Evaluating Advanced Forms of Social Media Use in Government

Completed Research Paper

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ABSTRACT

Government agencies gradually start moving from simpler to more advanced forms of social media use, which are characterized by higher technological and political complexity. It is important to evaluate systematically these efforts based on sound theoretical foundations. In this direction this paper outlines and evaluates an advanced form of automated and centrally managed combined use of multiple social media by government agencies for promoting participative public policy making. For this purpose an evaluation framework has been developed, which includes both technological and political evaluation, and focuses on the fundamental complexities and challenges of these advanced forms of social media exploitation. It has been used for the evaluation of a pilot application of this approach for conducting a consultation campaign concerning the large scale application of a telemedicine program in Piedmont, Italy, revealing its important potential and strengths, and at the same time some notable problems and weaknesses as well.

Keywords

Social media, web 2.0, government, public policy, software platforms-ecosystems, wicked problems

INTRODUCTION

There has been a growing adoption of the Web 2.0 social media by government agencies in the last years for strengthening communication with citizens and increasing their engagement in public policy making, aiming to take advantage of the large numbers of users attracted by these platforms, and the unprecedented capabilities they provide to simple non-professional users for developing, distributing, rating and accessing various types of digital content (Punie, Misuraca and Osimo, 2009; Bertot, Jaeger and Hansen, 2012; Bonsón et al., 2012; Snead, 2013). Government agencies initially adopted simpler forms of social media use, which included operating manually accounts in some social media, posting relevant content to them (e.g. concerning current and future policies and activities) manually and then reading citizens' interactions with it in order to draw conclusions from them. However, gradually they start experimenting with more advanced and sophisticated forms of social media use, which are characterized by higher both technological and political complexity (Charalabidis and Loukis, 2012; Charalabidis et al., 2012; Kokkinakos et al., 2012; Wandhöfer et al., 2012). In particular, these emerging forms share the following characteristics that distinguish them from the previous ones:

a) from a political viewpoint, they exploit multiple social media as communication channels with a wider range of citizens' groups, and especially with the ones not traditionally involved in politics, and discover and explore a wider range of needs, concerns, and issues posed by them, with respect to complex and critical societal problems and public policies,

b) from a technological viewpoint, they use for this purpose the application programming interfaces (API) of these social media (instead of manual operations),

c) for the automated posting of policy related content to them,

d) and for the automated retrieval of citizens' interactions with this content (e.g. views, likes, comments), and/or other relevant content,

e) while finally they make various types of advanced automated processing of these interactions/content in order to support drawing conclusions from them.

It is quite important to evaluate systematically these emerging advanced forms of social media use by government, both from technological and political viewpoint, based on sound theoretical foundations, in order to undrestand better their potential and the strengths, and at the same time their weaknesses and the problems. It is widely recognized by the relevant literature that extensive research is required for the development of advanced effective practices of social media exploitation by government agencies and also of appropriate specialized frameworks for evaluating them (Chun and Luna Reyes, 2012; Bertot, Jaeger and Hansen, 2012).

This paper makes two contributions in this direction:

I) It outlines and evaluates an advanced form of automated and centrally managed combined use of multiple social media by government agencies for promoting participative public policy making, which is developed within the PADGETS ('Policy Gadgets Mashing Underlying Group Knowledge in Web 2.0 Media' – www.padgets.eu) project, supported by the 'ICT for Governance and Policy Modeling' research initiative of the European Commission (presented briefly in the third section).

II) It develops a specialised evaluation framework for this purpose, which includes both technological evaluation based on the software platforms and ecosystems theory, and political evaluation evaluation based on wicked problems theory (both theories are described in the following section), focusing on the abovementioned fundamental complexities and challenges a) - e) of these advanced forms of social media exploitation in government.

The findings of our study are of general interest to a wide audience of researchers and practitioners in the public administration domain, as they offer interesting insights concerning the technological feasibility and the political effectiveness of such advanced forms of using social media in government; also, they provide a widely applicable research and evaluation framework, which focuses on the fundamental technological and political complexities and challenges of this new generation of advanced approaches to social media use in government.

This paper is structured into seven sections. The next section presents the theoretical background of our study. Then the proposed advanced form of multiple social media use by government agencies is outlined. It is followed by the proposed evaluation framework, and the research method in the next two section. Then the evaluation results are presented, while the final section contains some conclusive remarks and future research directions.

THEORETICAL BACKGROUND

Social Media in Government

Social media have a great potential for supporting, enhancing and transforming critical government functions and activities (Osimo, 2008; Punie, Misuraca and Osimo, 2009; Margo, 2012; Andersen, Medaglia and Zinner- Henriksen, 2012; Panagiotopoulos et al., 2012). In particular, they can offer to government agencies big opportunities for: i) increasing citizens' participation and engagement, by providing to more groups of modern societies a voice in debates on public policies development and implementation; ii) promoting transparency and accountability, and reducing corruption, by enabling governments to open up large quantities of activity and spending related data, and at the same time enabling citizens to collectively take part in monitoring the activities of their governments; iii) public services co-production, by enabling government agencies and the public to develop and design jointly government services; iv) exploiting citizens' knowledge and talent in order to develop innovative solutions to the increasingly serious and complex societal problems (Bertot, Jaeger and Hansen, 2012; Bertot, Jaeger and Grimes, 2012; Linders, 2012).

Highly useful for public policy making can be the capabilities offered by social media for a wide and low cost application of the 'crowdsourcing' ideas (Brabham, 2008), which have been initially developed in the private sector and have subsequently taken root in the public sector as well (probably with adaptations to the specificities of government). These Web 2.0 platforms enable government agencies to mine useful fresh ideas from large numbers of citizens concerning possible solutions to social needs and problems, new public services or improvements of existing ones, or other types of innovations (Bovaird, 2007; Torres, 2007; Lukensmeyer and Torres, 2008; Chun et al., 2010; Hilgers and Ihl, 2010; Nam, 2012; Linders, 2012). This can lead to the adoption of open innovation ideas in the public sector (Hilgers & Ihl, 2010), and gradually result in 'co-production' of public services through cooperation among government and citizens (Bovaird, 2007; Linders, 2012).

However, it is widely recognized that the exploitation of social media by government is still in its initial stages, and extensive research is required on it, in order to reach higher levels of maturity and effectivenes in this area, with main focus on the development of advanced effective practices of social media exploitation by government agencies and appropriate specialised frameworks for evaluating them (Chun and Luna Reyes, 2012; Bertot, Jaeger and Hansen, 2012), based on sound theoretical foundations. In the following two sections are outlined the theoretical foundations of the specialised framework we propose for the evaluation of these emerging advanced forms of social media use in government: the software platforms and ecosystems theory, used as foundation for the technological evaluation, and the wicked problems theory, used as foundation for the political evaluation.

Software Platforms and Ecosystems Theory

The theory of software platforms and ecosystems posits that software development today is increasingly based on pre-existing 'platforms' that consist of 'building blocks' offering basic functionality, which are used for developing 'modules' that provide additional features fulfilling specialized needs of specific user groups (Gawer, 2009; Baldwin & Woodard, 2009; Tiwana, Konsynski & Bush, 2010; Gawrer, 2010), e.g., Apple's iPhone operating system serves as a platform for the development of its thousands of 'apps' that provide specialized functionalities. Usually the platform is developed by a major player, and numerous modules are subsequently developed by a diverse developers' community, who possess specialized knowledge of specific user groups' needs that platform owners do not possess. This emerging software development paradigm is highly beneficial as it reduces significantly the time and cost required for developing new specialized functionality.

However, according to Tiwana, Konsynski & Bush (2010) this software development paradigm has some fundamental preconditions:
- a core 'platform', which is defined as a relatively stable extensible codebase of a software-based system providing a complete set of useful core functionalities,
- these be used for the development of 'modules', defined as add-on software subsystems that connects to the platform using its functionalities and at the same time adding new functionalities to it,
- through well defined and relatively stable 'interfaces', i.e. specifications and design rules that describe how the platform and modules interact and exchange information,
- so that an 'ecosystem' can be developed, consisting of the platform and the modules that have been developed based on it,
- and evolve based on effective 'governance', which includes the allocation of decision making rights to its various stakeholders (platform owner(s) and module developers), and the establishment of controls aiming to encourage desirable behaviors by the usually numerous module developers.

Since the emerging advanced forms of social media use by government agencies, including the one outlined in the following section of this paper, are based on the automated use of the functionality of multiple social media through their API, it is necessary to evaluate first the technological feasibility: to what extent we can implement these approaches adopting the above software development paradigm, using as 'platforms' (building blocks) the functionalities of the targeted social media. It is important to examine to what extent the API of the most popular social media enables the automated posting of all the required types of the policy-related content to them, and then the retrieval of citizens' interactions with this content (e.g., views, likes, textual comments), with all required attributes, in order to proceed to sophisticated processing of them; also, to what extent the abovementioned preconditions of platform-based software development are fulfilled.

Wicked Policy Problems Theory

According to the theory of wicked policy problems, which has been initially formulated by Rittel and Weber (1973), public policy problems have changed dramatically after World War II, and this necessitates following a different approach for addressing them. Previously, they usually had clear and widely accepted definitions and objectives, so they could be solved by experts through 'first generation' mathematical methods, which aim to achieve some predefined objectives with the lowest possible resources; this class of public policy problems had been termed as 'tamed'. However, big changes that took place gradually in most societies have increased dramatically the complexity of public policy problems. In particular, societies became more heterogeneous and pluralistic in terms of culture, values, concerns and lifestyles, and this made public policy problems 'wicked', i.e., lacking clear and widely agreed definition and objectives, and having many stakeholders with different and heterogeneous problem views, concerns and expectations. For these reasons this class of wicked problems cannot be solved by using 'first generation' mathematical methods, since they lack the basic preconditions for this: they do not have clear and widely agreed definition and objectives that can be adopted as criteria for evaluating possible solutions. So Rittel and Webber (1973) suggest that wicked policy problems require 'second generation' methods, which include a first stage of consultation among problem stakeholders, aiming to formulate a shared definition of the problem, and then a second

stage of mathematical analysis by experts of the well-defined at this stage problem. In the first stage discourse and negotiation take place, aiming to synthesize different views and opinions of the stakeholders, and finally to formulate a shared definition of the problem and the objectives to be achieved. Having this as a base, it is then possible to proceed in a second stage to a mathematical optimixation-oriented analysis carried out by experts.

Subsequent research on this 'second generation' approach to the solution of public policy problems has revealed that its first stage can be greatly supported by the use of appropriate information systems that allow stakeholders to enter 'topics' (meant as broad discussion areas), 'questions/issues' (particular problems to be addressed within a discussion topic), 'ideas' (possible alternative answers-solutions to questions/issues) and 'arguments' (positive or negative - evidence or viewpoints that support or object to ideas) (Kunz and Rittel, 1979; Conklin and Begeman, 1989; Conclin, 2003).

It is therefore important to evaluate to what extent these advanced forms of social media use by government agencies contribute to overcoming the above fundamental political difficulty of modern public policy problems i) by enabling more stakeholders to participate in relevant consultations at a lower cost and in shorter time, ii) by revealing topics, questions/issues, ideas/alternatives and positive/negative arguments perceived by various stakeholder groups, and iii) by facilitating convergence (at least to some extent) between stakeholders on the definition of the problem a policy attempts to address, the main issues, the main solutions/alternatives, and also their advantages and disadvantages.

AN ADVANCED FORM OF SOCIAL MEDIA USE IN GOVERNMENT

The proposed approach hinges on the conduction from a central system of consultation campaigns in multiple social media, with each of them attracting a different group of citizens from the ones we want to communicate with and involve in the discussion of a specific public policy.
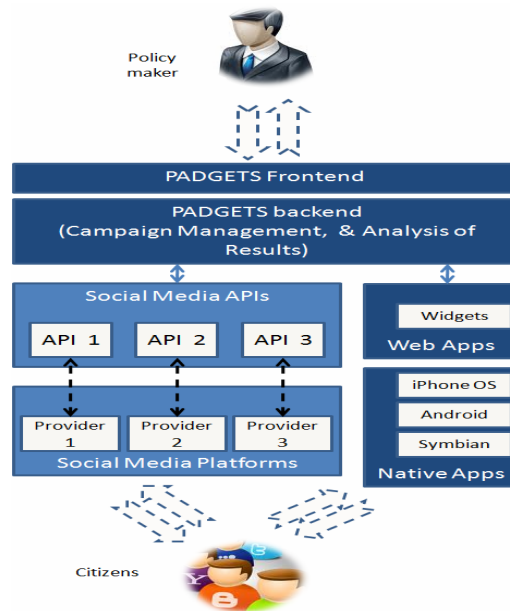
Figure 1: Centrally managed automated multiple social media use for policy consultation

In particular, each of these campaigns includes automated centrally controlled and coordinated publishing of 'Policy Gadgets' (content or applications) (also termed 'Padgets') in a number of selected social media using their APIs through the central platform, and then retrieval of citizens/users interactions with these Padgets (e.g., views, likes, ratings, comments) from the afore-mentioned social media. Finally, these interactions undergo three levels of sophisticated analyses: i) calculation of various analytics (e.g. number of views, likes, ratings, comments per day/region per gender, age and education group for each of the targeted social media and in total, ii) text mining (based on opinion mining techniques - for a review of them see Maragoudakis, Loukis and Charalabidis (2011), in order to determine the 'sentiment' of citizens' comments (positive or negative), and the main topics/issues/suggestions/arguments raised by them), iii) future projections through simulation (e.g. using system dynamics or agent-based simulation - for more details see Charalabidis, Loukis, and Androutsopoulou (2011)). Apart from social media native interfaces, citizens can join such consultation campaigns via

alternative channels, such as mobile phone apps or an iGoogle Web application. More information on this advanced form of social media use in government can be found in Boero et al. (2011) and Charalabidis and Loukis (2012).

EVALUATION METHODOLOGY

A framework for the evaluation of the advanced form of social media use in government outlined in the previous section (which can be used – with appropriate adaptations for other) has been developed. It focuses on the fundamental technological and political complexities and challenges of such sophisticated approaches to social media exploitation, as discussed in the introduction. The proposed evaluation framework is shown in Table 1. It includes two evaluation perspectives, with each of them including several evaluation dimensions:

I. Technological evaluation: It assesses to what extent it is technologically feasible by adopting the software platforms and ecosystems paradigm, which has been described in the second section of this paper, using as 'platforms' the targeted social media; to what extent the APIs of the targeted social media provide all the required capabilities for posting policy-related content to them and for retrieving from them citizens' interactions (e.g., views, likes, textual comments) with this content; in general to what extent the main preconditions of the platform-based software development paradigm are fulfilled.

II. Political evaluation: It assesses to what extent it is useful/beneficial for conducting policy related campaigns/consultations in shorter time and at lower costs; also, based on the theory of wicked policy problems described in the second section of this paper, to what extent it is useful for reaching wider audiences (i.e., more citizens' groups), and identifying particular problems/issues they perceive concerning the particular policy under discussion, possible solutions to them, and relevant advantages - positive arguments - and disadvantages - negative arguments; finally, to what extent it facilitates convergence (at least to some extent) between stakeholders, e.g. on the definition of the problem the policy attempts to address.

Technological evaluation
- to what extent the APIs of the targeted social media provide all the required capabilities for posting policy-related content to them
- to what extent the APIs of the targeted social media provide all the required capabilities for retrieving citizens' interactions with this policy-related content (e.g., views, likes, textual comments) having all required attributes
- in general to what extent the main preconditions of the platform-based software development paradigm are fulfilled
Political evaluation
To what extent the proposed approach is useful/beneficial for policy related campaigns/consultations in terms of …
- time saving
- cost saving
- reaching wider audiences (=more citizens' groups)
- identifying the particular problems/issues that exist concerning the particular policy
- identifying possible solutions to these problems/issues
- identifying relevant advantages (positive arguments) and disadvantages (negative arguments)
- facilitating convergence (at least to some extent) between stakeholders, e.g. on the definition of the problem the policy attempts to address, the main issues, the main solutions/alternatives, etc.

Table 1: Technological and political evaluation framework

RESEARCH METHOD

In order to assess these eleven dimensions (three technological and eight political) of the abovetioned advanced form of social media use in government, the following research method was adopted:

i) A pilot application of this approach was organized aiming to conduct a multiple social media campaign/consultation, in cooperation with the regional government of Piedmond, Italy, concerning the large scale application in the whole region of a

telemedicine initiative that had been initially applied successfully in a small province of it. Its objective was to convey information on this extension of the telemedicine initiative in the whole Piedmont region to interested and affected citizens, and especially to the main stakeholders (doctors, health services employees, patients and their families), and then to collect feedback from them (e.g. possible issues/problems, suggested actions, positive arguments - advantages and negative arguments - disadvantages, etc.), using social media, mainly Facebook, Twitter and Youtube. Relevant telemedicine related textual content and videos were posted, and citizens' interactions with them were automatically retrieved and processed.

ii) After the end of this consultation campaign, from the accounts of the regional government in Facebook, Twitter and Youtube were collected the statistics of it. We focused first on 'view' statistics, which allowed us to assess the level of 'reach' of the messages and content of the campaign. The inherent cross-platform nature of this consultation campaign implies the use of different measures from each platform for this purpose in order to calculate a total 'reach indicator'. For this purpose we used from Facebook the number of views of the posts associated to the campaign which were located on the fan page chosen by the policy makers. Regarding YouTube, we took into account the views of the telemedicine related videos uploaded as part of this campaign. With respect to Twitter, since the number of impressions of a given message ("tweet") cannot be computed, the only viable solution has been to estimate impressions using click-through on the links as well as YouTube referrals they included: as a consequence, this value represents a significant underestimation of the actual reach achieved through the specific platform. We also examined 'engagement' statistics and used them for calculating an 'engagement indicator'. Again due to the cross-platform nature of this consultation campaign we used for this purpose different measures from each platform: unique users who generated a story through comments, likes, and public sharing in Facebook, unique users who performed actions such as like, dislike, comments and sharing in YouTube, and in Twitter, unique users who re-tweet and reply to tweets representing policy messages published by the campaign initiator.

iii) Furthermore in order to assess the technological feasibility (i.e. assess the three dimensions of it shown in Table 1) we analyzed the official descriptions of the APIs of five widely used social media platforms: Blogger, Facebook, Twitter, YouTube and LinkedIn. In particular, we examined the methods they provide for publishing various types of content and for retrieving users' interactions with it, and also their interfaces and governance.

iv) Finally in order to conduct the political evaluation (i.e. assess the eleven components of it shown in Table 1) face to face semi-structured interviews were organized with experienced staff of the Piedmont regional government who were involved in the pilot (the Head of Regional Public Health Department and a senior member of the Regional Innovation Department). Each interview lasted about one hour and was tape-recorded, transcribed and then coded manually by the first and the fourth author separately, using an open coding approach (Maylor and Blackmon, 2005).

EVALUATION RESULTS

Technological Evaluation

From the analysis of the APIs of the above five social media platforms it has been concluded that all of them have strategies to support the development of third party applications using their data, i.e. to be used as 'platforms', by providing through their APIs a rich functionality for posting and retrieving content, exposing methods that 'go deeply' into their core functionalities. However, some notable problems and weaknesses have been identified as well. First, none of the existing social media allow deploying micro-applications in their environment, so the Policy Gadget (Padget) concept described previously cannot take the form of applications, but only the form of content published in several social media. Secondly, the APIs of most of the examined social media are not characterized by stability, and change very frequently, which necessitates significant effort in order to continuously adapt third party applications (such as our central system) in order to keep them operational. Third, there are problems in obtaining important author demographic information for each 'unit of content' (e.g., for each blog post, or Youtube comment) retrieved from them, such as author's gender, age group and education, which are necessary in order to calculate various analytics per gender, age and education group; this is very important for the usefulness of these analytics for the public policy makers, since they usually vary significantly among different gender, age and education groups, so aggregate values of them are much less useful to policy makers (as the composition of the users of such social media platforms with respect to gender, age group and education are usually not representative of the population). In particular, all the five examined social media can provide to a third party application some author demographics (however not the same for all these social media), which have been defined as 'public' by the particular user, on condition that 'registration' of the application has been made; for retrieving the remaining demographics, which have been defined by the user as 'private', his/her 'authorization' is required; the above processes tend to become homogenized across social media and standardized based on the OAuth standard (see http://oauth.net/). Furthermore, the above three important demographic

fields (gender, age group and education) were not available in all the users' profiles of the abovementioned five examined social media (e.g., the Twitter users' profiles include none of them). Moreover, some social media allow anonymous comments and likes/dislikes, so the demographics of their authors' remain unknown.

From the above analysis it has been concluded that the main pre-conditions of the platform-based software development paradigm are fulfilled to a satisfactory extent, but not completely. All five examined social media provide an extensive core 'platform' functionality, which is accessible to third party applications, and can be used for the development of 'modules' providing additional specialized functionalities through APIs, so that the platforms and the modules can work well together as an 'ecosystem'. Also, there are clear 'interfaces', i.e. specifications and design rules that describe how the platform and modules interact and exchange information, based on well defined API, and effective 'governance' mechanisms of the 'ecosystem' (based on the clear allocation of decision making rights to the main stakeholders - platforms' owners and modules developers). Therefore this advanced form of social media use by government agencies for supporting public policy making seems to be technologically feasible to a large extent. However, the lack of stability of platforms', and some missing important functionalities (e.g. provision of demographics data), make the practical application of the above paradigm more difficult and costly, and do not allow highly important (for government policy makers) functionality to be developed.

Political Evaluation

From the analysis of statistics of this consultation campaign in the Facebook, Twitter and Youtube accounts of the Piedmont regional government it has been estimated that with respect to citizens' reach its policy messages have generated over 28,000 impressions. This figure, that has to do with the mere reception of the policy message in the social media realm, is characterized by a cross-platform nature. As explained in the previous section in Facebook the figure encompasses the views of posts associated to the campaign which are located on the fan page chosen by the policy makers. Regarding YouTube, here the principle does not change, therefore the indicator includes views of the telemedicine related videos uploaded as part of this campaign. However, with respect to Twitter it is important to point out that the number of impressions of a given message ("tweet") cannot be computed resorting to either native or third parties' tools. In this platform, the only viable solution has been to estimate impressions using click-throughs on links as well as YouTube referrals: as a consequence, this value represents a significant underestimation (at least one order of magnitude) of the actual views performance achieved on the specific platform. Translating impressions into unique user accounts, the data offered by the platforms' analytics show that over 11,000 accounts have been reached.

Moving from passive interactions to active engagement, platforms' analytics reveal the participation of more than 300 (unique) individuals during the campaign lifecycle. The inherent cross-platform nature of this consultation campaign implies the use of different measures from each platform for the calculation of this indicator: unique users who generated a story through comments, likes, and public sharing in Facebook, unique users who performed actions such as like, dislike, comments and sharing in YouTube and, in Twitter, unique users who re-tweet and reply to tweets representing policy messages published by the campaign initiator.

All participants in the focus group discussion agreed that the above numbers were quite satisfactory, in comparison to previous policy consultations, and that this advanced form of exploiting social media has a good potential for disseminating information to wide and heterogeneous audiences, reaching groups of citizens not traditionally involved in politics, and also for stimulating reactions and feedback from them. Concerning the contribution that the proposed approach may offer to the efficiency of policy making in terms of ability to reach more people at lower costs, one of the participants offered a clear and synthetic answer: *"conducting the same activities without the platform would have implied roughly a double cost"*. Social media communication channels are characterized by rapid and viral diffusion patterns. This results in the possibility to reach a widespread audience with limited labor intensity, a characteristic representing an important value driver for policy makers. In addition, they all agreed that the concurrent and coordinated usage of complementary social media platforms such as Facebook, YouTube and Twitter proved to generate significant synergies in terms of overall cross-platform results.

The results of the analysis of citizens' textual comments was presented to the interviewees, who highlighted the ability of this combined exploitation of multiple social media approach to clearly single out both citizens' expectations, concerns and issues about policy solutions proposed by government, and also identify differences between stakeholder groups. These results provide policy makers with extremely useful insights, as they allow them to design and implement ad-hoc corrective actions or communication campaigns aimed at dissipating the doubts present among different stakeholders' groups.

However, they found this approach less performing in terms of solutions identification to various issues and concerns posed, and also of facilitating convergence between differing stakeholders' views. The difficulty in generating viable solutions has probably to do with the fact that the complexity of the wicked problems inherent in policy actions is quite difficult to address through social media interactions that are often characterized by tight brevity constraints (as in the case of Twitter) or by

quick interactions that leave little room to pondering and often contain a significant emotional component (Wang et al. 2007). As per the convergence between stakeholders' views, the limited performance may be ascribed to a number of factors. First, discussion tends to be fragmented between the different used social media thus rendering it more difficult for any given user to have an overall vision. Second, messages in government agency's social media accounts tend to be targeted at the government agency rather than aimed at opening up a debate among social media users.

CONCLUSIONS

In the previous sections was presented and evaluated an advanced form of social media use in government, which is based on the automated and centrally managed combined exploitation of multiple complementary social media. An evaluation framework has developed, which focuses on the fundamental technological and political complexities challenges of such complex approaches social media exploitation, drawing from theories belonging to different domains.

From a technological point of view, it has been concluded that the above approach is feasible and viable to a large extent, with the main preconditions of the platform-based software development paradigm it is based on being fulfilled. However, some problems and weaknesses have been identified: there are difficulties in obtaining authors' demographics from social media, mainly due to their privacy policies, which represents a constraint to the development of the initially planned functionality, limiting the value generated for policy makers. In addition, the lack of stability of most social media API increases maintenance efforts and costs.

From a political point of view, it has been concluded that this complex approach possess a strong potential to support addressing the fundamental political complexities and challenges of modern public policy making. It allows informing wide range of citizens' groups about the rational and the expected benefits of a planned policy in a quick and cost-effective way, interacting with them, and identifying a wide range of potential issues and barriers hindering a successful implementation of the policy. This is quite important, as the dominant so far electronic communication channel of government agencies with citizens, the government portals, are mainly oriented towards the provision of information and services (so they are perceived by citizens as a tool mainly for this purpose), and provide much less capabilities for interaction, participation and collaboration with citizens (e.g. Sandoval-Almazan and Gil-Garcia (2012)). The wealth of comments from different citizens' groups that such a multiple social media usage approach provides enables the identification of citizens' 'positive values' (things that citizens value) and also 'negative values' (things that citizens dislike) with respect to the particular policy or policy domain in general, which are very useful for the comprehensive design and evaluation of public policies taking into account not only economic efficiency criteria, but also wider 'public value' oriented ones (Moore, 1995; Alford and Hughes, 2008). However, it provides less support for finding solutions for these issues and barriers, and also for achieving convergence among heterogeneous stakeholders' views. So it should possibly be combined with other approaches that might be more effective in supporting identification and more detailed examination of alternative solutions, and achieving convergernce on them, e.g. closed 'structured e-consultation' among representatives of the identified main stakeholder groups and competent government agencies based on the IBIS framework (Loukis and Wimmer, 2012).

Furthermore, this paper adds to the existing frameworks for evaluating the use of social media in government (such as the ones proposed by Normann-Andersen et al. (2012), which focuses on the impacts on capabilities, interactions, orientations and values, and by Picazo-Vela et al. (2012), focusing on the impacts on interorganizational collaboration, organizational structures and processes, information and data, technologies, institutional framework and general context) being complementary to them. In particular, these existing frameworks aim to assess mainly the long term impacts of social media use in general, so they can be applied only after a considerable time period of social media use by government agencies; they are not focused on the special characteristics of this emerging new generation of advanced forms of social media exploitation in government, which have been discussed in the introduction. The evaluation framework proposed in this paper can be applied in a much earlier stage (after a shorter period of pilot use) for making an initial and highly focused evaluation of some fundamental elements (technological feasibility and political usefulness) of such an advanced approach of social media use in government, in order to support major decisions on its sustainability and also on important changes and improvements of it that might be required; if such an advanced approach is finally adopted and used for some time, then in a later stage an assessment of its long term impacts can be made, using an adaptation of one of the abovementioned existing frameworks.

Nevertheless, a significant amount of research is still necessary in order to turn such practices into a mainstream and highly value-added activity in government agencies. Future research efforts should thus try to investigate and test such advanced forms of social media use along the entire policy cycle, from agenda setting to policy evaluation, in order to test and assess its suitability to the different policy phases. Furthermore, our attention should focus on shedding some light on: the integration with existing traditional public policy formulation processes in terms of timing and interactions, the development of

discussion protocols allowing to move from simple opinion expression to coordinated and fruitful discussions, to the identification of solutions, and finally to some degree of convergence and consensus. Also, the proposed evaluation framework should be applied (with appropriate adaptations) to other advanced forms of social media use in government, leading to enrichments and improvements of it; an adaptation of it is already in progress for the evaluation of a novell form of 'passive' and 'non-moderated' crowdsourcing by government agencies using social media developed as part of the NOMAD project supported by the European Commission (Charalabidis et al. 2012).

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