

Electronic Citizens Participation: Systematic Review

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ABSTRACT

Citizen participation is considered as one of the core elements of transparency of Governments with regard to their citizens. In these participations, Governments generally ask people to give their opinions with regard to particular subjects. Governments then consider these opinions in their decision-making process. With the emergence of new ICTs that are widely spread and used by citizens, Government made a shift from face-to-face citizens' participation to an electronic citizens' participation or the so-called e-participation. In this context, governments need to identify the best means to achieve electronic participation in a way and a time that gives the citizens the opportunity to have a real influence on the decisions to be made. However, the literature shows that there is no consensus about these means. This paper is an attempt to examine, through an extensive literature review, the current state of the art about e-Participation. Results show that social welfare is the dominant domain in which e-Participation was conducted. They show also that social media technologies are the most used to conduct e-Participation initiatives.

CCS Concepts

• Applied computing~E-government

Keywords

Public Engagement; Citizen Participation; e-Government; e-Participation; e-Consultation

1. INTRODUCTION

Citizens' engagement is a form of democracy in which citizens are part of the decision making process with regard to the development of their society. In order to help increase transparency, trust, acceptability, and legitimacy of their decisions, policy makers are encouraging members of the public to engage in such a process and express their opinions. In this context, citizens exercise their democratic rights by actively participating in public decision processes either on an individual basis or in organized citizen groups.

Governments worldwide are adopting increasingly new Information and Communication Technologies (ICTs) to modernize their organizations, strengthen their operations and make them more responsive to the needs of their citizens. On the

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other hand, citizens in many countries are asking for more roles in decisions processes by directly interacting in a transparent mode with their governments. This interaction can take the form of electronic citizen participation (e-Participation). Through e-Participation, ICTs can help governments become better listeners to the needs and aspirations of their citizens. This new version of conventional citizen engagement has been intended to better promote transparency, trust, collaboration, strengthens, wealth and security of citizens by helping to make governments decisions more rational and effective. In addition, e-Participation is considered as a two-way communication between government and citizens that provides new opportunities for mutual learning. Hence, the concept of electronic participation (e-Participation) emerged as a mean, in the age of technology, for citizens to express their opinions. E-Participation can be considered as a new input that decision-makers have to integrate with their other sources of information, in order to take decisions.

Over the last decade, e-Participation has moved from theoretical concept to a reality of serious inquiry. In this context, public and private organizations have conducted numerous global, national, regional and local e-Participation initiatives. Moreover, some scholarly journals and conferences have assigned tracks and sections to papers and books written about e-Participation. Furthermore, a number of research laboratories and academic programs have been formed worldwide focusing on e-Participation.

e-Participation is a multi-disciplinary research area in which researchers from different fields and disciplines can be involved. In fact, there are various barriers and constraints facing the development and growth of e-participation. These barriers and constraints can be related for example to ICT's acceptability by citizens, accessibility to ICT's, governments' permissibility to use ICT's, financial constraints related to ICT's infrastructures [6, 52, 57]. These difficulties can also be related to conceptual and organizational contexts such as for example the reliability of the models and the tools used in e-Participation, the efficiency of organizational methods used to manage the e-Participation researches and projects, the resistance to change the traditional structure of governments, lack of resources, and missing interest [3, 27, 22].

This paper is a guide for the review of previous research on the topic of electronic citizen participation. It brings out several directions for future research that would help managers, decision makers and researchers to better understand the dynamic of electronic citizens' participation used in public consultation. In this review, we first identify the most relevant works in e-Participation. Then, we provide a framework to classify the selected works by dates, by location, and by cases.

The rest of this paper is organized as follows. Section 2 provides a quick overview of citizen participation. Section 3 describes the

literature review and the obtained results from this literature review. Section 4 presents an analysis and a discussion about the results of our systematic review. Section 5 concludes this paper.

2. CITIZENS' PARTICIPATION

Citizens' participation is a form of democracy in which citizens are part of the decision making process with regard to the development of their society [23, 36]. It can be defined as an interactive process between citizens themselves and between citizens and government officials in order to significantly contribute in public policy decisions in a transparent and responsible manner [58]. In other terms, citizens' engagement can be seen as forms of individual or collective actions allowing to identify and to deal with questions of public interest [31]. For example, different participatory initiatives were organized in cities such as participatory budgeting [62, 80], participatory development [9], democracy [4, 49] or street design, schools areas management [40].

2.1 Conventional Public Participation

In the literature, traditional public participation is a general term for any process that involves public input in decision-making [8, 64]. This process aims informing citizens and allowing them to give their opinions, about a special issue, to policy-makers with the aim to influence their final decisions in that issue. The main objective of public participation is to strength the relationship between citizens and their governments; governments aim to show that they listen to their citizens and that they consider their voices when making decisions.

In order to put in place a public participation, governments should put in place a clear and a simple process for citizens in order to encourage them to take part to this participation. However, it does not exist a single process that governments have to follow in order to put in place a public participation since the means that can be used in public participation are of different forms and formats. One of the most cited processes is a three stages plan that governments can use to develop a public participation. These stages involve many tasks and they are based on different participation techniques [8, 21]. The first stage consists on analyzing the context in which the public participation program will be conducted. It aims to prepare the public participation by identifying the subject of the participation, the location where it is going to take place, the public that will take part to this participation, and the timeline of the participation. The second stage allows identifying the public participation activities and how they will be accomplished including for example how citizens will be informed, how meetings will be conducted, how data will be collected, how data will be transferred to policy-makers, and how citizens will be informed by the decisions after the participation. The third stage consists on implementing the public participation by carrying out its activities. The success of the last stage largely depends on public involvements. Therefore, the necessity to involve the public in a decision-making is hardly discussed in the literature [17, 51]. Before asking people to spend their time responding public participation activities, it is necessary to first ensure that they have the means to participate in a way and a time that gives them the opportunity to have an influence on the decisions to be made [59, 76].

Even if public participation is an excellent mean of transparency and trust between governments and citizens, it is important to note the limits of face-to-face public participation. First conventional participation includes public notice, comment periods, advisory boards, or traditional public meeting. In these conventional participations, citizens are given, few minutes to express their

opinions at an open microphone. Doing so, this technique favors generally the most confident and infuriated speakers and not all speakers. In this case, some of the participating people, and that have not had the opportunity to express their ideas, are leaved more frustrated and distrustful than before. In addition, some of the meetings deviate from their main subject, since the citizens take the opportunity to reaffirm their role as protesters of other decisions that were made without their knowledge [50, 51]. These factors and others depicted in literature [39, 43], drive people to simply stay home, since getting involved in this way does not provide them with what they want.

In recent years, the use of Information and Communication Technologies has widely spread around the Globe and ICTs become available to citizens anywhere and at any time. Hence, governments tried to take advantage of the availability of ICTs to transform their relations with citizens. ICTs are then helping governments to outreach citizens to determine their needs and preferences in public policies and services, and are enabling citizens to access public institutions and have their voices heard. Consequently, governments decided to use ICTs for public participation as a new mean to hear their citizens. So, governments decided to organize both types of citizens' participation: face-to-face citizens' participation and electronic participation. In this case, governments should consider how best to deploy the optimal mix of conventional and ICT's modalities to reach the various social groups among their populations. This paper will focus on electronic participation (e-Participation) as a mean, in the age of technology, for citizens to express their opinions.

2.2 Electronic Participation

The process of engaging citizens through ICTs in policy and decision-making in order to make public administration participatory, inclusive, collaborative and deliberative is called e-Participation. Electronic participation has been referred to in the literature in different names such as on-line public engagement [12, 27], web-based citizen inputs [20], or e-Consultation [83]. As stated in [77], the use of ICTs in an e-Participation initiative can increase the supply of useful information, enhance consultation, and support decision-making. In this context, citizens' inputs will guarantee transparency of the taken decisions, and will reflect the values of good governance [25]. E-participation can be viewed as a new channel of inputs of data that may not be collected by face-to-face public consultation. With this new input, e-Participation will enhance the quality of a decision or a policy and ensures that it reflects citizens' opinions.

The combination of both modes of citizens' participation, face-to-face and electronic, allows governments to adapt their decisions in public policies and services to further meet the needs and preferences of their populations without excessive costs since ICTs are widely used and accessible by citizens. In most cases, governments will not have to deploy a new infrastructure but have to adapt the existing technologies to its needs. This is why, the development of a respectful and a responsible collaboration between citizens and governments to promote the common goods can play a valuable role for current and future generations. This collaboration supported by modern ICTs is transforming the governments' interface and relations with citizens.

In what follows, we present a literature review about e-Participation. The literature review mainly answers to the following questions: how do publications in e-Participation evolve over time? Where these publications are produced? What are the domains in

which e-Participation is applied? And what are the tools that were used in e-Participation?

3. LITERATURE REVIEW

This section provides a systematic literature review about e-Participation. First, we present the approach used to select the papers for this literature review. Then, we provide the classification of the selected papers according to the years of publication, the regions where these papers are published, the domains in which e-Participation was used, and finally the tools that were used to implement the e-Participation activity.

3.1 Literature Review Approach

This systematic literature review is conducted through two steps: (1) the strategy of locating and selecting the potential studies and, (2) the setting of inclusion criteria [35]. This literature review has been conducted in the following databases: ACM Digital library, IEEE Xplore, Springer Link, Science Direct, Inspec and arXiv.org. These databases cover both social science and engineering scientific publications. Doing so, we ensure that the literature review covers these two research domains and consequently may ensure its completeness. This research was done specially on conference and journal papers on the period of 2000-2015 considering that e-Participation is a recent research domain.

This literature review has been conducted using the following keywords: "e-Participation" or "electronic citizens' participation" or "electronic public participation" or "online public engagement" or "web-based citizen input". The first results from the search in the different databases generated a total number of 329 papers. Then, these papers were scrutinized by different analysis levels. A first pass on paper titles, then a second pass on papers abstracts, and finally a third pass through papers contents in order to select only relevant papers for this literature review. The relevant papers are those that present studies about e-Participation initiatives. All the papers that were not presenting initiatives were not selected. This analysis left finally 182 papers that will be included in this review.

From these 182 papers, there are 115 that are journal papers, and 67 papers that are conference papers. From the 115 journal papers, the International Journal of Electronic Governance is the journal that has the most selected papers in this literature review with eighteen journal papers. Table 1 summarizes the top 7 journals with the most selected papers along with the total number of selected journal and conference papers.

Table 1: Top 7 journals on number of selected papers

Journals		
	Search results	Selected papers
International Journal of Electronic Governance	20 (14,29%)	18 (15,65%)
Government Information Quarterly	19 (13,57%)	16 (13,91%)
Transforming Government People Process and Policy	14 (10,00%)	12 (10,43%)
International Journal of Electronic Government	13 (9,29%)	9 (7,83%)
Information Polity	12 (8,57%)	8 (6,96%)
Electronic Government	9 (6,43%)	8 (6,96%)

Journal of Information Technology and Politics	11 (7,86%)	7 (6,09%)
Total number of journal papers	140	115
Total number of conference papers	189	67

3.2 Distribution by Year

The evolution of publication in the last fifteen years, as depicted in Figure 1, shows three periods of publication: 2000-2005, 2006-2012, 2012-2015. For the first period, 2000-2005, the number of publications was stable and not high; it was less than five publications per year. The explanation to this observation is given by the fact that during the beginning of the 20th century, ICTs and mobile technologies are started making their first advances. ICTs were not widespread and widely used by either governments or citizens. Governments were holding conventional participatory initiatives but have not yet made the shift to electronic participatory initiatives. Hence, only scattered initiatives were initiated in some countries. In this context, at the beginning of the 2000's, politicians have not yet captured the impact that ICTs can have on society even if researchers associated e-Participation with political decision-making processes, administration officials, elected representatives and public leaders [15, 34].

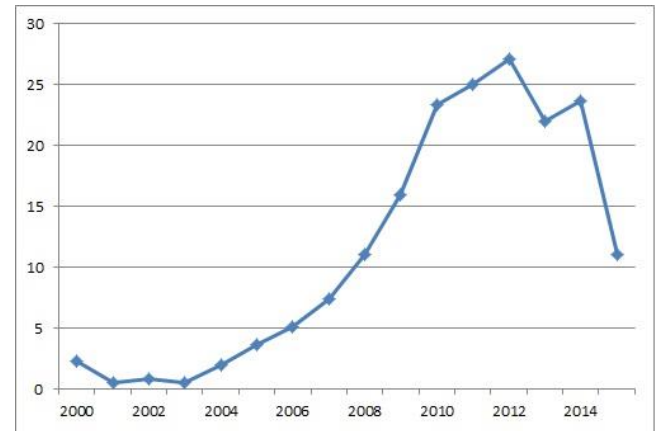


Figure 1: Distribution of papers by year

For the period 2006-2012, effective experimentations and research about e-Participation have started to be carried out worldwide. The emergence of social networks and the accessibility of citizens to new ICTs increased opportunities for citizens to participate in public decision-making using ICTs. Governments took advantage from these technologies to involve citizens in their decision-making process and by increasing the number of e-Participation initiatives. During this period, there was emergence of an active scientific and practitioner community, made up of academia, governments and solution providers [2, 47]. In this context, several scientific journals and international conferences were devoted to e-Democracy.

However, in the period of 2012-2015, a decrease in the number of papers that were published is observed. One of the main reasons behind this decrease is that governments were not able to provide tangible results about past e-Participation initiatives. In fact, the overall impact of different e-Participation initiatives was quite modest, since e-Participation's advances faced many different difficulties and challenges from different perspectives: political, economical, legal, technological, social, and cultural [27, 22, 65] which explain the tendency of the graph between 2013 et 2015 [66, 73].

3.3 Distribution by Region

Figure 2 presents the distribution of the reviewed papers by region according to the first author country. It shows that the European countries are the first to contribute in e-Participation field. European countries are followed by North American and Asian countries. We find Australia and African countries in the last positions.

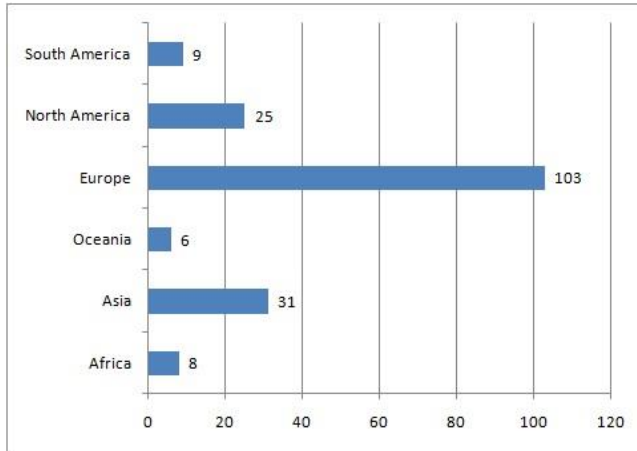


Figure 2: Distribution of papers by region

These results are in concordance with the regional ranking provided by the United Nations of the top 50 countries on e-Participation. In this ranking, there are 21 countries from Europe, 14 from Asia, 10 from Americas, 3 from Africa and 2 from Oceania [53]. For example, if we consider the case of Europe, since year 2000, the European Union has financed at least a hundred projects in this field which aimed to address various issues at the local, regional, national and European levels, by applying different methodologies and technologies.¹ The implementation of these projects was mainly carried out by consortiums in which academic, governmental and business partners from different European countries took part [42, 45, 55, 75].

3.4 Distribution by Domain

Among the selected papers, 84 papers present a case study or an example of an e-Participation initiative and that is related to a particular domain such as education, health, finance, social welfare, technology, or environment.

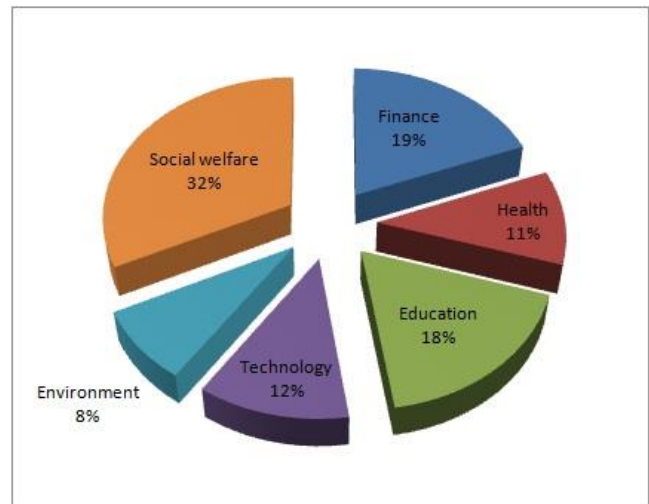


Figure 3: Distribution of papers by domain

Figure 3 shows that social welfare is the domain that the most e-Participation initiatives. Finance and education are in the second place for the most e-Participation initiatives. For the finance initiatives, the last United Nations survey about e-Participation [53] showed that several countries have put in place different e-Participation initiatives related to budgeting, and to policies and legal issues related to the financial sector. However, environment is the domain that has the less e-Participation initiatives. This is aligned with the United Nations survey about e-Participation [53] that also indicates that governments and citizens are more and more concerned with environmental threats like climate change fallouts, fossil fuels depletion, or biodiversity menaces. This may lead to a new distribution by domains for the upcoming years.

3.5 Distribution by Tool

A key factor that impacts the conduct of an e-Participation activity is the use of adequate technologies on both the side of governments and that of citizens. Figure 4 provides a distribution of 78 selected papers that mentioned the tools that were used in their presented examples or cases studies. The obvious point is that most of papers tend to discuss the use of social media at the expense of other online tools. 41 per cent of papers talk about an implementation of e-Participation activities through social media, 24 per cent through online forums, 22 per cent through governments' official web sites and 13 per cent through other online technologies. These results are in agreement with the comparison provided in the last United Nations survey about tools used by governments for e-Participation [53]. This tendency can be explained by several factors, mainly, because citizens are already very present and familiar with social media platforms. These platforms provide an opportunity for governments to bypass the development of their own platforms. In addition, social media initiatives do not require high investment costs for governments and citizens.

¹Online database of EU research projects, CORDIS.<http://cordis.europa.eu>

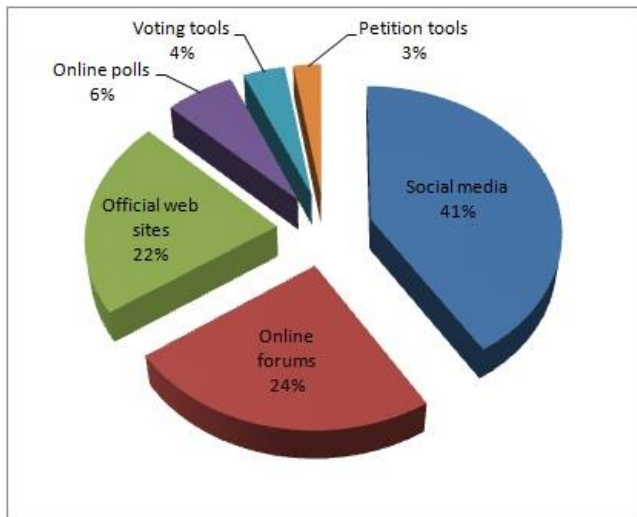


Figure 4: Distribution of papers by tool

The analysis of the reviewed papers shows that these tools are mainly used to perform four types of citizens' participation:

- Consultation: citizens will be asked to approve a choice or to give their opinion.
- Cooperation: citizens will be invited to propose new ideas besides giving their opinion.
- Co-decision: citizens will directly participate in a decision preparation.
- Evaluation: represents an ultimate level of participation, allowing citizens to evaluate the effectiveness of a decision implementation.

Figure 5 shows that social media and online forums are mostly used to perform consultation and cooperation activities. Governments' official web sites are used for citizens' engagements that involve direct decisions and evaluations. The other online tools are only deployed to gather citizens' opinions and ideas.

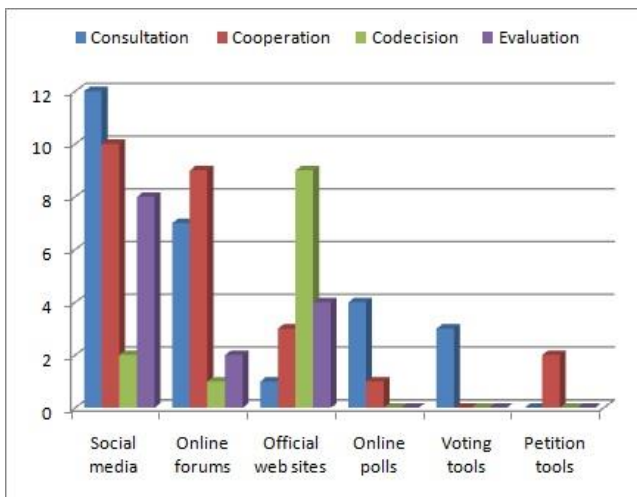


Figure 5: Distribution of papers by tool/participation type

²<http://www.demo-net.org>

³<http://islab.uom.gr/eP>

⁴<http://www.ep-momentum.eu>

4. DISCUSSION

In the literature, e-Participation is considered as a very dynamic and transformative area with an increasing capacity to disrupt existing power balances [78]. This transformative potential of e-Participation is being increasingly acknowledged by governments and international institutions, as illustrated by the attention that e-Participation receives in the United Nations e-Government reports [53]. For example, in Europe several initiatives, sponsored by the European Union (EU), the Council of Europe and European national governments, have contributed to the consolidation of this field as a scientific and research domain [42, 75]. Authors in [46] appraise the development of e-Participation over the last decade and try to identify the main challenges and barriers of this field in order to establish future research directions. A similar work has been done in [41, 74, 82] trying to establish theoretical, analytical and methodological frameworks for the field, as well as providing ontologies and evaluation models, which aim to guide research, design and practice of e-Participation. Even so, these frameworks are still too exploratory and it is difficult to apply them to real-world initiatives [1, 61]. Different proposals are made to governments to improve the used approaches for promoting and implementing e-Participation in [5, 7, 10, 11]. These efforts aimed to address different objectives of e-Participation at the local, regional, national and international levels, by applying various technologies and methodologies. Even though, much work remain to be done by academics, governments and practitioners to improve e-Participation features if they wish to lay the foundation for soliciting active public participation.

The analysis of the selected papers in our study led us to draw some important challenges facing the e-Participation development. In what follows, we expose these challenges. But before that, we will first give a brief overview of some practical achievements in the field worldwide.

4.1 E-Participation in Practice

The reviewed articles referred to many projects and experiments that intended to implement e-Participation tools and models [13, 70]. For example the European Union has promoted several e-Participation research programs such as the "eTEN", the "ICT-PSP" programs and the "e-Participation Preparatory Action" which have funded a significant number of e-Participation trial, development and deployment actions [63]. In addition, at least a hundred of projects have been financed in this field since year 2000 [42, 45, 55, 75]. The execution of these projects was mostly guided through consortium that included governmental, academic and business partners. A network of excellence for e-Participation research, DEMO-net², was established in 2006 and was later complemented with several research and evaluation studies, including the European e-Participation Study³, Momentum⁴ and Crossroad⁵ with some initiatives to establish networks of e-Participation investors and experts like Pep-Net⁶. Important studies and reports about these projects have been published to disseminate e-Participation knowledge to governments' actors and citizens [56, 72, 68].

In Canada and USA, different e-Participation platforms are largely deployed on local level allowing people to contribute to the development of the municipalities and provinces where they live and give their opinions on various projects that affect their future

⁵<http://crossroad.epu.ntua.gr>

⁶<http://pep-net.eu>

[19, 71, 85]. In Asia for example, the parliament of Malaysia has provided a technological infrastructure for e-Participation. This infrastructure allows politicians and members of parliament to fully utilize the internet-based tools to reach out to their constituent members [30, 84]. South Korea provides multiple channels web portals such as Seoul City's Oasis⁷, to allow citizens submit their ideas, discuss online or organize meetings with civil servants [33].

Brazil, on its national portal, provides a detailed search feature that allows citizens to locate the appropriate department to apply for different services of government and give their opinions [16, 60]. In Andorra, Argentina, Chile, Columbia, citizens can express their views and post comments through government social media pages and use on-line forums and blogs, to communicate with government officials [81, 44]. Citizens in Australia and New Zealand can send suggestions and comments on draft regulations to the concerned ministries and consult outcomes of previous e-Participation activities [28, 29]. In South Africa, across Africa and in other developing regions, e-Participation is supported by the Center of ICT for development (ICT4D)⁸ that seeks to produce new technologies to achieve economic, social and political goals in low-resource or low-income regions [48, 54, 79].

4.2 E-Participation Challenges

This literature review depicted that e-Participation is an emerging field still characterized by a lack of definitions, theories, methods and tools [46]. Despite the significant amount of resources invested to support e-Participation, the field does not seem to have advanced as much as expected.

The first challenge that was observed from this literature is that e-Participation is presented as a new field that is totally disconnected from conventional participation. However, several concepts, theories, and methods were developed in the context of conventional "Citizen Participation", and that could enhance e-Participation domain. In fact, an analysis of the retained papers in our study reveals some attempts to develop the e-Participation domain without considering the conventional "Citizen Participation" achievements. First, some works present e-Participation as a new research field that consider different disciplines, fields and research areas such as political sciences, sociology, psychology, information systems without mentioning "Citizen Participation" or "Civic Engagement" as pre-existing field [67, 24]. Second, most of the theoretical background in e-Participation literature is inspired by political science, particularly, deliberative public field and democracy models [46, 67]. While, other papers state that the knowledge developed in the areas of conventional "Citizen Participation" or "Civic Engagement" should be applied in e-Participation especially as any credible civic engagement exercise need to include some ICTs supporting [14, 16, 26, 27].

The second challenge is related to the topic, and to the tools and methodologies used in e-Participation initiatives. We observe that some of the proposed topics can have unrealistic assumptions, limited impacts on citizens, or simply are away from citizen's priorities. Also, we observed that the tools and methodologies that are used to achieve e-Participation objectives could be inappropriate or simply unknown to the public. To address these weaknesses, evaluation methodologies are needed. However, most of evaluation tools that have been used are quite complex and have provided unsatisfactory results [2, 1, 56, 60]. Moreover, it is very

difficult to perform empirical and comparative studies about e-Participation projects given their differences and divergences [1, 18, 38]. These differences generally concern project size, duration, methods, topics, resources and involved partners.

The third challenge is related to multi-disciplinary nature of e-Participation that has a very technical foundation but at the same time involves political, cultural and social disciplines [82]. Therefore, research in the field of e-Participation depends on a wide range of disciplines, like social, political and communication sciences, information technologies, etc. In fact, the conjugation between disciplines is still unusual and works that refer to different disciplines do not as much combine them, but gather them together [24]. The leverage of benefits from e-Participation interdisciplinary continues to be a too hard challenge [82].

The fourth challenge is related to the extensive use of social media as technologies to conduct e-Participation. In fact, governments ought to use social media to collect and take into account citizens views and feedbacks for different reasons. First, people are already very present and familiar with social media platforms that provide an opportunity for governments to avoid the setting up their own platforms. Second, social media initiatives do not require high investment costs. However, authors in [37] state the emergence of governments to build new on-line communities and suggest that it may be possible to design socially mediating technologies that support public-government collaborations. This will allow governments to not be dependent on social media tools. In this context, different e-Participation initiatives pay much more attention to scalability and attempt to take advantage of citizens' interactions in the existing social network services to support the policy formulation processes, rather than inviting them to visit government platforms. Propelled by this reality, the autonomous advances in e-Participation practice are speeding up, and e-Participation research and theory may soon not be able to keep pace with them [32]. Researchers are increasingly conscious that the approaches used for promoting e-Participation need to be developed, and are making different propositions in this perspective [5, 7, 10, 11].

Finally, the preparation of an e-Participation initiative should answer the following questions: "why", "who", "when", "where", and "how". The answer to the question "why" should link the role of the public with the intended outcomes of the e-Participation activity. In addition, this question should reflect how the public might provide additional information or knowledge to the decision-makers. The "who" identifies the individuals, groups and organizations that the e-Participation initiative should reach. For example, an e-Participation initiative can be addressed to a category of citizens: elders, workers, or students, to cite a few. Once the targeted population is identified, it is necessary to identify the timeline (when) of the initiative from when it starts to when it ends. An inadequate time frame can reduce the quality of inputs and can undermine the credibility of the e-Participation initiative. It is also important to identify the technological means (where), such as social media platforms, websites, or mobile applications for example, where the initiative will take place. Finally, it is important that governments notify and inform the public about the initiative in order to ensure its participation. The notification should provide general information about the e-Participation activity, and the involved institutions. Citizens can then decide if they are interested to participate. Hence, the preparation of the initiative can be then

⁷<http://oasis.seoul.go.kr>

⁸<http://ict4d.cs.uct.ac.za/>

considered as a premise for its success. Hence, one of the main challenges for governments is to evaluate if the e-Participation process was successful or not.

5. CONCLUSION

This paper presented a survey about electronic citizens' participation literature. In this survey, 182 papers have been reviewed and that were published between 2000 and 2015. The literature review showed that most of published papers are journal papers, that most of publication were done in European Union countries, that most of publications have been conducted between 2006-2012, that the most domain in which e-Participation initiatives were conducted is social welfare, and that social media are the most tools used to conduct e-Participation initiatives. This study revealed also different research challenges that remain open for future research and that require more attention from the research community. This study showed that e-Participation is a multi-disciplinary research field that brings a complexity in order to build new theories and methodologies to study e-Participation initiatives. It showed also that there are not enough studies that talk about different issues when implementing an e-Participation initiative such as organization, management, or evaluation of e-Participation initiatives.

Despite the identified challenges that were described in this paper, we think that there is other challenges that need to be addressed in future research. First, with the emergence of on-line communities and social media, one of the main challenges of the e-Participation is to provide an effective mediating technology to collect and take into account information provided by citizens. However, if the participation of citizens increases through ICTs, the mass of information that governments need to process will inevitably increase. Hence, the second challenge is that governments will be submerged by the acceleration of this scattered, multiform and continuous stream of information collected from citizens. This information has also the characteristic of being complex and heterogeneous (different sources: email, social media comments, images, videos, etc.). In addition, its structure differs from one field to another. However, this information is not necessarily relevant or true and it may be inaccurate and incomplete. Although, the ability of governments to gather this information goes beyond their ability to process, analyze and exploit it. Therefore, the third challenge consists in providing customized and evolutionary models and systems to extract and analyze knowledge from this data.

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