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POLICY PROCESSES SUPPORT THROUGH INTEROPERABILITY WITH SOCIAL MEDIA

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Abstract

Governments of many countries attempt to increase public participation by exploiting the capabilities and high penetration of the Internet. In this direction they make considerable investments for constructing and operating e-participation websites; however, the use of them has been in general limited and below expectations. For this reason governments, in order to widen e-participation, should investigate the exploitation of the numerous users-driven Web 2.0 social media as well, which seem to be quite successful in attracting huge numbers of users. This paper describes a methodology for the exploitation of the Web 2.0 social media by government organizations in the processes of public policies formulation, through a central platform-toolset providing interoperability with many different social media, and enabling posting and retrieving content from them in a systematic centrally managed and machine-supported automated manner (through their application programming interfaces (APIs)). The proposed methodology includes the use of 'Policy Gadgets' (Padgets), which are defined as micro web applications presenting policy messages in various popular Web 2.0 social media (e.g. social networks, blogs, forums, news sites, etc) and collecting users' interactions with them (e.g. views, comments, ratings, votes, etc.). Interaction data can be used as input in policy simulation models estimating the impact of various policy options. Encouraging have been the conclusions from the analysis of the APIs of 10 highly popular social media, which provide extensive capabilities for publishing content on them (e.g. data, images, video, links, etc.) and also for retrieving relevant user activity and content (e.g. views, comments, ratings, votes, etc.), though their continuous evolution might pose significant difficulties and challenges.

Keywords: e-participation, web 2.0, social media, interoperability, public policy, application programming interface (API)

1 INTRODUCTION

Governments of many countries attempt to increase public participation by exploiting the capabilities and high penetration of the Internet. This results in a rapid growth of e-participation (OECD, 2003 and 2004; Macintosh, 2004; Timmers, 2007), which is defined as the use of information and communication technologies (ICT) for supporting the provision of information to the citizens concerning government activities and public policies, the consultation with them and also their active participation. However, despite the high public investments made by government organizations for developing 'official' e-participation websites, aiming to inform citizens on various public policies under formulation and also to have various types of interactions and consultations with them, their use by the citizens has been in general limited and below the initial expectations (Ferro and Molinari, 2009). Most of these official e-participation spaces are largely unknown to the general public due to the high costs of their promotion and the slow pace of their dissemination, while the topics discussed there are often distant from people's daily problems and priorities, limiting the participation of non expert citizens.

These weaknesses, in combination with the high heterogeneity of citizens in terms of political interests, educational level and technological skills (so a common government e-participation for all might not be feasible), necessitate government to investigate the exploitation the numerous emerging Web 2.0 social media (O' Reilly, 2005; Osimo, 2008) as well in order to widen and improve e-participation. These Web 2.0 social media have been launched through citizens' initiatives and seem to be quite successful in attracting huge numbers of users. Initially they had a big impact on the social life of people (Dutton and Helsper, 2007), and later on several private sector industries, such as advertising and media (Wunsch-Vincent and Vickery, 2007). Recently there has been some first evidence that Web 2.0 applications can be useful in many different domains of government, both internal and extrovert (Osimo, 2008; Punie, Misuraca and Osimo, 2009). However, though there has been some previous research on the exploitation of Web 2.0 by private sector firms (e.g. Constantinides, 2009 and 2010), mainly for marketing purposes, which proposes some useful guidelines and frameworks, such a research is missing for the public sector.

In this direction this paper describes a methodology for the exploitation of Web 2.0 social media by government organizations in the processes of public policies formulation, through a central platform-toolset providing interoperability with many different Web 2.0 social media, and enabling posting and retrieving content from them in a systematic centrally managed and machine-supported automated manner, through their application programming interfaces (APIs). The proposed methodology is based on the use of 'Policy Gadgets' (Padgets), which are defined as micro web applications which present policy messages in various popular Web 2.0 social media (e.g. social networks, blogs, forums, news sites, etc) and at the same time enable and collect various types of users' interactions with them (e.g. views, comments, ratings, votes, etc.). These users' interaction data can be centrally processed at a first level resulting in useful 'analytics', and also at a second level being used as input in policy simulation models estimating the impact of various policy options. This methodology is going to be validated through 'real life' pilots in the PADGETS ('Policy Gadgets Mashing Underlying Group Knowledge in Web 2.0 Media' – www.padgets.eu) research project, which is supported by the 'ICT for Governance and Policy Modelling' research initiative of the European Commission.

The paper is structured in six sections. In section 2 the background is outlined, while in section 3 the fundamentals of our methodology are presented, followed by an application scenario in section 4. In section 5 the interoperability issues central to this methodology are investigated. Finally, section 6 summarizes the conclusions and our next steps.

2 BACKGROUND

2.1 Participatory Democracy

The design of public policy in most domains is a 'wicked' problem, since it is characterised by high complexity and many stakeholders with different and heterogeneous values, concerns interests and views of the problem (Rittel and Weber, 1973; Buckingham Shum, 2003; Gircle et al, 2003; Karacapilidis et al, 2005). Such problems do not have mathematically 'optimal' solutions and pre-defined algorithms for calculating them, but only 'better' and 'worse' solutions, and cannot be solved by formal methodologies, so they require 'second generation' approaches based on deliberation among stakeholders. These approaches include several circles of deliberation, in which the stakeholders interact, raise issues concerning the problem under discussion, propose solutions and argue about advantages and disadvantages of them. This deliberation is quite valuable, because it allows a better and more multidimensional understanding of the problem that a particular public policy aims to address, its complexity and its possible solutions, which combines views and perspectives of all stakeholders, so it can result in better and more acceptable and 'balanced' public policies. From a knowledge management perspective in such deliberations valuable 'tacit knowledge' possessed by the stakeholders is transformed into 'explicit (codified) knowledge' (Nonaka, 1994; Cohendet and Steinmueller, 2000), which can be processed, disseminated and combined with other relevant knowledge that public organizations possess, in order to formulate better public policies.

These necessities gave rise to a new model of democracy, which is termed 'participatory democracy' (Pateman, 1970; Barber, 1984; Held, 1987; Rowe and Frewer, 2000 and 2004). It combines decision making by citizens' elected representatives with extensive citizens' participation, with the latter not replacing (like in the 'direct democracy') but supporting and enhancing the former. A key principle of this model is that "the equal right to self-development can only be achieved in a participatory society, a society which fosters a sense of political efficacy, nurtures a concern for collective problems and contributes to the formation of a knowledgeable citizenry capable of taking a sustained interest in the governing process" (Held, 1987). 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'.

Participatory democracy also attempts to address the so called "deficit of democracy" and the abstention and disengagement of citizens from politics. The development and increasing penetration of ICT, and the Internet in particular, in many countries creates big opportunities for the extensive application of the above principles through electronic media (e-participation). So it is quite useful to investigate how we can use ICT (and especially the Internet, both it current paradigm Web 1.0, and the emerging Web 2.0, for the supporting and enhancing public participation and deliberation.

2.2 Web 1.0 e-Participation

Most of the previous research and practice on e-participation has been based on the Web 1.0 paradigm and resulted in the development of many 'official' e-participation websites by government organizations, which have used different technologies and various methodologies to purport to highly heterogeneous policy goals. However their usage by the citizens has been in general limited (Ferro and Molinari, 2009), much lower than the initial expectations; some important weaknesses have been identified:

- public administrations expected citizens to make the first step, moving from their own online environments to these 'official' government e-participation websites in order to participate in public debates on various proposed legislations or public policies,

- the designated 'official' spaces remain largely unknown to the general public, mainly due to the high costs of their promotion and the slow pace of dissemination of relevant information,
- the topics discussed were sometimes distant from people's daily problems and priorities, so that content contributions by non experts was inhibited,
- the tools adopted were not appropriate, or at least usable only by an educated minority,
- and the heterogeneity of real or potential online users with respect to educational level, technological skills and behaviour (e.g. only a small minority of Internet users is willing to actively produce content or offer reviews/feedbacks) was not taken into account.

The above reasons necessitate a change of approach in the implementation of e-participation by government, which takes into account and exploits the development and high penetration of Web 2.0. The increased capabilities provided by the latter to their users for creating content and the birth of social networks create big opportunities for the expression of political views, problems and needs. Governments should become more aware of the social complexity, and at the same time the wealth of information that is already available and is continuously developed in citizens-initiated Web 2.0 social media, in order to increase the quantity, quality and inclusiveness of e-participation. They should make a step towards citizens rather than expecting the citizenry to move their content production activity onto the "official" spaces government organizations created for e-participation.

2.3   Web 2.0 and Government

Initially Web 2.0 was used by people for personal and social communication, and later it was also adopted by several private sector industries, such as advertising and media, and had an important impact on them. Some knowledge is being developed on this, resulting gradually in guidelines and frameworks for the exploitation of Web 2.0 by private sector firms, mainly for marketing purposes (e.g. Constantinides, 2009 and 2010). Recently, there has been some first evidence that Web 2.0 applications are already being used in government as well, not only for 'soft' tasks (e.g. public relations and public service announcement)s, but also for 'core' ones (Osimo, 2008), such as:

- Regulation: e.g. 'Peer-to-Patent' is a web-based platform where patent applications are published and pre-assessed by self-appointed experts on a purely voluntary basis, and the evidence collected is submitted to the US Patent Office for evaluation and final decision.
- Service provision: e.g. PatientOpinion is a website launched by a General Practitioner in order to improve the National Health Service, which collects and publishes patients' feedback and ratings on the medical services they have received at hospitals.
- Law enforcement: e.g. Mybikelane is a website where cyclists post photos of cars illegally parked, with a view to raising awareness about this problem.
- Cross-agency collaboration: e.g. 'Intellipedia' is a wiki platform managed by the Central Intelligence Agency (CIA) of USA, which enables the direct collaboration between the analysts of the 14 US Intelligence agencies.
- Political participation: e.g. Petitions.gov.uk is an online service where citizens can submit petitions directly to the Prime Minister, and also view, discuss and sign petitions submitted by other users.

It is concluded that the use of web 2.0 in government can make it more simple, user-oriented, transparent, accountable, participative, inclusive and also joined-up. However, a comprehensive methodology and toolset for exploiting systematically web 2.0 social media by government organizations is missing, which would take into account relevant experience in the private sector (e.g. Constantinides, 2009 and 2010), and also the limited existing experience of the public sector it this area (Osimo, 2008) and the objectives and specificities of government organizations. Our research aims to contribute to filling this gap.

3.   DESCRIPTION OF THE METHODOLOGY

The proposed methodology is based on a central platform-toolset, which can provide interoperability with many different Web 2.0 social media, and enable posting and retrieving content from them in a machine-supported automated manner (through their APIs). It also allows policy makers to create graphically micro-applications, which we call 'Padgets' (Policy Gadgets), and will be deployed in many different web 2.0 social media in order to convey policy messages to their users, interact with them and receive their opinions; each of these media will have a different audience, so that we can finally reach various groups of citizens, which are quite different from the ones who visit and use the official government-initiated -participation websites. This 'Padget' concept we introduce is an extension to the concept of the 'gadget' applications in web 2.0, which involves the use of data and services from heterogeneous sources in order to create and deploy quickly applications that provide value added services, adapted to the specificities and needs of public policy formulation. In particular a Padget is composed of four elements:

I) A policy message, which could be a public policy in any stage of its lifecycle (e.g. a policy white paper, a draft policy plan, a legal document under formulation, a law in its final stage, an EU directive under implementation, etc.).

II) An interface that will allow users to interact with the Padget, which will be relevant to its particular objectives, e.g. it may give users the capability to access policy documents, be informed on relevant news, stipulate opinions, vote on some issues, upload material, tag other people opinions or content as relevant, get location based information, etc.

III) Relevant group knowledge, in the form of relevant content and users' activities that have been produced in external social media, forums, blogs, wikis, social networks, etc., which concerns the above policy and is properly annotated in order to indicate its relation with a particular web 2.0 location.

IV) A decision support model, which includes both first level processing resulting in simpler analytics (numbers of users who saw a policy message, or agreed/disagreed with it, or downloaded a relevant video, etc.), and also more advanced second level processing, based on the use of simulation modelling methods and tools; the latter will use as input the above data from the interaction of the Padget with the public, and possibly other types of data, and give as output estimations of the impact of specific policies on critical performance indicators that are of interest to the policy maker.

The main paradigms of simulation modelling have been examined for the above purposes nd compared (Borshchev and Filippov, 2004), such as Dynamic Systems (enabling high detail simulation in continuous time, and used mainly for technical systems), Discrete Events Modelling (enabling high detail simulation in discrete time), System Dynamics (enabling simulation in medium or high level of abstraction in continuous time) and Agent-based Modelling (enabling modelling the behaviour of the individual 'agents' forming the system (at various levels of granularity, e.g. citizens, groups, firms, etc.), so that from their behaviour the system's behaviour can be derived). From this comparison we came to the conclusion that Systems Dynamics (SD) (Forrester, 1958 and 1961; Kirkwood, 1998) is more appropriate for the analysis public policies, because i) this usually requires high level views of complex social or economic systems in continuous time, and ii) such systems include various individual processes with various types of stocks 'stocks' (e.g. users and non-users of various services or new technologies, employed and unemployed citizens, citizen groups of various income levels, etc.) and 'flows' among them (e.g. non-users become users, unemployed become employed and vice versa), which are influenced by a public policy. For these reasons SD has been successfully used in the past for estimating the evolution of a number of critical variables for society, such as unemployment, economic development, taxation income, technologies penetration, pollution, poverty, etc. and for the analysis of various types of public policies (e.g. Liu and Wang, 2005; Homer and Hirsch, 2006; Robert and Leslie, 2006;

Schwaninger et al, 2008; Armenia et al, 2008; Zamanipour, 2009; Teekasap, 2009). SD focuses on understanding initially the basic structure of a system (i.e. its main stocks, flows and variables influencing them) and then based on it estimating the behaviour it can produce (e.g. exponential growth or S-shared growth of the basic variable). This is done through seven basic steps: a) definition of the system/problem boundary, b) identification of the most important stocks and flows that change these stock levels, c) identification of variables that impact these flows, d) identification of the main feedback connections between variables and loops, e) formation of the equations of the model, f) simulation of it and finally g) analysis of the results (after which we might return to any of the previous steps in order to make modifications and improvements). Such an approach can be very useful for analyzing the effects of various policy options on society and economy.

Additionally, a Padget can also include a <u>privacy statement</u>, which informs the citizen (real or potential user) about what personal data will be collected for him/her, how it will be used and processed, and what will happen to this data after the expiration of the Padget.

Such a Padget can be deployed in many different web 2.0 social media. In particular, we are going to target the following categories of media (from each category we will choose the most appropriate ones taking into account the particular public policy under discussion and the audience we would like to involve in the discussion):

- Platforms for Communication, such as Blogs, Internet forums, Presence applications, Social networking sites, Social network aggregation sites and event sites.
- Platforms for Collaboration, such as Wikis, Social bookmarking (or Social tagging) sites, social news and opinion sites.
- Platforms for Multimedia and Entertainment, such as Photo sharing, Video sharing, Livecasting and Virtual World sites.
- Platforms for News and Information, such as Goggle News, Institutional Sites with high number of visitors (i.e. EU, Human Rights and WWF sites) and newspaper sites.
- Platforms for Policy Making and Public Participation, such as governmental organisations' forums, blogs, petitions, etc.

With respect to the decision model, it will receive as input the alternative policy scenarios and actions that have been planned by decision makers in combination with existing data referring to the policy issue (studies, statistical data, background information) and also data gathered through Padgets' interaction with end users (e.g. views, positive and negative comments, opinion polls, survey results, etc., referring to the adoption rate of the planned policy actions among citizens and other stakeholders). Based on the operation of a SD simulation engine embedded in the Padget decision model the potential policy outcomes will be estimated. These outcomes, after aggregation with existing background information about the particular policy issue, will be used as input for simulating policy actions related to the next steps of the policy making process, etc.; this procedure is going to be repeated several times (according to the alternative policy scenarios duration and the policy making process stages), creating thus several loops, in order to end up to the final outcomes and impact of each policy scenario and finally give the decision makers a basis for making the best possible decision.

4   METHODOLOGY APPLICATION SCENARIO

A typical application scenario of the proposed methodology in the policy making processes, would start from a policy maker or policy making group wanting to "harvest society's input" before making an important policy-related decision; this decision might be about a future policy to be introduced, or an already implemented policy that has to be evaluated as to whether and to what extent it aligns with society or needs modifications. The application of the above methodology in such a case would include the following steps:

A) The policy maker uses the platform capabilities in order to <u>design</u> an appropriate Padget, in a user-friendly environment through a graphical drag-and-drop user interface, similar to the ones of existing mashup editors used for creating gadget applications. In this phase the policy maker will put together the corresponding policy (presented through text, images, video, links, etc.) and decision model of the Padget, and also the security requirements in terms of access restrictions to content as well as a suitable interface for interacting with end users.

II) The Padget will then be <u>published</u> via the platform to a number of appropriate and 'fit for purpose' Web 2.0 social media (e.g. selected based on popularity, composition of audience, types of user activities, functionality, etc.) and becomes available to the public. There will be a variety of choices for deploying the Padget through the central platform according to the its objective and targeted audience, e.g. it can be deployed to a social network in the form of a specific policy application, as an embedded petition, poll or social tagging application in the sidebar of a popular blog, wiki or forum, or even in the platform's own registry. These multiple choices enable policy makers to make each policy gadget available to the various audiences so that a wide range of stakeholders can be involved in policy formulation.

III) The Padget <u>interacts</u> with the public in all these web social media; in each of them users can access it, see its policy message, access the related content and interact with it, i.e. express opinions, add material, vote and even create relations to other existing similar Padgets. The above will be performed in a privacy preserving manner and in accordance with the privacy preferences of the user and the privacy policy specified for the Padget.

IV) At the last stage the data collected through the interaction of the Padget with the end users in all the above Web 2.0 social media will be used as input a) for 'basic processing' that calculates various useful metrics (analytics), and b) for simulation modelling techniques and tools, such as the abovementioned SD, in order to support the policy maker to form a better <u>understanding</u> of the public policy at stake and its outcomes and impacts, and therefore to make better, more informed and socially rooted <u>decisions</u>.

In case that some of the targeted social media do not allow deploying applications (gadgets/widgets) in their environment their standard functionality can be used for publishing the policy message, or appropriate parts of it (e.g. only the text, or only the video or images), and then for collecting relevant user activity (e.g. counts of users who saw it, or agreed/disagreed with it, or forwarded it to other users, or even downloaded relevant videos or images, etc.) and content (e.g. comments), which will be processed as described above in step IV.

5   INTEROPERABILITY ISSUES

It is of critical importance for the proposed methodology the central platform to provide interoperability with many different Web 2.0 social media, enabling both posting and retrieving content from them in a machine-supported automated manner through their APIs. In order to assess the existing capabilities in this direction we examined the following ten highly popular Web 2.0 social media in this respect: Facebook, Youtube, Linkedin, Twitter, Delicious, Flickr, Blogger, Picassa, Ustream and Digg. In particular, for each of them we examined the following characteristics:

- Available APIs and types of capabilities they provide.
- Capabilities for pushing content in them through their APIs, where the term "push" reflects any kind of activity that results in the users adding some type of content in these platforms representing their opinion or their will, such as posts, photos, videos as well as ratings, requests, approvals, intentions, etc. (e.g. YouTube video rating, Facebook Like actions and Friend Requests, Twitter re-tweet, '@' replies and follow activities).
- Capabilities for retrieving content from them through their APIs, where the term "retrieve" reflects any kind of activity that results in the users acquiring some kind of

information from these platforms representing activities that have occurred in them, such as comments on a post, photo or video, approved requests, manifested intentions, re-publication activities, etc. (e.g. how many rates a YouTube video concentrates, how many comments and shares a Facebook post brings about, how many re-tweets and '@' replies a Twitter post enjoys).

• Capabilities for deploying applications (gadgets/widgets) in their environment and having users interact with them.

In total more than 100 methods provided by the APIs of the above ten highly popular Web 2.0 social media were analysed. The following Table 1 shows an extract from this analysis, concerning the Create&Publish Post method of Blogger.com application programmable interface (API).

API Method:	Create & Publish Post		
Description:	Creates and publishes new blog entries, as well as drafts of entries. First, an XML representation of the post to publish must be created. This XML needs to be in the form of an Atom <entry> element.		
URL:	*http://www.blogger.com/feeds/blogID/posts/default*		
Formats:	Xml, Atom 1.0		
HTTP Method(s):	PUT		
Requires Authentication:	True		
API restrictions:	False		
Parameters:	Required	Type	Description
blogID	*Yes*	int	The blog's id
Title (in xml)	*Yes*	string	The post's title
Content (in xml)	*Yes*	html	The post's content
Category (in xml)	*Optional*	Category Term	One or more categories the post is related to.
<app:control> (in xml)	*Optional*	Yes/No	"*Yes*" Specifies that the post should be archived as a draft rather than a normal post. "*No*" turns an <u>existing</u> draft blog post into a published post. <app:control xmlns:app='http://www.w3.org/2007/app'> <app:draft>yes</app:draft> </app:control>

Table 1.   The "Create and Publish Post" method of Blogger.com

From this analysis of the APIs of the above ten social media we have reached the conclusion that there is a clear strategy of these Web 2.0 social media to become more open and public and conform with open API standards. In this scope, they provide more and more functionalities through their APIs for posting and retrieving content, while they try to engage more developers to develop applications based on their services. The general trend is exposing methods through their APIs that "go deeply" into their innermost functionalities and provide developers with an ever growing set of capabilities. This includes on one hand content push functionality; this content can be text, images, videos or more complex forms of media such as "events" , "albums" etc. A large portion of the APIs is dedicated to the creation, (or uploading), modification and deletion of such content. On the other hand there also exists functionality that supports the direct retrieval of various types of content generated by users, such as "user ratings", "unique visits" or "retransmissions" (to other nodes of a social network). However, only Facebook and Linkedin allow deploying applications in their environment. In the following paragraphs we outline our findings concerning some representative cases.

For instance, Blogger is a blog publishing system; the service itself is located at www.blogger.com, and blogs that do not publish to their own websites are hosted by Google

at sub-domains of blogspot.com. It provides all the functionality expected in a blog such as commenting, rating, RSS feeds, etc. Additionally it incorporates various social features for better reader engagement. It allows readers to follow a blog via the Followers gadget which can be added to a blog's layout. With this gadget, the readers can click the "Follow This Blog" link to add their blogs to their Blogger Dashboard and Google Reader account. Furthermore, Blogger's functionality can be greatly extended by adding various gadgets from either Google or third parties. Some examples are Facebook and Twitter widgets, "share this" gadgets and Picasa embeddable albums. In order to communicate with Blogger programmatically, the use of the Blogger Data API is required, which allows client applications to view and update Blogger content in the form of Google Data API feeds. A client application can use the Data API to create new blog posts, edit or delete existing posts, and query for posts that match particular criteria. In particular, the utilities supported from the current version of the API are: creating posts, retrieving posts, updating posts, deleting posts, comments and export format. The current Blogger Data API is under the Developer's Guide version 2.0 , supports a lot of Client Libraries and includes Sample Code. There are three main platforms to access Blogger's API: 1) Protocol: XML & HTTP, 2) .Net, 3) Java.

Another quite different interesting case is the Facebook, which allows building entire applications that integrate into the Facebook website, and there is no restriction as to the purpose of the application. It provides the Facebook Markup Language (FBML, an extension to HTML) that can be used to build full Facebook Platform applications that deeply integrate into a user's Facebook experience. The application can hook into several Facebook integration points, including the profile, profile actions, Facebook canvas, News Feed and Mini-Feed. XFBML can be also used as a way to incorporate FBML (Facebook Markup Language) into an HTML page on a Facebook Connect site or an iframe application. Its API uses a REST-like interface. This means that Facebook method calls are made over the Internet by sending HTTP GET or POST requests to the Facebook API REST server (http://api.facebook.com/restserver.php); nearly any computer language can be used to communicate over HTTP with the REST server. Furthermore, the Facebook Query Language (FQL) allows using a SQL-style interface to more easily query the same Facebook social data that are accessible through other Facebook API methods.

However, it should be mentioned that the above APIs and other relevant capabilities provided by Web 2.0 social media are continuously evolving, providing new functionality in order to address new users' needs. Therefore developers should adopt only the most common and stable subset of available commands, if they want to ensure that the functionality of their application will be maintained across time. Moreover, every social medium has a different approach about how open and public it should be; this includes the extent to which it allows developers to automatically access its content and create embedded applications to their web sites. Therefore, our methodology should adopt an adaptive approach, allowing for the inclusion of more methods on the way but also provide means for structuring the provided interfaces into similar categories, denoting their differences and allowing for future convergence.

6   CONCLUSIONS

The emerging Web 2.0 social media, which attract an increasing number of users, have been used initially by individuals, and then by private sector industries, such as advertising and media, generating significant value for them; however, they have been used only to a limited extent by the public sector. In order to contribute to filling this research and practice gap in this paper we have presented a methodology for the exploitation of the Web 2.0 social media by government organizations in the processes of public policies formulation, through a central platform-toolset providing interoperability with many different social media, and enabling posting and retrieving content from them in a machine-supported automated manner through their APIs.

The proposed methodology includes the use of 'Policy Gadgets' (Padgets), which are defined as micro web applications presenting policy messages in various popular Web 2.0 social media (e.g. social networks, blogs, forums, news sites, etc) and interacting with their users, in order to get and convey their input to policy makers. An analysis of the APIs of ten highly popular Web 2.0 social media has given encouraging results: it has shown the growing trend to provide more and more functionalities for posting and retrieving content from them in a machine-supported automated manner. However, only a few of them allow deploying applications in their environment. Also, the continuous evolution of these APIs, in order to provide new functionalities for addressing new users' needs, is expected to pose some difficulties and challenges.

In order to achieve a machine-supported interaction with large number of citizens through social media interoperability with the most popular platforms has to be established and maintained, through the systematic analysis of the offered functionalities, their categorisation and their future convergence.

The proposed methodology allows for the exploitation of the emerging and highly used web 2.0 social media by government organizations as part of their citizen participation strategies. We expect that it will enable governmental administrations to make a step towards citizens, going to the web locations each group is using for interaction, rather than expecting the citizens to move their content production activity onto the "official" spaces created for e-participation; this has the potential to widen and improve public participation. This methodology is a breakthrough approach to public discourse that will provide government organizations easy and intuitive access to Web 2.0 media for communicating policy proposals and collecting feedback, leverage the network effects of existing social media to involve users and online communities in the policy formulation process, increase citizen trust and transparency through public and established social channels, and also assist in forecasting public response and the impact of policy measures.

Further work will be devoted in the formal description of the provided interfaces, properly categorised and documented in a wiki mechanism, to be made available to the research and practice community. Significant effort is also needed for the validation and further elaboration of this approach, to be conducted within the PADGETS research project through a number of pilots in real life conditions. These pilots will concern important policies of the three government organizations participating in this project: the Observatory for the Greek Information Society, the Centre for e-Governance Development, Slovenia, and the Regione Piemonte, Italy; all these pilots will be evaluated using both quantitative and qualitative techniques.

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