

Evaluating a Passive Expert-Sourcing Method for Policy Making from Innovation Diffusion Theory Perspective

Full Paper

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Abstract

The first attempts of government agencies to apply crowdsourcing ideas aimed at the collection of policy-related information, knowledge and ideas from the general public ('citizen-sourcing') concerning various social problems and needs, in order to support the development of effective public policies for addressing them. However, it was soon realized that, due to the high complexity of modern social problems and needs, it would be quite beneficial if this could be complemented by the collection of relevant information, knowledge and ideas from experts as well; this leads to the gradual emergence of 'expert-sourcing', as an important foundation of public policy making. Such practices constitute important innovations in the policy development processes, so it is necessary to analyze them from this perspective; the most fundamental question to be investigated is to what extent these innovative expert-sourcing practices have the fundamental preconditions for a wide diffusion and adoption in government. Our paper makes a contribution in this direction by evaluating an ICT-based passive expert-sourcing method for supporting policy making from this perspective, using as theoretical foundation the Diffusion of Innovation Theory.

Keywords

crowd-sourcing, citizen-sourcing, expert-sourcing, government, public policy, innovation.

Introduction

Motivated by the multiple 'success stories' of 'crowdsourcing' in the private sector (Hossain et al. 2015), the public sector has started moving in this direction as well, attempting to apply these ideas in its particular context, and this gives rise to the gradual development of the 'citizen-sourcing' (Nam 2012; Charalabidis and Loukis 2012; Ferro et al. 2013; Mergel et al. 2013; Charalabidis et al. 2014; Prpić et al. 2015; Loukis et al. 2017). The first citizen-sourcing initiatives aimed at the collection of policy-related information, knowledge and ideas from the general public, concerning various social problems and needs, in order to support the development of better, more effective and acceptable public policies. This also enables the identification and better understanding of the 'public values' (Moore 1995; Cordella and Bonina 2012), so that they can be incorporated into public policies. However it was soon realized that, due to the high complexity of modern social problems and needs that had to be addressed through effective public policies, it would be highly beneficial if this general public oriented citizen-sourcing could be complemented by the collection of information, knowledge and ideas from experts as well (Ferro et al. 2013; Androutopoulou et al. 2015; Loukis et al. 2017); this leads to the gradual emergence of 'expert-sourcing'. It enables combining/complementing the public values (which might include some not achievable wishes and hopes, or underestimate long term trends and consequences) with the realities and

constraints set by experts' specialized knowledge, for the formulation of effective public policies. This is in line with previous political sciences research on the role and importance of both 'democracy' (democratic processes and consultation with stakeholder groups) and 'technocracy' (specialized knowledge of experts) for the development of public policies (Radaelli 1995 and 1999; Brown, 2009; Esmark 2016).

However, these expert-sourcing practices, aiming at the collection of public policy related information, knowledge and ideas from experts' communities, constitute important innovations in the policy development processes of government, so it is necessary to analyze them from this perspective as well. The most fundamental question to be investigated from this perspective is to what extent these innovative expert-sourcing practices have the fundamental preconditions for a wide diffusion and adoption as public policy making support tools. For this purpose, we can use relevant theories and frameworks developed through the extensive previous research that has been conducted on the diffusion of innovations (Kapoor et al. 2014; De Vries et al. 2016). The analysis of these emerging expert-sourcing practices from the innovation diffusion perspective can reveal important insights on their diffusion potential, and their strengths and weaknesses from this perspective: characteristics of them that favor, as well as ones that hinder, their diffusion; these will allow the identification of improvements of expert-sourcing practices and systems, which can enhance their diffusion potential, and in general lead to higher levels of effectiveness and maturity in this area.

However, there is a lack of research on such questions, and in general a lack of evaluations of these emerging expert-sourcing methods and practices from an innovation diffusion perspective. Our paper contributes to filling this research gap, by evaluating an ICT-based passive expert-sourcing method for supporting policy making (Androutsopoulou et al., 2016), which has been developed in the European research project 'EU-Community' (project.eucommunity.eu/), from this innovation diffusion perspective, using as theoretical foundation the well-established 'Diffusion of Innovation' (DOI) theory (Rogers 2003). The main research question of this study is:

'To what extent this ICT-based expert-sourcing method, viewed as an innovation, has the five critical characteristics that according to the DOI theory determine the degree of adoption of an innovation (relative advantage, compatibility, complexity, trialability and observability)?'

This paper consists of six sections. In the following section the background of this study is presented. Then the abovementioned ICT-based expert-sourcing method is outlined, followed by a description of the research method and data of our study. Then the results of the evaluation of this method are presented, while in the final section the conclusions are summarized and future research directions are proposed.

Background

Active and Passive Government Citizen-sourcing

Most of the research that has been conducted on government citizen-sourcing is focusing on the 'active citizen-sourcing' paradigm, which uses government agencies' web-sites or social media accounts in order to pose 'actively' a particular social problem or public policy (existing or under development), and solicit relevant information, knowledge, opinions and ideas from the citizens (the general public) (Charalabidis et al. 2012; Ferro et al. 2013; Mergel et al. 2013). More recently, there has been some research interest in the 'passive citizen-sourcing' paradigm, which aims to exploit 'passively' policy-related content that has been generated by citizens freely, without any direct stimulation or direction by government, in various external (i.e. not belonging to government agencies) web-sites or social media, such as political fora, news web-sites, political blogs, Facebook, Twitter, etc. accounts; the analysis of this content can provide useful information, knowledge and ideas concerning important social problems and public policies (Bekkers et al. 2013; Charalabidis et al. 2014; Loukis et al. 2017).

However, the research that has been conducted in this area focuses on general public oriented citizen-sourcing, i.e. on the collection (active or passive) of policy-related information, knowledge and ideas from the general public. The evaluations of these citizen-sourcing initiatives (e.g. Ferro et al. 2013; Androutsopoulou et al. 2015) conclude that they can provide insights into the perceptions of the general public concerning important social problems and needs, and existing or proposed public policies for

addressing them, which can be quite useful; at the same time they conclude also that, due to the high complexity of modern social problems and needs that have to be addressed through effective public policies, in order to collect higher quality policy-related information, knowledge and ideas, it would be highly beneficial to target – beyond the general public – also knowledgeable experts on the particular social problem or public policy of interest. Previous political sciences research has revealed the importance of both ‘democracy’ (democratic processes and consultation with stakeholder groups) and ‘technocracy’ (specialized knowledge of experts) for the development of effective and acceptable public policies (Radaelli 1995 and 1999; Brown, 2009; Esmark 2016). The above lead to the gradual development of the new paradigm of ‘expert-sourcing’, as an important foundation of public policy making. Some first attempts have been made in this direction as part of the European research project ‘EU-Community’ (project.eucommunity.eu/), in which an advanced ICT-based passive expert-sourcing method has been developed (Androusoyopoulou et al. 2016). Our paper contributes to the development of the knowledge base on this emerging expert-sourcing paradigm, by evaluating the above ICT-based passive expert-sourcing method for the support of policy making from the highly important diffusion potential perspective: viewing it as an innovation in the policy development processes of government, we investigate to what extent it has the fundamental preconditions for a wide diffusion.

Diffusion of Innovation Theory

For the above investigation, quite useful can be the theories and frameworks that have been developed in the extensive previous research that has been conducted concerning the diffusion of innovations, in order to identify factors that affect it positively or negatively (comprehensive reviews of this research are provided by Kapoor et al. (2014) and De Vries et al. (2016)). From the review of this literature it was concluded that the most widely recognized theory in this area is the ‘Diffusion of Innovation’ (DOI) theory proposed by Rogers (2003), which has been extensively employed for analyzing ICT-related innovations in both the public and the private sector from a diffusion potential perspective (Raus et al. 2009; Loukis et al. 2011; Wu et al. 2015). According to the DOI theory, there are five critical characteristics of an innovation that determine the degree of its diffusion:

- i) Relative Advantage, defined as the degree to which an innovation is perceived as better than the idea, work practice or object it supersedes;
- ii) Compatibility, defined as the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters;
- iii) Complexity, defined as the degree to which an innovation is perceived as difficult to understand, implement and use;
- iv) Trialability, defined as the degree to which an innovation may be experimented with in a limited scale;
- v) Observability, defined as the degree to which the results of an innovation are visible by the external environment.

Therefore we are going to examine to what extent this ICT-based passive expert-sourcing method (outlined in the following section) has the above characteristics, which are the main determinants of its diffusion potential.

An ICT-based Passive Expert-sourcing Method

In this section, we outline (for the sake of completeness of this paper) the advanced passive ICT-based expert-sourcing method for supporting support policy making, developed in the European research project ‘EU-Community’ (see project.eucommunity.eu/), which is evaluated in the following sections as to its diffusion potential; more detailed information about it is provided in Androusoyopoulou et al. (2016).

Its application is based on an ICT platform consisting of two main components. The first component maintains a directory of profiles of individuals possessing high levels of knowledge and expertise on some pre-defined topics related with EU policies. Data about these individuals are collected automatically through crawlers, that crawl at regular time intervals numerous external sources, which can be pre-defined websites (e.g. Euractiv.com, EUR-Lex, Europa Whoiswho directory, RSS Feeds, blogs and news sites) and social media accounts (e.g. LinkedIn, Twitter), or even can be entered manually by interested individuals (self-registration). Also, this component calculates for each of these experts their ‘reputation scores’ (for one or more of the abovementioned pre-defined topics), using an algorithm based on the

following criteria (having different weights): self-evaluation; peer-assessment (based on endorsements from other experts); ‘business card’ reputation (based on the reputation ranking of the organization each expert works in, or committees he/she belongs to, and his/her position in them); readers’ assessments of documents authored by him/her; network value (level of influence as the sum of his/her network connections); proximity trust (degree of connection in social media); past rankings (taking into account reputation rankings in previous months); offline reputation (manually added for persons with no online presence). This component provides extensive capabilities for experts’ search, e.g. by name, country or EU policy or topic, and returns experts found in its database in descending reputation score order.

The second component of the ICT platform supporting the application of this method maintains a database of relevant documents concerning the pre-defined policy related topics of interest. For this purpose it crawls at regular time intervals various external online sources of content related to EU policies, such as relevant blogs, websites of EU institutions (e.g. European Commission), relevant media (such as EurActiv, European Voice, EU Observer) and various EU policy stakeholders’ websites (such as various business and professional associations and NGOs’ portals), and also social media accounts, where relevant positions and opinions are published, and updates with new content the above documents’ database. For each of these documents a ‘quality score’ is calculated, using an algorithm based on the following criteria: author (his/her reputation score provided by the first component described above); ratings by other experts submitted in the platform, with respect the quality, accuracy, value, relevance and timeliness of the document. Furthermore, these documents undergo sophisticated processing using text/opinion mining and sentiment classification techniques, in order to assess their topics and sentiment (positive, negative or neutral). These documents are structured around ‘policy processes’ (as policy process can be modelled any prospective, ongoing or completed E.U. legislative procedure, or any political debate in general), which can be created by system users. This component provides a ‘timeline visualization’ (Figure 1), which shows in a temporal order the main documents (based on the above quality scores) associated with a policy process selected by the user, grouped under a set of user-defined stages of the particular policy process. In this visualization different colors are used in order to indicate documents of different origins, such as European Institutions, National/Local Governments, Academic Institutions, Civil Society Organizations, Media, etc.; also shapes are used to reflect different types of documents (e.g. rectangles reflect the proposal documents, while general documents are represented by circles). Finally, the sizes of the shapes representing these documents reflect their quality scores (higher quality documents are shown bigger).

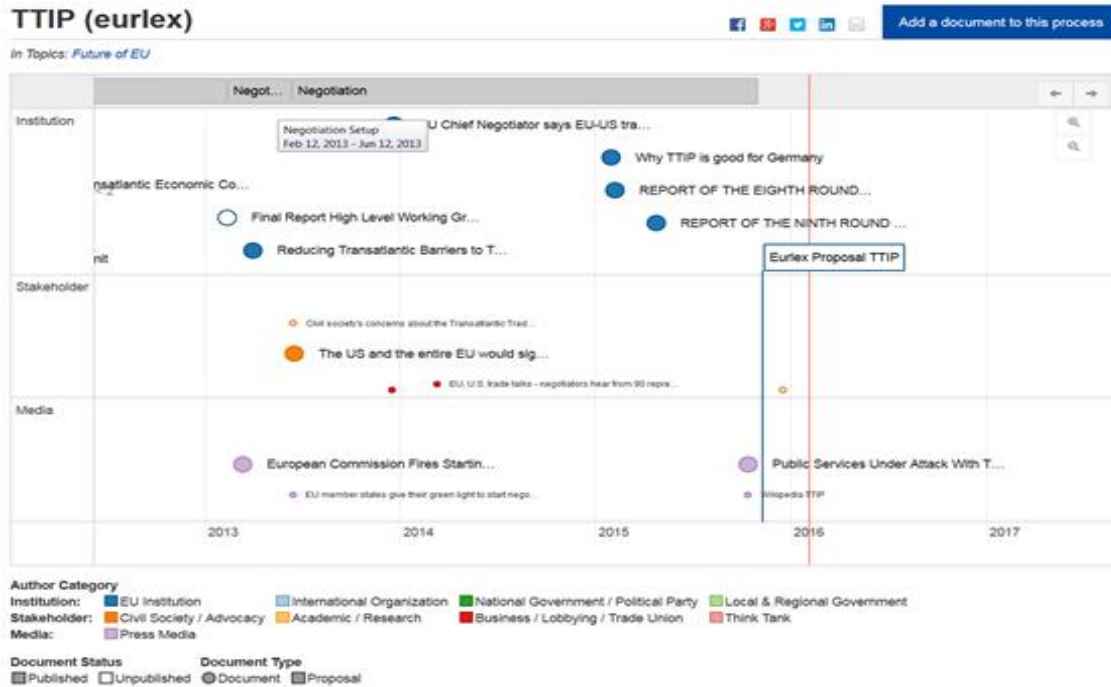


Figure 1. Policy process documents’ visualization

Research Method and Data

Initially an evaluation framework was constructed based on the DOI theory, which is shown in Table 1. In particular, for each of the five critical characteristics of an innovation that according to the DOI theory determine the degree of its diffusion (relative advantage, compatibility, complexity, trialability and observability) we defined one or if necessary two evaluation dimensions, adapted to the particular objectives and characteristics of this expert-sourcing method. For the 'relative advantage' we defined two evaluation dimensions ED1 and ED2, which correspond to the two particular objectives of the method: to identify knowledgeable experts as well as documents containing high quality knowledge on public policy related topics we are interested in. The same applies for the 'compatibility', for which we defined two evaluation dimensions ED3 and ED4, concerning the compatibility of the method with the public policy formulation processes, as well as with the mentalities and the values of their participants. For the 'complexity', 'trialability' and 'observability' we defined one evaluation dimension for each (ED5 to ED7).

To what extent this ICT-based expert-sourcing method:

ED1: is a better way for identifying highly knowledgeable and credible experts on a specific public policy related topic we are interested in, compared with other existing 'physical' or 'electronic' alternative ways for doing this?

ED2: is a better way for the acquisition/collection of high quality expert knowledge concerning specific public policies (existing, under development or proposed) in comparison with other existing 'physical' or 'electronic' alternative ways for doing this?

ED3: is compatible with the public policy formulation processes as they are applied in European institutions and in European countries, and can be integrated in these processes?

ED4: is compatible with the needs, the mentalities and the values of the participants of the democratic public policy formulation processes (such as members of parliaments and their assistants, representatives of various policy stakeholder groups, journalists, etc.)?

ED5: its practical use by the above participants of democratic public policy formulation processes is easy and does not require much effort?

ED6: can be initially applied in small scale pilot applications in order to assess its capabilities, advantages and disadvantages, before proceeding to a larger scale application of it?

ED7: is an innovation highly visible to the colleagues and collaborators of each adopter (e.g. participants of the democratic public policy formulation processes, policy makers, etc.), so that a wider interest in the adoption of this innovation can be generated?

Table 1. Evaluation Framework

In order to evaluate this ICT-based passive expert-sourcing method outlined in the previous section using the above evaluation framework, three pilot applications of it have been conducted, concerning three important EU policy related topics agreed among the 'EU-Community' project partners: Innovation and Entrepreneurship, Energy Union and Future of the European Union (EU). For each of them numerous online sources were crawled, in order to retrieve and store expert profiles, and also various types of relevant documents (e.g. blog posts, social media content, word/pdf documents, web pages and articles, etc.); then processing of them was performed as described in the previous section, leading to the calculation of the reputation scores of the experts, and the quality scores of the documents. Five interviews were conducted with Members of the Greek Parliament from the main political parties. Each interview had a duration of 1.5 hour, and included initially a presentation of this passive expert-sourcing method and its supporting ICT platform; then the interviewee was asked to use the platform (with our assistance) in order to perform searches of experts/documents concerning the above three topics, examine and understand the results' visualizations, and then see document-level details.

In order to collect evaluation data from the interviewees about this ICT-based passive expert-sourcing method we used both qualitative and quantitative techniques. According to relevant literature (Ragin & Amoroso, 2011; Cooper and Schindler, 2013) on one hand the qualitative techniques allow a more in-depth examination of a social phenomenon, and enable the generation of deeper knowledge about it, its

positive and negative aspects as well as a deeper understanding of them (concerning ‘how’ and ‘why’); on the other hand the quantitative techniques enable the summarization of various positive and negative aspects into a small number of ratings, which make it easier to draw conclusions. Therefore in order to combine the abovementioned advantages of the qualitative and the quantitative techniques, in each of these interviews initially we conducted a qualitative in depth discussion about the method, structured in accordance with the above seven evaluation dimensions ED1 – ED7 (shown in Table 1). The above qualitative discussions were recorded, and then transcribed and coded manually using an open coding approach (Cooper and Schindler, 2013). Then we asked the interviewees to fill a short evaluation questionnaire, which included seven questions corresponding to the above seven evaluation dimensions; each of them was converted to a positive statement, and the interviewees were asked to provide the degree of their agreement/disagreement with it in a five-levels scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree), as a summary/aggregation of all the positives and negatives they mentioned in our discussion along this evaluation dimension.

Results

In Table 2 we can see the results of the processing of the quantitative evaluation data collected through the questionnaire; for each aspect/question are shown the frequencies/numbers of the responses ‘strongly disagree’ (SD), ‘disagree’(D), ‘neutral’(N), ‘agree’ (A) and ‘strongly agree’ (SA) respectively.

	SD	D	N	A	SA
To what extent this ICT-based expert-sourcing method is useful :					
ED1: is a better way for identifying highly knowledgeable and credible experts on a specific public policy related topic we are interested in, compared with other existing ‘physical’ or ‘electronic’ alternative ways for doing this?	0	0	0	4	1
ED2: is a better way for the acquisition/collection of high quality expert knowledge concerning specific public policies (existing, under development or proposed) in comparison with other existing ‘physical’ or ‘electronic’ alternative ways for doing this?	0	0	2	3	0
ED3: is compatible with the public policy formulation processes as they are applied in European institutions and in European countries, and can be integrated in these processes?	0	2	1	2	0
ED4: is compatible with the needs, the mentalities and the values of the participants of the democratic public policy formulation processes (such as members of parliaments and their assistants, representatives of various policy stakeholder groups, journalists, etc.)?	0	1	2	2	0
ED5: its practical use by the above participants of democratic public policy formulation processes is easy and does not require much effort?	0	1	1	3	0
ED6: can be initially applied in small scale pilot applications in order to assess its capabilities, advantages and disadvantages, before proceeding to a larger scale application of it?	0	0	0	4	1
ED7: is an innovation highly visible to the colleagues and collaborators of each adopter (e.g. participants of the democratic public policy formulation processes, policy makers, etc.), so that a wider interest in the adoption of this innovation can be generated?	0	0	2	2	1

Table 2. Results of processing the quantitative evaluation data collected through the questionnaire (frequencies of interviewees’ responses to all questions)

From the above Table 2 we can see that all interviewees agree or strongly agree (4 and 1 respectively) that

this ICT-based expert-sourcing method offers relative advantage concerning the identification of knowledgeable and credible experts on a specific policy related topic we are interested in. However, lower is the level of agreement concerning the relative advantage offered by the method concerning the acquisition of relevant experts' knowledge: three interviewees agree, while the remaining two are neutral (neither agree or disagree). In the discussions were mentioned two alternative tools they use for the above purposes: a) the well-known search engines (e.g. Google), as well as the search capabilities provided by various social media platforms (e.g. Twitter), which they use extensively in order to search for policy relevant knowledge; and b) they monitor specific sources they know manually. Regarding the former, they highlighted that only by proper use of search engines, using appropriate keywords and time period, they can find relevant results (i.e. documents), which are however of varying levels of relevance and quality. The interviewees believe that this weakness can be overcome by the proposed method, as it filters the content it collects and extracts the most relevant and highest quality part of it; at the same time it helps them identify new and more sophisticated sources. A considerable advantage offered by this method is the reduction of the effort required for visiting and reading manually multiple specific sources of interest (e.g. websites, blogs or social media accounts). However, the lack of capability of adding or excluding particular online sources is perceived as a drawback; one of the interviewees said "it doesn't cover all types of resources we read, such as legal documents", and another one that "we don't read blogs, since many times they have been proven unreliable or spam". So, the relative advantage of this method is reduced by the lack of capabilities for customization by the users of the online sources of content crawled. One of the interviewees said that "we would adopt this approach if it could cover larger amount of sources/content and simultaneously sustain their quality through appropriate filtering of them". Another barrier in the adoption of the method, as described by one of the interviewees is that "It is too neutral and open. I would like to concentrate on views that are compatible with my political outlook, political orientation and policy objectives". The provision of online sources customization capabilities can probably address this need.

With respect to experts' identification, the interviewees highlighted the absence of tools offering similar capabilities with the proposed ICT-based expert-sourcing method; so, they currently rely either on the word of mouth or on the well - established online search engines. Since these two methods are considered not much useful for this purpose and risky (in terms of whether they find the right persons), the relative advantage of the proposed method is substantial in helping them identify the most knowledgeable persons per topic. Nevertheless, two factors were mentioned as critical determinants of the diffusion and success of this method: the first is the reliability of the provided information ("I want to know that results are valid and reliable"), and the second is its completeness ("I want to be sure that the information provided by the system is complete and that the most significant experts per topic are included"). It was suggested that in order to achieve high levels of results' reliability and completeness it is necessary: a) to test extensively the two algorithms of the method (used for calculating experts' reputation and documents' quality scores respectively), for instance by comparing their results with assessments of recognized experts, publish the results of these tests (in order to increase users' trust in this method), and based on them make improvements of these algorithms; b) to use a wide range of diverse and high quality online sources; c) to build and maintain an extensive diverse and high quality community of experts around this ICT platform, who will provide large number of ratings of the experts and the documents, resulting in more reliable reputation and relevance scores respectively.

Concerning the compatibility of the method with the public policy formulation processes we can see in Table 2 that opinions are divided: 2 interviewees disagree, 1 is neutral and 2 agree. In the discussions, there was a common feeling of the interviewees that this method is compatible with the EU policy processes, however less compatible than with the ones applied in the member countries (which is reasonable, as the method was initially designed in the 'EU-Community' research project in order to meet the requirements of the EU legislative procedures). For instance, it was mentioned that the policy formulation process in Greece is more 'closed', with lower level of stakeholders' participation: usually a small number of representatives of the main stakeholders (e.g. business and professional associations, trade unions, etc.) are invited by the competent parliamentary committee in order to present their opinions and positions; however, rarely these stakeholders, and also the scientific/academic community, write relevant postings in blogs, social media or web-sites (e.g. newspapers' ones), and this happens only for highly important topics. Furthermore, it was mentioned that this method, in its current form, is more compatible with the needs of the participants of the EU policy making processes, but less compatible with the needs of the participants of the member states' policy making processes. In order to increase the

compatibility of the method for the latter at national level the following suggestion was made by one of the interviewees: “In order this method to be helpful at national level, I would like to see content not only on EU policy related topics, e.g. on European policy for energy, but also on national policy related topics, which are debated at national level, and especially about topics that are of interest across the European Union, e.g. concerning national policies on education or health. This would help me to compare with other countries before formulating my position at national level, and also would reinforce transnational cooperation”. It was also proposed that a tool for the automated translation of these documents should be integrated in the ICT platform supporting the application of this method.

Similar are the reactions of the interviewees concerning the compatibility of the method with the mentality and the values of the participants of the democratic public policy formulation process; as we can see from Table 2: 1 interviewee disagrees, 2 are neutral and 2 agree. Although there was wide agreement that in general this ICT-based expert-sourcing method seems compatible with the mentality and the values of progressive people participating in the policy formulation processes, who will be willing to adopt it, they highlighted that there are also colleagues with outdated mentalities, who might not be interested in the use of such ICT tools. Moreover, they stressed the fact that many participant of the democratic process adopt too ‘legalistic’ approaches to the formulation of public policies (i.e. placing too much emphasis on the legal aspects of them), so that the compatibility of the method with their mentalities can be increased if more sources of legal information are included.

With respect to the ease of use, most of the interviewees (3) agree that this ICT-based method does not require much effort and is easy to use, while 1 is neutral on this and 1 disagrees. The environment of the ICT platform was characterized as a user friendly and intuitive one, which can be easily used without much training from a user familiar with ICT. However, it is believed that some politicians, mainly older ones without much familiarization with ICT, will probable face difficulties when using the platform; for them some training will be required in order to get familiar with the platform functionalities. Another interviewee mentioned that the usability of the platform should be investigated in more depth (e.g. through questionnaires and interviewees with people who use it every day for some time period). A recommendation made by one of the interviewees was to make it usable from mobile devices, as “policy makers are constantly on the move”.

There was a general consensus on the fact that the method could be tested in a smaller scale in order to identify its advantages and disadvantages before proceeding to a larger application of it (4 agree and 1 strongly agree). However, in one of the discussions it was mentioned that smaller scale applications might result in crawling only a small number of sources, reducing pluralism and perspectives’ diversity: “In order to have pluralism and avoid reflection of one-sided views the system should remain open, which might not be the case in a smaller application”.

Finally, most of the interviewees agree or strongly agree (2 and 1 respectively) on the observability of this method, while the remaining 2 are neutral. It was recognized that it has potential to become widely visible and gain much interest when it reaches a good level of maturity. However, it was raised again that the method, as it is now, is closer to the European Union processes of policy making, and think will reduce the positive impressions that this visibility will generate.

Conclusions

Previous research concerning the application of crowdsourcing ideas in the public sector for supporting public policy making has concluded that it should be oriented towards not only the general public (‘citizen-sourcing’), but also the knowledgeable experts as well (‘expert-sourcing’). It is necessary to combine/complement the public values, needs and preferences (Moore 1995; Cordella and Bonina 2012) identified through the general public oriented citizen-sourcing values with the realities and constraints set by experts’ specialized knowledge, in order to develop acceptable and effective public policies. However, there is a lack of research on this ‘expert-sourcing’ paradigm. So extensive research is required in order to develop efficient and effective government ‘expert-sourcing’ practices and methods (which as mentioned above should complement, and not replace, the existing general public oriented ‘citizen-sourcing’ methods); and also to analyse them from not only the usual technological perspectives, but also from various management and political sciences perspectives as well, in order to identify their strengths and

weaknesses; this is going to enable improvement and evolution of expert-sourcing methods and practices, and lead to higher levels of effectiveness and maturity in this area. Our paper contributes to filling this research gap, by evaluating an ICT-based passive expert-sourcing method for support policy making, from an important management sciences perspective: the innovation diffusion perspective. We investigate to what extent it has the fundamental preconditions for a wide diffusion and usage in government policy making processes, using as theoretical foundation the ‘Diffusion of Innovation’ theory (Rogers 2003).

Our findings provide some first positive evidence that this method in general has a moderate to good diffusion potential. Its main strengths are the good relative advantage it offers concerning the identification of knowledgeable and credible experts on a specific policy related topic we are interested in, as well as its trialability in a small scale and observability/visibility; also, to a lower extent, the moderate to good relative advantage it offers concerning the acquisition of relevant experts’ knowledge, as well as ease of use. However, its main weakness is its low compatibility, on one hand with the policy formulation processes beyond the EU level (for which this method has been initially developed), and especially with the country-level policy formulation processes, and on the other hand with the needs and mentalities of part of the participants in these processes at a parliamentary level. Furthermore, some interesting improvement directions have been identified, which can increase significantly the diffusion potential of this method: crawling a wider range of diverse and high quality online sources; provision of capabilities for definition and customization of these online sources by the users, so the former can be adapted to the particular interests, work practices and political orientations of the latter; building and maintaining an extensive diverse and high quality community of experts around such platforms, which will provide large numbers of ratings of the experts and the documents, resulting in more reliable reputation and relevance scores respectively; furthermore, this method should enable finding experts, documents and knowledge not only for EU level policy related topics, but also county-level ones, and offer automated translation of relevant documents; and also the system should be accessible through mobile devices as well.

This study has interesting implications for research and practice. With respect to research, it contributes to the creation of knowledge on a new paradigm for the application of the crowd-sourcing ideas in the public sector to support policy making, the expert-sourcing, which remains unexplored; this new knowledge concerns not the technological aspects of it (usually receiving most of researchers’ attention), but another highly important aspect of it: its diffusion potential. Furthermore, we have developed an interesting framework for the evaluation of expert-sourcing methods from an innovation diffusion perspective, which can be very useful for future research in this area. With respect to practice, our study provides some first positive evidence concerning the diffusion potential of this method, especially with respect to the relative advantages it offers; and also, interesting directions for improvements of the method, which can increase its practical usefulness and diffusion potential.

Further research is required for the more extensive evaluation of this ICT-based passive expert-sourcing method from additional perspectives, and also by other groups of participants in national level policy formulation processes, beyond the Members of Parliament (e.g. representatives of various business and professional associations, trade unions, etc.), as well as by different groups of participants of regional or municipal level policy formulation processes. Furthermore, more research is required for the testing of the algorithm used by this method for the calculation of experts’ reputation and documents’ quality scores, and possibly for their improvement. At the same time research should be conducted on the exploitation of ICT for the transfer of knowledge in the opposite direction: from the democratic processes towards the experts/technocracy (e.g. concerning diverse needs, values and concerns of different stakeholder groups on the particular social problem or public policy the experts are dealing with).

REFERENCES

- Androutsopoulou, A., Charalabidis, Y., and Loukis, E. 2015. “Using Social Media Monitoring for Public Policy Making – An Evaluation,” in *Proceedings of 9th Mediterranean Conference on Information Systems (MCIS 2015)*, Samos, Greece.
- Androutsopoulou, A., Mureddu, F., Loukis, E., and Charalabidis, Y. 2016. “Passive Expert-Sourcing for Policy Making in the European Union,” in *Proceedings of IFIP EGOV-EPART 2016 Conference*, Guimarães, Portugal.

- Bekkers, V., Edwards, A., and de Kool, D. 2013. "Social media monitoring: Responsive governance in the shadow of surveillance?", *Government Information Quarterly*, (30:4), pp. 335-342.
- Brown, M. B. 2009. *Science in Democracy: Expertise, Institutions, and Representation*. Cambridge, MA: MIT Press.
- Charalabidis, Y., and Loukis, E. 2012. "Participative Public Policy Making Through Multiple Social Media Platforms Utilization," *International Journal of Electronic Government Research* (8:3), pp. 78-97.
- Charalabidis, Y., Loukis, E., Androutsopoulou, A., Karkaletsis, V., and Triantafillou, A. 2014. "Passive Crowdsourcing in Government Using Social Media," *Transforming Government: People, Process and Policy* (8:2), pp. 283-308.
- Cordella, A., and Bonina, C. M. 2012. "A public value perspective for ICT enabled public sector reforms," *Government Information Quarterly*, (29:4), pp. 512-520.
- Cooper, D. R., and Schindler, P. S. 2013. *Business Research Methods*. 12th Edition. McGraw-Hill: New York, USA.
- De Vries, H., Bekkers, V., and Tummers, L. 2016. "Innovation in the Public Sector: A Systematic Review and Future Research Agenda," *Public Administration*, (94:1), pp. 146-166.
- Esmark, A. 2016. "Maybe It Is Time to Rediscover Technocracy? - An Old Framework for a New Analysis of Administrative Reforms in the Governance Era," *Journal of Public Administration Research And Theory* (in-press).
- Ferro, E., Loukis, E., Charalabidis, Y., and Osella, M. 2013. "Policy Making 2.0: From Theory to Practice," *Government Information Quarterly* (30:4), pp. 359-368.
- Hossain, M., and Kauranen, I. 2015. "Crowdsourcing: a comprehensive literature review," *Strategic Outsourcing: An International Journal*, comprehensive literature review," *Strategic Outsourcing: An International Journal* (8:1), pp. 2-22.
- Kapoor, K. K., Dwivedi, Y. K., and Williams, M. D. 2014. "Rogers' Innovation Adoption Attributes: A Systematic Review and Synthesis of Existing Research," *Information Systems Management* (31:1), pp. 74-91.
- Loukis, E., Spinellis, D., and Katsigiannis, A. 2011. "Barriers to the adoption of B2B e-marketplaces by large enterprises: lessons learnt from the Hellenic Aerospace Industry," *Information Systems Management* (28:2), pp. 130-146.
- Loukis, E., Charalabidis, Y., and Androutsopoulou, A. 2017. "Promoting Open Innovation in the Public Sector Through Social Media Monitoring," *Government Information Quarterly*, (34:1), pp.99-109.
- Mergel, I., and Desouza, K. C. 2013. "Implementing Open Innovation in the Public Sector: The Case of Challenge.gov," *Public Administration Review* (73:6), pp. 882-890.
- Moore, M. 1995. *Creating public value: Strategic management in government*. Cambridge, MA: Harvard University Press.
- Nam, T. 2012. "Suggesting frameworks of citizen-sourcing via Government 2.0," *Government Information Quarterly* (29), pp. 12-20.
- Prpić, J., Taeihagh, A., and Melton, J. 2015. "The Fundamentals of Policy Crowdsourcing," *Policy & Internet* (7:3), pp. 340-361.
- Radaelli, C. M. 1995. "The Role of Knowledge in the Policy Process," *Journal of European Public Policy*, (2:2), pp. 159-183.
- Radaelli, C. M. 1999. "The Public Policy of the European Union: whither Politics of Expertise?", *Journal of European Public Policy* (6:5), pp. 757-774.
- Ragin, C., and Amoroso, L. 2011. *Constructing Social Research: The Unity and Diversity of Method*. 2nd edition. Pine Forge Press – Sage Publications: California, USA.
- Raus, M., Flügge, B., and Boutellier, R. 2009. "Electronic customs innovation: An improvement of governmental infrastructures," *Government Information Quarterly* (26:2), 246-256.
- Rogers, E. 2003. *Diffusion of Innovations – Fifth Edition*. The Free Press: New York, USA.
- Wu, I. L., and Chiu, M. L. 2015. "Organizational applications of IT innovation and firm's competitive performance: A resource-based view and the innovation diffusion approach," *Journal of Engineering and Technology Management* (35), pp. 25-44.