



Policy making 2.0: From theory to practice

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ABSTRACT

Government agencies are gradually moving from simpler towards more sophisticated and complex practices of social media use, which are characterized by important innovations at the technological, political and organizational level. This paper intends to provide two contributions to the current discourse about such advanced approaches to social media exploitation. The first is of practical nature and has to do with assessing the potential and the challenges of a centralized cross-platform approach to social media by government agencies in their policy making processes. The second contribution is of theoretical nature and consists in the development of a multi-dimensional framework for an integrated evaluation of such advanced practices of social media exploitation in public policy making from technological, political and organizational perspectives, drawing from theoretical constructs from different domains. The proposed framework is applied for the evaluation of a pilot consultation campaign conducted in Italy using multiple social media and concerning the large scale application of a telemedicine program.

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1. Introduction

Dramatic changes taking place all over the world give rise to new social problems and also make the existing 'traditional' ones even more acute and complex. This situation necessitates the adoption of more citizen-centric and participative forms of public policy making characterized by a stronger interaction between government agencies and citizens, which will allow the former to exploit the knowledge and the creative ideas of the latter concerning the pressing social problems, and also to increase transparency and trust. Over the last years there has been a growing adoption of social media platforms by government agencies for the above purposes (Bertot, Jaeger, & Hansen, 2012; Snead, 2013).

Government agencies initially adopted simple practices of social media use, which included setting up and operating manually accounts in some social media, posting manually content to them (e.g. concerning their policies and activities) and then reading citizens' interactions in order to draw conclusions. Recently, they started experimenting with more sophisticated practices of social media use, which include important innovations at the technological, political and organizational level, leading to increased complexity at all these three levels (Charalabidis & Loukis, 2012; Ferro et al., 2011; Kokkinakos et al., 2012; Wandhöfer

et al., 2012). In particular, at technological level they gradually proceed to the automated posting of content to multiple social media, retrieval from them of relevant citizens' generated content. This is done using both application programming interfaces (API) and automated advanced content processing techniques to draw preliminary conclusions. At the political level, government agencies attempt to communicate with a wider range of citizens' groups, having different cultures, values, and concerns, disseminate to them public policies related information and receive feedback from them. This enables the discovery and exploration of a wider range of heterogeneous views concerning complex 'wicked' (see next section) societal problems and relevant public policies. Furthermore, the adoption of such practices as part of the policy making processes constitutes an important organizational innovation for government agencies.

However, it is widely recognized that further research is required concerning the exploitation of social media by government agencies in various directions, including the development of advanced effective practices and of appropriate frameworks for evaluating them (Bertot, Jaeger, & Hansen, 2012; Chun & Luna Reyes, 2012). Our paper contributes to filling these research gaps. In particular, our main research objectives are:

- i) to assess the potential and the challenges of a centralized cross-platform approach to social media exploitation by government agencies in their policy making processes,
- ii) to develop a multi-dimensional framework for an integrated evaluation of such advanced practices of social media use in public policy making from technological, political and organizational perspectives, based on theoretical foundations from different domains.

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This research has been conducted as part of an international research project named PADGETS ('Policy Gadgets Mashing Underlying Group Knowledge in Web 2.0 Media' - www.padgets.eu), co-funded by the European Commission.

This paper is structured into eight sections. Section two outlines the background of this study. Section three describes the centralized cross-platform approach to social media exploitation by government agencies. Section four presents the proposed multi-dimensional evaluation framework. Section five describes a pilot policy consultation campaign based conducted in Italy. Section six outlines the research method employed. Section seven presents the results of the pilot and its evaluation. Finally, section eight contains some conclusive remarks and future research directions.

2. Background

2.1. Social media in government

Government agencies are increasingly adopting social media in their policy making processes, as they offer interesting opportunities for: i) increasing citizens' participation and engagement, by providing to more groups a voice in discussions of policy development and implementation; ii) promoting transparency and accountability, and reducing corruption; iii) public services co-production, by enabling government agencies and the public to develop and design jointly government services; and iv) exploiting public knowledge and talent in order to develop innovative solutions to the increasingly serious and complex societal problems (Bertot, Jaeger, & Grimes, 2012; Bertot, Jaeger, & Hansen, 2012; Bertot, Jaeger, Munson, & Glaisyer, 2010; Linders, 2012; Tapscott, Williams, & Herman, 2008).

These Web 2.0 platforms enable government agencies to 'crowdsource' 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 (Chun, Shulman, Sandoval, & Hovy, 2010; Hilgers & Ihl, 2010; Linders, 2012; Lukensmeyer & Torres, 2008; Nam, 2012; Torres, 2007). This can lead to the application of open innovation ideas in the public sector (Hilgers & Ihl, 2010), and gradually result in 'co-production' of public services by government and citizens in cooperation (Linders, 2012). According to Lukensmeyer and Torres (2008) such 'citizen-sourcing' may change government's perspective from viewing citizens as "users and choosers" of government services to "makers and shapers" of them.

However, it is widely recognized that extensive further research is required concerning the exploitation of social media by government agencies. Chun and Luna Reyes (2012) suggest that additional research is required in this area, mainly in three directions: i) development and analysis of advanced forms of social media usage in government, and appropriate methodologies for evaluating them; ii) development of techniques for processing the 'big social data' collected through citizens' interactions with government in social media, in order to identify ideas, opinions and sentiments; and iii) investigation of the effects of social media exploitation by government on citizens' participation, trust and collaborative governance. Also, Bertot, Jaeger, and Hansen (2012) argue that the usage of social media by government poses important new questions and challenges that require extensive research, such as how social media should be used, how this can lead to social inclusion and not increase exclusion of some groups, how can privacy, security, accuracy and achieving issues be addressed, how social media use in government should be governed, and finally what will be its effects on our current democratic models and practices. This paper contributes to filling two of the above research gaps: (a) it analyzes and evaluates an advanced centralized cross-platform approach to social media exploitation by government agencies in order to support public policy making, and (b) it develops a framework for the multi-dimensional evaluation of such advanced practices of social media exploitation by government, which focuses on their fundamental innovations and complexities,

including three perspectives: technological, political and organizational. The following sections (from 2.2 to 2.4) present the theoretical lenses of these three evaluation perspectives.

2.2. Software platforms and ecosystems theory

The theory of software platforms and ecosystems posits that software development today is increasingly based on pre-existing 'platforms' consisting of 'building blocks' offering basic functionality, which are used for developing 'modules' that provide additional features fulfilling specialized needs of specific user groups (Gawer, 2010; Tiwana, Konsynski, & Bush, 2010), e.g., Apple's iPhone operating system served as a platform for the development of its thousands of 'apps' that provide specialized functionalities. Usually the platform is developed by a major player, while numerous modules are developed by a developers' community, who possess specialized knowledge about users' needs. This emerging software development paradigm is highly beneficial, as it reduces significantly the time and cost required for developing specialized functionality.

According to Tiwana et al. (2010) the main concept in this software development paradigm is the 'platform', which is defined as an extensible codebase of a software system providing core functionality that can be shared by numerous modules interoperating with it, and the interfaces through which it can be accessed and used; as 'module' is defined as an add-on software subsystem that connects to the platform in order to add functionality to it, while as 'ecosystem' is defined the collection of the platform and the modules that have been developed based on it. Highly important for the functioning of this software development paradigm are the 'interfaces' (stable specifications and design rules that describe how the platform and modules interact and exchange information) and the 'architecture' (conceptual blueprint that describes how the ecosystem is partitioned into a relatively stable platform and a complementary set of modules that are encouraged to vary, and also the design rules binding on both). The development and evolution of such an ecosystem also necessitate effective 'governance' of it, defined as the allocation of decision making to its various stakeholders.

2.3. 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, so a different approach is required 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 has been termed as 'tamed'. However, big changes that took place gradually in most societies 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, values and concerns.

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 definitions and objectives that can be adopted as criteria for evaluating possible solutions. So Rittel and Weber (1973) suggest that wicked policy problems require 'second generation' methods, which combine in a first stage consultation among problem stakeholders, in order to formulate a shared definition of the problem, and then in a second stage mathematical analysis by experts. In particular, in the first stage discourse and negotiation take place, aiming to synthesize different views and opinions, and finally 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

Table 1
Innovation characteristics that determine the degree of its adoption.

Characteristic	Definition
Relative advantage	The degree to which an innovation is perceived as better than the idea, work practice or object it supersedes
Compatibility	The degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters
Complexity	The degree to which an innovation is perceived as difficult to understand, implement and use
Trialability	The degree to which an innovation may be experimented with on a limited scale basis
Observability	The degree to which the results of an innovation are visible to others

second stage to a mathematical analysis carried out by experts of the well-defined problem.

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 which allow stakeholders to enter ‘topics’ (meant as broad discussion areas), ‘questions/issues’ (particular problems to be addressed within the discussion topic), ‘ideas’ (possible alternative answers-solutions to questions/issues) and ‘arguments’ (positive or negative – evidence or viewpoints that support or object to ideas) (Conklin, 2003; Conklin & Begeman, 1989).

2.4. Diffusion of innovation theory

The adoption of the proposed approach to social media usage by government agencies in their public policy making processes and work practices represents a major organizational innovation. Therefore,

it is pivotal to examine it from this perspective in order to understand to what extent it has the required characteristics for wide adoption and diffusion. For this purpose we can use the well-established innovation diffusion proposed by Rogers (2003), which has been extensively employed for analyzing ICT-related innovations in both the public and the private sectors (Raus, Flügge, & Boutellier, 2009; Wonglimpiyaratana & Yuberck, 2005). According to this theory, there are five critical characteristics of an innovation that determine the degree of its adoption (see Table 1).

3. A centralized cross-platform approach to social media use

A centralized cross-platform approach to social media exploitation by government agencies in their public policy making processes has been developed within the PADGETS project, which is shown in Fig. 1.

It is based on the concept of ‘Policy Gadgets’, defined as resources (having the form of content or applications) created by a policy maker, which are typically instantiated through a central system within multiple social media platforms using their APIs. This allows public decision makers to conduct consultation campaigns in a number of selected social media, with each of them possibly attracting different citizens’ groups, so that many and heterogeneous groups affected by a particular policy can be reached. The interactions of citizens with these Policy Gadgets (e.g., views, likes, ratings, comments) are then retrieved by the central system using the APIs of these social media. Finally, these interactions undergo sophisticated processing (calculation of various indicators, text mining, sentiment analysis, etc.) in order to derive useful information for the policy maker.

A more detailed description of the key concepts of this approach and the ICT infrastructure developed for supporting it can be found in Charalabidis and Loukis (2012) and Ferro, Osella, Loukis, and Charalabidis (2013).

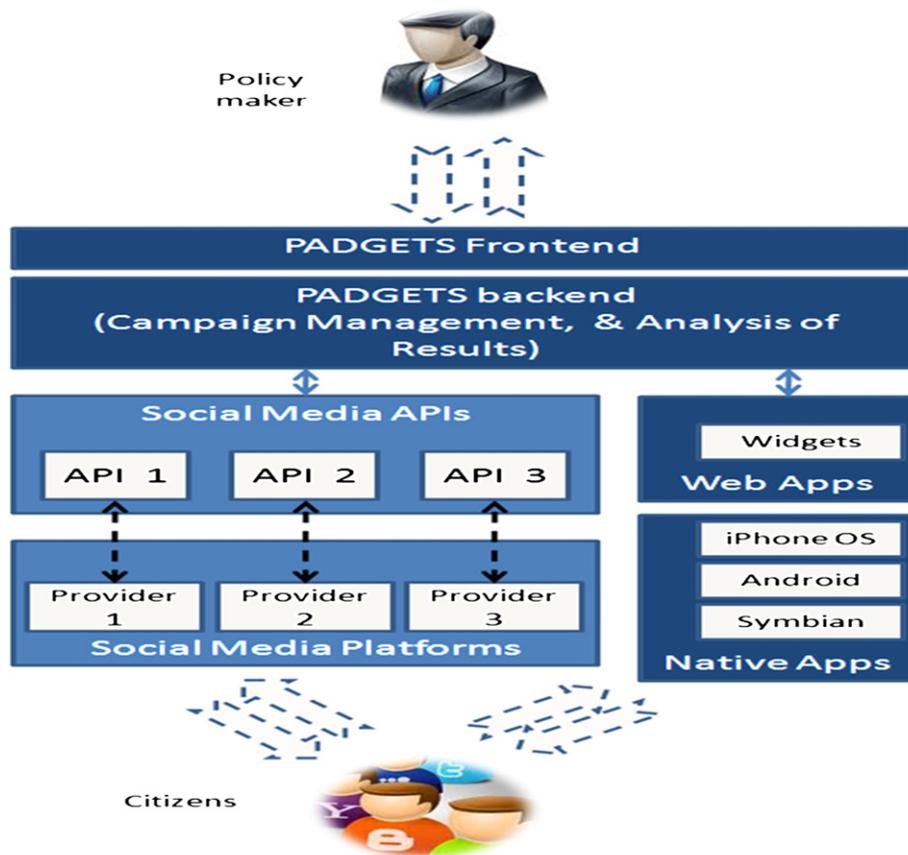


Fig. 1. A centralized cross-platform approach to social media use.

4. A multi-dimensional evaluation framework

A multi-dimensional framework has been developed for the evaluation of the above centralized cross-platform approach to social media exploitation by government agencies, which is shown in Table 2. It focuses on the fundamental innovations and complexities that characterize these emerging advanced practices of using social media in government policy making processes at the technological, political and organizational level.

From a technological perspective, the implementation of the above approach has to follow the platforms-based development paradigm previously outlined and use as platforms all the targeted social media. It relies to a significant extent on extensive and complex 'external' functionality (i.e. functionality provided not by the central system developers, but by actors external to it) from multiple social media. For this reason it is of critical importance to assess first the technological feasibility of this approach, and the most appropriate lens for this is the 'Software Platforms and Ecosystems Theory'. So the first perspective of our evaluation framework is the technological feasibility evaluation. It assesses to what extent the proposed approach is technologically feasible adopting the software platforms and ecosystems paradigm (Gawer, 2010; Tiwana et al., 2010), using as 'platforms' the targeted

Table 2
A multi-dimensional evaluation framework.

Technological feasibility evaluation
<ul style="list-style-type: none"> - 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) - To what extent the main preconditions of the platform-based software development paradigm (such as clear interfaces and governance) are fulfilled - In general to what extent the whole approach is technologically feasible
Political evaluation
<p>To what extent the proposed approach is useful/beneficial for policy related campaigns/consultations in terms of ...</p> <ul style="list-style-type: none"> - Time saving - Cost saving - Reaching wider audiences (= more citizens) - 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) - In general collecting high quality feedback/knowledge from the citizens on the particular policy - Facilitating convergence (at least to some extent) between stakeholders on the definition of the problem the policy attempts to address, the main issues, the main solutions/alternatives, and also their advantages and disadvantages - Drawing conclusions concerning the degree of citizens' awareness of the policy - Drawing conclusions concerning the degree of citizens' interest in the policy - Drawing conclusions about the degree of citizens' acceptance of the policy
Organizational innovation diffusion evaluation
<p>To what extent the proposed approach:</p> <ul style="list-style-type: none"> - Is a better way for consultations with citizens on various public policies than that of the other existing 'physical' (i.e., through 'physical' meetings) or 'electronic' ways for this (relative advantage) - Is compatible with the policy formulation processes of government agencies (compatibility) - Its practical application by government agencies policy makers does not require much effort (complexity) - It can be initially applied in small scale pilot applications by government agencies, in order to assess its capabilities, advantages and disadvantages, before proceeding to a larger scale application (trialability) - Is an innovation highly visible to other public agencies, policy makers and the society in general, which can create positive impressions and comments (observability)

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 all the necessary elements of citizens' interactions (e.g., views, likes, textual comments) with this content. Also, it assesses to what extent the main preconditions of the platform-based software development paradigm (such as clear interfaces and governance mechanisms) are fulfilled.

From a political perspective, this centralized cross-platform approach to social media use in policy making aims to communicate with a wider range of heterogeneous citizens' groups, having different cultures, values, concerns, and especially with ones not traditionally involved in politics, and explore a wider range of views and opinions concerning a particular policy under discussion. In this way it attempts to overcome the fundamental difficulty of modern public policy problems, which become increasingly 'wicked' (Rittel & Weber, 1973), lacking clear and widely agreed definitions and objectives, and having many stakeholders with different and heterogeneous problem views, values and concerns. For this reason, it is important to assess to what extent this advanced approach to social media contributes to achieving the above political objectives, and the most appropriate lens for this is the 'Wicked Problems Theory' (Conklin, 2003; Conklin & Begeman, 1989; Rittel & Weber, 1973) outlined in 2.3. Therefore the second perspective of our evaluation framework is the political evaluation. It assesses to what extent this approach is useful for conducting policy related campaigns in shorter time, at lower costs and reaching wider audiences. Also, whether it is useful for identifying particular issues within a particular policy domain, possible solutions to them, and relevant advantages; and finally, whether it facilitates convergence (at least to some extent) between stakeholders on the definition of the problem the policy attempts to address, the main issues, the main solutions, and also their advantages and disadvantages. Furthermore, it assesses to what extent it is useful for drawing conclusions concerning citizens' awareness of, interest in and acceptance of this policy.

Finally, the adoption of such sophisticated and complex approaches to social media use as part of the policy making processes of government agencies constitutes an important organizational innovation. Therefore it is paramount to assess the presence of the preconditions for a wide adoption and diffusion, and a suitable basis for this is the well-established and widely used innovation diffusion theory of Rogers (2003). The third perspective of our framework is thus the organizational innovation diffusion evaluation. It assesses to what extent this approach has the five characteristics proposed by the above theory: relative advantage, compatibility, complexity, trialability and observability.

5. A pilot consultation campaign

In order to evaluate the centralized cross-platform approach to social media exploitation by government agencies presented in Section 3, using the evaluation framework described in Section 4, a pilot consultation campaign was conducted by the Piedmont Regional Government, Italy. In 2008, the Piedmont Region launched a pioneering and piloting telemedicine project in one of the least populated and most mountainous of its provinces: Verbano-Cusio-Ossola (VCO). This small pilot project was very successful, it was thus decided by the Regional Government to conduct a consultation campaign through multiple social media, aiming at exploring the possibility to implement the VCO telemedicine initiative at a larger scale in a context different from the initial one, transferring the experience of a limited area to the whole region. In particular, its objective was to convey information on this planned extension of the telemedicine initiative in the whole Piedmont region to interested and affected citizens (e.g., patients and their families, doctors), and then collect feedback from them, using social media. Fig. 2 provides a synoptic pictorial representation of the whole process followed in this consultation campaign. The main social media used were Facebook, Twitter and Youtube, and also Flickr and LinkedIn assumed an ancillary role; both textual

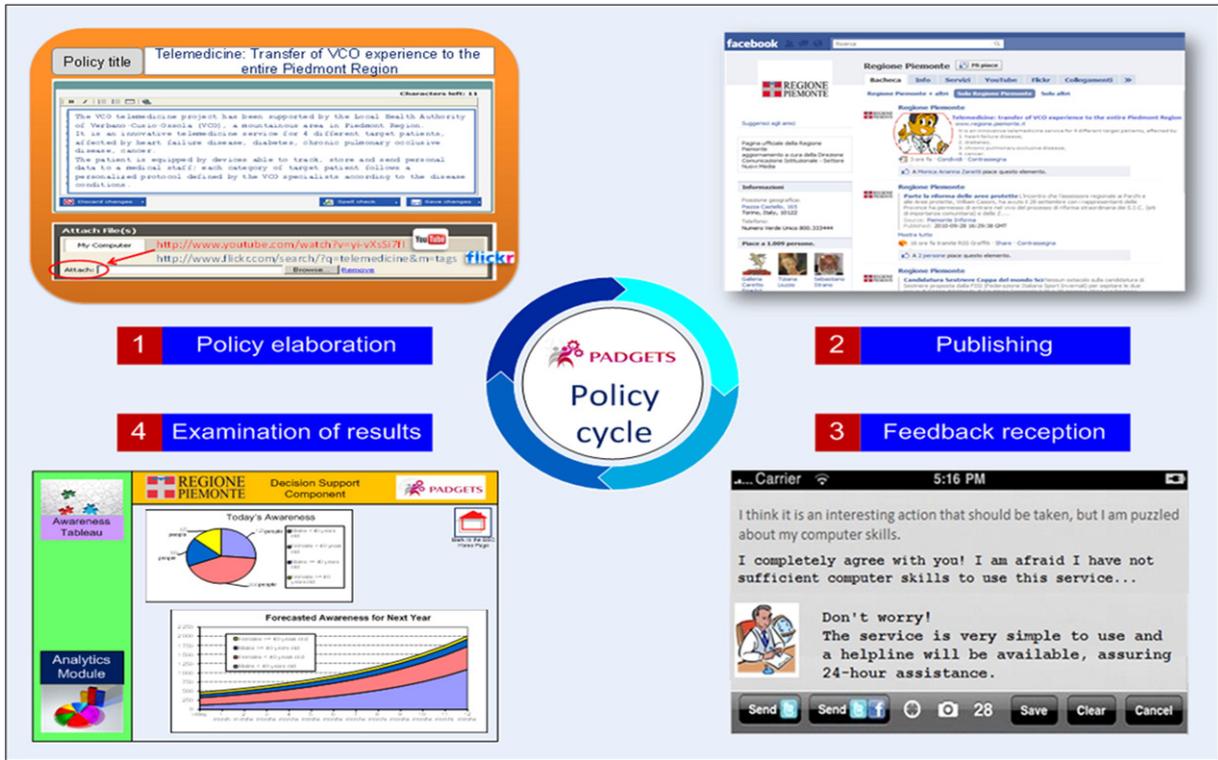


Fig. 2. Overview of the social media campaign process.

information and videos concerning this telemedicine program were posted. In postings made to Facebook and Twitter a brief Web questionnaire was linked-to in order to be filled by citizens, including questions about the level of acceptance of this telemedicine policy, and also the willingness to co-finance its implementation (e.g., cover personal costs of devices rental, Internet connection, etc.).

Given the complexity of the debated theme, the campaign involved a plurality of stakeholders both within and outside Piedmont government's boundaries. The main stakeholders' groups are shown in Fig. 3.

In addition, the term 'policy maker', although frequently used, does not reflect the high organizational complexity present within government (which includes many different departments involved,

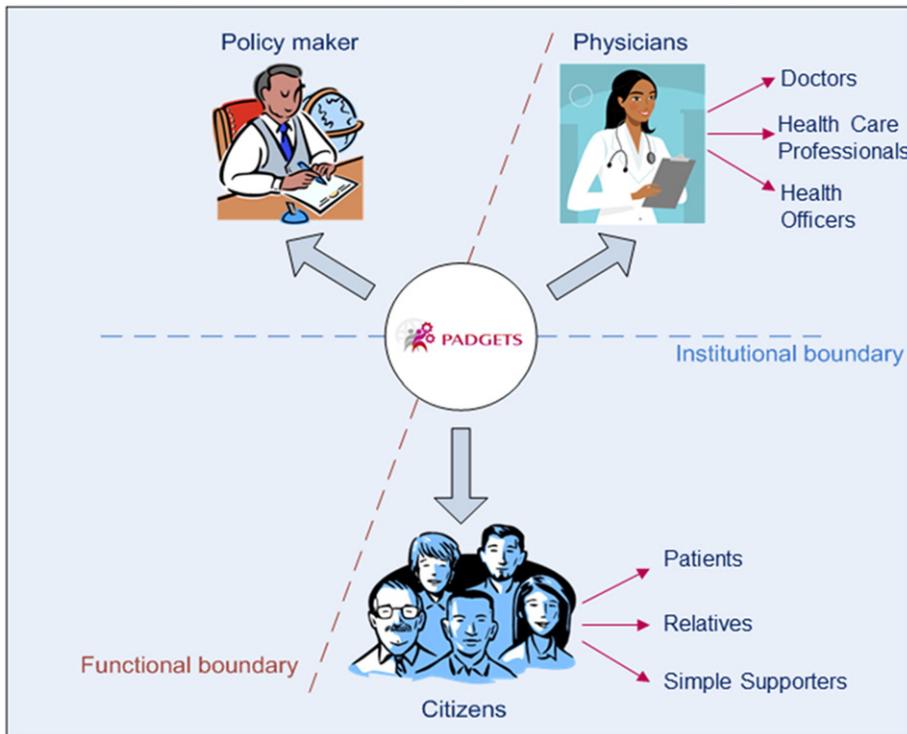


Fig. 3. Stakeholders overview.

with different roles, competences and cultures). As it is possible to notice from Fig. 4, the management of the social media campaign on telemedicine has required the active participation of a plurality of actors within the Piedmont regional government from public health, budget & finance, institutional communication and regional innovation units.

Remaining within the boundaries of the regional government, an important class of stakeholders, whose input was highly relevant to this social media consultation campaign, is that of the National Health System employees working on providing public health services to patients, a broad spectrum of health care professionals involved in lifelong learning programs and associations and charities involved in patients' assistance. Finally, with respect to citizens, some specific categories of them seem to be more prone to participate in the pilot: citizens with chronic diseases (e.g., heart failure, diabetes, chronic pulmonary occlusive disease, and cancer) and their families. A more detailed description of this pilot is provided by Ferro et al. (2013).

6. Research method

In order to address our research questions data were collected from five different sources:

- i) Initially, after the end of this consultation campaign, the statistics of this consultation campaign were collected from the accounts of the regional government in Facebook, Twitter and Youtube. 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' (measuring number of impressions). 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.

- ii) We collected the textual comments entered by citizens in the above social media platforms, as they might include quite useful information for policy makers concerning particular issues, barriers or improvements to consider in formulating this telemedicine policy.
- iii) We also collected citizens' responses to the brief Web questionnaire linked-to postings made to Facebook and Twitter, and processed them using SPSS 20.0. The data collected from the above sources i)–iii) were examined and discussed with staff from the involved departments of the Piedmont regional government (see Section 5). These data provided a first basic picture of the outcomes of this consultation campaign, which was used as a background for the interviews that followed (see source v) below).
- iv) Furthermore in order to evaluate the technological feasibility (i.e. assess the four components of it shown in Table 2) 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.
- v) Finally in order to conduct the political evaluation and the organizational innovation diffusion evaluation (i.e. assess the eleven components of the former and the five components of the latter shown in Table 2) 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

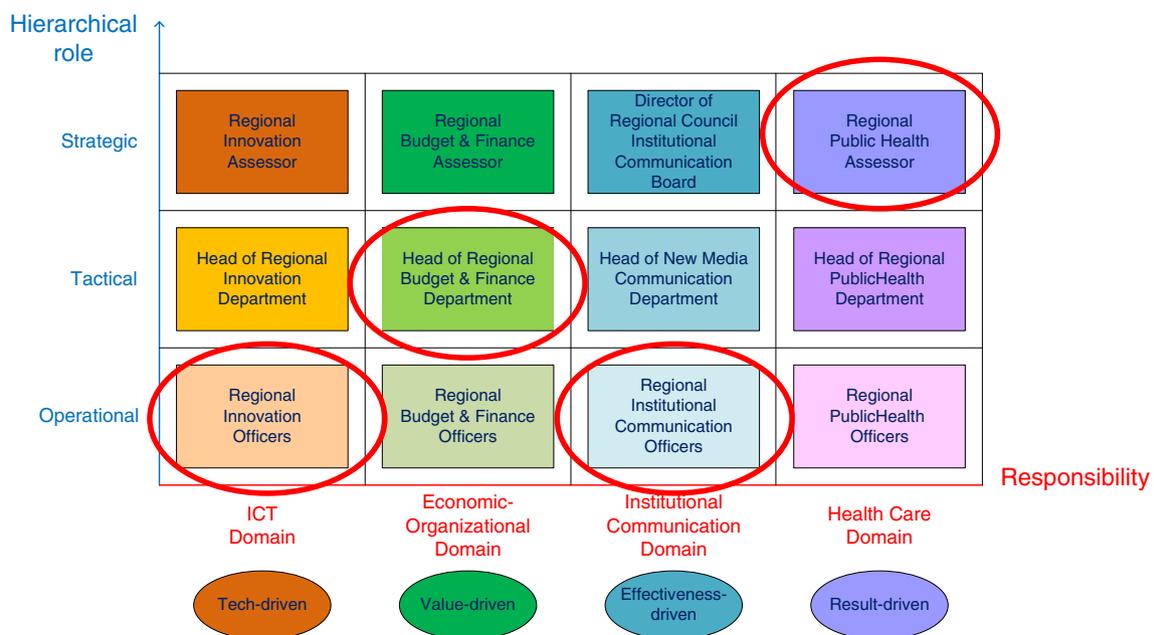


Fig. 4. Policy maker stakeholder categories.

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 & Blackmon, 2005). Results were then compared and differences were resolved.

7. Results

7.1. Basic results

7.1.1. Citizens' reach and engagement

In terms of reach, the policy messages posted in the abovementioned social media platforms have generated over 28,000 views, based on the calculation method described in Section 6. 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. In addition, it is relevant to stress that performances exhibited by campaign messages published during the pilot on regional government's accounts have been remarkably superior to other messages posted in the same period apart from the institutional campaign, which may be seen in the guise of a control group. A quintessential example in this vein has to do with Facebook regional channel: the messages of this campaign had reach three times larger than that of the others (on average), while, in terms of active engagement, and generated reactions about twenty times more than that of the usual.

7.1.2. Citizens' opinions on telemedicine

The results from the analysis of citizens' responses to the Web questionnaire highlight that the underlying telemedicine policy idea was received very positively by 94% of the respondents. In addition, 62% of them declared willing to co-finance the implementation of the solution.

The analysis of citizens' comments provided very useful insights on the benefits expected from this telemedicine policy, and at the same time on possible problems, issues, barriers and required improvements. First of all, telemedicine is perceived as a lever for the rationalization of public spending, especially in a period of tight budgets. Some messages in this vein are reported below:

'The project has very good prospects and it can certainly represent an efficient way to reduce the cost of public health and prevention services'.

'An example to follow for regions like mine, Lazio, where – more and more frequently – past and present spending reviews are leading to closure of hospitals'.

Substantial benefits are expected to arise also on the patient's side: whilst the continuous supervision of the patient's conditions contributes to improve the quality of healthcare provision, a reduction in the number of trips to the hospital has a remarkable impact in terms of savings (i.e., time devoted to mobility and waiting in queues, and cost of fuel), effort and environmental footprint (i.e., containment of CO₂ emissions). Below, a selection of messages emphasizing this point of view:

'Telemedicine can remarkably reduce the queue for particular clinical examinations whose waiting time has now become eternal'.

'By improving the quality of life as well as the quality of care provision, telemedicine constitutes a smart use of technology. Tough times for aficionados of long queues at the counters of local health offices!'.

However, despite rosy expectations coming from technophiles, there are still some major roadblocks clearly perceived by the some parts of the population. In fact, a number of concerns have been expressed about the

uneven technological literacy among patients, in light of the relentless aging phenomenon:

'It's better a "virtual" Doctor than dying for lack of care ... However, please help patients who do not master technologies!'.

Finally, citizens involved in the campaign outlined the risk of applying a technocratic approach that does not take into account the human aspects of the physician–patient relationship:

'In my opinion, the human relationship is paramount, especially in severe cases or with elderly people'. 'In any case, data interpretation – especially in more complex situations – requires always a thorough (and human) assessment'.

These opinions can be quite useful for the formulation of public policies in this area. According to the 'public value' paradigm (Alford & Hughes, 2008; Cordella & Bonina, 2012; Moore, 1995), government policies should aim not only at economic objectives, but also at a wider range of objectives associated with promoting collective values and preferences, by fulfilling 'the needs and wants of collective citizenry'. Similarly, public sector ICT should be examined not only from an economic and efficiency perspective, but also from a public value perspective, with respect to its role in the production of public value (Cordella & Bonina, 2012; Cordella & Iannaci, 2010). However 'defining what is valuable to the collective citizenry is an inherent challenge' (Alford & Hughes, 2008). This wealth of comments from different citizens' groups that such a multiple social media usage approach provides can be very useful for meeting this big challenge, since it enables the identification of 'positive values' of citizens with respect to the particular policy or even policy domain in general (i.e. things that citizens value), as it happens in the first five of the above comments: rationalization of public spending, reduction of queues in clinical examinations, better patients' quality of life, less trips to hospitals, and reduced CO₂ emissions. At the same time it enables the identification of 'negative values' perceived by citizens with respect to the particular policy or even policy domain in general (i.e. things that citizens dislike), as it happens in the next five comments: health care with less human relationships between patients and doctors, or with less 'physical examination', etc. These positive and negative values of the citizens can be very useful for the design of public policies, and also for their subsequent evaluation, based on the public value paradigm.

7.2. Evaluation

7.2.1. Technological feasibility evaluation

From the analysis of the APIs of the most widely used social media platforms it has been concluded that all these social media have strategies to support the development of third party applications using their data, by providing through their APIs a rich functionality for posting and retrieving content, exposing methods that 'go deeply' into their core functionalities. From the above analysis it can be 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 and highly useful purposes' 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 the proposed complex form of social media used by government agencies for supporting public policy making seems to be technologically feasible to a large extent.

However, some deficiencies have been identified as well. First, 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 platform) in order to keep them operational. Second, there are problems in obtaining important author demographic information for each 'unit of content' (e.g., for each blog post) retrieved from them, such as author's gender, age group, education, etc., which is necessary in order to calculate various indicators (e.g., metrics of the awareness of, interest in or acceptance of our policy message) per gender, age and education group; this is very important for the usefulness of these indicators for the public policy makers, as they usually vary significantly among different gender, age and education groups, as aggregated 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).

7.2.2. Political evaluation

Interviewees believe that this centralized cross-platform approach to social media use may contribute significantly to the efficiency of policy making in terms of ability to reach more people in a shorter time and at lower costs. One of them offered a clear and synthetic answer on this:

"Conducting the same activities without the platform would have meant doubling the cost."

Interviewees emphasized that 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 agree that the concurrent and coordinated usage of complementary social media platforms such as Facebook, YouTube and Twitter enabled reaching a much wider range of citizens' groups and also proved to generate significant synergies in terms of overall cross-platform results. More citizens' groups can be reached or involved in a policy-related discussion by using multiple social media, in comparison with the existing alternative methods (e.g. organizing 'physical meetings', or electronic consultations in government operated 'official' websites); however, it has been noted that there are still citizens' groups who do not have ICT access and skills, so still they cannot be reached and involved in this way (physical meetings are more appropriate for them).

Furthermore, taking into account the analysis of citizens' comments described in 7.1.2, interviewees highlighted the ability of this approach to clearly single out both issues and concerns posed by various stakeholders' groups, and at the same time their expectations, concerning the investigated policy solutions, and to identify differences among groups. Also, they agree that these comments reveal positive and negative values of citizens:

'what citizens like and what they dislike',

concerning a particular policy, or policy domain in general, and also possible positive or negative impacts of the policy in these dimensions.

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, Zeng, Carley, & Mao, 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 users to have an overall vision. Second, messages tend to be targeted at the government agency rather than aimed at opening up a debate among social media users.

Finally, when looking at the extent to which the approach proposed allows to highlight the levels of people's awareness, interest and acceptance towards a given policy solution, the interviewees believe that the approached proved extremely valuable. The traceability of actions generated over social media (e.g., likes, shares, retweets) combined with the possibility to associate social media usage with more traditional survey-based interactions allowed to produce reliable estimates.

7.2.3. Organizational innovation diffusion evaluation

All interviewees agreed that such a centralized use of multiple social media in policy making processes of government agencies offers strong relative advantages, in comparison with existing both 'physical' alternatives (e.g. physical meetings for communicating with citizens concerning various public policies under design or implementation) and 'electronic' ones (e.g. government e-participation/e-consultation portals). A substantial relative advantage arises with respect to previous generation of e-participation models due to the fact that government makes a first step towards citizens rather than expecting the citizenry to move their content production activity onto the 'official' spaces created for e-participation. It was mentioned that the high levels of citizens' reach and engagement achieved and the useful insights offered by citizens' textual comments and opinions, indicate the significant benefits and relative advantages that the examined centralized cross-platform approach provides.

With respect to compatibility, the interviewees found that this approach seems to fit in with the policy formulation processes of Piedmont Regional Government, since:

'it is flexible enough to allow public agencies to adopt it without completely changing the standard processes',

and also is compatible to their existing value system. However, this compatibility, and also the above mentioned benefits, were to a significant extent due to three specific characteristics of the particular government agency, which might not exist in other contexts: i) their long political tradition of bi-directional communication with citizens in all phases of policy making (other government agencies might not place much emphasis on this, due to a focus on the everyday operations and emergencies, or fear of losing control), ii) their previous skills and experience in using social media for the above purpose, and iii) their positive general attitude towards innovation. They stressed that a 'typical public servant' might initially not feel 'culturally fit' for and familiar with the language and style of dialog in most social media, and find it difficult to participate effectively in such dialogs; so some training, followed by some 'familiarization period' would probably be required.

With respect to complexity, it was mentioned that this approach, in combination with the ICT tools supporting it, have the distinctive trait of keeping moderate the cognitive effort required to policy makers. The tool hides complex processing algorithms behind the scene and provides decision makers with a set of synthetic, fresh and relevant data through intuitive visual outputs. The easily understandable way of reporting campaign results determines a substantial simplicity in usage that clears the hurdle of complexity, creating a fertile soil for a smooth adoption by every policymaker inclined to embrace 'open' policy making.

Furthermore, the successful completion of the pilot held in Piedmont Region corroborates the a priori conviction that this approach might take advantage of a noticeable scalability that allows to move all along the continuum ranging from small scale to full scale. All interviewees agreed that this innovation may be experimented in a small scale without particular obstacles, since there does not exist a 'minimum efficient scale' for running a campaign, so it is characterized by trialability.

Finally, the interviewees mentioned that the high exposure given by social media to public policy campaigns makes this innovation highly visible to other public agencies, policy makers and the society in general. In fact, policy messages make their appearance on public pages accessible by everyone (i.e., Facebook Fan Pages, Twitter Pages, YouTube Channels) and viral ‘contagious’ phenomena occurring in the social media realm in light of intertwined social connections play their part in garnering a rapid and vast spreading of the policy proposal at stake. These result in high observability of this innovation.

8. Conclusions

Government agencies move towards more sophisticated practices of using social media in their policy making processes, which are characterized by important innovations and higher complexity at the technological, political and organizational level. It is important to analyze and evaluate these emerging practices from multiple perspectives, based on sound theoretical foundations. This paper made a contribution in this direction:

- It evaluated a centralized cross-platform approach to social media exploitation by government.
- It developed for this purpose a multidimensional evaluation framework, which focuses on the fundamental innovations and complexities that characterize these emerging advanced practices of using social media in government policy making processes at the technological, political and organizational level.

From our analysis interesting conclusions have been drawn concerning the strengths and the potential, and at the same time the weaknesses and challenges of this approach. In particular, it has been concluded that it is technologically feasible to a large extent, since the APIs of social media provide a variety of methods for posting and retrieving content. However, the problems of obtaining authors’ demographics from social media, mainly due to their privacy policies, do not allow an important part of the required functionality for policy makers (calculations indicators per gender, age and educational group) to be provided; also, the lack of stability of most social media API increases the required maintenance effort and cost.

From a political point of view this approach can be useful/beneficial for addressing fundamental challenges that public policy making faces in its attempts to solve the wicked problems of modern societies. In particular, it enables reaching wider and heterogeneous audiences in shorter time and at lower costs, conveying policy-related information to them, and also identifying a wide range of particular problems/issues they perceive with respect to a policy under discussion. Furthermore, 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 action or domain, which are very useful for the comprehensive design and evaluation of public policies. On the other hand, this approach seems to be less efficient in solutions generation and also in convergence facilitation among stakeholders’ views.

Finally, it has been concluded that this approach has the fundamental preconditions for a wide diffusion and adoption by government agencies: relative advantage, compatibility with existing values and processes, reasonable complexity, trialability and observability. However, its compatibility, and in general the benefits to be created by it, depends to some extent on the culture and the skills of the adopting government agency.

The above findings indicate that this ICT intervention in the policy making processes of government agencies can create considerable value, which is shaped both by features of the technologies used (e.g. ease of use and extensive content generation capabilities of the social media platforms) and also by human agency and culture (e.g. government agencies’ political tradition concerning interactions

with citizens, culture, skills and experience in social media exploitation, general attitude towards innovation). So they point neither towards ‘technological determinism’ nor towards ‘social determinism’, but rather in a socio-technical direction (adopting the terminology of Heeks and Bailur (2007)).

Our results have interesting implications for research and practice. With respect to research they provide a multi-dimensional evaluation framework that can be used (with appropriate adaptations) for the investigation of the emerging more sophisticated practices of using social media in the policy processes of government agencies, which focuses of the main innovations and complexities (technological, political and organizational) that characterize these practices, and combines theoretical foundations from different domains. With respect to practice, our results indicate that government agencies should not limit themselves to the existing today simpler practices of social media use for communicating with citizens, but should adopt more sophisticated approaches using multiple social media that attract different citizens’ groups, having high levels of automation of content posting and retrieval, and also advanced processing capabilities. However, the success of these practices will require training and familiarization of their staff with a new language and style of dialog with citizens, quite different from the existing ones. Also, social media should provide more demographics (mainly gender, age and education group) concerning content retrieved from them, which will enable the development of much more valuable third party applications for government (and possibly for private sector firms as well). Furthermore, they should stabilize their APIs and reduce their changes to the absolutely necessary ones.

Nevertheless, a significant amount of research is still necessary in order to turn such practices into a mainstream and highly value-added activity. Future research efforts should thus try to evaluate other advanced practices of social media use in government along the entire policy cycle, from agenda setting to policy evaluation, in order to test and assess their suitability to the different policy phases. In particular, the attention should focus on shedding some light on: their integration with existing traditional processes in terms of timing and interactions, the development of discussion protocols allowing to move from opinion expression to coordinated and fruitful discussions, and the identification of possible distortions in the dynamics of opinion formulation over social media. Furthermore the proposed evaluation framework can be enriched and include additional perspectives, and then used for the evaluation of such advanced practices of social media use in government.

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