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Beyond Information-Sharing. A Typology Of Government Challenges And Requirements For Two-Way Social Media Communication With Citizens

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Abstract: Despite great advances in ICT, social media, participatory platforms and mobile apps, we seem to still be locked in the one-way communication "paradigm" where information flows unilaterally from government to citizens and seldom vice-versa. As a result, citizens are more receivers rather than conscious producers of information, data, ideas, solutions and decisions in the context of public policies. By means of an extensive literature review, this paper aims to explore the challenges on the part of government that prevent the transition to more dialogic governance and identifies the requirements for a meaningful application of social media for this purpose. The paper contributes to the literature in three ways: i) redefining a typology of social media-based citizens-government relationship; ii) clarifying the difference between challenges and risks of social media application by governments and identifying a typology of government challenges; and iii) identifying government requirements as a *conditio sine-qua non* for overcoming these challenges upfront, enabling more effective two-way interactions between governments and citizens. The paper concludes with discussion of implications and directions for further research.

Keywords: Social media, Social media-based collaboration, Government challenges, Government requirements, Citizen engagement, Two-way communication, Citizens-government relationship

1. Introduction

Social media have become highly embedded in the daily activity patterns of many citizens. Digital and web 2.0 technologies (e.g. online forums, web-GIS, e-petition platforms, wikis, and social networking sites such as Facebook and Twitter) are supposed to facilitate new forms of citizen participation in government activity within the framework of concepts such as digital democracy, open and e-government, e-participation and co-production (Conroy and Evans-Cowley, 2006; Silva, 2010; Meijer, 2011; Desouza and Bhagwatwar, 2014). Collaboration between governments and citizens is sought in various policy domains, ranging from health care, crime prevention, public service and information delivery to urban planning, transportation, corruption and so on (Desouza and Bhagwatwar, 2012).

However, it is still unclear whether the aforementioned digital technologies are able to contribute significantly to a more active engagement of citizens in policy-making, implementation and (public) service delivery. While it is widely acknowledged that social media open up opportunities for improved government-to-citizens interactions and communication (Bertot *et al*., 2012; Chun and Reyes, 2012; Lee and Kwak 2012, Linders, 2012; Picazo-Vela *et al*., 2012; Skoric *et al*., 2016), some authors highlight the need for a change in government culture, routines and resource management that also includes connecting in person and taking offline action to effect change (ALotaibi *et al*., 2016; Evans-Cowley & Hollander, 2010; Slotterback, 2011; Magro, 2012; Casey and Li, 2012; Kleinhans *et al*., 2015). The rise of social media use by governments appears not to have affected the unilateral relationship between who provides information and takes decisions (playing an active role, the government) and who receives the information or the consequences of a decision (playing a passive role, the citizens). In fact, we seem to still be locked in the one-way communication "paradigm" where citizens are more receivers rather than conscious producers or creators of information, data, ideas, solutions and decisions in the context of public policies. The actual influence of social media (in general applications that allow creation and sharing of user-generated content) on decision-making processes and their results is yet to be fully explored. Many authors have emphasised that current practices have not reached the dialogic (two-way communication and collaboration) ideal of governance (Desouza and Bhagwatwar, 2012; Zavattaro and Sementelli, 2014; Afzalan and Evans-Cowley, 2015; Ertiö, 2015).

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The need for more effective and substantial two-way communication between governments and citizens is not just a product of technological progress. Due to the prolonged economic crisis, many European countries have installed austerity measures and severe cuts and reforms in public policy. To mitigate austerity regimes and continuing welfare state retrenchment, governments promote active citizenship, citizens are invited to take (more) responsibility and fill in gaps left by government spending cuts in health care, education, employment and neighbourhood governance (Voorberg *et al*., 2015). This challenge for citizens does not require less but rather more two-way interaction, or at least more effective dialogue between citizens and governments. They need to make better use of each other's assets and resources to achieve better outcomes and/or more efficiency in (public) service delivery. In essence, this is a definition of co-production (Bovaird and Loeffler, 2012: 1121), implying that two-way communication and collaboration between governments and active citizens, both offline and online, are a *sine qua non* for co-production.

Considering the growing importance of co-production and the widespread acknowledgement that social media create opportunities for 'better' interactions between governments and citizens, the question is why current practices of social media application have not reached the aforementioned transition to a dialogic ideal of governance. Using an extensive literature review, this paper aims to explore the challenges on the part of government that prevent such a transition and identify the requirements for a meaningful application of social media that enables two-way communication between governments and citizens. While the literature on social media challenges is abundant, this paper contributes to the extant literature through a clarification and systematization of three issues:

1. the confusion regarding the nature and various intensity of citizens-government relationships due to a proliferation of categorizations of these relationships in the literature that tend to overlook each other;
2. the nature and types of challenges for governments because of a tendency to confuse challenges and other elements such as requirements and risks, while we will show that they are different;
3. the essential initial requirements (from the government) to apply social media in a more dialogic way.

Hence, the paper tries to answer questions such as: beyond the readily available technology, what steps do governments need to take for two-way communication and meaningful collaboration with citizens? What challenges do governments face in the application of social media for such purposes and what are the necessary requirements that allow challenges to be addressed?

The paper is structured as follows. Section 2 identifies and clarifies the levels of social media-based interaction between citizens and government that may lead to collaboration and/or co-production. In section 3, we present the research design that has been utilised to conduct this research. In section 4, a specific typology of government challenges is defined. Section 5 provides a typology of the requirements that governments need to meet to address the challenges. Section 6 sets out the conclusions and the specific contribution of this work to the wider literature and e-government activity.

2. Types of social media-based citizens-government relationship

The use of social media, defined as internet-based applications built on the ideological and technological foundations of Web 2.0 that are designed to facilitate dissemination of information, interaction, and exchange of user-generated content (Kaplan and Haenlein, 2010; Kavanaugh *et al*., 2012), allows new forms of interaction and civic engagement to emerge and is adding on to other forms of communication, rather than replacing them (Wellman *et al*., 2003; Wenger *et al*., 2009; Chun and Reyes, 2012; Lee and Kwak 2012, Linders, 2012; van Varik & van Oostendorp, 2013; Skoric *et al*., 2016). In this paper, we will refer to these forms as types of the *citizens-government relationship typology* within which different types and levels of communication, interaction and involvement can be found. These new types of citizens-government relationship have been discussed by many authors, but categorizations available in the literature are often overlooked by authors trying to develop their own categorization (McMillan, 2002; Suen, 2006; Linders, 2012; Khan, 2015; Mergel, 2013; Williamson and Parolin, 2013; De Souza and Bhagwatwar, 2014; Li and Feeney, 2014; Ertiö, 2015; Jones, 2015). This has increased rather than cleared confusion. Generally, three levels with an increasing degree of interaction are identified:

- Information sharing. One-way communication from government to citizens. McMillan (2002) calls this *Monologues* whereas Linders (2012: 449) defines this level *Government as a Platform.*
- Interaction (two-way communication with dialogue between citizens and government representatives flowing both ways). McMillan (2002) calls this *mutual discourse*.
- Civic engagement, involvement, collaboration: on this level, the two-way interactions go beyond basic information exchange to 'materialise' in policy measures or other interventions. This level is also known as *co-production*, i.e. the public sector and citizens making better use of each other's assets and resources to achieve better outcomes and improved efficiency (Bovaird and Loeffler 2012: 1121).

However, some authors (e.g. Desouza and Bhagwatwar, 2014; Ertiö, 2015) identify more levels and sub-levels which further specify the role of and information flows between the actors involved in the citizen-government relationship. Ertiö (2015) for example identifies *consultation* as a sub-level of information sharing where information flows one-way from citizens to governments, and *criteria power* (ability of citizens to determine a policy or service) and *operational power* (ability of citizens to determine how a policy or service is carried out in practice) as the two sub-levels of civic engagement, involvement and collaboration (the author calls this level *empowerment*). Interestingly, Desouza and Bhagwatwar (2014: 37) in their four archetypes of technology-enabled participatory platforms identify the *citizen-centric and citizen-sourced data* archetype "as an alternative medium for citizens to organize themselves to make a difference in their local communities." Linders (2012) calls this level *Do it Yourself Government.*

This, in our opinion, is the 'top' level of the citizen-government relationship typology in which citizens self-organize to produce solutions. However, at this level there may be little or no interaction between citizens and government as self-organization is predominantly effectuated by citizens. Interaction takes place only where choice and implementation of the solution still requires some government action, as Desouza and Bhagwatwar (2014) and Linders (2012) emphasise in their categorizations. However, in this *Do it Yourself* and citizen-to-citizen relationship type, we also find self-organization among citizens about matters of private interest that concern individual decisions (where to find the best plumbing service, or the best school for their children). In such a case there is not necessarily a relationship between citizens and government. Hence, government action is not by definition required. This kind of self-organization about private and individual matters may result in two different kinds of output: in the first case they stay in the domain of private and individual choice without impacting the public sphere. In the second case, they may develop into demands of public interest (new playground needed, new kindergarten) that require some government action, for example in terms of building permits. It is for this latter reason that we include them in the self-organization level. Based on the international literature, the levels of the citizens-government relationship typology can be defined as in Table 1 below.

Table 1: Typology of social media-based citizens-government relationship

Levels	**Sub-levels**
Information sharing	Informing: One-way communication ('broadcasting') from government to citizens.
	Consulting: One-way communication from citizens to governments.
Interaction	Two-way communication with dialogue and feedback between citizens and government representatives.
Co-production	The public sector and citizens making better use of each other's assets and resources to achieve better outcomes and improved efficiency.
Self-organization	Citizens create solutions independently that are to be recognised, facilitated or adopted by governments and require some government action.
	Citizens share information and self-organize for matters of private interest that may develop into public demands requiring some government action.

However, despite a growing number of web-based and mobile-based platforms where people can express their opinion, identify local problems and propose solutions, authors highlight persisting issues, including "little evidence of social media being used to create mutual discourse communication" (Williamson and Parolin; 2013: 560), a model of "participatory sensing rather than participatory decision-making through apps" (Ertiö; 2015: 317), and "a large segment of the population (…) does not feel comfortable making use of emerging social media (Linders, 2012: 452).

In sum, while the technology is readily available, we find that government is not fully exploiting the potential of such platforms, so there are probably issues and challenges that prevent governments from further developing and using the communicative potential of social media. The challenges may relate to technical, organizational, and online matters, but also to factors that are predominantly of an offline nature. While recent research has explored those factors affecting citizens' decisions to use social media platforms for communication with their government (ALotaibi *et al*., 2016), we still lack a proper answer to the following question: what are the challenges for *government* to application of social media platforms in ways that enable effective two-way communication about ideas and solutions?

In the next section the research design is discussed. The aim of section 4 is to identify the challenges that can hinder web-based two-way communication through social media.

3. Research Design

In order to perform our extensive review of government challenges and requirements we split our work into two phases: the first one dedicated to the challenges and the second phase to the requirements. We decided not to employ a systematic literature review method because of the extremely high number of articles on social media use which would have included too many irrelevant sources (i.e. topics such as advertising, healthcare, families and parenting). Instead, we decided to employ a snowball approach and built our body of literature through this method. As far as the *challenges* are concerned, we started with a Google Scholar search via the most relevant keywords to our study of social media challenges for government organizations: "government social media" and "social media challenges". In order to identify the most relevant research articles among the Google Scholar search results, we started from those which contained in their title the term social media in connection with either the word government/public sector or challenges and were cited more than 100 times (according to Google Scholar) (e.g. Kaplan and Haenlein, 2010; Mergel, 2010; Bertot *et al.,* 2010 & 2012; Kavanaugh *et al*., 2012; Linders, 2012; Macnamara and Zerfass, 2012; Magro, 2012; Picazo-Vela *et al*., 2012; Khan *et al*., 2014. Zavattaro and Sementelli, 2014). We have mainly reviewed studies that focus on the application of social media in government and highlight challenges specific to their case studies and surveys (e.g. Evans-Cowley and Hollander, 2010; Landsbergen, 2010; Casey & Li, 2012; Kavanaugh *et al*., 2012; Picazo-Vela *et al*., 2012; Mergel, 2013; Williamson and Parolin, 2013; Afzalan and Evans-Cowley, 2015; Alasem, 2015; Bonson *et al*., 2015; Jukic & Merlak, 2017). The snowball approach used the reference lists of the aforementioned studies to identify and further build up relevant literature. However, we did not limit our search for challenges to government and e-government studies only. Literature from other fields was also used such as business, management and corporate social media (Farhoomand *et al*., 2000; Kaplan and Haenlein, 2010; Kuikka and Akkinen, 2011; Poba-Nzaou *et al*., 2016) since some issues and challenges originating from these fields (e.g. organization reputation, human resources, resistance to change) are relevant for the public sector too.

As far as the *requirements* are concerned, we started from the concept of capabilities to which scholars generally refer in the e-government literature (e.g. Layne and Lee, 2001, Gottschalk, 2009; Klievink and Janssen, 2009; Lee, 2010; Valdes *et al*., 2011; Lee and Kwak, 2012; Fath-Allah *et al*., 2014; Khan, 2015) and extended our review to the maturity models and maturity stages, and their inherent capabilities, of adoption and implementation of social media and ICT in government (see Table 3 in section 5). The analysis of these capabilities informs our identification of requirements that governments need to meet. We also look at business literature since social media have been used in business for longer than in government and requirements could potentially be drawn from here, especially with regard to financial, budget, analysis, and monitoring elements (Lehmkuhl *et al*., 2013; Geyer and Krumay, 2015).

4. Challenges to application of social media by government

In this section we review and focus specifically on the challenges that make it hard for governments to engage in two-way communication activities with citizens. However, before we start our review of challenges, it is of utmost importance to define what we mean by 'challenge' to the use of social media by the government. Poba-Nzaou *et al*. (2016: 4011) define challenges as "any issue an organization may have that may prevent them from adopting social media." However, this definition seems too general for our purposes. We feel that a clear definition of challenges is lacking in the literature and there is a general tendency to include other elements, e.g. risks, in the challenges category. We focus on challenges and try to clarify what is meant by challenges, why they are different from risks and therefore cannot be included in the same category.

4.1 Definition of challenges

Challenge is defined by the Oxford Dictionary as "a task or situation that tests someone's abilities". The Cambridge Dictionary defines challenge as "(the situation of being faced with) something that needs great mental or physical effort in order to be done successfully and therefore tests a person's ability." As can be seen, both definitions emphasise the ability of a person to do something (a task). For our categorization purposes, it is necessary to further clarify what an ability is as a prerequisite to identify the challenges. The Oxford Dictionary defines ability as the "possession of the means or skill to do something". The Cambridge Dictionary defines it as "the physical or mental power or skill needed to do something." In our case the focus is on government and so we can define the abilities (means, power and skills) of government as the set of human and financial resources that the government possesses to do something. Thus, challenge can be defined as the situation or task that tests the government's abilities (resources, skills and expertise) to do something, namely adopt, use and optimise social media for two-way communication and collaboration strategies with citizens.

On the contrary, **risks** are negative or unwanted consequences (Khan et al., 2014) that arise after the government has started using social media. Risks differ from challenges in their nature and because they arise usually at a later stage and as a consequence of not properly addressing challenges. It derives that the ability to address challenges will reduce and mitigate risks. Examples of risks are related to intellectual property or copyright infringement, psychological consequences, identity theft, public criticism, the amount of time that government employees without social media duties and responsibilities spend on social media while at work, system failures and downtime. Even though extremely important for the success of social media projects, risks are not the focus of this section. Also, in this section we are not interested in the factors that influence the usefulness of social media, the satisfaction of the general public with government social media, citizens' adoption of e-government services, and the success of social media implementation (e.g. Creswell et al., 2006; Hrdinova et al., 2010; Shareef et al., 2011). Some of them are of course interrelated (e.g. availability of a social media strategy is fundamental for the success of social media projects), but our focus is explicitly placed on challenges.

4.2 Typology of challenges

Different categorizations of challenges have been already attempted in the literature (e.g. Bertot *et al*., 2012; Meijer *et al*., 2012; Picazo-Vela *et al*., 2012; Khan *et al*., 2014). We review the challenges that have been identified through both empirical applications of social media in government (e.g. in urban planning) and surveys and interviews with government officials. Two categorizations are particularly useful for our purposes. First, Kuikka and Akkinen (2011) distinguish between challenges based on whether they are ***internal*** or ***external*** to the organization. Second, Poba-Nzaou *et al*. (2016) distinguish between *challenges directly associated with social media* and *challenges not related to social media themselves.* We will call these ***direct*** and ***indirect*** challenges, respectively.

We will first discuss the challenges based on the internal/external categorization and then we will move on to present whether they can be considered direct or indirect through the help of a matrix that defines a typology of challenges for social media application by governments.

4.2.1 External challenges

As the name indicates, this kind of challenges comes from aspects that are external to the organization. Therefore, the organization has little or no power to address the causes of these challenges in advance or to influence their scope. Borrowing from the categorization and conceptual framework of Picazo-Vela *et al*. (2012: 507) (general context, institutional framework, inter-organizational collaboration and networks, organizational structures and processes, information and data, technology), we found that external challenges fall within the categories of general context, institutional framework, data and technology.

Generally, the main external challenge identified in the literature is related to the general context and concerns Internet accessibility, digital illiteracy and the digital divide of the population. This is normally considered not to be a major issue in the Western World where the majority of people have access to the Internet. However, as many authors highlight (Burkhardt *et al*., 2014; Bertot *et al*., 2012; Picazo-Vela *et al*., 2012) if we broaden the spectrum of countries and contexts, people and age groups, limited access to the Internet by the wider population and their low ability to use social media can constitute a problem for government and complicate the use of social media for the dissemination of information, provision of services, collaboration with citizens

and so on. However, single government organizations have little power or too few means to overcome limited access and citizens' lack of abilities to reduce the digital divide.

Other external challenges come from the institutional framework. Bertot *et al*. (2012) provide an extensive analysis of the impact of U.S. laws and regulations on the use of social media by government. Examples are regulations on accessibility of social media by people with disabilities and in different languages, on privacy, data protection and security. Availability of information in different languages and for the visually impaired requires further work and expertise from the government. With regard to privacy and data protection, external challenges also relate to the use of third party social media (e.g. Facebook, Twitter, YouTube) and ownership of the data and information that is posted to them.

Finally, Poba-Nzaou and colleagues (2016) identify challenges related to data management and technology that can be classified as external ones. These relate to the complexity and high speed of (global) technological change of social media, and the completeness, accuracy, and format of data and information coming from the public which test government's abilities as consumer of this externally created information.

4.2.2 Internal challenges

Contrary to external challenges, internal challenges depend on aspects that are internal to the organization and its structure (e.g. Voorberg *et al*., 2015), and which the organization can directly influence. Several internal challenges are identified in the literature. Again, referring to the categorization of Picazo-Vela *et al*., (2012), we can relate internal challenges to organizational structures and processes, information, data and technology. As can be noted, we do not consider "inter-organizational collaboration and networks" since we believe that this category gives rise to challenges that are included in the three previously mentioned internal categories (e.g. uniformity of data, consistent technology between government agencies, and relationships between agencies in terms of functions and hierarchy).

The first set of internal organizational and process-related challenges can be linked to the preparation of a clear strategy and policy guidelines for social media use regarding purposes, target audience, what, when and how often to post, announcing and publicizing social media use (Heeks, 2006; Landsbergen, 2010; Bryer and Zavattaro, 2011). Macnamara and Zerfass (2012) in their study found that about 20 percent of surveyed organizations had a broad social media strategy and about 35 percent had social media guidelines. As Mergel (2013) stresses in her work, based on 25 interviews with US federal government agencies' representatives, there is little reflection to strategically plan out engagement activities beyond pushing government information out through social media. The lack of a social media strategy and guidelines can depend on a second set of internal challenges that relate to the structure of the organization and organizational culture. As Curtis *et al*. (2010) suggest, organizations with a strong public relations department are more likely to adopt and use social media. Farhoomand *et al*. (2000), Williamson and Parolin (2013), and Voorberg *et al*. (2015) emphasise that as regards the organization culture, challenges concern lack of knowledge and understanding of the value and benefits that could be gained from citizen input to public service delivery, lack of management commitment, resistance to change, and negative attitudes. Meijer *et al.* (2012) stress the importance of availability of transformational leadership as one of the main challenges to achieve institutional innovation.

Another important internal challenge comes from the management and business literature (Kuikka and Akkinen, 2011) in terms of reputation of the organization. The reputation challenge is believed to apply to government agencies too and can derive from public criticisms. Government agencies need to be able to handle criticism on social media related, for example, to lack of political commitment to policy agenda and social issues, episodes of corruption, unpopular decisions on public investment and so on. This challenge depends on the organization's decisions and can be managed and influenced by the organization itself. We consider this as a direct challenge when it arises on social media channels. Other internal challenges relate to availability of trained personnel and expertise, and cost justification to retrain public relations managers or hire new personnel to guarantee timely responses to citizens' comments and questions on social media to foster two-way communication (Landsbergen, 2010; Bryer Zavattaro, 2011; Bovaird & Loeffler, 2012; Kavanaugh *et al*., 2012; Lee and Kwak, 2012).

The last set of internal challenges regard data management and technology. The government agency needs to guarantee the objectivity of data, its quality, integrity and openness (e.g. accessible formats, complete, reliable and updated data) (Bertot *et al*., 2012). Hardware, software and infrastructure needs also represent a

challenge and if not well planned could result in incompatibility of systems and use of untested technology (e.g. all departments of an agency using the same social media platform) (Pica-Vela *et al*., 2012).

After having categorized the challenges in internal and external categories, Table 2 summarises the different sub-categories and highlights whether a challenge can be considered direct or indirect. Based on this, the next section discusses and identifies the requirements on the part of government that (if these are properly satisfied) allow challenges to be overcome upfront.

Table 2: A typology of challenges: Direct-Indirect and Internal-External

	Direct challenges	**Indirect Challenges**
Internal challenges	• Availability of social media strategy and policy guidelines. • Data management, technology and proper understanding of benefits. • Organizational reputation	• Organization structure and culture. • Availability of trained personnel, expertise, cost justification.
External challenges	• Digital divide and inaccessibility • Complexity and speed of social media change (data protection, privacy and ownership). • Accuracy, completeness, and format of social media data coming from the public.	• Institutional framework, laws and regulations.

5. Organizational and technological requirements

After having reviewed the different levels of the relationship between citizens and government (see Table 1) and defined the challenges that governments face in the adoption and use of social media for two-way communication purposes, it is now important to focus and understand the actions, processes and requirements that the government needs to meet for an application of social media that leads to meaningful two-way communication with citizens. In the e-government literature, scholars generally refer to **capabilities** rather than requirements (e.g. Layne and Lee, 2001, Gottschalk, 2009; Klievink and Janssen, 2009; Valdes *et al*., 2011; Lee and Kwak, 2012; Khan, 2015). However, we feel that the term 'requirement' is able to express the role of such conditions better than capability, since the latter gives the idea of something that should be part of government's abilities, skills and expertise. Instead, we believe that a requirement is a necessary condition, a pre-requisite that however does not have to be necessarily part of what the government is able to do (capability, skills, expertise). Certain requirements can be outsourced (e.g. analytics and use of metrics, as discussed later). Hence, requirement refers to any necessary condition, i.e. a *conditio sine qua non,* for application of social media in a way that allows two-way communication and perhaps the co-production level of the government-citizens relationship to be reached. Taking the necessary actions to meet the requirements would enable the government to get rid of, mitigate or more easily address the previously explained challenges once they arise. Such requirements are very unlikely to be addressed all at once but rather in consecutive steps over time. Hence, we are interested in stage models that conceptualise the capabilities (requirements) to transition from less to more mature stages of social media use by governments. Such models are commonly found in the literature on e-government.

For example, Lee (2010) carried out a qualitative review of 12 stage models of e-government and highlighted the main concepts and themes (information, interaction, transaction, and so on) that are common to the different models in different stages. Fath-Allah *et al*. (2014) carried out a review of 25 models developed over time, focusing on the differences and similarities between models and the features of different stages. These two studies, however, do not focus on the requirements needed to move from one maturity stage of e-government to the next one.

We try to integrate these two reviews with models that were overlooked and seek to focus more on the models that are dedicated specifically to social media (and their requirements) rather than e-government in general. We include models that were produced in academic literature only, thus excluding those produced by international organizations like the United Nations or consultancy firms like Accenture (UN, 2001 and 2012; Accenture, 2003). Also, we focus on more recent models without the need to go back to the late 1970s (Nolan, 1979) and early 1990s (Galliers and Sutherland, 1991) when the internet and social media did not exist. Table 3 below summarises the relevant literature that we have reviewed in relation to e-government models and in particular the needed capabilities to transition from a less mature to a more mature stage of social media use

in government. We are not trying to integrate different models into a single model. Rather, the review of capabilities informs our identification of requirements that governments need to meet in order to move from a lower stage of social media use (information-sharing purposes) to a higher stage (interaction and co-production purposes), as identified in Table 1. We focus our attention on the higher-stage capabilities found in the literature (stages 3 to 5, see Table 3) as more relevant to identify the essential requirements for achieving two-way communication between citizens and government.

Requirements also emerge from the analysis of the challenges carried out in the previous section. Different from the challenges, we believe that there is no need to distinguish between internal and external requirements here, since by definition government requirements need government (internal) action. Instead, we adopt the same classification as Lee and Kwak (2012) who make a distinction between **organizational** and **technological** capabilities and see it as fit for the concept of requirements. Moreover, we again distinguish between **direct** and **indirect** requirements which, just as in the previous section on challenges, directly concern social media and their features in the case of direct requirements and other elements such as the legal framework, governance and interoperability, financial and budget management in the case of indirect requirements.

Table 3: Review of e-government and social media (SM)-based Maturity Models capabilities

Models	1st Stage capabilities	2nd Stage capabilities	3rd Stage capabilities	4th Stage capabilities	5th Stage capabilities
E-government Growth model (Layne and Lee, 2001)	Create index website. Link to other sites. Site maintenance. Allocate specific resources. Set privacy arrangements. Set roles and responsibilities.	Set online transactions. Define interactive conversations. Set security mechanisms. Organize authentication and confidentiality arrangements.	Vertically integrate systems at different levels (federal, state, local).	Horizontally integrate different functions of government services. Determine a change in the mindset of agency director.	---
Public Sector Process Rebuilding Maturity Model (Andersen and Henriksen, 2006)	Horizontal & vertical integration within government. Change front-end systems. Adoption and use of intranet.	Extensive use of intranet. Create personalized web interface for customer processes. Assume end-user orientation.	Create accountable and transparent processes.	Achieve data and service mobility across organizations. Guarantee ownership of data transferred to customers.	---
E-Gov. Interoperability Maturity Model (Gottschalk, 2009)	Integrate hardware, software, information, data.	Align work processes (inter-organization)	Collect, store and share knowledge. Achieve inter-organizational collaboration.	Share values on customer-oriented products, services, problems, solutions, decisions, implementations.	Create synergy on strategies and goals.
Joined-up Government Maturity Model (Klievink and Janssen, 2009)	Develop applications used and shared by various organizations.	Set up system integration. Change commitment and culture. Networking and relationship (within organization). Enable intra-organizational cooperation. Organise service management.	Develop generic facilities. Develop domain expertise. Achieve integration, collaboration. Assume external orientation. Manage system project, service, and portfolio. Identify user requirements.	System Architecture integration, improvement development, coordination. Set up planning and sourcing activities. Arrange service level agreements. Obtain central leadership and political support. Orchestrate service delivery.	Define a management program. Establish inter-organizational collaboration. Orchestrate service delivery. Set up service governance.
Open Gov. Maturity Model (Lee and Kwak, 2012)	Publish online only limited and not up to date data.	Publish online high value government data. Improve data quality (accuracy, consistency, and timeliness). Develop data privacy standards, architecture, governance, structure.	Build culture of transparency. Post and share user created content. Optimize data governance structure and processes. Enhance data privacy and security.	Set up data analytics for new insights and improving decision-making. Train government employees to develop data analysis skills.	Expand depth of data transparency. Make data accessible easily by mobile devices. Achieve seamless integration of data analytics with government activities. Realize public value of data.

Models	1st Stage capabilities	2nd Stage capabilities	3rd Stage capabilities	4th Stage capabilities	5th Stage capabilities
Three-stage Adoption Process (Mergel and Bretschneider, 2013)	Push for adoption of SM ("*intrapreneurial*" change agents). Expand domain of use (number of applications and individuals).	Set standard processes for technology adoption. Set standards for privacy, access, and accuracy of information. Accept organizational changes in culture and operations.	Set standards, rules and processes to manage process and resources associated with SM adoption. Formalize ICT management. Train and support SM staff.	---	---
Gov. 2.0 Utilization Model (Khan, 2015)	Develop SM expertise. Earmark financial resources. Develop e-government infrastructure. Establish dedicated SM pages.	Collaborate with citizens. Achieve cross-agency collaboration.	Provide online service through SM.	---	---
SM for Organizational Innovation (Lehmkuhl *et al.*, 2013)*	Partially integrate SM content with existing communication channels. Use process measures (number of comments). Define employees directly involved with SM. Accept SM use (by innovators).	Define SM objectives. Develop and publish dedicated SM contents. Assess performance (number of responses, amount of user generated content). Define SM budget. Identify indirectly involved employees. Accept SM use (by early adopters).	Define a centralised perspective of SM. Differentiate type of information and contents to publish on SM channels. Use qualitative measures (customer satisfaction). Set up centralised SM channels. Identify management collaboration between functions. Accept SM use (by early majority).	Integrate SM entirely into organization's operations. Define a brand strategy. Assess user generated content (sentiment analysis). Use budget only for major adaptations (operations are integrated and run smoothly). Integrate external partners into SM communication. Accept SM use (by late majority).	SM as enabler of new business/service models. Full align SM channels and other media. Link SM to organization objectives. Make SM part of regular communication (no specific budget needed). Identify all points of interactions with external users and stakeholder. Accept SM use (by almost all staff).
SM Maturity Model (Geyer and Krumay, 2015) **	Define responsibilities and flow of actions. Define a SM strategy. Align SM to other communication channels. Set up privacy and security guidelines.	Define SM related roles. Describe roles and tasks. Prepare SM guidelines. Set up SM expert pool. Define code of conduct. Establish dedicated ICT support.	Monitor SM activity. Understand and assess relevant stakeholders' sentiments.	Integrate SM across different company's departments. Align SM channels across departments.	Arrange community and crisis management process. Establish training programs and career paths for employees.

* From this table we are excluding the capabilities of Stage 0 of the model "no degree of maturity".
**We have merged the capabilities from two different stages (SM integration and SM strategy) into stage 4.

5.1 Organizational requirements

Organizational requirements refer to the processes, roles, policies, resources, governance settings that the government needs to meet if social media are to be used for two-way communication. Our analysis excludes fundamental cultural elements such as a civic culture of openness, transparency and collaboration. These basic and contextual elements are fundamental for leveraging social media in government. However, single (local) government agencies usually have little or no power to influence and shape them.

One of the basic organizational requirements (generally found in the capabilities of stages 1 to 3 of Table 3 above) is to have in place a social media strategy and a set of guidelines (Valdes *et al.*, 2011; Lee and Kwak, 2012; Picazo-Vela *et al.*, 2012; Khan, 2015; Lehmkuhl *et al.*, 2013; Geyer and Krumay, 2015). Through the social media strategy the government agency determines whether it wants to use a push, pull or networking strategy (Mergel, 2010), the type and purposes of social media it wants to use (e.g. relational, expressive, informational) (Skoric *et al.*, 2016), its objectives, the targeted audience, stakeholders and influencers (both private and public), community and crisis/reputation management processes, monitoring and measuring activities. Slightly different from the social media strategy is the preparation of guidelines which determine how often to post,

the kind of information, responsiveness, acceptance of comments, and wording and behaviour guidelines (Geyer and Krumay, 2015). As different authors highlight (Lee and Kwak, 2012; Meijer et al., 2012; Mergel and Bretschneider, 2013) it is also essential to obtain political support, sponsorship and acceptance by the organizational leadership of the social media initiative and develop mutual trust with citizens.

Another essential set of requirements relates to the structure of the organization and governance in terms of interoperability and integration between departments of the same agency or of different agencies (these last ones are generally found in the higher stages of Table 3). Dedicated departments, trained personnel, financial resources in the budget, roles, tasks and responsibilities such as social media managers, experts, analysts and consultants also need to be determined (Lee and Kwak, 2012; Lehmkuhl, 2013). Mergel and Bretschneider (2013) emphasize the need for co-ordination and governance among different sub-units of an agency in order to avoid for example the creation of multiple social media accounts. Gottschalk (2009) and Klievink and Janssen (2009) place strong emphasis on this aspect also in terms of inter-organizational exchanges of best practices and back-office coordination for joined service delivery.

The last set of organizational requirements concern the definition of an up-to-date regulatory framework in terms of privacy, disclosure of confidential information, authentication, security, ethical issues and service agreements with third-party social media providers (Layne and Lee, 2001; Lee and Kwak, 2012).

5.2 Technological requirements

As regards the technological requirements, which are closely linked to the organizational ones, we found that these are mainly related to three areas: ICT infrastructure, data, and technological skills.

ICT infrastructure and architecture (lower stages of Table 3) (networks, information systems) need to be aligned between different departments and with the technology that the agency has chosen for its social media initiative. Standards-setting processes need to involve hardware as well as software to allow the different sub-units of an agency to collaborate effectively (Gottschalk, 2009; Klievink and Janssen, 2009; Mergel and Bretschneider, 2013). As far as data are concerned (higher stages of Table 3), we can distinguish two dimensions: firstly, data and information created and published by the agency; and secondly, data and information gathered from social media channels. Ownership and control over data produced and shared by the agency is required as well as quality in terms of accuracy, timeliness, and consistency (Lee and Kwak, 2012). The agency also needs to set up standards and guidelines for social media data and feedback collection, archiving mechanisms and communication procedures (Geyer and Krumay, 2015).

The final set of requirements is linked with technological and analytical skills within the organization (higher stages of Table 3). Moderating, monitoring and measuring social media activities and their impact on followers is essential. Technological skills such as data crawling and mining, content and sentiment analysis are required if the government intends to use the social media data and feedback to improve or create new services, activities and decisions. As can be seen, this set of requirements is strictly related with organizational requirements to train or hire skilled personnel. Geyer and Krumay (2015: 1865) call this set of skills “social media listening and monitoring” as a fundamental element to understand and assess the opinions of relevant stakeholders. Lee and Kwak (2012) distinguish between process-centric metrics and outcome-centric metrics. While the former tend to focus more on quantitative aspects such as number of visitors, downloads, published datasets, likes, retweets, shares and so on (for use of such metrics see for example Bonson *et al*., 2015; Agostino and Arnaboldi, 2015), the latter focus more on intangible aspects such as learning, innovation, creation of best practices, and continuous public engagement. Table 4 summarizes the requirements that we have identified in the literature review through the analysis of the maturity models and classifies them on the basis of whether they can be considered direct or indirect. In the concluding section, we present the discussion and conclusions of this review paper. We also provide some directions for future research.

Table 4: A typology of requirements: Organizational/technological and Direct/Indirect

	Direct requirements	**Indirect requirements**
Organizational requirements	• SM Strategy. • SM Guidelines. • Trained personnel for technological skills (see below).	• Political support and sponsorship. • Governance and interoperability. • Update of the legal framework to support and regulate the use of SM in government.
Technological requirements	• Set metrics on how to measure, assess, monitor activity and impact. • SM feedback management, analysis and interpretation techniques (data crawling and mining; content and sentiment analysis).	• ICT Infrastructure aligned between departments and with chosen technology. • Ownership and control over data and information published, data and storage management.

6. Discussion and Conclusions

Since the turn of the millennium, we have witnessed the rise of popular social media and the associated wide belief in their utility for facilitating new forms of citizen participation in government activity (Linders, 2012; Picazo-Vela *et al*., 2012; Skoric *et al*., 2016). More recently, austerity regimes and post-crisis recovery policies have resulted in multi-scalar government invitations that ask citizens to take (more) responsibility and engage more with governments. Despite this twofold window of opportunity for stronger interaction, a one-way communication "paradigm" where citizens are still receivers of public policy seems to prevail (Casey and Li, 2012; Mergel 2013; Kleinhans *et al.*, 2015). It is highly unlikely that this lack of progress can be ascribed only to technological issues. Rather, the evidence points at governments' organizational and human resources as a bottleneck. Instead of moving the field forward, confusion has been created by a proliferation of problem categorizations in the literature that tend to overlook each other and a tendency to mix different elements that may hinder government application of social media (e.g. confuse risks with challenges). Therefore, this paper has set out to clear part of the confusion and to contribute to the literature by providing typologies of government-citizen relationships, challenges and requirements, based on a review of literature from the fields of public administration, urban planning, business, management and corporate social media. As such, it takes a different viewpoint from papers that unilaterally delve into technological implications.

We have argued that clearing up confusion requires, first of all, integrating various definitions and intensities of interaction between citizens and governments into a relatively 'simple' but comprehensive typology of social media-based citizens-government relationship with four levels: information-sharing, interaction, co-production, and self-organisation (Table 1). With each level, the complexity of relationships increases, creating both challenges and requirements for governments to facilitate appropriate two-way communication.

Secondly, confusion can be reduced if we distinguish between challenges and risks, and focus on challenges on the part of government that may prevent a transition to social media-supported interaction and dialogic governance with citizens. We define *challenges* as situations or tasks that test governments' abilities to adopt, use and optimise social media for two-way communication and collaboration strategies with citizens. Challenges are not to be confused with risks, which usually arise as a consequence of not properly addressing challenges. The typology (see Table 2) distinguishes between challenges that are either internal or external to an organization, and, in line with Poba-Nzaou *et al*. (2016), between challenges directly associated with social media and challenges not related to social media themselves: direct versus indirect challenges.

Finally, this paper defines *requirements* as any necessary condition for the use of social media in a way that allows two-way communication and/or the co-production level of the government-citizens relationship to be reached. In line with Lee and Kwak (2012), our typology of requirements distinguishes between organizational and technological requirements and between direct and indirect requirements (see Table 4). In brief, requirements are conditions that must be met to improve two-way communication, whereas challenges reflect situations that test governments' abilities to use social media for this purpose. Key organisational requirements relate to social media strategies, guidelines, structure of the organization, and governance. Key technological requirements relate to ICT infrastructure, data management, and technological skills.

There are of course limitations to this research. Being grounded in literature reviews, the findings need contextualisation, based on characteristics of specific settings, ranging from national contexts to local organisational cultures. Moreover, considering the origin of the used literature, the findings may reveal a slight

imbalance towards the situation in the USA, compared to Europe. Our typologies can be used as a starting point for further refinement and empirical testing in specific situations. They are particularly useful to systematically evaluate cases of 'networked co-production' of citizens and governments (Meijer, 2011), to reveal to what extent governments have addressed all challenges and to what extent requirements towards effective two-way communication can be met. Future research may also rank various challenges and requirements according to their (relative) importance and target specific challenges or requirements for governments in more detail. Finally, even if challenges and requirements for social media use are well addressed, online two-way communication between governments and citizens requires *offline* follow-up actions to make any changes in public policy or service delivery. Further research should reveal to what extent government 'back offices' need to be adapted to implement ideas or solutions that arise from online dialogic governance.

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