DIFFERENT DIGITAL MODERATED AND NON-MODERATED MECHANISMS FOR PUBLIC PARTICIPATION

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Abstract

Several off-line mechanisms have been developed and applied for the participation of citizens in government policy making and services design. The increasing adoption of ICT, and especially the Internet, by individuals allows the development of a new generation of digital mechanisms for public participation (e-participation). The dominant digital mechanism has been in the last ten years the development of official e-participation websites by government agencies, which provide to the citizens information on government activities and also policies and services under formulation, and allow them to participate in relevant consultations in electronic fora. However, the effectiveness of this mechanism has been much lower than expectations. In this paper are presented three different digital mechanisms for public participation, which have been developed by the authors as part of European research projects. The first of them is based on the use of structured e-forum, in which citizens can enter only annotated postings according to a predefined discussion ontology. The second is based on the use of a central platform which can publish policy-related content and micro-applications to multiple social media simultaneously, and also collect and process data on citizens' interaction with them (e.g. views, comments, ratings, votes, etc.). While the previous mechanisms were moderated by government, the third one – still under development as part of the European research project NOMAD - is non-moderated. It is based on the search by government agencies for content on a public policy under formulation, which has been created in numerous social media and other sources (e.g. blogs and micro-blogs, news sharing sites, online forums, etc.) by citizens freely, without any government initiation, stimulation or moderation, and the advanced processing of this content.

Keywords: public participation, e-participation, structured forum, social media, crowdsourcing.

1 INTRODUCTION

It is widely recognized for long time that representative democracy should be combined with continuous citizens' involvement in government policy making and services design, and this has lead to the development of "public participation" and "participatory democracy" ideas (Pateman, 1970; Barber, 1984; Held, 1987; Rowe and Frewer, 2000). Row and Frewer (2004) 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'. For the practical application of these ideas initially many off-line mechanisms have been developed; the most widely used ones according to Rowe and Frewer (2000) are: public

hearings/inquiries, public opinion surveys, consensus conferences, negotiated rule-making, citizens' juries/panels, citizens/public advisory committees, focus groups and referenda.

The rapid growth and penetration of the Internet enabled the development of new digital mechanisms for the more extensive and less costly application of public participation ideas, which have the potential to involve much larger numbers of citizens and more diverse groups at a lower cost in comparison with the initial 'off-line' mechanisms, and this lead to the development of electronic participation (e-participation) (OECD, 2004; Timmers, 2007; Saebo, Rose and Flak, 2008; Loukis, Macintosh and Charalabidis, 2011). The first digital public participation mechanism has been the development of official e-participation websites by government agencies, which provide to the citizens information on government activities, and also policies and services under formulation, and allow them to participate in relevant consultations taking place in e-fora, and also in e-surveys and e-polls. However, this first digital mechanism for public participation has been highly government initiated and controlled, since government defined and controlled the topics and rules of all electronic discussions taking place there. The use of this mechanism by the citizens has been in general limited and below the initial expectations (Ferro and Molinari, 2009), while the quality of these electronic consultation was not satisfactory; most of these official e-participation spaces were largely unknown to the general public due to the high costs of promotion and the slow pace of dissemination, while the topics dealt with were sometimes distant from people's daily problems and priorities.

The above weaknesses of the above first digital mechanism for public participation lead on one hand to a second digital mechanism aiming mainly to improve the quality of these electronic consultations. It is based on the use of structured e-forum, in which citizens can enter only semantically annotated postings according to a predefined discussion ontology (Karacapilidis et l, 2005; Xenakis and Loukis, 2010; Loukis and Wimmer, 2011). On the other hand the emergence of the new Web 2.0 social media enabled the gradual emergence of a third digital mechanism for public participation, which aims mainly to increase the number and diversity of participants; it is based on the exploitation of popular social media where citizens choose to discuss and generate content (Charalabidis and Loukis, 2011). In particular, 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.).

However, all the above three digital mechanisms for public participation are initiated and moderated by government, since they are based on a stimulation provided by government (e.g. an electronic discussion initiated in an electronic forum in an official e-participation space, or a posting in some popular social media), which controls the topics and the rules (at least for the first two mechanisms) of the consultation. Therefore another more innovative non-moderated digital mechanism for public participation could be based 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 could then undergo various types of advanced processing in order to extract from it arguments, opinions, issues and proposals on the particular policy. This mechanism is investigated and evaluated in the research project NOMAD ('Policy Formulation and Validation through non moderated crowdsourcing' – http://www.nomad-project.eu/), which is partially funded by the 'ICT for Governance and Policy Modelling' research initiative of the European Commission.

In this paper we analyse the last three more recently emerged digital mechanisms for public participation, which have been developed by the authors as part of European research projects, putting more emphasis on the last more innovative and non-moderated one. In section 2 their common background (crowdsourcing) is presented. Then sections 3, 4 and 5 describe in more detail these mechanisms (use of structured e-forum, centralised exploitation of multiple social media, web content collection and analysis). Finally, section 6 summarizes the conclusions and proposes future research directions.

2 BACKGROUND

In this section is presented the common background of the above digital mechanisms for public participation, which is the theoretical and empirical research that has been conducted on crowdsourcing. While previously the design 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 (Mau, Leonard and The Institute Without Boundaries, 2004). This is referred to as 'collective intelligence', which is defined as a 'form of universally distributed intelligence, constantly enhanced, coordinated in real time, and resulting in the effective mobilization of skills'. Lévy (1997), Surowiecki (2004) and Brabham (2008) have described and analyzed several cases of crowd wisdom at work, which resulted in successful solutions that emerged from a large body of solvers. 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 once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call. This can take the form of peer-production (when the job is performed collaboratively), but is also often undertaken by sole individuals' (Howe, 2006).

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 useful method 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 (Surowiecki, 2004; Brabham, 2008; Howe, 2006; Brabham, 2012) such a crowd can solve scientific 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 produce highly successful commercials and fresh stock photography against a strong competition from professional firms. 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 (Brabham, 2012), which, based on the analysis of several case studies, identifies four dominant crowdsourcing types/approaches: i) the knowledge discovery and management approach (= an organization tasks crowd with 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 crowd with creating and selecting creative ideas), and iv) distributed human intelligence tasking (= an organization tasks crowd with analyzing large amounts 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 (Stewart, Huerta and Sader, 2009; Li and Hongjuan, 2011; Brabham, 2009).

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 (Nam, 2012; Hilgers and Ihl, 2010; Bovaird, 2007; Torres, 2007; Lukensmeyer and Torres, 2008; Chun et al., 2010). According to (Nam, 2012) 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 (Brabham, 2012), and gradually result in 'co-production' of public services by government and citizens in cooperation (Lévy, 1997).

3 USE OF STRUCTURED ELECTRONIC FORUM

The first digital mechanism for public participation, as mentioned in the introduction, has been based on the e-forum, which enables electronic consultations on various policy related topics. It allows participants to enter postings on the topic under discussions, or on other participants' postings, which however do not have any semantic annotation. A significant improvement in this direction is the structured e-forum, which allows participants to enter only semantically annotated postings according to a predefined discussion ontology, aiming to improve discussion quality (focus and effectiveness) (Karacapilidis et al, 2005; Xenakis and Loukis, 2010; Loukis and Wimmer, 2011). The most widely used for this purpose discussion ontology has been the one proposed by the issue-based information systems (IBIS) framework (Kunz and Rittel, 1979; Conklin and Begeman, 1989; Conklin, 2003). Its main elements are 'questions' (issues-problems to be addressed), 'ideas' (possible answers-solutions to questions-problems) and 'arguments' (evidence or viewpoints that support or object to ideas).

So in a structured e-forum each participant is be allowed to enter a new 'issue', or 'alternative', or 'comment', or 'pro-argument' or 'contra-argument'. This guides the participants to think in a more structured way about the problem under discussion (i.e. which are the main issues, what are the main alternatives for addressing each of them, which are the main advantages and disadvantages of each alternative) and make more mentally processed and focused contributions, so it is expected to increase the quality, focus and effectiveness of the discussion. Also, the participants would have to associate their postings with previous ones entered by other participants, according to the rules defined in the IBIS discussion ontology, e.g. an 'alternative' can be associated only with an 'issue', but not with a 'pro' or a 'contra' argument, while a 'pro' or a 'contra' argument can be associated only with an 'alternative'. This improves the communication and interaction among the participants, and therefore increases further the quality, focus and effectiveness of the discussion.

In Figure 1 we can see part of the tree of a discussion taking place in a structured e-forum, concerning the establishment or not of private universities in Greece (from Karacapilidis et al, 2005).

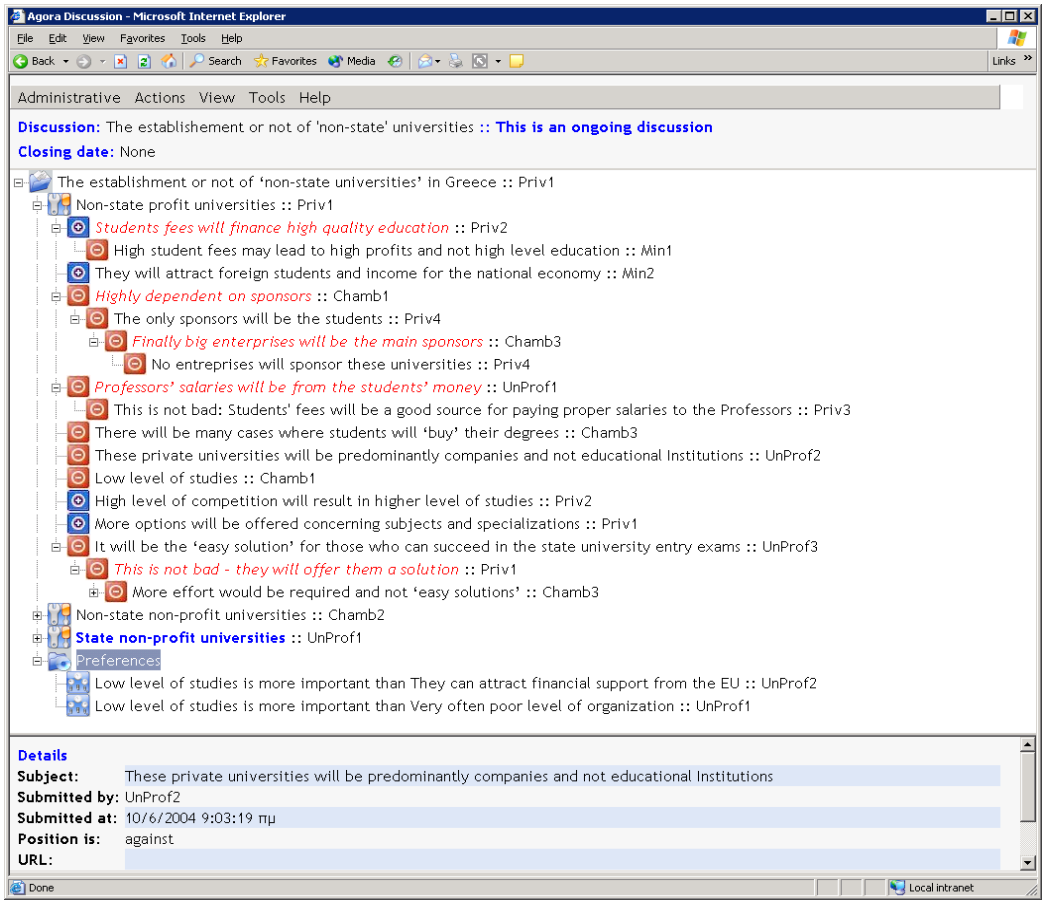

Figure 1. The tree of a discussion in a structured e-forum

Each entry in the tree corresponds to an argumentation element (issue, alternative, pro-argument, or contra-argument). Each element is accompanied by an icon that indicates the element type, and also the username of the user who submitted it and the date of submission.

An elaboration, pilot application and systematic evaluation of this digital mechanism for public participation has been conducted as part of the LEX-IS project ('Enabling Participation of the Youth in the Public Debate of Legislation among Parliaments, Citizens and Businesses in the European Union) of the 'eParticipation' Preparatory Action of the European Commission (Xenakis and Loukis, 2010; Loukis and Wimmer, 2011). It has been concluded that it enables a higher quality and more focused and effective electronic discussion. More sophisticated users (i.e. more educated and knowledgeable) seem to perceive a higher usefulness of the e-structured forum tool than the less sophisticated ones, since the former can much better use complex discussion languages and exploit to a larger extent the potential of these tools for structuring discussion. However, even for the less sophisticated users, the structured e-consultation seems to offer big advantages over the unstructured one. However, at the same time it has been concluded that for less sophisticated users the structured e-consultation can be too difficult and demanding; this is mainly due to the big mental effort it requires, on one hand for thinking in the highly structured way that such tools impose, annotating correctly the postings and in general using efficiently the 'discussion language', and on the other hand for understanding the structured postings of the other participants and the connections among them. On the contrary more sophisticated users (such as the undergraduate and postgraduate students who participated in the Greek pilot) seem to be able to utilize correctly and efficiently the 'discussion language' provided even by a complex e-consultation language, though they recognize as well that this requires a considerable mental effort. Such sophisticated users are capable of utilizing efficiently all the 'expressiveness' of such a language (even a rather rich and complex, such as the one of the IBIS-based e-consultation model), making effective use of all the types of postings provided.

Therefore, the above empirical evaluation research on the structured e-forum has lead to the conclusion that it constitutes a digital mechanism for public participation which on one hand improves the quality of the discussion, by making it more focused and effective, but on the other hand is more appropriate for more sophisticated users, and might result in reduced participation of less sophisticated users. So it is an 'expert crowdsourcing' tool that can increase the quality but at the same time decrease the quantity of public participation.

4 CENTRALIZED EXPLOITATION OF MULTIPLE SOCIAL MEDIA

The development of this digital mechanism for public participation has been based on the wide recognition that governments have to exploit the numerous users-driven web 2.0 virtual spaces, which have been launched through citizens' initiatives with quite high 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 (Chadwick, 2009b; Honeycutt and Herring, 2009; Agarwal, Lim and Wigand, 2011; Larsson and Moe, 2011). 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 web 2.0 social media (e.g. Facebook, Youtube, Twitter, Blogger, etc.) in many different domains of government, including public participation (Osimo, 2008; Tapscott, Williams and Herman, 2008; Meijer and Thaens, 2010; Charalabidis and Loukis, 2011).

However, this exploitation of social media for increasing public participation and involving diverse groups should be efficient, systematic and centrally managed. Charalabidis and Loukis (2011) propose such an approach, which is based on a central platform that can publish policy-related content (e.g. text, images and videos on a public policy under formulation or modification) and relevant micro-applications towards multiple social media simultaneously, and then collect data on citizens' interaction with them (e.g. views, comments, ratings, votes, etc.), using the application programming interfaces (API) of the targeted social media. The interaction data collected can undergo various types of advanced processing (e.g. access analytics, opinion mining, simulation modelling) in order to

extract synthetic conclusions from them and provide substantial support to government policy makers, always respecting data privacy guidelines. It should be noted that the targeted social media can be selected so that each of them is used by different citizens' groups (e.g. with respect to age, income, political orientations, lifestyle, etc.) or focusing on a different type of content (e.g. short text, long text, images, video), resulting in a wide interaction with diverse groups of citizens. This social media based digital mechanism for public participation, which is shown in Figure 2, is currently further elaborated and evaluated as part of the research project PADGETS ('Policy Gadgets Mashing Underlying Group Knowledge in Web 2.0 Media' – www.padgets.eu), which is partially funded by the 'ICT for Governance and Policy Modelling' research initiative of the European Commission.

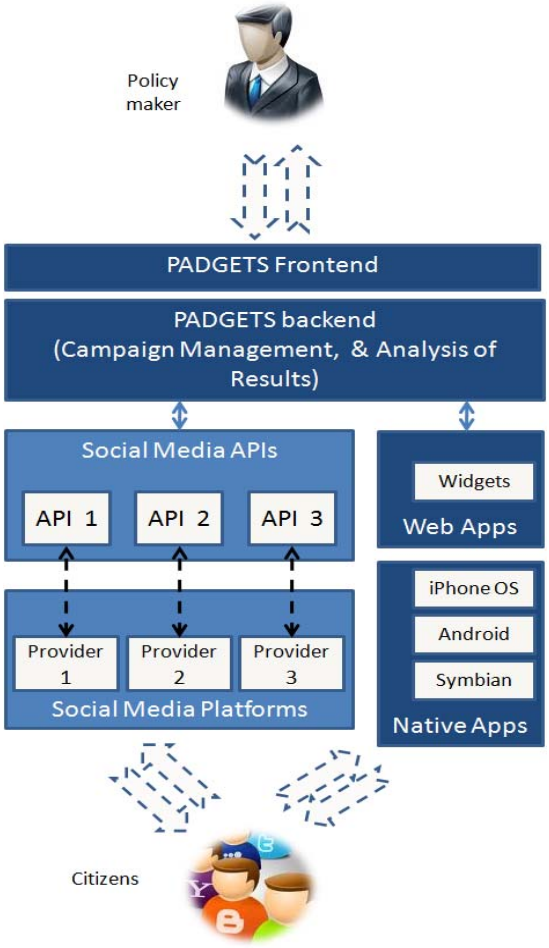

Figure 2. Centralized exploitation of multiple social media for widening public participation

Some first findings from the research conducted in this project is that the above approach can definitely contribute to relaxation of current constraints in terms of size, frequency and quality of citizens' participation, taking advantage of the continuously growing web 2.0 social media. So it is a 'wide crowdsourcing' tool that can increase mainly the quantity and diversity of public participation. At the same time the above research has reached the conclusion that the above benefits will not be straightforward. There are some important preconditions for the successful application of this new multi-channel approach to e-participation, which necessitate significant interventions in government agencies at the organizational, human resources and technological level.

5 WEB 2.0 CONTENT COLLECTION AND ANALYSIS

All the previously described digital mechanisms for public participation are initiated and moderated by government, since they are based on a stimulation for discussion provided by government (e.g. an

electronic discussion initiated in an electronic forum of an official e-participation space on a particular topic, or a posting in some popular social media). Therefore another more 'passive' and non-moderated digital mechanism for public participation could be the exploitation (collection and analysis) of the vast amount of citizens-generated content in many web 2.0 social media, without any stimulation by government, in order to support governments in understanding better the needs, wishes and beliefs of citizens, and create better and more socially rooted policies.

This digital mechanism for public participation includes four stages (Figure 3), which enable the policy-makers (e.g. government organizations, members of parliament, politicians) to effectively LISTEN and monitor what citizens say in social media, ANALYSE those conversations and get the main stakeholders' needs, positions and opinions, RECEIVE these data properly processed and displayed for an effective use and exploitation, and finally ACT on this information, by proceeding to a more active crowdsourcing through more specific postings to various social media.

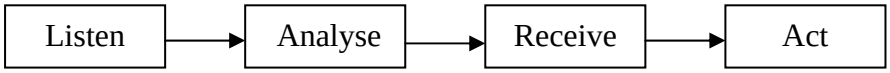

Figure 3. The four stages of the web 2.0 content collection and analysis mechanism

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 particular topic (e.g. a public policy under formulation or modification) defined by the policy-maker. For this purpose an advanced crawler will be used, i.e. a program which searches the Web, visits a large number of relevant possible sources of information, such as, among others, micro-blogging sites, such as Twitter, blogs constructed using Blogger, WordPress, Typepad and LiveJournal, video sites including YouTube, Vimeo, Metacafe, Bliptv, social networks such as Facebook and MySpace, discussion forums, news sites, images sites such as Flickr, corporate sites, etc., and collects relevant content from them.

The second stage, called ANALYSE, includes advanced processing and analysis of the above content, from which are identified relevant citizens' needs, opinions, concerns, proposals, sentiments and other information hidden within the text of the citizens conversations. Each web page will go through a series of automated analysis processes:
- Language Detection, with the use of a Natural Language Processing algorithm, 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 their 'tone' (positive, neutral, negative) of the above identified elements
- 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 third stage, called RECEIVE, will include advanced processing of the outcomes of the previous stage resulting to the construction of a position map of the extracted argument clusters, built upon the relevance, the visibility and the sentiment (either positive or negative) of the data collected from the web hosted conversations. 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 integrated and displayed for an effective use by the policy-maker.

While in the above three stages of the proposed methodology a 'passive crowdsourcing' is performed (i.e. the policy maker passively collects and analyses a relevant content on a public policy under formulation, which has been created in many different web 2.0 locations, without his/her intervention or moderation) in the fourth stage, an 'active crowdsourcing' is performed. In this stage, called ACT,

once the policy maker finds out about the existing opinions of his/her constituency, having the form of a cluster of problems, needs and proposals, he/she will formulate a draft-policy agenda, which can be tested out against social opinion. This is going to be achieved by embedding it in various social media (e.g. blogs, twitter, facebook, youtube, etc.) through relevant postings to them, soliciting citizens' remarks, opinions, positions and proposals on it.

The above approach necessitates an advanced ICT platform, which is going to be developed, validated and evaluated as part of the NOMAD project ('Policy Formulation and Validation through non moderated crowdsourcing' – http://www.nomad-project.eu/) mentioned in the Introduction. Its architecture is shown in Figure 4. It will consist of six main components:

I. Policy Modelling Component: It will use advanced semantic representation technologies for modelling the particular policy, its domain and also topics and arguments relevant to the policy.

II. Semantically Driven Data Acquisition Component: It will perform focused crawling, capable of accessing a variety of Web 2.0 applications (e.g. social media, wikis and blogs), and retrieving citizen-created content pertinent to the policy model.

III. Argument Extraction Component: It will apply multi-lingual and cross-lingual information extraction technologies to the content retrieved by the data acquisition component, in order to extract structured representations of the citizens' arguments associated with the policy model produced by the abovementioned component I.

IV. Opinion Mining & Sentiment Analysis Component: It will apply opinion mining technologies to the retrieved content, taking into account the extracted citizens' arguments, to detect opinions (= subjective judgements) and analyze their sentiment.

V. Argument Summarization Component: Using summarization technologies and exploiting statistical and semantic information, it will generate qualitative information about opposing arguments, in the form of anonymity-preserving automatically-generated summaries.

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.

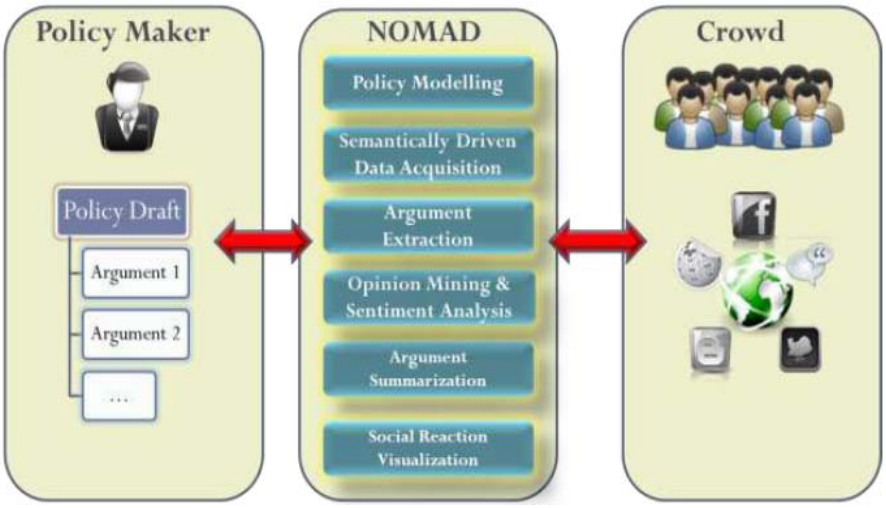

Figure 4. Platform technological architecture

6 CONCLUSIONS

For the practical application of public participation ideas initially many off-line mechanisms have been developed and used. The rapid growth and penetration of the Internet enabled the development of new digital mechanisms for the more extensive and less costly application of public participation ideas. The dominant digital mechanism has been in the last ten years the development of official e-

participation websites by government agencies, which provide to the citizens information on government activities and also policies and services under formulation, and allow them to participate in relevant consultations in electronic fora. However, the effectiveness of this mechanism has been much lower than expectations with respect to both quantity and quality of participation. In the previous sections of this paper have been presented three different digital mechanisms for public participation, which have been developed by the authors as part of European research projects. In the following Table 1 a comparison among these digital mechanisms is shown. We remark that they differ in their basis (web 1.0 or web 2.0), the quantity and quality of public participation they drive, the extent of government control and moderation and the type of crowdsourcing they perform.

Mechanism	Basis	Participation Quantity	Participation Quality	Government Control - Moderation	Type of crowdsourcing
Electronic Forum	web 1.0	low	high	high	active - wide
Structured Electronic Forum	web 1.0	very low	medium	very high	active - experts
Centralized exploitation of multiple social media	web 2.0	high	medium	low	active – very wide
web 2.0 content collection and analysis	web 2.0	very high	medium	none	passive – very wide

Table 1. Comparison among the four digital mechanisms for public participation

This variety of available both off-line and on-line digital mechanisms for public participations allows government agencies to define the appropriate mechanisms' mix they should use, taking into account on one hand the characteristics of the public they want to involve in a policy related debate (from educational, cultural, age, sex, income, computer literacy and use viewpoints), and the complexity of the corresponding social problems and needs, and on the other hands the characteristics of these mechanisms shown in the above Table. Further research is required on the above digital mechanisms for public participations, the value they generate, their effectiveness along various dimensions and the factors affecting it, and also methodologies for determining the most appropriate mechanisms' mix for each particular circumstance. Research is in progress by the authors, as part of the PADGETS and NOMAD projects, on the last two mechanisms, based on 'real life' pilot applications of them and systematic evaluations using both quantitative and qualitative techniques.

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