a proposal for such framework, including several methods, are described in this paper. We focus on the analysis of textual data in debates.

Following is Sect. 1.1, in which we briefly cover related work. Sect. 1.2 then describes an implementation of a framework for policy-making support in online communities. The fundamentals as well as the combination of methods to support a decision maker by increasing the use of harvested data are presented in Sect. 2. Results are explained by means of a use case in Sect. 3, and a summary is given in Sect. 4.

1.1 Related Work

The analysis of weblogs (blogs) is a topic currently heavily investigated. As an example, the EU project *SynC3* [18] is aiming at structuring the information of personal blogs to combine them with news information. The application *BlogPulse* [6] was developed to discover trends in a set of 100,000 weblogs. The output are key person names, phrases, and paragraphs. Qiazhu Mei *et al.* focused on the extraction of spatio-temporal data together with subtopics [13]. Monitoring the development in blogs is described by [14]. They cover technical issues like website extraction and cleaning as well. The important challenge of analyzing trends of opinions and sentiments is addressed by [15]. Teufl *et al.* proposed a clustering and graph-based framework [20] to limit the need for manual analysis. Maragoudakis *et al.* [10] reviewed different opinion mining methods and developed a framework to use them. The impact of social media to elections (especially in the Netherlands) is proven by [4]. The way how members of parliaments use Twitter for online discussions is investigated by [19].

Next to this work, some governments already have online platforms to get into contact with the population. An example is the platform *ePetition*[2] in Germany allowing for signing a petition which forces the government to discuss the topic at a specific number of signatures. For each petition, a discussion forum is available as well. In Greece, the platform OpenGov[3] allows for discussion of current laws in development.

Research in these fields is often concerned with methods from the area of information extraction and natural language processing. A short overview of such approaches can be found in [11].

[1] http://www.facebook.com/, http://www.blogger.com/, http://www.twitter.com/

[2] https://epetitionen.bundestag.de/

[3] http://www.opengov.gr/

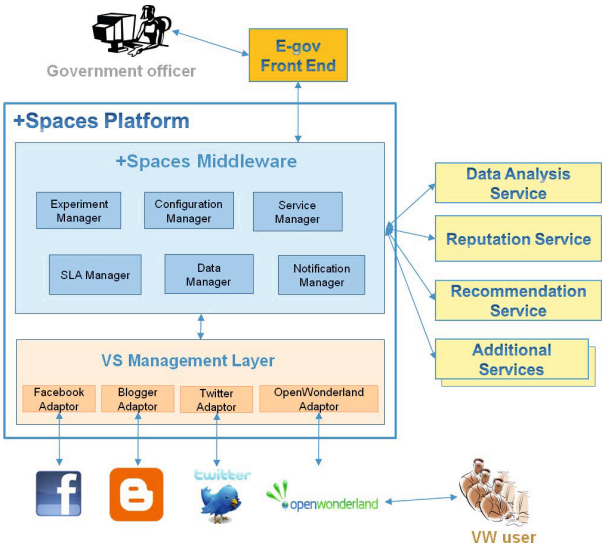

Fig. 1. Structure of the +Spaces platform

1.2 Policy-Making Support in Online Communities

The EC project +Spaces[4] (dubbed positive spaces) aims at developing a workflow to allow policy and decision makers to interact with the inhabitants of virtual spaces [22]. As presented in Fig. 1, a government officer accesses the platform through a single front end. She can *e. g.* assemble a poll consisting of several questions, each with several answer possibilities and/or a free text field. Another possibility is to initiate a discussion and provide an initial statement for that. While polls have the focus on getting feedback for a 'closed' question, the second possibility allows for learning about novel ideas and insights a government officer may not have thought of.

After designing the poll or debate statement (what we call experiment), the experiment is deployed to the virtual spaces using the middleware and the connected management layer. +Spaces is focusing on Facebook, Blogger, Twitter, and Open Wonderland[5]. The latter is an open source 3D world environment with similarities to Second Life[6] but the advantage of being deployable on self-administered servers and connectability due to source code availability.

Inhabitants of these worlds, namely people registered to Blogger, Twitter, or Facebook, can then participate in these experiments. Announcements are designed in a way such that viral dissemination is supported which is common in Facebook through 'sharing' and in Twitter through 're-tweeting'. This fact is supported by the numbers of participants of a pilot for poll experiments in

[4] http://www.positivespaces.eu/
[5] http://www.openwonderland.org/
[6] http://secondlife.com/

2011. Here, 77 participants made 473 contributions in different virtual spaces, 56 participants were recruited virally.

Through a notification mechanism, the data generated by the participants are propagated by the middleware to services to provide an analysis to the policy maker. Services as well as connectors to virtual spaces are modular and can be extended anytime. Figure 1 shows that one of the services developed in the +Spaces project is the proposed data analysis presented in this paper.

Our hypothesis is that such a way to prepare and present data, focusing on textual debates in this contribution, can support a policy maker by saving time and in getting an overview of the data. The fundamental idea is that by means of sentiments as well as main topics, debate contributions typically repeat themselves throughout a discussion—such characteristics need to be determined and shown to the user. In the following Sect. 2, the fundamentals of such methods and our adaptions are explained.

2 Methods

In the following, the methods for the analysis of semi-structured debates from online communities are described. They are designed to prepare the support of a policy maker.

2.1 Topic Modeling

The fundamental idea of modeling the topics of a debate is to present the main themes which are occurring. Additionally, the main words describing a topic are extracted. We follow two different strategies here, a k-means clustering [9] followed by an extraction of most important phrases; and alternatively a joint approach using latent Dirichlet allocation (LDA) [2]. The implementations from the MALLET toolkit [12] are used.

Typically for topic modeling, n grams or single tokens are used as input. To support a good understanding of the textual context, we are using noun phrases instead or optionally in addition. To limit the dimensionality, each token is previously transformed to its stem[7]. Stop-words are removed as well as URLs, email addresses, and numbers.

***k*-means Clustering.** The clustering method k-means [9] is an iterative approach to assign instances d_i ($0 \leq i < n$, with number of instances n) to a given number k ($k \in \mathbb{N}^{>0}$) of clusters. All instances in one cluster should have a high similarity with respect to some metric $\mathrm{m}(d_q, d_r)$. Each instance is correponding with a debate contribution in our case.

In short, the Voronoi iterations to find k clusters work as follows: Randomly, the instances d_i are assigned to k clusters. With respect to the metric m, the cluster centers are computed. Then, each instance is assigned to the closest cluster

[7] Using the Snowball Stemmer http://snowball.tartarus.org

center, followed by re-computation of the cluster centers. This iterative algorithm stops when the clusters are stable or after a specified number of iterations.

The cosine similarity measure on the tf·idf-weighted term vector space is used as metric m here. Each instance is represented by a vector of weights $\mathbf{w}_l$ for the occurring tokens in the lth instance. The weight $w_{k,l}$ for the kth token in the lth instance is $w_{k,l} = \mathrm{tf}_{k,l} \cdot \mathrm{idf}_k$, where $\mathrm{tf}_{k,l}$ is the frequency of the kth token (*term frequency*) in the lth instance normalized by the frequency of the most frequent term in that instance, which is a local measure. The global measure *inverse document frequency* is the logarithm of the number of instances by the number of instances with the kth term [1].

The cosine similarity measure $m(d_q, d_r) := \frac{\mathbf{w}_q \cdot \mathbf{w}_r}{|\mathbf{w}_q| \cdot |\mathbf{w}_r|}$ is the degree between two instances d_q and d_r with weight vectors $\mathbf{w}_q$ and $\mathbf{w}_r$ in that vector space [1]. To detect the most important terms representing all instances in each of the k clusters, we use the highest ranked terms with respect to tf·idf. Note that these tf·idf values are not the same as in the clustering: In contrast to measuring the similarity of contributions, similarities of clusters are taken into account here. Therefore, all terms in one cluster are handled equivalently and $0 \leq l < k$.

Latent Dirichlet Allocation. The basic idea of latent Dirichlet allocation is that instances are represented as random mixtures over latent topics, where each topic is characterized by a distribution over terms [2]. Again, we allow to use stemmed noun phrases. LDA combines the two steps of clustering and extraction of keywords presented in the previous section in a joint fashion. As all documents are assigned to several topics, we report the most probable topic only. The values of the parameters of the LDA implementation in the MALLET toolkit are adapted as described by [17].

2.2 Sentiment Analysis

Sentiment analysis is the assignment of an expressed sentiment to a text fragment. Typically, the classes *positive* and *negative*, and *neutral* are used [5,7,8]. Most systems incorporate dictionary-based features; in the most straight-forward case, string matching with word lists with positive and negative connotation. An example for such system incorporating dictionaries next to other methods applied on online debate data has been presented by [16].

We apply a dictionary-based approach using the word lists of 6859 words (4818 negative, 2041 positive) provided by Hu and Liu[8] [7]. Let D^+ be the set of positive words and D^- the set of negative words. A sentiment score $sent(d_i)$ for a textual contribution d_i (where t_{ik} is the kth token in d_i) is $sent(d_i) = \sum_k s_{ik}$, where $s_{ik} = 1$ if $t_{ik} \in D^+$ and $s_{ik} = -1$ if $t_{ik} \in D^-$.

As described in Sect. 2.1, the contributions are clustered into topics of similar content to provide the user with an overview what the debate is about. To

[8] http://www.cs.uic.edu/~liub/FBS/opinion-lexicon-English.rar, accessed 1st Dec 2011.

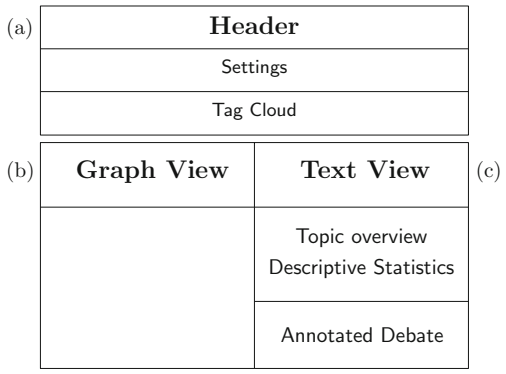

Fig. 2. Schematic structure of the graphical user interface for the interactive debate visualization

enhance that with the associated sentiment, we assign the sentiment score of the documents of topic T_i by $\widehat{sent}(T_i) = \frac{1}{|T_i|}\sum_{d_i \in T_i} sent(d_i)$, where $\frac{1}{|T_i|}$ is a normalization factor. The combination of sentiments for LDA could have been implemented by taking the probabilities of tokens representing a specific topic into account as well. A drawback would be the limited transparency of the approach to the user.

2.3 Concepts of User Interaction

In Sect. 2.1 and 2.2, the methods to support a user in analyzing a textual debate for a specific theme have been introduced and explained. The results of these analyzes need to be shown to a reader or decision maker in an intuitive way. We implemented a web service based on a relational database harvesting the necessary data. This database acts as a temporary storage of the clustering results and updates the content in real time when a new debate contribution is included. Figure 2 shows a schematic overview of the web-based interface, divided into two main sections: The header of the page (a) acts as a common part for automatic summarization of the debate and the possibility to parametrize topic modeling and the sentiment analysis. The lower part is divided into the graph view (b) and the textual view (c) onto the debate.

An introduction of the debate content is given by a tag cloud of the main phrases in the debate and a depiction of demographic data of the participants. The selection of methods and parameters presented in Sections 2.1 and 2.2 is user-specified.

In the graph view section (Fig. 2(b)), a graph consisting of vertexes v_i for each cluster T_i and directed edges $e_j = (v_k, v_l)$ is shown. Such edge is introduced if and only if $\exists d_m \in T_k$ and $\exists d_n \in T_l$ such that d_m and d_n are directly succeeding in the debate thread. A weight denoting the number of succeeding contribution pairs is additionally attached to that edge. In that way, the graphical depiction

Doc.	Topic
d_1	T_1
d_2	T_1
d_3	T_1
d_4	T_2
d_5	T_2
d_6	T_2
d_7	T_3
d_8	T_1

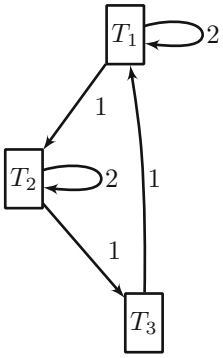

Fig. 3. Example debate thread with clustering and graph depiction

summarized the linear structure of the thread by means of topics. It makes loops in contributions of same topic or between different topics clearly observable. An example of a debate thread together with its graph view is shown in Fig. 3. Here, topic T_1 as well as T_2 consist of three contributions, while two are answering without changing the topic. The contribution with topic T_3 is leading back to T_1, while there is only one transition between all different clusters of topics.

The textual view (Fig. 2(c)) consists of two different sections. Firstly, the found topics are presented together with additional information, *i. e.* the top words describing the topic of the cluster, the number of debate contributions $|T_i|$ in the ith topic and a normalized sentiment score $\widehat{sent}(T_i)$. The second subsection of the textual view consists of the annotated text itself. The information added to the text is the annotation of words associated with a sentiment, the sentiment score of each contribution and a highlighting of the topic-distinguishing words of each cluster.

This view needs to be highly interactive by means of different filtering possibilities: The user can select a topic to limit the shown debate distribution to those in the topic. Additionally, it needs to be possible to show only contributions associated with a positive or negative sentiment or to filter the contributions by a specific word, be it freely specified or selected from the tag cloud.

3 Results and Discussion

3.1 Experimental Setup

As described in Sect. 1.2, one aspect of the +Spaces project is to create a platform for civil servants and policy makers which provides an easy to use and clearly arranged graphical user interface for practical usage within a political context. To reach this goal, an example debate has been annotated in cooperation with the policy makers for analyzing the usefulness of the presented approaches.

A debate about the current Greek financial crisis was selected [21] and annotated by two members of a focus group. This group has the function to evaluate

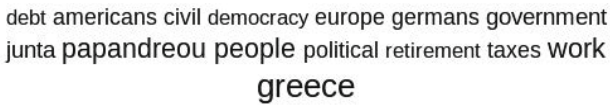

Fig. 4. Frequency based tag cloud of the evaluation debate

Show	Topics	Most relevant words	Number of contributions in this topic	Specificity of relevant words in topic	Averaged sentiment of topic
☑	Topic 1	working, germans, people, weeks, figures, products, vacation, timents, average, good, don, laws, job, receipts, europe, europeans, book, sector, comments, paid, retirement, fact, germani, starting, businesses	16	64.1%	1.19
☑	Topic 2	greek, greece, countries, americans, days, problem, mania, taxes, while, government, place, credit, speaks, years, truth, public, person, debts, paying, developers, mentality, make, veri, home, question	15	72.3%	0.0
☑	Topic 3	papandreou, years, junta, constitution, grandfather, power, economy, fires, civil, tomaski, prime, george, gap, crisis, michael, return, coup, parliament, democraci, mans, talking, parti, good, war, minister	9	63.9%	-1.11
☑	Topic -	contribution not classified!	-	-	-

Fig. 5. LDA clustering results of the evaluation debate as list

and discuss the results coming from the +Spaces consortium and the members have a strong political background. The chosen political debate has a length of 39 contributions coming from 24 different participants. The total number of words in this debate is 3994, the average contribution length is 102, the standard deviation is 90.

The task of the annotators was to underline the most important terms, as well as to assign a sentiment. For simplicity, one of three sentiment classes (*positive*, *negative*, *neutral*) were attached to each contribution. This task turned out to be complex for the special case of political debates; the inter-annotator agreement determined via Cohen's kappa [3] for the sentiment annotation is not substantial.

3.2 Header Section

The top part of the graphical user interface contains a tag cloud providing a first overview of the debate's content (*cf.* Fig. 4). The main tags (size is coupled logarithmically to frequency) show that the content of the debate is a political discussion concerning Greece and Greek people, the government and taxes. The tag "debt" provides an indication that the debate is about a financial topic.

3.3 Textual View Results

Figure 5 exemplifies the structured results of LDA applied to the debate introduced in Sect. 3.1. Each row in the table corresponds to a detected topic. The first column allows the user for filtering the debate contributions only showing the ones from the specified topic. The third and main column shows representative words and phrases together with the color used to highlight them in the debate text. The fourth column shows the number of debate contributions in this topic. This gives the user an impression of how dominant a specific topic

Fig. 6. Automatically annotated text of the evaluation debate [21] with the additional pseudonymized information about the user, the virtual space, the topic membership, the time stamp, and the sentiment score

is in comparison to the others. The fifth column shows the ratio of the number of found relevant words in this topic and in the whole debate. This value can be understood as specificity of the topic.[9] The last column shows the overall sentiment score of the contributions in the specific topic.

LDA automatically identified three different topics in this case, while a fourth cluster contains contributions that are unspecific (no important words found). 24 of 74 unique relevant words defined by annotators to be of interest (32.43 %) are detected. The k-means algorithm with tf·idf ranking determinates 15 of the relevant words (20.27 %). The three topics give a good insight in the main parts of the discussion: Topic 1 may be called *Political Context in Europe*, the 2nd *Financial and Business Issues* and the 3rd *Greek Opinions*.

With the knowledge of the main topics, the user may want to have a closer look at the detailed results of the topic modeling and the sentiment analysis according to the debate's text. Figure 6 exemplifies the contribution-based layout of this section. The important information provided to the user are the time when the contribution was written, the user information, the assigned topic id and the

[9] If the ratio is close to 1, nearly all relevant words are only mentioned in the topic specific contributions.

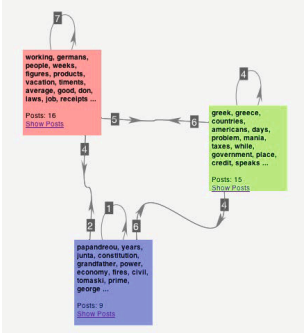

Fig. 7. Screenshot of the graph view of the evaluation debate with LDA

sentiment score of the particular contribution. The text itself is annotated with relevant words using the appropriate color. The topic assignment is stated by the topic id and the colored bar on the left border of the contribution.

In addition to the annotation of all relevant words of each topic, the textual view is enriched with the sentiment score. The annotations in the text are presented with a colored underscore and a [+] for a word with positive and [−] for a word with negative sentiment.

3.4 Graph View Results

Figure 7 shows the visualization of the resulting graphs based on LDA. As described in Sect. 2.3, the number of nodes is equivalent to the number of topics and the labeled edges encode the topics and their transition within the succeeding contributions. In k-means clustering, the number of topics is exactly as specified by the user, in contrast, LDA uses three clusters and leads to a well-arranged graph. The colorization of the nodes is associated with the colors in Fig. 5. The most relevant words of each topic are presented inside of each node. A link to the textual view of the contributions within this cluster is provided. The graph view enables the user to analyze the structure of the debate in a very condensed way.

4 Summary and Future Work

Analysis of textual debates from online communities and presenting them in a way that is clear and valueable for policy makers is a challenging task. In this paper we presented our approach to this challenge, incorporating topic modeling and sentiment analysis, and a web-based implementation of innovative visualizations for presenting the results in an easily perceivable way.

An overview of a debate is presented as a frequency weighted tag cloud. The determination of the main topics along with their most important words allows policy makers to get deeper understanding into a long debate, especially

in the graphical view and the annotated text with different colors. Each topic is additionally assigned with the average sentiment score to not only show most important phrases but the associated emotions as well.

The manual annotation of data is a difficult task, as shown by the limited agreement of two annotators. Nevertheless, we could show on an example debate that despite of the comparatively low complience with manual annotation, the automated approach can lead to understandable and helpful results. How to evaluate such unsupervised methods is still question of research: While an annotator may find some clustering meaningful, another automatically detected one can as well be helpful while being less obvious.

Future work will focus on the execution of a pilot of the whole +Spaces platform, specifically for debates. We assume to retrieve a large amount of real world data and will optimize our approach on such contributions coming from Facebook, Blogger, and Twitter. Presumably, the language used in political debates performed on such platforms differs from texts on other platforms. The same holds for other topics, depending on the participating users and technical limitations, like the limited lengths of texts.

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References

1. Baeza-Yates, R.A., Ribeiro-Neto, B.: Modern Information Retrieval. Addison-Wesley Longman Publishing Co., Inc., Boston (1999)
2. Blei, D.M., Ng, A.Y., Jordan, M.I.: Latent dirichlet allocation. Journal of Machine Learning Research 3, 993–1022 (2003)
3. Cohen, J.: Weighted kappa: Nominal scale agreement provision for scaled disagreement or partial credit. Psychological Bulletin 70(4), 213–220 (1968)
4. Effing, R., van Hillegersberg, J., Huibers, T.: Social Media and Political Participation: Are Facebook, Twitter and YouTube Democratizing Our Political Systems? In: Tambouris, E., Macintosh, A., de Bruijn, H. (eds.) ePart 2011. LNCS, vol. 6847, pp. 25–35. Springer, Heidelberg (2011)
5. Esuli, A., Sebastiani, F.: Determining term subjectivity and term orientation for opinion mining. In: Proceedings of the Conference of the European Chapter of the Association for Computational Linguistics, EACL (2006)
6. Glance, N.S., Hurst, M., Tomokiyo, T.: Blogpulse: Automated trend discovery for weblogs. In: WWW 2004 Workshop on the webblogging ecosystem: Aggregation, Analysis, and Dynamics. ACM (2004)
7. Hu, M., Liu, B.: Mining and summarizing customer reviews. In: Proceedings of Knowledge Discovery in Databases Conference. ACM, Seattle (2004)
8. Kim, S.-M., Hovy, E.: Determining the sentiment of opinions. In: Proceedings of the COLING conference, Geneva, Switzerland (2004)
9. MacKay, D.: Information Theory, Inference and Learning Algorithms. In: An Example Inference Task: Clustering, ch. 20, pp. 284–292. Cambridge University Press (2003)

10. Maragoudakis, M., Loukis, E., Charalabidis, Y.: A Review of Opinion Mining Methods for Analyzing Citizens' Contributions in Public Policy Debate. In: Tambouris, E., Macintosh, A., de Bruijn, H. (eds.) ePart 2011. LNCS, vol. 6847, pp. 298–313. Springer, Heidelberg (2011)
11. McCallum, A.: Information extraction: Distilling structured data from unstructured text. Queue 3, 48–57 (2005)
12. McCallum, A.K.: MALLET: A Machine Learning for Language Toolkit (2002), http://mallet.cs.umass.edu
13. Mei, Q., Liu, C., Su, H., Zhai, C.: A probabilistic approach to spatiotemporal theme pattern mining on weblogs. In: Proceedings of the 15th International Conference on World Wide Web, WWW 2006, pp. 533–542. ACM, New York (2006)
14. Nanno, T., Fujiki, T., Suzuki, Y., Okumura, M.: Automatically collecting, monitoring, and mining japanese weblogs. In: Proceedings of the 13th International World Wide Web Conference on Alternate Track Papers & Posters, WWW Alt. 2004, pp. 320–321. ACM, New York (2004)
15. Pang, B., Lee, L.: Opinion mining and sentiment analysis. Found. Trends Inf. Retr. 2, 1–135 (2008)
16. Somasundaran, S., Wiebe, J.: Recognizing stances in ideological on-line debates. In: Proceedings of the NAACL HLT 2010 Workshop on Computational Approaches to Analysis and Generation of Emotion in Text, Los Angeles, California, USA (June 2010)
17. Steyvers, M., Griffiths, T.: Probabilistic topic models. In: Latent Semantic Analysis: A Road to Meaning. Lawrence Erlbaum (2007)
18. sync3: Eu project sync3 (2011), http://www.sync3.eu/
19. Sæbø, Ø.: Understanding Twitter^{TM} Use among Parliament Representatives: A Genre Analysis. In: Tambouris, E., Macintosh, A., de Bruijn, H. (eds.) ePart 2011. LNCS, vol. 6847, pp. 1–12. Springer, Heidelberg (2011)
20. Teufl, P., Payer, U., Parycek, P.: Automated Analysis of e-Participation Data by Utilizing Associative Networks, Spreading Activation and Unsupervised Learning. In: Macintosh, A., Tambouris, E. (eds.) ePart 2009. LNCS, vol. 5694, pp. 139–150. Springer, Heidelberg (2009)
21. The Guardian: Greece is the word (2011), http://www.guardian.co.uk/commentisfree/michaeltomasky/2010/mar/10/greece-usa-breakfast-with-papandreou
22. Tserpes, K., Jacovi, M., Gardner, M., Triantafillou, A., Cohen, B.: +spaces: Intelligent virtual spaces for egovernment. In: Proceedings of International Conference on Intelligent Environments (IE 2010), Guanajuato, Mexico (June 2010)

Exploiting eParticipation Using an Ontological Approach

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Abstract. When building an eParticipation environment, many questions arise. Who will the participants be? What are the outcomes? How will citizens interact? How will they be selected? All these questions will influence the specification of an eParticipation environment. In order to create an effective eParticipation environment, the designer pays attention to all these characteristics, which can be tricky, especially when selecting ICTs to support the eParticipation process. This paper suggests the use of an ontological approach when specifying these eParticipation environments, in order to reduce the designer's cognitive efforts when designing effective eParticipation environments.

Keywords: ontology design, specification phase, eParticipation environments.

1 Introduction

Recently, initiatives to bring togheter government and citizen raised new research questions regarding citizen participation in the matters of their being informed, consulted and making decisions using Information and Communication Technologies (ICTs) [1][2]. By using ICTs, e.g. chats, blogs, discussion fora voting tools and others, eParticipation environments are created by software engineers, reducing citizens efforts, as compared to traditional approaches for public participation [3]. In these environments, citizens are able to discuss their opinions, be informed of new topics and demands to be discussed and vote on such topics to reach a decision.

However, there are challenges in adding the "e" in participation. One of these challenges is the answer to the question "How do we select the appropriate tools in order that an eParticipation iniciative achieves its outcomes?". Selecting the right tools is important if we want to achieve the proper outcomes [4]. If the right tools are selected, they will certainly affect the course of the process positively and, as a consequence, its effectiveness [5].

Concerning tool selection, note that the effective access to software artifacts is only possible when the access to them is organized around the problem domain structure [6]. In this context, in order to acccess these software artifacts and to properly select them, it is necessary to fully understand the public participation context, dictated by participation methods, techniques or mechanisms [7][8][9]. These methods hold characteristics in common which are essential to create a public participation initiative. Each of these characteristcis will lead to necessary principles to build a

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participation environment. With these principles in hand, it is possible to start thinking of which tools may be employed to add the "e" to participation.

One of our goals is to elucidate these questions, regarding which the characteristics of an eParticipation methods are, which are the eParticipation tools commonly applied to build an eParticipation process and how participation methods and ICT tools may be related to build an eParticipation environment. After clearing these questions, we add this knowledge to an ontology previsously created, called ePDO [3] by adding concepts and properties to it. By describing a use scenario we demonstrate how an ontological approach may help a designer to specify an eParticipation environment.

This paper is organized as follows. After this introduction, we briefly present participation and eParticipation concepts. After that, we describe participation methods and their characteristics, followed by the description of ICTs to enable participation. In the next section, we describe the additions made to ePDO in order to support the specification process. We also present a use scenario for this ontology. Finally, conclusions and future works are presented.

2 Participation and eParticipation

Participation is the act of taking part in something. In this context, citizens may have distinct levels of participation [10], from anecdotic participation, in which citizens are manipulated to believe that they have their voice heard, to real decision-making participation, when citizens share their opinions which are accounted in making decisions which affect them.

eParticipation describes citizens, by using information and communication technologies, being able to perform tasks common to participation, but in an online environment [11] [4]. It is correct to assume that these eParticipation tasks range from information, consultation and active participation [12]. The last category of participation is also split into involvement, collaboration and empowerment [13]. There are a number of distinct names for these participations contexts, but the important is that they all take into account the citizen as the center of the participation.

In this context, distinct eParticipation tools may be employed to create eParticipation environments [4][14] [11]. These may range from simpler ones, used in any context apart from eParticipation, to more specific tools to support this kind of participation.

To control the procedures and guarantee the correct outcomes, a participation or eParticipation may follow a participation method. There are a number of methods to promote participation [7]. However, authors state that only a few fit the active participation category [15][8].

When building eParticipation environments, it is important to consider the outcomes expected and the tools selected to create the eParticipation initiative, with the risk of building flawed citizen participation, which decreases citizens' confidence in these processes, making it harder for the citizen to participate. Indeed, the choice of the correct tools improve the correct progress of the eParticipation initiative, leading to these citizens' greater confidence [4]. In the next sections, we will provide a closer overview of these participation methods and ICTs, showing how to relate them when building eParticipation environments.

3 Characterizing Participation Methods

Public participation encompasses consulting, involvement and information procedures to allow those affected by a decision to have an input. The way these inputs are gathered may be characterized by distinct participation methods [15].They may also be called public participation processes [8], mechanisms or techniques [7]. They will be called participation methods herein.

Each of these participation methods have a set of characteristics that define them, e.g. number of participants and participant selection [8]. In order to describe a common understanding of these, we performed a literature review searching for participation methods descriptions. The next paragraphs discuss the most relevant findings describing existing participation methods, along with their descriptions. From these descriptions, we present a set of common characteristics and describe the most relevant deliberative participation methods [15] using these characteristics.

Rowe and Frewer [15], in their paper about the evaluation of public participation methods, describe those who are closer to active citizen participation and more formalized in the literature. They are: Referendum, public hearings/inquiries, public opinion surveys, negotiated rule-making, consensus conference citizens' jury/panel, citizen/public advisory committee and focus groups.

The same authors also mentions guidelines for evaluating participation methods, which are very interesting to be observed if common characteristics of participation methods are to be extracted. These are divided into two dimensions: acceptance criteria, related to the public acceptance of the process, and process criteria, related to the effective construction and implementation of a procedure. Since the specification of eParticipation environments is being considered, we may pay closer attention to the second criteria. This dimension has as criteria: participants' access to appropriate resources to achieve their participation goals; scope, task and nature definitions for each activity during the participation; structured decision-making using appropriate mechanisms for decision-making process exhibition; and finally, cost/effectiveness.

Authors from [8] also present a discussion about design and evaluation of participation methods. In their work, the authors establish four elements that distinguish participation methods: selection of participants (which is also mentioned in [16]; number of participants; input type and number of meetings until a decision is made. Also, after analyzing distinct participation methods described in the literature, authors establish principles for designing and evaluating participation methods, divided into four elements: representation, regarding the way we represent the issues; procedures, related to the steps to execute one participation method, being these steps, e.g., duration, moderation or answers given by the public participating; information, which deals with the need to evaluate how information is selected, presented and interpreted; and results, regarding deliberation, e.g. how the outcomes were informed to the citizens, and which consensus was reached. Although this work seems similar to Rowe and Frewer's work, it provides guidelines to evaluate and to implement participation methods, whilst [15] provide a framework for evaluation.

There are also more detailed descriptions, although superficial ones, for running participation methods [9]. The author also highlights the need of correctly selecting a participation method to achieve an expected outcome. It considers four determinant

characteristics for this choice: participation objectives; topic to be discussed; participants and their expertise; available time when searching for a solution; and budget available when running the method.

Rowe and Frewer [7] wrote about a topology of participation mechanisms. The authors describe the most relevant variables of these participation methods. They are: participants' selection method; information elicitation facilitation; information input form; information transfer form and information aggregation facilitation. These variables are described by the authors because they alter the effectiveness of the participation mechanisms.

After analyzing the abovementioned works, we have summarized our findings in a general set of characteristics used to describe a participation method, and also essential to be considered when building a public participation process. These are Participants selection, number of participants, form of participation, access to information, duration and presentation of results. Discussion over these characteristics are presented in details on [17].

We also applied these characteristics to the methods previously presented in [15], in order to show the coverage of these characteristics when used to describe participation methods. Table 1 shows the result of this description.

Table 1. Definition of Rowe and Frewer's participation methods[15] according to characteristics extracted

	Participants Selection	Number of part.	Form of part.	Access to inf.	Duration	Presentation of results
Referenda	Mandatory	Large	One-question poll	Government	Predefined	Official release
Public hearings/ inquires	Open	Large	Open discussion	Government	Open	Press release
Public opinion surveys	Selective (rep.)	Medium (between 100 and 1000 citizens)	Survey	Government	Predefined	Press release
Negotiated rule-making	Selective (i.)	Small	Guided discussion	Government	Open	Official release
Consensus Conference	Selective (rep.)	Small	Guided discussion	Citizen	Predefined	Press release
Citizens' jury/ panel	Selective (rep.)	Small (12/ 20 citizens)	Guided discussion	Citizen and Government	Predefined	Press release
Citizen/ public advisory committee	Selective (rep.)	Small	Guided discussion	Citizen and Government	Open	Press release
Focus groups	Selective (rep.)	Small (5 to 7 citizens)	Guided discussion	Citizen and Government	Open	Press release

As Phang and Kankanhalli [4] mentions, each of the participation methods characteristics will have an influence in the building of an eParticipation environment. In our proposal, these characteristics will help us to establish principles for the specification of eParticipation environments.

When establishing principles for specifying these eParticipation environments, one must note that authors strongly recommend that these environments follow

characteristics or principles of virtual communities [18]. On this matter, in [18] authors proposed three categories of principles for building eParticipation virtual communities: technical and content design; participants' social behavior; and interface design. Our principles relate to their technical and content ones. However, our work is based on participation methods and their characteristics and requirements. We describe these principles in detail in Table 2.

We can also associate these principles back to the participation methods. We notice that there are common principles to most of the participation methods. This occurs because such methods have similar deliberative characteristics associated to their execution, which demands that specific principles are followed. Table 3 shows these relationships, which will afterwards be used in our ontology for supporting the specification of eParticipation environments.

Table 2. Principles related to each characteristic identified

Characteristic	Principles
Participants selection	P1: Environment should allow the access of participants through registration, as in a virtual community. P2: The environment should allow the selection of participants through a selection tool. P3: Environment should allow the sending of requests of participation by the government, calling citizens to participate in activities
Number of participants	P4: Environment should allow structuring the environment for a small number of participants P5: Environment should allow structuring the environment for medium number of participants P6: Environment should allow structuring the environment for large number of participants
Form of participation	P7: Environment should allow the definition of exhibition and propagation of information by the participants. P8: Environment should allow the definition of free discussion spaces. P9: Environment should allow creating surveys with multiple questions. P10: Environment should allow creating polls with a single question. P11: Environment should allow creating a debate between citizens and government exchanging opinions. P12: Environment should allow the presence of moderators in discussions. P13: Environment should allow the citizen to vote in one or more opinions. P14: Environment should allow the moderator to regulate opinions, when they are not in accordance with pre-established rules.
Access to information	P15: Environment should allow the insertion of information (text, image, video, links, among others) by citizens P16: Environment should allow the insertion of information by the government (.e.g. open data).
Duration	P17: Environment should allow the administrator to put a timestamp on participation processes. P18: Environment should allow the environment to have a participation process with no established ending date.
Presentation of results	P19: Environment should allow making information available about deliberation made on it. P20: Environment, via government, should allow to report the outcome of the deliberation, in a general way, for participants

Table 3. Relationship between participation methods and principles

Participation Method	Associated Principles
Referenda	P1,P6, P13, P16, P17, P20
Public hearings/ inquiries	P1, P6, P8, P13, P16, P18, P19
Public opinion surveys	P2,P3,P5, P9, P10, P16, P17,
Negotiated rule-making	P2,P3, P4, P11, P16, P18, P20
Consensus Conference	P2,P3,P4, P7, P11, P12, P14,P16, P17, P19
Citizens' jury/ panel	P2,P3,P4, P7, P11, P12, P14, P15, P16, P17, P19
Citizen/public advisory committee	P2,P3, P4, P7, P8, P15, P16, P18, P19
Focus groups	P2,P3, P4, P11, P12, P14, P15, P16, P18, P19

4 ICTs to Enable eParticipation

The use of ICTs to promote citizens' participation is evidenced in works [4], reports and analysis of ways to promote citizens' participation [19] [11]. In order to add the "e" in participation, it is important to use tools which support all the stages of online participation processes.

In the literature, there are many definitions for these ICTs [20] [14][4][11]. This plurality of definitions may be upsetting when selecting ICTs to build an eParticipation environment. Distinct definitions often mix technologies and tools, making it harder to understand which ones are tools and which ones are technologies and the possible reuse of these tools in other eParticipation initiatives.

Aiming at classifying tools for eParticipation, we consider, from the related works, tools in which the end user is the citizen or the government, i.e., there are interaction among the users using these tools. The tools analysed were the ones described by Thorleifsdottir & Wimmer [11], which are the most complete description of these tools when compared to other analyses.

By analyzing these tools, we also notice that some functionalities are transverse to many tools, e.g. the need for a profile to register the citizen. We call these functionalities ICT components. The following are the components identified, and the tools that implement these functionalities:

- Chat: provides a space for free discussion among participants, with no focus on a single subject. Related ICT: eParticipation Chat Rooms
- Profile: allow the user to register for an environment, virtually becoming a part of it. This component can be considered fundamental when you want to start a process of participation, as participants must identify themselves. Related ICTs: all those described.
- Forum: Unlike Chat, a forum is structured by topics, to facilitate discussion. Discussion is free, but moderation may be needed. ICT identified: eParticipation Discussion Forum / Board
- Debate: enables debating about a given topic. In this debate, citizens share their opinions and vote against, neutrally or favorably to a topic. An interaction

language may be used to structure discussion, such as DemIL [21]. ICT identified: ePanel, eDeliberative Polling.

- Information Provision: allows one to make information available for citizens through a number of sources: audio, video, wikis, blogs, podcasts, videocasts, links or documents uploaded. ICTs identified: Podcasts, Wiki, Blog, and FAQ.
- Petition: Employ when creating petitions. These petitions can be created when citizens want to gather signatures for a specific topic to be discussed by the government. ICT identified: ePetitioning.
- Meeting: ICT for creating meeting spaces between citizens and government. Meeting can take place in real time or not. Government and citizens are may exchange opinions. ICT identified: Webcast.
- Survey: provides a way for creating a set of questions to be answered by citizens. ICT Identified: eConsultation, eDeliberative Polling.
- Poll: Component for creating a single poll with one question to be answered by citizens. In this component, citizens do not need to be identified; however, it is possible for them to do so. ICT identified: eConsultation, eDeliberative Polling.
- Voting: ICT Component for creating an official voting. Like a poll, a question may be answered by the citizens. However, the citizen must be identified as a registered voter, although this registration would not be necessarily related to his/her choice. When implementing this component, additional security questions must be considered. ICT identified: eVoting.
- Alert: ICT component that account for sending citizens alerts about topics of their interest or to call them to participate in a given participation process. ICT identified: Alert services, online newsletters, Listserv.

It is important to notice that although the Demo-net report presents these tools, they are not final, and many other tools may be employed. However, they represent a great number of ways for implementing participation processes. Moreover, the ICT components identified are not final. They will need to be adapted to distinct contexts of participation. The goal when summarizing these ICT components is to extract their common functionalities, in order to allow the reuse of these functionalities in other eParticipation initiatives, and thus help the selection of ICTs to implement when specifying an eParticipation environment.

5 Connecting Principles with ICT Components

In order to have an eParticipation environment, the principles described in Table 2 need to be implemented by the ICTs, which are built by ICT components, primarily. The principles are related with these ICT in Table 4.

When associating principles with ICT components identified, some interesting issues arise. Petition component did not have any principle associated to it. One may argue that this is because this is not a formalized participation method, but a way for citizens to start a participation initiative. Regarding the principles, P15 was mentioned both as being implemented by Debate or by a Meeting. The selection of the component in this case depends on how the government will interact with citizens.

Another intriguing question is that not all principles have a relation with a component. This means that these principles were not thought of when using these tools, but may also mean that the ICTs implicitly implement these principles. In order to organize uncovered principles, five additional components are suggested in order to complement these missing principles.

- Selection: Component for selecting participants in a given participation process. Principle identified: P2.
- Environment Organization: Component for organizing the environment according to the number of citizens. This organization may be conducted by adapting the interfaces for multiple users, e.g. when these are in a forum. Principles identified: P4, P5, P6.
- Duration: Component to organize the duration of the processes. Principles identified: P17, P18.
- Moderation: Component that deals with moderation, e.g. allow selecting a moderator, and giving this citizen power to moderate discussions. Principles identified: P12,P14.
- Result: Component that organizes the results and output them adequately, according to the specification of the process. Principles identified: P19, P20.

Table 4. Relationship between ICT components and Principles

Component	Principles implemented
Chat	P7
Profile	P1
Forum	P8
Debate	P11
Information Provision	P15, P16
Petition	No principle identified
Meeting	P11
Survey	P9
Poll	P10
Voting	P13
Alert	P3

6 Description of the Extension of the Ontology

When building an eParticipation environment, many questions arise. Who will the participants be? What are the outcomes? How will citizens interact? How will they be selected? All these questions will influence the specification of an eParticipation environment.

Ontologies are adequate to answer these questions. Given these and many other advantages of ontologies [22], we propose the use of an ontology to help the specification of these systems. When using concepts to describe the characteristics of participation methods and ICT along with ICT components and principles and properties among all these concepts, we can turn the ontology into a powerful

mechanism to support the designer when specifying an eParticipation environment. By using ontology, the decision when choosing ICTs to build the environment is now shared between ontology and designer of the environment, with the ontology being a knowledge base that can be expanded by the very designer, if there is the need for doing so.

An initial version of the ontology and a model for applying this ontology in the specification of an eParticipation environment has been mentioned before [3]. This ontology is called ePDO (eParticipation Domain Ontology). In this work, our goal was to expand it by defining the relationship among participation methods and ICTs in order to support the designer in the specification of these environments.

The abovementioned sections elucidate the relationships among participation methods and ICTs that a designer would search when building an eParticipation initiative. This information will allow us to evolve the ontology previously described in [3]. A new version of ePDO is presented in Figure 1 and explored in details on the following subsections. We omitted some concepts to make it clearer for the reader to understand the new additions to ePDO.

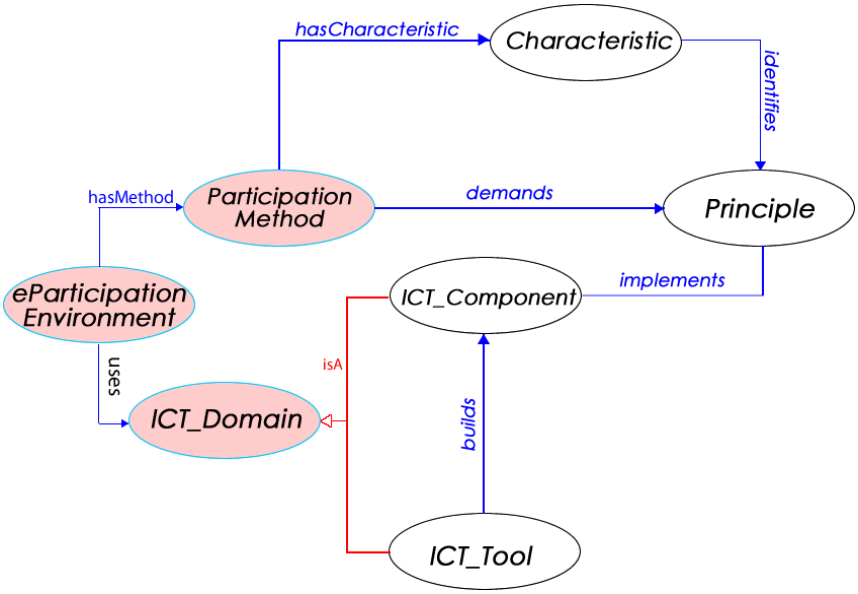

Fig. 1. A portion of ePDO[3], painted, and new terms, unpainted

6.1 New Terms and Properties of the Ontology

New concepts and properties must be added to the ontology to allow a designer to use it as a support for specifying an eParticipation environment. These concepts are:

- Characteristics: Class containing the characteristics described as relevant to define participation methods, as mentioned in Section 2.

- Principles: This class contains as subclasses each principle captured from the characteristics of participation methods.
- ICT_Domain: This class contains two subclasses: ICT_Component and ICT_Tool. The former contains as subclasses the components identified in the ICTs, while the latter contains the ICT tools described by [11].

The evolution of the ontology is not complete if concepts are added. It is necessary to add the knowledge to relate these concepts so that the ontology will contain the knowledge to help a designer in the specification of the eParticipation environment.

These new properties (along with their inverse properties) are the following:

- builds/isBuiltBy: Relationship between an ICT Tool and the ICT components necessary to build one ICT Tool, as described in Section 5.
- Demand/isDemandedBy: Relationship between participation methods and principles, as in Table 3.
- Implements/isImplementedBy: Relationship between ICT components and principles, as in Section 6.
- hasCharacteristic/isCharacterizedBy: Relationship between participation methods and characteristics, as in Section 4.1.
- identify/isIdentifiedBy: Relationship between characteristics and principles.

6.2 A Method for Using the Ontology

Suppose that a designer need to build an eParticipation environment (e.g. a referendum) as a demand given by the government. In this referendum, people of a country will one question to answer. Citizens will be able to discuss these questions and the alternatives to the latter.

Guided by the ontology, the designer starts by describing the characteristics of the referendum. The ontology has the knowledge to associate characteristics of a referendum to principles (through the *identifies* property). Each principle is related to ICTs components (through the *implements* property). These ICT components, when aggregated, will build one or more ICTs (shown by the property *builds*). At this time, the designer will have the information of which ICTs he will need to design and implement to build this eParticipation environment. Figure 2 illustrates this process.

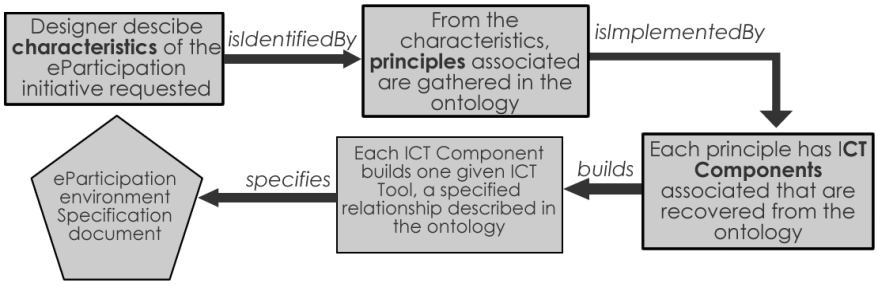

Fig. 2. Knowledge discovery process on the ontology

7 Conclusions and Future Works

This paper proposes the use of an ontological approach to support the specification of eParticipation environments. To perform such a task, we analyzed the relationship between participation methods and ICTs, defining principles for building eParticipation processes and ICT components to use when building such processes In this paper, the knowledge acquisition was in evidence, rather than an implementation of the ontology.

One thing that should be mentioned is that, when using ontologies to specify eParticipation environments, the designer, from the very beginning, may find dependencies and necessary components to build these environments, which makes it important to implement an environment aligned with the citizens' needs and the outcomes expected, essential to perform an efficient eParticipation process [5].

As future works, we intend to seek to reuse the ontology in other parts of the software lifecycle of the building of eParticipation environments [23] aiming at automating the process of building these environments [3] and using components as building blocks to implement them [24]. Testing with designers with expertise in electronic government using the ontology to specify eParticipation environments will be performed, in order to validate and to improve this solution.

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References

1. Sæbø, Ø., Rose, J., Flak, L.S.: The shape of eParticipation: Characterizing an emerging research area. Government Information Quarterly 25, 400–428 (2008)
2. Macintosh, A., Coleman, S., Schneeberger, A.: eParticipation: The Research Gaps. In: Macintosh, A., Tambouris, E. (eds.) ePart 2009. LNCS, vol. 5694, pp. 1–11. Springer, Heidelberg (2009)
3. Slaviero, C., Garcia, A.C.B., Maciel, C.: Towards an Ontology to Support the Deployment of eParticipation Environments. In: Andersen, K.N., Francesconi, E., Grönlund, Å., van Engers, T.M. (eds.) EGOVIS 2011. LNCS, vol. 6866, pp. 146–160. Springer, Heidelberg (2011)
4. Phang, C.W., Kankanhalli, A.: A framework of ICT exploitation for e-participation initiatives. Communications of the ACM 51, 128 (2008)
5. Velikanov, C.: Requirements and tools for an efficient eParticipation. In: Proceedings of the 11th Annual International Digital Government Research Conference on Public Administration Online: Challenges and Opportunities, pp. 32–40. Digital Government Society of North America (2010)
6. Clayton, R., Rugaber, S., Wills, L.: Dowsing: a tool framework for domain-oriented browsing of software artifacts. In: Proceedings 13th IEEE International Conference on Automated Software Engineering (Cat. No.98EX239), pp. 204–207. IEEE Comput. Soc. (1998)
7. Rowe, G., Frewer, L.J.: A Typology of Public Engagement Mechanisms. Science, Technology & Human Values 30, 251–290 (2005)

8. Abelson, J., Forest, P.-G., Eyles, J., Smith, P., Martin, E., Gauvin, F.-P.: Deliberations about deliberative methods: issues in the design and evaluation of public participation processes. Social Science & Medicine 57(2003), 239–251 (1982)
9. Slocum, N.: Participatory Methods Toolkit - A practitioner's manual. ViWTA and King Baudoin Foundation (2003)
10. Arnstein, S.R.: A Ladder of Citizen Participation. Journal of the American Planning Association 35, 216–224 (1969)
11. Thorleifsdottir, A., Wimmer, M.A.: DEMO-net: Deliverable 5.1 Report on current ICTs to enable Participation (2006)
12. OECD: Citizens as Partners - OECD Handbook on Information, Consultation and Public Participation in Policy-Making. OECD Publishing (2001)
13. IAP2: IAP2 Spectrum of Public Participation (2007)
14. Kumar, N., Vragov, R.: Active citizen participation using ICT tools. Communications of the ACM 52, 118 (2009)
15. Rowe, G., Frewer, L.J.: Public Participation Methods: A Framework for Evaluation. Science, Technology & Human Values 25, 3–29 (2000)
16. Mulgan, G., Blears, H.: People & Participation (2005)
17. Slaviero, C., Garcia, A.C.B., Maciel, C.: Métodos de participação e Tecnologias de Informação e Comunicação: transformando participação em eParticipação. In: IV Workshop de Computação Aplicada em Governo Eletrônico, pp. 17–24 (2012)
18. Maciel, C., Roque, L., Garcia, A.C.B.: E-Democracy: Concepts, Experiences and Challenges. In: Herrmann, P. (ed.) Democracy in Theory and Action, pp. 51–92. Nova Science Publishers, Inc., New York (2011)
19. IAP2: Public Participaton Toolbox (2000)
20. Tambouris, E., Liotas, N., Tarabanis, K.: A Framework for Assessing eParticipation Projects and Tools. In: Proceedings of the 40th Hawaii International Conference on System Sciences, Hawaii, pp. 1–10. IEEE (2007)
21. Maciel, C., Garcia, A.C.B.: DemIL: an online interaction language between citizen and government. In: Proceedings of the 15th International Conference on World Wide Web, pp. 849–850. ACM, Edinburgh (2006)
22. Noy, N.F., McGuinness, D.L.: Ontology development 101: A guide to creating your first ontology (2001), http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.136.5085&rep=rep1&type=pdf
23. Happel, H., Seedorf, S.: Applications of ontologies in software engineering. In: Proc. of Workshop on Sematic Web Enabled Software Engineering (SWESE) on the ISWC, Citeseer, pp. 5–9 (2006)
24. Maciel, C., Slaviero, C., Souza, P. C., Campos, M. A. D., Santana, E. C.: Platform design details to support eparticipation environments deployment. In: Third IFIP WG 8.5 International Conference on eParticipation (ePart 2011), Delft. Electronic Government and Electronic Participation, vol. 37, pp. 382–391. Trauner Verlag, Austria (2011)

Public Policy Formulation through Non Moderated Crowdsourcing in Social Media

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Abstract. The emergence of web 2.0 social media enables the gradual emergence of a second generation of e-participation characterized by more citizens' control, in which government agencies post content (e.g. short or longer text, images, video) to various social media and then analyze citizens' interactions with it (e.g. views, likes/dislikes, comments, etc.). In this paper we propose an even more citizens controlled third generation of e-participation exploiting web 2.0 social media as well, but in a different manner. It is based on the search by government agencies for content on a public policy under formulation, which has been created in a large set of web 2.0 sources (e.g. blogs and microblogs, news sharing sites, online forums) by citizens freely, without any initiation, stimulation or moderation through government postings. This content undergoes advanced processing in order to extract from it arguments, opinions, issues and proposals on the particular policy, identify their sentiments (positive or negative), and finally summarize and visualize them. This approach allows the exploitation of the vast amount of user-generated content created in numerous web 2.0 social media for supporting governments to understand better the needs, wishes and beliefs of citizens, and create better and more socially rooted policies.

Keywords: e-participation, public policy, crowdsourcing, social media, sentiment analysis, visual analytics.

1 Introduction

For long time it has been widely recognised that representative democracy, in which citizens' representatives identify needs and problems of society and design public policies and services for addressing them, should be combined with continuous citizens' involvement; this is based on an understanding of the growing complexity and multi-dimensionality of social problems and needs, which necessitates the

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exploitation of citizens' extensive knowledge on them. This gave rise to a new model of democracy, which is termed "participatory democracy" [1] – [4], and combines decision making by citizens' representatives with citizens' participation, with the latter not replacing but supporting and enhancing the former. Row and Frewer [5] define public participation as 'the practice of consulting and involving members of the public in the agenda-setting, decision-making and policy forming activities of organizations or institutions responsible for policy development'. Many governments all over the world have shown consistent interest in and made considerable efforts for enabling the participation of citizens in the formulation of public policiesthrough various mechanisms and channels [6] – [8]. We can distinguish three main motivations of government for this: to produce better quality policies (proportionality and fairness), to build trustand gain acceptance of policy-making processes (awareness and consensus-building), and to shareresponsibility for policy-making (inclusion and participation).

The development and increasing penetration of information and communication technologies (ICT), and the Internet in particular, provides an efficient and inclusive channel for the extensive application of the above principles. This gave rise to the development of electronic participation (e-participation) [9] – [13]. According to the OECD [10] e-participationis defined as the use of ICTs for supporting the provision of information to the citizens concerning government activities and public policies, the consultation with the citizens and also their active participation. However, the first generation of e-participation has been highly government-controlled, based on official websites of government agencies, which defined and controlled the topics and rules of all electronic discussions taking place there. The use of these official e-participation spaces by the citizens has been in general limited and below the initial expectations [14]; most of these officiale-participation spaces were largely unknown to the general public due to the highcosts of promotion and the slow pace of dissemination, while the topics dealt with were sometimes distant from people's daily problems and priorities, sothat content contributions by non-experts was inhibited.

The emergence of the new Web 2.0 social media enables the gradual emergence of a second generation of e-participation,taking place in popular social media where citizens choose to discuss and generate content, which is characterized by less government control and more citizens' control. In this new paradigm of e-participation government agencies post content (e.g. short or longer text, images, video) to various social media on their policies under formulation or implementation, and then collect and analyze citizens' interactions with it (e.g. views, comments, likes/dislikes, retransmissions, etc.). Therefore, in this second generation of e-participation governments continue defining and controlling the discussion topics to some extent (through making postings and initiating discussions on the topics they choose), but do not control the rules of the discussion (which are the ones defined by the social media). It has been widely recognised that governments have to exploit the numerous users-driven Web 2.0 virtual spaces, which have been launched through citizens' initiatives with dramatic success in terms of adoption and usage, for widening and enhancing e-participation.In many of these social media there is already significant 'bottom-up' political activity initiated by the citizens and not by government agencies [15] – [18]. Many political discussions are taking place there, political information and news are exchanged and propagated, and also off-line

political events and initiatives (e.g. movements, demonstrations) are organized and promoted. For these reasons some governments have already started adopting this new e-participation paradigm and exploiting social media (e.g. Facebook, Youtube, Twitter, Blogger, etc.) in many different domains of government, including public participation [19] – [22].

In this paper we propose an even more citizens driven andcontrolled third generation of e-participation, which again exploits web 2.0 social media, but in a different way than the second generation.It is based initially on the search by government agencies for content on a public policy under formulation, which has been created in numerous web 2.0 sources (e.g. blogs and microblogs, news sharing sites, online forums, etc.) by citizens freely, without any initiation, stimulation or moderation through government postings. This content then undergoes linguistic processing and semantic analysis in order to extract from it opinions, arguments,issues and proposals on the particular policy, identify their polarity (positive or negative), and finally summarize and visualize them. This approach allows the exploitation of the vast amount of user-generated content that is created in numerous web 2.0 social media, in order to supporting governments in understanding better the needs, wishes and beliefs of citizens, and creating better and more socially rooted policies. In this third generation of e-participation governments control neither the discussion topic (they simply 'listen' what topics and issues are mentioned by citizens in a broad policy area, which correspond to needs and problems that citizens, and not governments, identify), nor the discussion rules (they accept the ones defined by the various social media they exploit). The research presented in this paper has been conducted as part of the research project NOMAD ('Policy Formulation and Validation through nonmoderated crowdsourcing', which is partially funded by the 'ICT for Governance and Policy Modelling' research initiative of the European Commission.

The paper is structured in five sections. In section 2 the theoretical foundations of the proposed methodology are outlined. Then in section 3 the methodology is described, while in section 4 is presented the technological architecture of the ICT platform that will support this methodology. Finally, section 5 summarizes the conclusions and proposes future research directions.

2 Theoretical Foundations

In this section the theoretical foundations of the proposed methodologyare outlined: a) bottom-up public policy formulation (in 2.1), and b) crowdsourcing (in 2.2).

2.1 Bottom-Up Public Policy Formulation

The formulation of public policies for addressing problems and needs of society has been traditionally a top-down process. Governments and citizens' representatives have had the main role in identifying needs and problems of society and designing public policies and services for addressing them. The participatory democracy and public participation ideas gave some role to the citizens, who are provided some information on government activities and policies, and are asked to participate in consultations and contribute through opinions and responses on issues and questions

defined by government. According to OECD [6] – [8] the development of public participation includes three stages. The first two of them are:

- Information Provision, which establishes an 'one-way relation' between government and citizens, in which government produces and delivers information to be used by citizens.
- Consultation, which establishes an asymmetric 'two-way relation' between the government and the citizens, in which citizens provide views and feedback to government on issues and questions that government has previously defined.

These first two stages of public participation have a strong top-down orientation, and are fully controlled and initiated by government agencies. However, according to the above OECD reports (which are based on the experience of its numerous member countries), they can be followed (depending on the whole political context) by a third stage termed as 'Active participation', in which a more symmetric 'two-way relation' between government and citizens is established. In this stage citizens have a wider role in proposing new policy options and discussion topic, in addition to the ones proposed by government, and in shaping the policy dialogue in general, though the government still has the responsibility for the final decisions. This form of public participation is less government controlled, and can result in bottom-up public policies formulation providing significant benefits: it can provide new fresh ideas concerning needs and problems of society, ways of addressing them, advantages and disadvantages of the latter, and lead to the identification of cultural, social and economic changes that require government action, and to overcoming obsolete government agencies stereotypes in understanding social problems and needs and designing solutions.

According to the corresponding OECD reports on e-participation [9] – [10], the development of e-participation follows a similar trajectory. Its first two stages have a strong top-down orientation, aiming to support through ICT, and especially exploiting the Internet, the provision of information to the citizens on government activities and policies, and the consultation with the citizens on issues and questions defined by government. However, its third stage has a bottom-up orientation and focuses on supporting and facilitating a more active participation of citizens, through online tools and discussion formats which enable them to set the agenda for discussion (e.g. raise new issues that have to be discussed, in addition to the ones raised by the government), submit their own proposals and policy options and in general shape the final outcomes. Similarly, United Nations [23] – [24] suggest a three-step plan for enhancing eParticipation, which includes: (a) increasing e-information provision to citizens for decision making, (b) enhancing e-consultation for deliberative and participatory processes (both these steps having a top-down orientation) and (c) supporting e-decision making by increasing the input of citizens in decision making (this step having a bottom-up orientation).

This bottom-up dimension of e-participation and policy formulation, despite the abovementioned benefits it provides, is the least exploited and explored. Only some types of ICT tools having been investigated for this purpose, such as e-petition spaces (in which citizens can enter petitions concerning new government actions (e.g. services, programs, regulations) to the government or parliament, and solicit support and signatures) [25] – [26], electronic discussion groups supporting the development of new

policy options and the deliberation on them and online referenda. Also, the analysis of e-participation initiatives of many countries has shown that they focus mainly on e-information provision and e-consultation (i.e. on top-down oriented e-participation and policy formulation), and much less on the electronic support of citizens public policy related initiatives (i.e. bottom-up oriented e-participation and policy formulation) [27] – [28]. The methodology proposed in this paper contributes to filling this gap, as it allows the exploitation of user-generated content created freely by citizens in numerous web 2.0 social media on a public policy under formulation, without any government initiation or stimulation, in order to identify relevant needs, problems, proposed government actions, and also advantages and disadvantages of the latter.

2.2 Crowdsourcing

While previously thedesign and problem solving activities of firms were regarded as tasks performed exclusively by highly knowledgeable professionals, recent literature argues that these critical tasks can be performed even better by large, diverse and pluralistic teams of less knowledgeable individuals, giving rise to new distributed group-based multi-disciplinary design and problem solving practices [29]. The capability of a large network of people, termed as 'crowd', networked throughweb technologies, to perform difficult design and problem solving activities is gradually recognized by management researchers and practitioners.This is referred to as 'collective intelligence', which is defined as a 'form of universally distributed intelligence, constantlyenhanced, coordinated in real time, and resulting in the effective mobilization of skills' [30]. Since 'no one knows everything, everyone knows something,[and] all knowledge resides in humanity' [30], digitization and communication technologiesmust become central in this coordination of far-flung genius. In [31] and [32] are described and analyzed several cases of crowd wisdom at work, which results in successful solutionsemerging from a large body of solvers. Based on the analysis of such cases [32] finds that 'under the right circumstances, groups are remarkablyintelligent, and are often smarter than the smartest people in them'.This is due to the diversity of opinion, independence, decentralization and aggregation that characterize such a crowd.

These ideas lead to the emergence of crowdsourcing, which is defined by J. Howe, one the pioneers of this domain, as 'the act of a company or institution taking a function onceperformed by employees andoutsourcing it to an undefined (and generally large) network of peoplein the form of an open call. This can take the form of peer-production (when the job is performedcollaboratively), but is also often undertaken by sole individuals' [33]. Another practical definition of crowdsourcing by D. Brabham is 'a new web-based business model that harnesses the creative solutions of a distributed network of individuals', in order to exploit 'collective wisdom' and mine fresh ideas from large numbers of individuals [32].

Crowdsourcing has started being applied initially in the creative and design industries, and then it expanded into other industries, for solving both mundane and highly complex tasks. It gradually becomes a usefulmethod for attracting an interested, motivated group of individuals, which can provide solutions superior in quality and quantity to those produced by highly knowledgeable professionals. As reported by several case studies [31] – [34] such a crowd can solvescientific problems

that big corporate R&D groups cannot solve, outperform in-house experienced geophysicists of mining companies, design original t-shirts resulting in very high sales, and producehighly successful commercials and fresh stock photography against a strong competitionfrom professional firms. These success stories indicate that the crowd, at least in some design and problem solving activities and under appropriate circumstances, can outperform the traditional industry faster and cheaper. This can result in a paradigm shift and new design and problem solving practices in many industries.

Limited research has been conducted on crowdsourcing, which is mainly descriptive, presenting mainly success stories of using this approach for performing design and problem solving tasks. However, there are some studies attempting to generalize and identify trends and patterns in this area. A typical example is the study presented in [34], which, based on the analysis of several case studies, identifies four dominantcrowdsourcing types/approaches: i) the knowledge discovery and managementapproach (= an organization tasks crowdwith finding and reporting information and knowledge on a particular topic), ii) the broadcast search approach (= an organization tries to find somebody who has experience with solving a rather narrow and rare empirical problem), iii) the peer-vetted creative production approach (= an organization tasks crowdwith creating and selectingcreative ideas), and iv) distributed human intelligence tasking (= an organization tasks crowdwith analyzing largeamounts of information). Also, there are some studies that aim to develop methodologies for the practical application of crowdsourcing in various types of organizations, and for the motivation of individuals to participate [35] – [37].

Though crowdsourcing ideas have been applied initially in the private sector, it is interesting and useful to investigate their applicability in the public sector. There are some first studies concluding that government organizations can apply these ideas, and use 'citizen-sourcing' for collecting information on citizens' needs and for the solution of difficult problems [38] – [43]. According to [38] traditionally government agencies provide services to citizens, who consume them without questioning about them or taking part in decisions that led to their design and provision; social media can drive and facilitate new paradigms of government services design based on citizens-sourcing, in which citizens' roles change, so that government become a consumer to whom citizens provide information, knowledge or even useful professional services. Citizen-sourcing can lead to the application of open innovation ideas in the public sector [34], and gradually result in 'co-production' of public services by government and citizens in cooperation [30].

This paper makes a contribution in this direction, presenting a methodology for the application of crowdsourcing by government agencies, which followsthe first of the abovementioned crowdsourcing approaches proposed by [34](discovery and reporting of information and knowledgeon a public policy under formulation). An innovative feature of the proposed methodology is that it supports an 'extended crowdsourcing', which extends even before the 'open call' for information, knowledge and solutions for a particular topic or issue that characterizes crowdsourcing (see the abovementioned definition of it in [33]), having both 'passive' (non-moderated) and 'active' (moderated) components. In particular, it includes initially a search for relevant content on a public policy under formulation, which has been created in numerous web 2.0 sources (e.g. blogs and microblogs, news sharing sites, online

forums, etc.) by citizens freely, without any initiation, stimulation or moderation through government postings (= passive crowdsourcing). Based on the advanced processing and analysis of this content some first conclusions on the needs, issues, opinions, proposals and arguments of citizens on this public policy under formulation, which will provide a basis for an 'open call' (= active crowdsourcing), having the form of postings to various social media, that solicits citizens' interactions (e.g. likes/dislikes) or comments (e.g. remarks, opinions, positions, proposals) on more specific topics and questions.

3 Methodology Description

The proposed methodology includes four stages (Figure 1), whichenable the policy-makers users of it (e.g. government organizations, members of parliament, politicians) toeffectively LISTEN and monitor what citizens say in social media, ANALYZE those conversations and get the mainstakeholders positions and opinions, RECEIVE all responses and data properly processed and displayed for an effective use and exploitation, and finally ACT onthis information by proceeding to a more active crowdsourcing through postings to various social media. The results of the policy-maker's actions will also be monitoredand undergo the same processing in order to lead to refinements until the finalized policy is formulated.

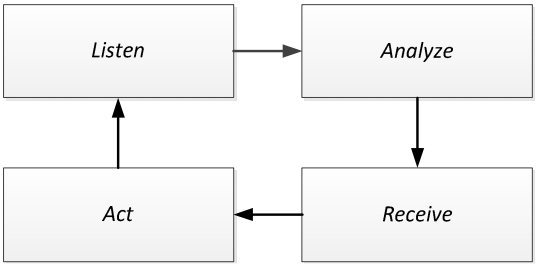

Fig. 1. The four stages of the proposed methodology

In particular, the first stage, called LISTEN, includes listening and monitoring what people say, what their needs, their opinions, positions and proposals are on a topic (e.g. a public policy under formulation) defined by the policy-maker. For this purpose a focused crawler is necessary, that is, a program which browses the Web in an automated, organised fashion, and attempts to visit solely contentthat is relevant to a previously known topic (or set of topics). For the purposes of the discussed platform, the crawler should reach relevant textual information from a variety of sources, with emphasis on environments that provide sizable user-created content, like blogs, micro-blogging sites, social networking platforms, discussion forums, comment-enabled news, corporate or video sharing sites etc.

The second stage, called ANALYZE, includes advanced processing and analysis of the content, from which are identified relevant citizens' needs, opinions, concerns, proposals, sentiments and other information hidden within the citizens' conversations. As the majority of the available information is in textual form, the processes related to

this stage will mainly make use of linguistic techniques. In particular, each web page found by the crawler in the previous stage will go through a series ofautomated analysis processes:

- *Language Detection*, which will recognize the language used in the page.
- *Opinion and Argument Extraction*, with the use of the appropriate semantic similarity measures and inference mechanisms that will allow the identification of analysed content that is pertinent to the particular policy.
- *Sentiment Analysis*, using smart sentiment classifiers analyse the mentions, which recognize the polarity (positive, neutral, negative) of the elements identified above.
- *Argument Summarisation*, with the use of the appropriate algorithms for generating qualitative information about opposing arguments, in the form of anonymity-preserving and automatically-generated summaries.

The RECEIVE stage aims to present to the end-user (policy maker) the knowledge acquired from the previous phases in a complete, coherent and usable manner. The platform will provide an aggregated view of the discovered opinions, their polarity, their association with policy concepts and statements, and statistical indications of their significance and impact. With the use of visual analytics all related data will be presented into a visible form that highlights important features, including commonalities and/or discrepancies. In this context, all the data that comes from sources as diverse as blogs, online opinion polls and government reports are properly displayed for an effective use by the policy-maker.

The three stages above perform a 'passive crowdsourcing', where the policy maker collects and analyses content which has been created without his/her intervention or moderation. In the fourth stage, ACT, the policy maker uses the collected cluster of problems, needs and proposals to formulate a draft-policy agenda, which can be tested out against social opinion. This is going to be achieved by 'active crowdsourcing' where policy text is posted to various social media (e.g. blogs, Twitter, Facebook, YouTube, etc.), soliciting citizens' remarks, opinions, positions and proposals on it.

4 Platform Technological Architecture

The methodology proposed in the previous section will be implemented and supported using an advanced ICT platform, which is going to be developed as part of the NOMAD project mentioned in the introduction. Its architecture is shown in Figure 2. Its main components are:

I. Policy Modeling Tool: Using advanced semantic representation technologies, it will model the particular policy, its domain and also topics and arguments relevant to the policy. It will be a user-friendly visual tool for semantic authoring, to be used by a domain expert with limiting expertise in knowledge representation technologies. It will be based on the ELEON Ontology Authoring Environment [44], developed by the National Center for Scientific Research 'Demokritos', which participates as a partner in the NOMAD project consortium. ELEON supports editing ontologies and relating such ontologies with linguistic resources that can be used to extract structured ontological information from text. It supports the author with a number of innovative methods for ontology checking [45] and auto-completion [46].

II. Data Acquisition Module: The envisioned system will include a set of topical crawling modules in order to access web information from a variety of Web 2.0 applications. The topics will be defined via the appropriate keywords or phrases. In accordance with the proposed methodology, we will focus on sources that ensure the acquisition of user-created content, in particular Twitter, Facebook, Google+, YouTube, blogs constructed with Blogger and WordPress, forums and community networks, etc. The different sources have distinct content characteristics, in terms of the median size of each semantically meaningful text segment (article, comment, status, tweet etc.) and the general characteristics of the participating public. Thus, the various crawling modules will use a differentiated method for determining the relevance of a segment to the policy model concepts. Furthermore, the crawlers will provide source-level demographic information for the acquired content (by analyzing the available metadata and incorporating source information by platforms like Alexa).

III. Linguistic Processing Pipeline: The acquired textual content will be processed by a linguistic pipeline, comprising all the necessary processes for extracting information from the examined sources. In general, standard linguistic analysis will be applied (sentence splitting, tokenization, POS-tagging) in order to produce a structured form of the available data for further processing.An important step for the association with the policy model concepts is the identification of named entities and in particular entities relevant to the domain under examination. Thus, a Named Entity Recognition and a Co-reference Resolution process are required in order to achieve the semantic association of the available content and the constructed policy model.For the implementation of the linguistic pipeline,there will be parameterized and used the relevant components and tools available in the Ellogon platform developed by NCSR 'Demokritos' [47] – [48], an open source, general purpose natural language engineering platform, which provides a large set of linguistic analysis components. The system will take into account content in three languages (English, Greek and German) for the components that are language-dependent.

IV. Opinion Mining &Argument Extraction: The process is three-fold; the first step is to identify the presence of an opinion (i.e. subjective statements) related to a concept pertinent to a given policy model; the second step is to extract arguments that relate to and support the identified opinion; the final step is to determine the polarity (positive, negative, neutral) of the statement towards the aforementioned concept.The identification of text segments that bear an opinion and –possibly- related arguments will rely on machine learning techniques, where the machine learning system is trained with annotated documents in selected topics and with domain-agnostic content (a subset of the initial acquired web content). The system will also retain demographic information derived from the characteristics of the content's source and linguistic characteristics of the actual text.The sentiment analysis sub-component will be based on existing tools developed by NCSR 'Demokritos' [49, 50] as well as on other open source tools and resources. The implemented algorithms take into account various intricacies of the language forms commonly used in the context of user-generated web content, such as metaphors, nuances, irony etc.

V. Argument Summarization:The collected arguments and opinions and their relations to the various aspects and topics of the policy under formulation will be used in order to compile multi-dimensional quantitative data. The aggregation of individual

arguments and opinions will be done in a manner which guarantees that the serveddata cannot be used to identify individual opinions and arguments. Furthermore, topical and geographical trends in each source (e.g., the tendency to discussions that pertain to particular places or topics) will be used to annotate sources, and the data crawled from them, with broad demographic and geographical properties. For example, a source can be annotated as a forum where mostly young people post, or one where mostly engineers post, or mostly Greeks, or mostly students of literature, etc. Such annotations will be exploited by the visualization component in order to offer a rich a multi-faceted presentation of the aggregated data.

VI. Social Reaction Visualization: This component will provide the policy maker with multi-faceted aggregates based on the results produced by the previous components, intuitively presented using information visualization and visual analytics techniques. We are going to explore the exploitation of visual analytics ideas and methods in the public policy formulation domain. The term visual analytics was introduced in the middle of the previous decade (2004-2005) in the research and development agenda [54, 55]. It describes a new multidisciplinary analytics field that combines various research areas including visualization, human computer interaction, data analysis, data management, geo-spatial and temporal data processing, spatial decision support and statistics. Application areas can be found wherever large amounts of data have to be analyzed. These include physics and astronomy, climate simulation, business intelligence and many more as stated in the European research roadmap [56]. However, currently there is no research concerning the exploitation of visual analytic tools and methods for supporting the policy making life cycle. Our research aims at filling this research gap.

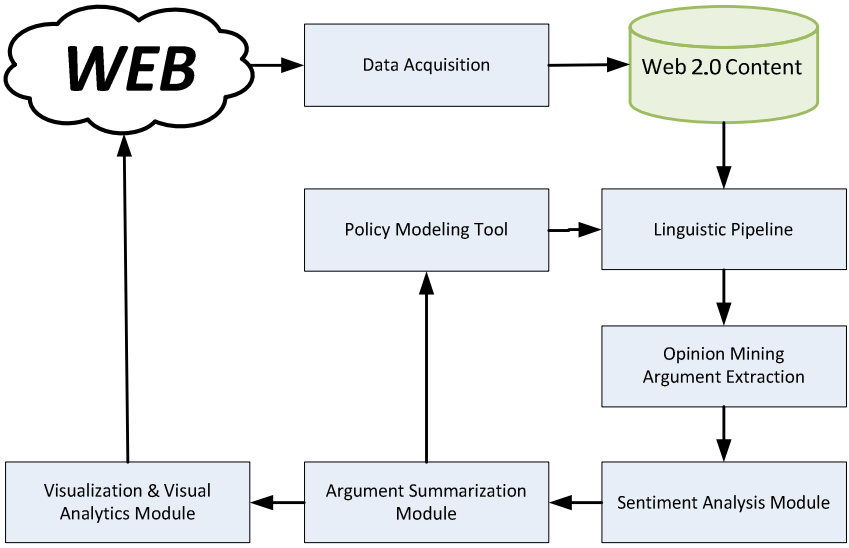

Fig. 2. An abstract depiction of platform's technological architecture

5 Conclusions

The first generation of e-participation has been based on the construction of official websites of government agencies, which provided to the citizens information on their activities and policies, and also capabilities for participation in consultations, whose topics and rules were defined fully by the government. Therefore it was highly government-controlled and had a top-down orientation. The limited use of these official websites and the emergence of web 2.0 social media leads to the gradual emergence of a second generation of e-participation, which is based oncontent (e.g. short or longer text, images, video) posted by government agencies to various social media, and then on the analysis of citizens' interactions with it (e.g. views, likes/dislikes, comments, etc.). This second generation of e-participation is less government-controlled and more citizens-controlled (as governments continue controlling the discussion topics to some extent - through making postings and initiating discussions on the topics they choose - but do not control the rules of the discussion - which are the ones defined by the social media). In the previous sections, a methodology has been proposed that leads to a third generation of e-participation,exploiting also the web 2.0 social media, and characterised by even more citizens' control. It includes initially the search by government agencies for content on a public policy under formulation, which has been created in numerous web 2.0 sources (e.g. blogs and micro-blogs, news sharing sites, online forums, etc.) by citizens freely, without any initiation, stimulation or moderation through government postings. This content is retrieved, centrally stored andprocessed using various advanced techniques in order to extract from it citizens' opinions, issues, arguments and proposals on the particular policy, identify their sentiments (positive or negative), and finally summarize and visualize them.

The proposed methodology allows the exploitation of the vast amount of user-generated content created in numerous Web 2.0 social media for supporting governments in understanding better the needs, wishes and beliefs of citizens, and creating better and more socially rooted policies. It can enable a more bottom-up e-participation and public policy formulation, which can offer significant benefits: it can provide new fresh ideas concerning needs and problems of society, ways of addressing them, advantages and disadvantages of the latter; also, it can lead to the identification of cultural, social and economic changes that require government action, and to overcoming obsolete government agencies stereotypes in understanding social problems and needs and designing solutions. Also, it provides guidance for the application of crowdsourcing by government agencies, in a novel 'extended' form, which includes both 'passive crowdsourcing' (non-moderated) and 'active crowdsourcing' (moderated) stages. In this way more valuable 'tacit knowledge' on important social problems and needs, and policy options for addressing them, which is possessed by large numbers of citizens, can be transformed into 'explicit (codified) knowledge' that can be used by government for designing better and more socially rooted policies.

The proposed methodology will be further validated in the NOMAD project. Initially, based on user requirements analysis, the ICT platform that will support the implementation of the methodology (see Figure 2) will be developed. Then, the proposed methodology and the above platform will be validated through a number of pilots in real life conditions, so that their added value in the policy making process can be assessed. In

particular, in the above pilots it will be examined to what extent the platform is user-friendly and also functions correctly and effectively, to what extent this methodology can provide the abovementioned benefits and value, and what improvements of them should be made. In general, further research is required concerning methodologies and tools for the application of crowdsourcing by government agencies for increasing the bottom-up dimensions of public policy formulation.

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References

1. Pateman, C.: Participation and Democratic Theory. University Press, Cambridge (1970)
2. Barber, B.: Strong Democracy. University of California Press, Berkeley (1984)
3. Held, D.: Models of Participation. Polity Press, Cambridge (1987)
4. Rowe, G., Frewer, L.J.: Public Participation Methods: A Framework for Evaluation. Science, Technology & Human Values 25(1), 3–29 (2000)
5. Rowe, G., Frewer, L.J.: Evaluating Public-Participation Exercises: A Research Agenda. Science, Technology, & Human Values 29(4), 512–557 (2004)
6. Organization for Economic Co-operation & Development: Citizens as Partners – Information, Consultation and Public Participation in Policy-Making. OECD Publication Service, Paris (2001a)
7. Organization for Economic Co-operation & Development: Engaging Citizens in Policy-making: Information, Consultation and Public Participation - PUMA Policy Brief. OECD Publication Service, Paris (2001b)
8. Organization for Economic Co-operation & Development: Evaluating Public Participation in Policy Making. OECD Publication Service, Paris (2004)
9. Organization for Economic Co-operation & Development (OECD): Engaging Citizens Online for Better Policy-making- Policy Brief. OECD Publication Service, Paris (2003)
10. Organization for Economic Co-operation & Development (OECD): Promise and Problems of e-Democracy: Challenges of Online Citizen Engagement. OECD Publication Service, Paris (2004)
11. Timmers, P.: Agenda for eDemocracy – an EU perspective. European Commission (2007)
12. Saebo, O., Rose, J., Flak, L.S.: The shape of eParticipation: Characterizing an emerging research area. Government Information Quarterly 25, 400–428 (2008)
13. Loukis, E., Macintosh, A., Charalabidis, Y.: Editorial of the Special Issue on E-Participation in Southern Europe and the Balkans: Issues of democracy and participation via electronic media. Journal of Balkan and Near East Studies 13(1), 1–12 (2011)
14. Ferro, E., Molinari, F.: Making Sense of Gov 2.0 Strategies: No Citizens, No Party. In: Prosser, A., Parycek, P. (eds.) Proceedings of EDEM 2009 (2009)
15. Chadwick, A.: Guest Editor's Introduction: The Internet and Politics in Flux. Journal of Information Technology and Politics 6(3-4), 195–196 (2009)
16. Honeycutt, C., Herring, S.C.: Beyond Microblogging: Conversation and Collaboration via Twitter. In: Proceedings of the 42nd Hawaii International Conference on System Sciences (HICSS), Waikoloa, Big Island, Hawaii (2009)

17. Agarwal, N., Lim, M., Wigand, R.: Finding her Master's Voice: the Power of Collective Action among Female Muslim Bloggers. In: Proceedings of the 19th European Conference on Information Systems, ECIS 2011, Helsinki, Finland (2011)
18. Larsson, A., Moe, H.: Who Tweets? Tracking Microblogging Use in the 2010 Swedish Election Campaign. In: Proceedings of the 19th European Conference on Information Systems, ECIS 2011, Helsinki, Finland (2011)
19. Osimo, D.: Web 2.0 in Government: Why and How? JRC Scientific and Technical Reports. European Commission, Joint Research Centre, Institute for Prospective Technological Studies (2008), retrieved online, http://ftp.jrc.es/EURdoc/JRC45269.pdf
20. Tapscott, D., Williams, A.D., Herman, D.: Government 2.0: Transforming Government and Governance for the Twenty First Century. nGenera Corporation (2008)
21. Meijer, A., Thaens, M.: Alignment 2.0: Strategic use of new internet technologies in govrnment. Government Information Quarterly 27, 113–121 (2010)
22. Charalabidis, Y., Loukis, E.: Transforming Government Agencies' Approach to eParticipation through Efficient Exploitation of Social Media. In: Proceedings of the European Conference on Information Systems, ECIS 2011, Helsinki, Finland (2011)
23. United Nations: e-Government Readiness Knowledge Base (2007)
24. United Nations: e-Government Survey 2008: From eGovernment to Connected Governance (2008)
25. Santucci, D.: Studying e-petitions: State of the art and challenges. In: ESF-LIU Conference on Electronic Democracy, Vadstena, Sweden (2007)
26. Cruickshank, P., Edelmann, N., Smith, C.: Signing an e-Petition as a Transition from Lurking to Particiption. In: Tambouris, E., Macintosh, A., Glassey, O. (eds.) Second IFIP International Conference on Electronic Participation, ePart 2010, Lausanne, Switzerland (2010)
27. Panopoulou, E., Tambouris, E., Sanchez-Nielsen, E., Zotou, M., Tarabanis, K.: Learning from eParticipation initiatives of regional and local level authorities in Greece and Spain. Journal of Balkan and Near Eastern Studies 13(1), 13–35 (2011)
28. Medaglia, R.: Measuring the diffusion of eParticipation: a survey on Italian local government. Information Polity. An International Journal of Government and Democracy in the Information Age 12(4), 265–280 (2008)
29. Mau, B., Leonard, J.: The Institute Without Boundaries: Massive Change. Phaidon, New York (2004)
30. Lévy, P.: Collective Intelligence: Mankind's Emerging World in Cyberspace. Plenum, New York (1997)
31. Surowiecki, J.: The Wisdom of Crowds: Why the Many are Smarter than the Few and How Collective Wisdom Shapes Business, Economies, Societies, and Nations. Doubleday, New York (2004)
32. Brabham, D.C.: Crowdsourcing as a Model for Problem Solving An Introduction and Cases. Convergence: The International Journal of Research into New Media Technologies 14(1), 75–90 (2008)
33. Howe, J.: The Rise of Crowdsourcing. Wired 14(6) (2006), retrieved from, http://www.wired.com/wired/archive/14.06/crowds.html
34. Brabham, D.C.: Crowdsourcing: A Model for Leveraging Online Communities. In: Delwiche, A., Henderson, J. (eds.) The Routledge Handbook of Participative Cultures. Routledge (2012)
35. Stewart, O., Huerta, J., Sader, M.: Designing crowdsourcing community for the enterprise. In: Proceedings of the ACM SIGKDD Workshop on Human Computation. ACM, New York (2009)

36. Li, Z., Hongjuan, Z.: Research of crowdsourcing model based on case study. In: Proceedings of 8th International Conference on Service Systems and Service Management, ICSSSM (2011)
37. Brabham, D.C.: Moving the Crowd at Threadless – Motivations for Participation in a Crowdsourcing Application. Information, Communication & Society 13(8), 1122–1145 (2009)
38. Nam, T.: Suggesting frameworks of citizen-sourcing via Government 2.0. Government Information Quarterly 29, 12–20 (2012)
39. Hilgers, D., Ihl, C.: Citizensourcing: Applying the concept of open innovation to the public sector. The International Journal of Public Participation 4(1), 67–88 (2010)
40. Bovaird, T.: Beyond engagement and participation: User and community coproduction of public services. Public Administration Review 67(5), 846–860 (2007)
41. Torres, L.H.: Citizen sourcing in the public interest. Knowledge Management for Development Journal 3(1), 134–145 (2007)
42. Lukensmeyer, C.J., Torres, L.H.: Citizensourcing: Citizen participation in a networked nation. In: Yang, K., Bergrud, E. (eds.) Civic Engagement in a Network Society, pp. 207–233. Information Age Publishing, Charlotte (2008)
43. Chun, S.A., Shulman, S., Sandoval, R., Hovy, E.: Government 2.0: Making connections between citizens, data and government. Information Polity 15(1-2), 1–9 (2010)
44. ELEON Ontology Authoring and Enrichment Tool, http://www.iit.demokritos.gr/~eleon
45. Bilidas, D., Theologou, M., Karkaletsis, V.: Enriching OWL Ontologies with Linguistic and User-relatednAnnotations: the ELEON system. In: Proceedings of IEEE International Conference on Tools with Artificial Intelligence (ICTAI 2007), Patras, Greece (2007)
46. Konstantopoulos, S., Karkaletsis, V., Vogiatzis, V., Bilidas, D.: Authoring Semantic and Linguistic Knowledge for the Dynamic Generation of Personalized Descriptions. In: Sporleder, C., et al. (eds.) Language Technology for Cultural Heritage, Springer, Heidelberg (2011)
47. ELLOGON Linguistic Analysis Platform, http://www.ellogon.org
48. Petasis, G., Karkaletsis, V., Paliouras, G., Androutsopoulos, I., Spyropoulos, C.D.: Ellogon: A New Text Engineering Platform. In: Proceedings of the 3rd International Conference on Language Resources and Evaluation (LREC 2002), Las Palmas, Canary Islands, Spain (2002)
49. Rentoumi, V., Petrakis, S., Karkaletsis, V., Klenner, M., Vouros, G.A.: A Collaborative System for Sentiment Analysis. In: Konstantopoulos, S., Perantonis, S., Karkaletsis, V., Spyropoulos, C.D., Vouros, G. (eds.) SETN 2010. LNCS, vol. 6040, pp. 411–416. Springer, Heidelberg (2010)
50. Rentoumi, V., Giannakopoulos, G., Karkaletsis, V., Vouros, G.: Sentiment analysis of figurative language using a word sense disambiguation approach. In: Proceedings of RANLP 2009 (2009)
51. Wong, P.C., Thomas, J.: Visual analytics. IEEE Computer Graphics and Applications 24(5), 20–21 (2004)
52. Thomas, J., Cook, K. (eds.): Illuminating the Path: Research and Development Agenda for Visual Analytics. IEEE Press, Los Alamitos (2005)
53. Keim, D.A., Kohlhammer, J., Ellis, G.P., Mansmann, F.: Mastering The Information Age – Solving Problems with Visual Analytics. In: Eurographics, Goslar, Germany (2010)

Author Index