Citizens' electronic participation: a systematic review of their challenges and how to overcome them

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Abstract: The evolution of the internet and the popularity of the social media have brought new possibilities for citizens' participation into government decision-making. Laws, in democratic countries, have enforced government's data and process transparency. Nevertheless, the e_government research has demonstrated that citizen's participation is still very low. This paper presents a systematic literature review of e-participation research addressing three questions: 1) what are the reasons for the low citizens' participation?; 2) what is the role of the government in e-participation?; 3) what are the current approaches to promote e-participation? Although participation is a right for which the citizens should be fighting for, they have been neglecting to act. Researchers have indicated the government still plays a central role since information and opportunities flow through the government-controlled technological platforms. Nonetheless, there is hope, to initiate a virtuous cycle in which citizens control and expand popular participation, leading to a greater demand for government action.

Keywords: systematic review; e-participation; engagement.

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1   Introduction

In recent years, a growing share of the population has accessed the internet. Currently, citizens not only consume, but also produce and share information over the social media. Rejoicing or revolting with the displayed information, citizens manifest themselves in their social networks. These manifestations are about other citizens, corporations or governments. The social media empowered citizens by providing a rapid echo for their opinion to voice their needs to corporations and, even, the government.

Citizens' pressure all over the world has resulted in the development of e-participation platforms to inform citizens of government decisions, actions and expenses, to provide services and to source citizens' demands. In Brazil, electronic government has been implemented for many years (Dias-da-Fé et al., 2016) with successful examples such as electronic voting and online income tax services. However, theses services were aimed to assist the government to acquire citizens' information. After popular pressures that occurred in 2013, the government issued a decree to stimulate actual e-participation.

E-participation involves the extension and transformation of participation in societal democratic and consultative processes, mediated by information and communication technologies (Sanford and Rose, 2007). Zheng (2017) states "e-participation applications refer to the applications on government websites that enable citizens to interact with government and participate in decision-making processes." According to Sæbø et al. (2008), it aims to support active citizenship with the latest technology developments, increasing access to and availability of participation in order to promote fair and efficient society and government. The internet and the social media should be the sufficient technologic ingredients to allow full democracy (Ferber et al., 2007).

Electronic participation, i.e., participation using digital media, improves the effectiveness of political decision-making, increasing opportunities for citizens to participate in policy-making. This participation also minimises distortions in the government's understanding of the needs and preferences of its citizens, as well as legitimises government decisions and improves citizens' trust in government, since they perceive government to be more transparent and responsive (Tolbert and Mossberger, 2006). Policy implementation can be more successful and face less opposition from citizens when the policy better integrates their visions into the planning process. Criticisms of government performance can be reduced through various strategies that incorporate participation and sharing of information (Berman, 1997). In the face of all this, Porwol et al. (2012) states that citizen participation is an imperative in every modern

democracy and e-participation is considered possibly the best solution for future policy making.

Information is there through the internet. The social media is there to connect people and help them to organise themselves. Nevertheless, although citizens seem to master the social media technology for leisure, they are not using the available online government platforms to get informed, monitor the actions or communicate with the government. If on the one hand the internet allows citizen participation, on the other there is a lack of interest, trust and participation of citizens in democratic politics (Quental and Gouveia, 2018). Cruickshank et al. (2009) consider that 1% participation in any e-participation initiative is a success. However, Ferro and Molinari (2010) concluded that only 3 to 5% of the population participate in electronic consultations. Other data show that 90% of internet users are 'lurkers' (Lange et al., 2008) and 9% contribute in small extent (Nielsen and Tognazzini, 2014).

This fact triggered our curiosity to understand the government-citizens interaction. This paper reports a systematic review addressing the following questions.

1   What are the reasons for the low citizens' participation?

2   What is the government's role according to the literature?

3   What are the approaches to promote e-participation?

The remainder of this paper is organised as follows. Section 2 explains how this systematic review was conducted. The results are presented in Section 3. In Section 4, we present the e-participation situation in Brazil according to the three research questions. Section 5 presents an analysis of what was found in the literature. Section 6 concludes the paper and outlines future work.

2   The literature review method

We conducted a systematic literature review to assure covering all relevant material that shed light on our research questions, as pointed by Magdaleno et al. (2012). Our study was conducted in three main phases: planning, execution and reporting.

2.1   Planning phase

During the planning phase, we identified the review objectives, specified the research questions, and developed the review protocol that specifies the inclusion and exclusion criteria and document the search strategy.

2.1.1   Objective and research questions

This study aims to understand the status and identify, within the e-government research area, the barriers preventing and the incentive mechanisms fostering the citizens-government interaction through virtual environments. The virtual environment represents any internet platform, such as websites, for direct and indirect communication between citizens and the various spheres of government.

Our research was guided to answer the following questions:

Q1 What are the reasons for the low citizens' participation?

Q2 What is the government's role according to the literature?

Q3 What are the approaches to promote e-participation?

2.1.2   Search string

The papers were selected following pre-established search expressions. We followed the population/problem, intervention/exposure, comparison, and outcome (PICO) literature review process (O'Connor et al., 2008). PICO is a technique used in evidence-based practice to frame and answer research questions. For each paper, we looked for the characteristics of the population being studied; the intervention, if any, proposed; the comparison of the results with related research and the outcome and contribution.

Our search string was as presented in Table 1.

Table 1   The search terms used in PICO search.

PICO	Search string
Population/problem	Citizen participation OR citizen-initiated e-participation OR threats to participation OR lurking.
Intervention	Online government system OR online government platform OR eParticipation OR egov
Comparison	
Outcome	Theory OR approach OR method OR model

2.2   Execution phase

The search string was executed over the Scopus and IEEE Xplore databases on 9/14/2018. Twenty-two papers returned from the Scopus database and twenty nine papers from IEEE Xplore after the execution of the search expression. Due to the amount of returned publications, we do not use exclusion criteria and include all papers. Thus, all these publications have been completely read, evaluated, analysed and compared.

2.3   Reporting phase

The results from the previous phases have been documented and are presented in Section 3.

3   Findings

### 3.1   Q1: what are the reasons for the low citizens' participation?

The reasons for the citizens' low participation represent the barriers for participation. We classify the barriers between technical and non-technical. Technical barriers are those in which the impediment to participation can be solved by adjusting or introducing new ICT (information and communication technology). We consider non-technical barriers otherwise. As illustrated in Figure 1, there are 15 barriers: five techniques and ten

non-techniques. Technical barriers are presented by the dotted lines, while non-technical barriers are presented in solid lines.

The 15 barriers are independent from each other. However, one barrier may stimulate another. For example, the barrier 'lack of alignment between the topics being discussed and the daily issues and priorities of the citizen' can lead to 'lack of interest in political issues'. However, these two barriers are different and should not be grouped. It cannot be said that the citizen has no interest in political affairs because the topics discussed are far from his or her priorities. Van Deth and Elff (2004) argue that without a minimum of curiosity about politics, citizens become unaware of the opportunities they missed to defend their own welfare and to contribute to collective decisions. Accordingly, dissolving one barrier may lead to solving another. For example, bringing citizens to participate in online debates may foster their interest in political engagement.

In Figure 1, we present the 15 barriers organised in a sequence according to their degree of severity. The degree of severity was evaluated considering how hard is to solve the barrier from the government perspective. For example, as observed in Figure 1, accessibility issues are easier to address than integration to other government systems.

Figure 1 Barrier's degree of severity
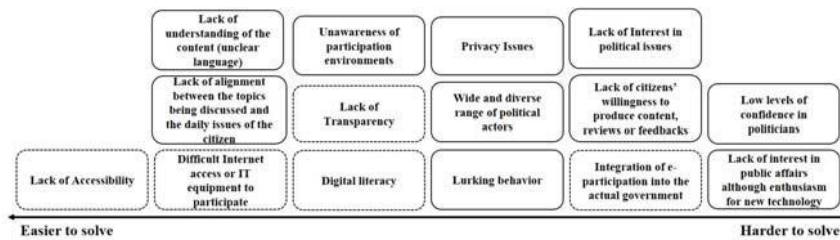
In general, technical barriers are easier to solve because the government can take advantage of technology to combat the barrier (accessibility, internet access or IT equipment to participate). On the other hand, non-technical barrier depend on the willingness of the population. Breaking the inertia of the crowd is harder. It involves educating people to combat the digital illiteracy. It involves promoting and advertising participation environments (unawareness of participation environments). It involves creating a government's routine to maintain the government sites up-to-date and accessible to all (transparency and topics far from daily problems). It also involves making sure the information is presented in a lawman understandable form (clear language). Most of the barriers that present a greater degree of difficulty cannot be solved by isolated actions of the government (interest in political issues, lurking, more enthusiasm for new technology, minority of users are willing to produce content, low levels of confidence in politicians). Other barriers may require changes in the government's own structure (current government, wide and diverse range of political actors). Maintaining citizens' information privacy and government access safety present challenges because the government needs to prevent possible fraud in participation.

Table 1 complements Figure 1 by indicating the source from each of the barriers. Eight, out of the 15, were mentioned by more than one author. Lack of transparency was the most popular cited barrier for citizens' participation. Being mentioned by different

researches shows the importance of these barriers and the need of actions to promote greater citizen participation.

Table 2   Barriers by author

Barriers	Authors
Digital illiteracy	Jung et al. (2015), Sanchez-Nielsen and Lee (2013), Thiel (2016) and Charalabidis et al. (2010)
Difficult internet access or IT equipment to participate	Thiel (2016)
Integration of e-participation into the actual government	Sanchez-Nielsen and Lee (2013), Charalabidis et al. (2010)
Lack of accessibility	Bicking et al. (2011)
Lack of interest in political issues	Thiel (2016), Sanchez-Nielsen and Lee (2013), Charalabidis et al. (2010) and Rexhepi et al. (2016)
Wide and diverse range of political actors	Sanchez-Nielsen and Lee (2013)
Low levels of confidence in politicians	Thiel (2016), Sanchez-Nielsen and Lee (2013) and Caetano et al. (2017)
Lack of understanding of the content (unclear language)	Sanchez-Nielsen and Lee (2013) and Farina et al. (2013a)
Lack of alignment between the topics being discussed and the daily issues and priorities of the citizen	Charalabidis et al. (2010)
Lack of citizens' willingness to produce content, reviews or feedbacks	Charalabidis et al. (2010)
Privacy issues	Thiel (2016), Sanchez-Nielsen and Lee (2013) and Santamaría-Philco et al. (2016)
Unawareness of participation environments	Charalabidis et al. (2010) and Bicking et al. (2011)
Lack of interest in public affairs although enthusiasm for new technology	Thiel (2016)
Lack of transparency	Potra et al. (2015), Girish et al. (2012), Chaieb et al. (2018) and Bolívar (2018a, 2018b)
Lurking behaviour	Jung et al. (2015)

Another way of looking at the participation barriers is to observe the citizens' participation capacity and willingness. According to the OECD Publishing report (2009), citizens that do not participate can be further specified two major groups:

1   Citizens that are willing, but unable, to participate for a variety of reasons, such as cultural or linguistic barriers, geographic distance, disability or socioeconomic status. In general, what prevents people in this group from participating are technical barriers, since they cannot participate without being able or have the means to do so.

2   Citizens that are able but unwilling to participate because they are not very interested in politics, do not have the time, or do not trust the government to make good use of their contribution. People in this second group do not participate because of non-technical barriers. They are able and have the means to participate but do not participate online for the same reasons they do not participate offline.

3.1.1 Technical barriers

Digital literacy is related to the fact that not every citizen knows how to use ICTs. Digital literacy can keep individuals restricted in what they can do and which information they can access (Bhatt and MacKenzie, 2019). Regarding digital literacy, Sanchez-Nielsen and Lee (2013) argue that the use of ICT solutions are not enough and suggests the use of various channels of participation, including face-to-face communication. Charalabidis et al. (2010) claim that the adopted ICT tools are not appropriate for the majority of the population becoming restricted to a well-educated minority. Thiel (2016) adverts that citizens' interaction can be even harder for older people for not mastering the new ICTs. Joining this group, there are yet those people who have an aversion to technology in general. Jung et al. (2005), cited in Sæbø et al. (2009), claims that one of the main barriers to electronic participation is the lack of civic participation in the implementation and development of public services. This can lead to the development of platforms that are new to the public and in formats that the public is not used to interact. Due to its widespread use, Twitter or WhatsApp might be alternative platforms to attract the public and encourage their engagement to the policy-making process.

In addition to the lack of skills to interact, there are those people who do not even have access to the Internet or IT equipment to participate electronically. Despite smartphone coverage of more than 90% in many European countries, there are still some who do not have access to a computer or the internet (Thiel, 2016). This barrier mainly affects the poorest groups. To overcome this barrier, Porwol et al. (2012) state that combining online with offline channels is required.

One barrier cited by several authors is the lack of transparency. Kim and Lee (2012) argue that e-participants' assessments of government transparency is related to openness, corruption, two-way communication with citizens, and fair and increased opportunities to participate in the rulemaking process in the government that provides e-participation programs. Lee and Kwak (2012), cited in Potra et al. (2015), claim the lack of transparency and frequent updating of the data can frozen citizens desire to participate. Looking at the UN's e-government index, Girish et al. (2012) claims that the lack of political freedom implies the lack of transparency. In this context, the government only discloses superficial information to pretend transparency. There are other contexts in which the government is willing to share information, but as a one-way communication, using the social media (Chaieb et al., 2018). For Bolívar (2018a, 2018b), citizens will not participate if they do not have their voices heard. Girish et al. (2012) argue that the effect of democratic institutions is quite substantial on the level of electronic participation and supports the hypothesis that a more democratic political structure increases the extent of participatory e-government in the country. Girish et al. (2012) argue that e-participation not only requires the ability to engage the public and encourage online participation, but also the commitment within the government to have a more participatory democratic decision-making process.

Another technical barrier that hampers citizens' participation is the lack of assimilation of citizens' suggestions into the actual government structures. As shown by Macintosh and Whyte (2008), many e-participation initiatives are pilots and allow only occasional participation in some areas of government. However, it is necessary to move from experimentation and pilots to large-scale usage of e-participation applications.

To be effective, technologies must be integrated into the broader spectrum of the government structure, taking into account social complexity, political culture, organisational structures and technological dependencies (Sanchez-Nielsen and Lee, 2013). Charalabidis et al. (2010) argue that the methodologies used for electronic participation were not scalable, so they could only be used in pilot trials with limited impact. We must take into account that sharing decision-making power necessarily requires a pro-active attitude of the government to lead the way (Lycarião and Sampaio, 2017). It is natural, that politicians resist to these power sharing and do not facilitate integrating these virtual environments with the existing information structure. Even when adaptations of real structures are successful, difficulties arise from serving a large and diversified population.

Bicking et al. (2011) also place the lack of accessibility as a technical barrier to reach large audiences. They argue that accessibility is the means to overcome barriers to participation so that citizens with disabilities can use ICT tools for active community engagement. However, we observe that in our daily life those social groups that need some form of accessibility are forgotten. What we perceive is that the four technical barriers could be resolved with the support of governments, providing technical training, access to IT equipment, working their internal structures to integrate electronic participation and promoting greater accessibility to promote electronic participation of more groups of society.

3.1.2 Non-technical barriers

Many of the reasons that prevent citizens from participating online are common with those that prevent citizens from participating offline (Sanchez-Nielsen and Lee, 2013). The most relevant non-technical barrier is the citizen's lack of interest in political issues (Thiel, 2016) and the fact that public administration expects the citizen to take the first step to participate in the government electronic platforms (Charalabidis et al., 2010). Van Deth and Elff (2004) argue that without a minimum of curiosity about politics, the citizen will not even be aware of the opportunities to defend their welfare and contribute to collective decisions. These people do not have the time to participate, have a poor perception of politicians, or do not trust the government to make good use of their contribution. Young people who have not entered into the working force is one example of groups with political apathy (Rexhepi et al., 2016). For Sanchez-Nielsen and Lee (2013), governments should go where the public is, rather than wait for the public to come to government.

Another important non-technical barrier concerns the politician's perception on the citizens' capacity to participate in the government decision-making process. This was observed in the work of Mahrer and Krimmer (2005), where high-ranking politicians in the Austrian Government were interviewed. Most of these politicians have argued that the average citizen is not interested in politics and is not qualified to influence government decisions that, according to these politicians, get more complex each year. Politicians have argued that it is their job to deal with this complexity, and that for this they have been elected. When asked about the future role of citizens in the political decision-making process, most politicians argued that the most important citizen participation should be to cast their vote in the polls. Mahrer and Krimmer (2005) concluded that the fear of change seems to be the major motivator for politicians to slow down the evolution of digital democracy. The politicians' perception might be right;

however, it seems conveniently right, since it is hard to rule with so many eyes monitoring the rulers. It seems a bilateral trust issue between citizens and politicians. According to Komito (2005), the interaction between the citizen and the government will allow that trust to be recovered.

Another non-technical barrier to e-participation is the fact that there is a wide and diverse range of political actors (Sanchez-Nielsen and Lee, 2013). The many political actors, acting in different spheres of government, may have different agendas that prevent effective citizens' e-participation. Yan and Ting (2018) state that often those bureaucrats in the lower levels of government see citizen participation as an obligation imposed by higher layers of government. Bureaucrats who perceive online citizens' participation as an imposition are more likely to oppose such an initiative or manipulate the system to promote the organisation's own interests, which may reduce the effectiveness of citizens' online assessment (Yan and Ting, 2018). As noted by Mahrer and Krimmer (2005), most of these politicians are not interested in empowering citizens, but only to pretend that, leading to a government fake transparency. On the other hand, there are other political players with actual democratic interests that may have their actions hampered by a disinterested majority of citizens' that giving up their right to e-participation.

The technical barriers, with political background, end up leading to other non-technical barriers regarding citizens' trust in politicians (Thiel, 2016). Sanchez-Nielsen and Lee (2013) argue that the first wave of e-participation projects were not successful due to the need for greater participation of government officials. The Brazilian Government's Legislative Idea received 51,143 ideas between 2012 and 2018. However, only ten ideas became laws (https://www12.senado.leg.br/ecidadania/documentos/home/results). This makes the citizen distrust the environment of participation. Barros and Sampaio (2016) argue that negative experiences with e-participation initiatives in particular can radically undermine participation in the future. For Lidén (2016) a bad political leadership and little citizen collection also has a negative role in participation. Caetano et al. (2017) cite the discrediting of the political sphere and the disinterest of citizens due to poor political education. Citizens may also not participate because politicians will not consider their opinion. This can be observed in the participation platform legislative idea, of the Brazilian legislative power, where more than 51,000 proposals have already been made, but only ten have become laws. Anttirioko (2003) suggests that citizen participation, in experiments or practices of digital democracy, should truly influence the subjects discussed.

The citizen not understanding what is being treated on the platforms and not having access to useful information is another barrier to participation. There is an audience willing to participate, but it fails because of a number of reasons such as cultural or linguistic barriers (Sanchez-Nielsen and Lee, 2013). Farina et al. (2013a) argue that participation opportunities usually do not provide participants with useful information for their participation (in addition to instructions on the use of technology). Information about the agency's mission, authority, and mode of operation – often crucial to understanding what types of topics, ideas and solutions can be considered – can be found by going to the main site, but those links rarely appear on the with any type of highlight. Farina et al. (2013b) state that:

1   Many individuals and groups do not realise when the rules that affect them are happening.

2   The volume and linguistic, economic, technical and legal complexity of the agency's typical set of regulatory documents far exceeds what many potential participants can or will read and understand.

3   Most new entrants do not understand that results are determined by analysing relevant factual information and political arguments rather than by majority preferences.

Another non-technical barrier is the fact that topics discussed are far from the daily problems and priorities of the citizen. Thus, Charalabidis et al. (2010) argue that the contributions of non-specialists are inhibited. With regard to these last two barriers, we understand that the information provided needs to be relevant and that citizens feel that they are influencing issues relevant to society, not just minor issues. Thus, for citizens to participate in relevant issues, they must also have access to relevant issues. According to Peristeras (2009), there is an extreme imbalance of information between the citizen and the various spheres of government. A United Nations study (UN, 2003) showed that the 20 leading e-government countries allowed citizen participation in irrelevant and useless issues, and that these countries were only one-third the potential of what they could offer.

The fact that the minority of users is willing to produce content or offer feedback is also another barrier (Charalabidis et al., 2010). In some cases, this barrier may be related to privacy issues, which are another non-technical barrier. Santamaría-Philco et al. (2016) argue that it is necessary to create an environment of technological confidence so that citizens first choose to participate in a process and secondly to provide clear and effective data through the various tools created for this purpose. For these authors, the overall process for the life cycle of a public participation process consists of three main sub-processes: preparation, implementation, and evaluation. They assert that trust must exist before, during, and after the life cycle of the public participation process. Thiel (2016) believes that, especially in times of wiretapping scandals, people tend to distrust systems originating from official institutions that ask them about their opinion. Regarding these two barriers, one must consider that, whether through laziness, privacy or other reasons, most users only consume information on the Internet and rarely produce anything. This difficulty in collecting information hampers the creation of participatory experiences appropriate to the interests of users. This may cause the initiatives to not serve the interests of users and generate a cycle of non-participation. To overcome this difficulty, Lemos and de Araujo (2018) argue that governments should make available applications that offer useful citizen services in exchange for their data.

There are still those people who do not participate because the environments of electronic participation are unknown to them. Charalabidis et al. (2010) argue that government platforms are largely unknown to the public, mainly because of high promotion costs and slow pace of dissemination. In informal conversations with other students at our university and in WhatsApp groups, most people said they did not know the existence of these environments. Bicking et al. (2011) argue that the lack of strategy for publicising e-participation projects in social networks leads to a low audience in the platforms of these projects. However, if there is no interest or financial resources to address this issue, those citizens who already use these platforms can assist in their promotion by inviting others to participate.

Among those users who reach the platform of participation, it may happen that their enthusiasm is greater by new technology than by genuine interest in public affairs (Thiel, 2016). It happens because the people in a more accustomed generation technology can

have great interest in learning and using new technologies, but return the barrier of lack of interest in political issues after they have known technology.

The last barrier we observed in this review was the lurking. Jung et al. (2015) argues that some citizens are 'free riders' in policy outcomes because they take on the benefits of the efforts and participation of others. What we observe in this subsection is that technical barriers like much of non-technical have a political motivation or could be solved by politicians. However, users of participation platforms can encourage the participation of other citizens to create a cycle where greater participation leads to demands for solutions to other barriers to participation. As there are several barriers to participation to solve, there is the opportunity of several researches to promote a greater electronic participation of the citizen.

To overcome barriers that impede participation, both government and researchers must contribute. One contribution that researchers can make is to study ways to overcome those barriers that do not depend on government initiatives. With respect to those barriers where there is a need for government intervention, researchers can collaborate with government by engaging their knowledge to develop solutions. When government is disinterested in seeking solutions, researchers can explore ways to encourage greater citizen awareness and participation so that citizens can put pressure on government. Engaging both government and researchers will overcome the barriers and achieve greater participation.

3.2 Q2: what is the government's role according to the literature?

There are two government roles according to the authors studied in this systematic review. The first role is to promote convergence between different technologies and the second, and most cited by the authors, is to design forms of dissemination to raise awareness and encourage citizens to participate.

To promote e-participation, Caetano et al. (2017) argue that the government should use the various available techniques and technologies. These authors propose that the government should use a solution to support collaboration among citizens based on three main areas of study: Social media, crowdsourcing and information visualisation. In this proposal, citizens would be allowed to specify problems by providing an initial understanding of the situation to others. A crowdsourcing environment would then be used to facilitate voluntary citizen engagement in solving problems. From there the temporal evolution of the problem would be monitored using the discovery of knowledge in social networks. Therefore, the proposal of Caetano et al. (2017) is a collaborative environment to promote greater participation of the population in the decision-making process of the government, allowing citizens to contribute to solving social problems. This collaborative environment is in line with Bolívar's (2018a, 2018b) ideas, which advocate the concept of creative citizenship in smart cities, focused on participation in decision-making in all aspects of life. For him, a smart city is a city that emerges as an ecosystem of innovation through intensive civic participation.

Given the low levels of participation in political and community life, it is necessary to devise forms of dissemination to raise awareness and encourage citizens to participate (Dahlgren, 2009). Chaieb et al. (2018) argue that it is important that government institutions develop organisational, methodological and technological means to make the best use of social networks. Thus, by encouraging the electronic participation of citizens

(opening and encouraging debates on specific issues) in order to analyse the exchanges of messages of citizens in these networks and to consider them in their decision-making processes. In contrast, Sampaio (2016) found that many e-participation initiatives are only advisory and suggest that citizens can participate in online decisions. In addition to social networks, in their work, Quental and Gouveia (2018) proposed the disclosure of the possibility of participation also through the website and by e-mail.

Other authors also make proposals for the use of social networks by the government. However, Charalabidis et al. (2010) propose that the government use information that is already available and are continuously produced in social networks by citizens in order to increase the quantity, quality and inclusion of participation. For these authors, governments should take a step towards citizens, rather than waiting for citizens to shift their content production activity to 'official' spaces created for electronic participation. Farina et al. (2013a) also agree that the government needs to engage more proactively to alert and engage new entrants. They argue that social media, such as Twitter and Facebook, can provide more proactive, numerous and targeted communications, as well as bring the audience directly to the platform of participation they will use (Farina et al., 2011). These authors also argue that it is necessary to look for ways to reduce the complexity of information for inexperienced people to participate. They also believe that knowledge about the broader regulatory context should be available, and that education about the process should happen. For Bicking et al. (2011) this proactivity must be associated with the use of appropriate strategies and tools to encourage citizens and government officials to interact regularly and increase each other's knowledge.

Sanchez-Nielsen and Lee (2013) believe that before launching a participation platform, the government should promote the awareness of target groups (especially decision makers). In addition, after launching the platform, promote the facilitation of e-participation processes, engaging target groups, delivering results to decision makers and ensuring their feedback. These authors argue that while there is likely to be a tendency for ICT to play an important role in dissemination and engagement through social media, other forms of face-to-face engagement are necessary to ensure the success of the initiative. The authors also say that people can recommend the platform to their friends through sharing in social networks, which functions as a 'word of mouth' solution.

For Alharbi and Kang (2014) the role of government is to try to understand the intention of citizens to use electronic participation. For Wahid and Sæbø (2015), the government needs to focus on the information relevant to the needs of the citizen and the citizen's perception that the focus of the government is on that information relevant to him. When studying scenarios on the future use of e-participation tools in Europe, Kubicek and Westholm (2005) observed that the range of stakeholders involved requires personalised communication integrated with the delivery of relevant information. In studying electronic participation in the Chinese context, Zhang (2014) states that the citizen will participate in realizing that this participation is dealing with public things, of collective interest of society. Therefore, the government should focus on showing that participation is related to the public interest.

Citizen participation in government is very important for achieving a more democratic society. This participation legitimises government decisions and improves citizens' trust in government, since they perceive government to be more transparent and responsive (Tolbert and Mossberger, 2006). Therefore, it should be in the interest of the government to seek ways to promote greater participation. If the citizen uses more and

more new technologies, the government must also make use of these technologies and strengthen their relationship with the citizen. However, as stressed by Macintosh and Whyte (2008), having a mechanism available on a website does not mean that it will be used. Sá et al. (2016) believe that not just the government providing the service, but the service should have quality. To achieve successful e-participation initiatives Alathur et al. (2016) recommend that government policies should provide a supportive environment for institutionalising and accommodating citizen-initiated e-democracy forums to enhance citizens' input into decision-making.

The 2001 study by the OECD stated "governments need the tools, information and capacity to evaluate their performance in providing information, conducting consultation and engaging citizens, in order to adapt to new requirements and changing conditions for policy-making." Macintosh and Whyte (2008) propose the evaluation of e-participation projects using the following criteria:

1 Engaging with a wider audience (which assesses ease of use to achieve greater participation).

2 Obtaining better informed opinions (where the engagement method deliberately provides respondents with background information in order to elicit better informed opinions the evaluation should analyse the use made of this information as an indication of how relevant it has been).

3 Enabling more in-depth consultation (this requires an engagement method that goes further than simply providing background information by supporting deliberative debate. The evaluation should therefore consider analysis of the content and structure of the discussion to assess the depth achieved).

4 Cost effective analysis of contributions (online submission of responses creates opportunities for more cost effective engagement. Responses made online save transcription costs, and those to closed questions can be analysed in real-time).

5 Providing feedback to citizens (where there is an intent to inform participants about the responses received and their impact on local authority decisions, the evaluation needs citizens' assessment of this feedback).

As shown in the previous subsection, the government could address many of the barriers to participation. This is one more reason why the government should seek ways to reach the citizen.

The citizen cannot directly promote greater use of the technologies by the government. However, if the government does not take initiatives to promote greater citizen participation, the citizen who is already a user of participation platforms can encourage others to participate. It is also up to researchers to develop mechanisms to stimulate participation. Greater participation will help create greater political engagement among citizens who will demand more government commitment.

### 3.3 Q3: what are the approaches to promote e-participation?

As shown in Figure 2, the approaches to promote electronic participation can be divided into three groups:

1 political initiatives

2   promotion of participation in a way that is attractive to the user

3   promotion of user perceptions.

However, we must note that to promote participation the approaches of different groups must be combined. Political initiatives alone will not promote participation without the user having an attractive platform for participation. Likewise, an attractive platform will not keep users engaged if they do not realise benefits in their use. The user also will not perceive benefits in participation if there is no involvement of the politicians.

Figure 2 Approaches to promoting participation
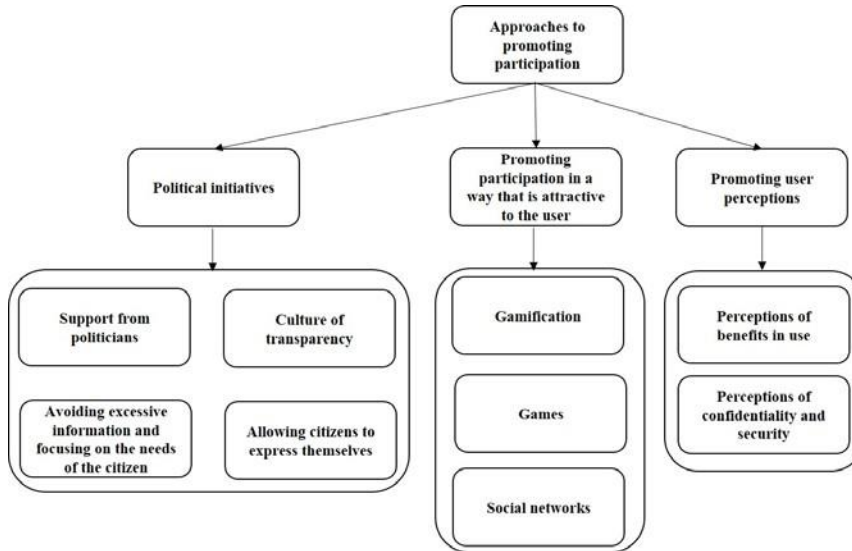
3.3.1 *Political initiatives*

As shown previously, many of the barriers that hamper citizens' participation are political. Thus, approaches to promoting participation are also political initiatives. First, there are needs to be supported by politicians who should be actively involved in e-participation initiatives (Bicking et al., 2011; Wahid and Sæbø, 2015). The various spheres of government should give this support so that the barriers that impede the promotion of participation can be overcome and the citizen can see that the possibility of participation is not only to give the impression that the government is democratic. There must be actual political will to promote citizens' participation (Baguma et al., 2016).

There should also be a culture of transparency (Wahid and Sæbø, 2015). Potra et al. (2015) cite Lee and Kwak (2012) to declare that the government should increase transparency. Data transparency increases public awareness and trust on the government. Citizens, better informed, become more interested in the government work. de Oliveira and Rodegheri (2014) state that the construction of electronic participation environments presupposes the existence of three essential elements: inclusion, transparency and universality, where citizens can freely express themselves and have access to

information. It is necessary that the government does not censor the information to be shared. For this may create an environment of distrust for the citizen who may feel discouraged to participate.

If on the one hand it is necessary for the government to be transparent and to make information available, on the other hand there is no point in overloading citizens with information that they will not be able to process. One must consider that citizens have other activities in their daily lives and they will not spend their time filtering information. In the same way, citizens will not have the incentive to use their free time and participate in something that is outside their reality and needs. Baguma et al. (2016) argue that successful e-participation requires prioritisation (that is, focusing on specific groups, targeting specific issues of most concern to the majority of citizens, and selecting a small number of priorities). Bicking et al. (2011) recommend minimising the number of topics discussed online and providing quality information on selected topics to avoid fragmentation of participation and excessive information.

Another political initiative necessary to encourage participation is to allow citizens to express themselves. Chaieb et al. (2018) argue that citizens are not only interested in receiving government information on the social network, but also manifesting themselves. This is in line with Bolívar's (2018a, 2018b) work, which states that citizens will only be willing to engage in the implementation of new insights and solutions if their voices are heard during platform development. For Quental and Gouveia (2018), electronic consultations should take into account important aspects, such as ensuring that all citizens can express their opinions on issues and policies that affect them; considering that the participants' time is valuable.

3.3.2 Promotion of participation in a way that is attractive to the user

As illustrated in Figure 2, there are three approaches to promoting e-participation: gamification, games, and social networks. In this section we present the advantages and disadvantages of each approach.

First of all, gamification is the transformation of an activity into a game. Thiel (2016) is an example of work that uses game-related elements, such as, points, score and badges to encourage citizens to engage in the participatory platforms. It is a very effective way to attract people, but it demands a great effort to government participatory platform in terms of designing a game with the desired participation elements and keep updating with new features to maintain citizens' interest.

'Games' (not ganimifcation) represents the inclusion of a piece of entertainment inside the participatory platforms to attract and motivate people to participate in serious purposes. Rexhepi et al. (2016) use the Minecraft game to promote participation in urban redesign.

At last, social networks are websites and applications that allow the sharing of information between people and/or companies. Facebook and Twitter are two examples of the most used social networks.

Government initiatives should be accompanied by approaches to make the participation environment more attractive to the user. Thiel (2016) proposes the use of gamification to motivate the user. However, the same author the following year shows disadvantages of this proposal (Thiel and Fröhlich, 2017). From the psychological point of view, the motivations are divided into intrinsic and extrinsic (Deci and Ryan, 1985). Intrinsic motivation is that motivation that depends exclusively on the individual and that

is directly linked to their feelings, tastes, priorities, desires and other stimuli related to internal issues. The extrinsic motivation refers to behaviours that we develop to obtain results that go beyond the activity itself. Davis et al. (1992) have found that extrinsic and intrinsic motivations can influence the use of technology. Gamification tends to use extrinsic motivation (Lee and Doh, 2012). However, it should be noted that extrinsic motivation does not hold in the long-term when incentives are withdrawn (Thiel and Fröhlich, 2017). Another observed effect of gamification to stimulate citizen participation is the decrease in intrinsic motivation (Thiel and Fröhlich, 2017). It should also be noted that the use of rankings can help achieve the expected effects in competitive societies, such as in the USA, but studies show that they do not have the expected effect in societies such as Brazil (Tomaselli et al., 2015).

The use of games is also an approach presented in the literature (Rexhepi et al., 2016). Rexhepi et al. (2016) affirm that the games use as incentive, self-interest and altruism with their playful elements. The games work the intrinsic motivation of the user (Lee and Doh, 2012), thus using the characteristics of the user. However, it is necessary to take into account that people have different personalities, gender, age and abilities (Codish and Ravid, 2014) and therefore the implementation of games that meet these different characteristics can become costly. In addition, when studying the promotion of participation using games, Tinati et al. (2017) noted that fun and entertainment were considered important for participation at an early stage, but it is important for the user to realise that they are contributing to a larger cause.

The most proposed approach in the literature is the use of social networks (Wahid and Sæbø, 2015). However, there is still resistance to its use by politicians. Macintosh et al. (2009) observed that e-participation methodologies widely neglect the spontaneous political discussions on social media as valid e-participation. Porwol and Ojo (2017) studied the perspective of politicians on the use of citizens' contributions to social networks. The decision makers and politicians point out that lack of comprehensive information on the origin, demographics and identity of contribution renders the interaction on social media to be of very limited benefit to decision making process. Bicking et al. (2011) recommend using social networks, as they are more familiar and popular with citizens. The citizen can also be taken to participate in social networks through the recommendation of a friend or family member, or for the convenience of the social media in use (Setiawati and Pratiwi, 2015). Jung et al. (2015) cites Park and Lim (2014) who claim that to make the most of the use of government platforms relies heavily on government performance in creating meaningful connections and interactions with the public. For Jung et al. (2015), systems should be based on social media and be an alternative communication tool to promote the reciprocal exchange of information through a citizen-government interaction interface. It must also provide ubiquitous government services through social media, where the needs and opinions of citizens transmitted by e-participation must be readily available to the appropriate government bodies responsible for supporting them. Jung et al. (2015) further claims that tools based on social media have become more popular than traditional ones, such as paper-based requests and telephone answering centres, so they should be used. Tools should also enable administrators and citizens to communicate actively with each other. Using social networks to promote citizen participation, whether in the social network itself or using it to publicise the participation platform seems to be an excellent strategy because these networks already have billions of users worldwide (https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/). If participation platforms

are unknown to the population, social networks have the advantage of being widely known and users are already accustomed to using them and are already attracted to these environments. These social networks further favour social influence (Kelman, 1974), allowing influential users to encourage others to participate electronically on government platforms.

3.3.3 Promotion of user perceptions

We must also consider that political initiative and attractive participation environments for users are not enough if they do not perceive benefits in using these environments and feel secure to participate. Perceptions of benefits in the use of e-participation, such as perceived utility (Estuar et al., 2016; Zhang, 2014; Hidayanto et al., 2017a), perceived quality of website, perceived ease of use (Zolotov et al., 2018) are treated by several authors studied in this systematic review. Vidiasova et al. (2017) point to ease of use as the most important factor for the development of e-participation. This makes sense because if users do not know how to use the platform, they will move away from it.

According to Wijnhoven et al. (2015), the main factors preventing e-participation projects are that projects are perceived as too complicated and that people believe they do not have enough knowledge to contribute in a meaningful way. Alharbi and Kang (2014) argue that the more favourable the assessments users have of e-participation services, the more favourable will be their attitude toward e-participation and vice versa. Sanchez-Nielsen and Lee (2013) state that it is important for participation that citizens receive feedback from decision makers and that they have confidence in the policy making process. It is also important to collect recommendations and suggestions from users to involve them, and to get them more actively involved. Good website design can make users feel more engaged and increase their intent to use e-government services, while poorly designed websites can frustrate users and get them out because they can not find what they want (Aladwani, 2013; Segovia et al., 2009). Hidayanto et al. (2017b) state that the e-government service with good quality, in terms of interface or performance, will leave a good impression for users. Thus, their expectations regarding the system will increase. However, it is useless for a platform to be useful if the user does not know how to use it (Alomari, 2014; Quental and Gouveia, 2018; Setiawati and Pratiwi, 2015). Farina et al. (2013a) cite Barber (2003) and Susskind (2008) to argue that facilitation is one of the tools to allow ordinary citizens to participate effectively in political deliberation. Expert facilitators, which are not part of the community of participants (Barber, 2003; Coleman, 2007; Kearns et al., 2002), would do this facilitation. Farina et al. (2013a) argue that facilitating moderation is especially important to support the effective participation of those inexperienced and interested members of the public. If citizens do not perceive benefits in electronic participation, they will not be able to overcome barriers to participation. The importance of this topic can be seen in the number of authors who believe that these perceptions of benefits will promote citizen participation.

Beyond the perception of benefits in participation, citizens will not participate if they do not feel safe to manifest themselves in the electronic platform (Alharbi and Kang, 2014; Alomari, 2014). In the context of electronic participation, trust can be understood as the willingness of citizens to engage in e-participation services offered by the government based on their beliefs about the integrity, benevolence, and competence of the government and not because of any kind of pressure from the government. Citizens'

trust in the context of e-government, especially during the initial meetings, is related to two factors, namely, trust in government and trust in the internet (Bélanger and Carter 2008; Hussein et al., 2010). Faced with a possible lack of confidence, Quental and Gouveia (2018) suggest allowing anonymity for those who wish. Vidiasova et al. (2017) believe that anonymous participation will cause users to overcome their fear of writing something that can be used against them later.

4   E-participation in Brazil

Regarding the third research question (approaches to promote e-participation), we present in this section the policy initiatives, promoting participation in a way that is attractive to the user and promoting user perceptions by the Brazilian Government.

Several initiatives have been taken by the Brazilian Government to allow the citizen to be more active in the government's decision-making process. The Decree 8.243 of the Brazilian Federal Government (http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2014/decreto/d8243.htm) instituted the National Policy of Social Participation. Several virtual environments of social participation (VESP) were also created, such as Dialoga Brasil (http://dialoga.gov.br), Participa.br (http://participa.br) and the Legislative Idea (http://www12.senado.leg.br/ecidadania/principalideia). Despite all this effort, the collected log data still show a low participation in these environments. In these participation environments, citizens express their opinions on issues initiated by the government. These environments focus on specific information on the topics under discussion. However, they do not provide information so that the citizen can give grounded opinions. Some of these participation environments are no longer used since 2016, after the impeachment of the president in the country. A portal of transparency (http://www.portaltransparencia.gov.br/), in which citizens can access all federal government expenditure, was also created. E-participation efforts in Brazil focus of government is on technology and not on the needs of the citizen (Luciano et al., 2018). There is also a lack of citizen's engagement due to the image of public organisations. This demonstrates that creating such environments is not enough. It is necessary to create mechanisms that encourage citizen participation in the decision-making process through these environments.

The Brazilian Government does not use games or gamification. The president and his office use Facebook and Twitter to post messages to citizens who can also comment on those messages. However, there is no use of social networks to promote e-participation. Legislative Idea is integrated with Facebook to allow citizens to log in using their account in the social network, but that is just it. Citizens' perceptions of these environments are very bad. This is reflected in the low usage numbers.

Through the law of access to information, we request data on citizen participation in these environments. The National Secretariat of Social Articulation, responsible for portals Participa.br (http://participa.br/) and Dialoga Brazil (http://dialoga.gov.br/), informed us that these portals were launched in 2014 and 2015, respectively. However, the Secretariat did not have a historical series of annual participation in these environments, only data referring to 7/20/2018, which was when they informed us the data. On that day there were 4.364 users registered in the portal Participa.br. The Secretariat also informed us that, since its creation until that moment, the portal had received 13.600.792 accesses. The Secretariat stressed that it does not promote a study on

effective participation per citizen and the portal is not prepared to produce this information. That means that the number of hits reported above only means that citizens have accessed the portal, not that they have published or issued an opinion in any public consultation. Regarding Dialoga Brazil, the Secretariat reported that the portal was launched in 2015 and has not had any activities since 2016. The last numbers of the portal show that it obtained a total of 293,298 accesses, 236,996 users and 17,344 offers.

We also obtained information provided by the Legislative Power regarding the Legislative Idea portal (https://www12.senado.leg.br/ecidadania/documentos/home/results). In this portal, any citizen can make a proposal for a legislative idea. Legislative ideas have the deadline of 4 months to receive the support of 20,000 other internet users. Those receiving this number of support are referred to the Commission on Human Rights and Participatory Legislation, where they will be debated by the senators and will receive an opinion. In 2012, the Legislative Idea received 398 proposals. The number of proposals grew in the following years, reaching 26,671 proposals in 2017. According to data available on the internet, in 2018 the platform received 12,499 proposals.

Since 2013, the Brazilian population has already exceeded 200 million people (https://www.ibge.gov.br/apps/populacao/projecao/). 1% of participation in any e-participation initiative is considered a success (Cruickshank et al., 2009). However, data presented in this section show that the participation of Brazilian society in government e-participation initiatives does not reach 0.0001%, 10,000 times less than desirable. The methodologies and technologies for popular participation are among the challenges that appear in the Great Challenges of Research in Information Systems in Brazil (2016–2026) (Araujo et al., 2017). This is because citizen participation is an increasingly urgent need in modern societies, but the mobilisation of citizens is still a challenge.

5 Discussion

In this systematic literature review of e-participation research, we answered three questions:

1 What are the reasons for the low citizens' participation?

2 What is the role of government in e-participation?

3 What are the approaches to promote e-participation?

Regarding the first research question, we observed that citizens do not participate online for the same reasons that they do not participate offline. It was possible to verify a cycle that causes non-participation. According to an OECD Publishing (2009) report, 78% of individuals have a low interest in policy and/or politics. However, this lack of interest is related to a bad perception that citizens have of government and politicians. Meijer (2015) points out that citizens' image of government can be a major barrier, especially if they do not trust the government. This is a big problem because 48% have a low level of trust in how the government uses its citizens' input (OECD Publishing, 2009). It is then possible to observe a cycle of non-participation. The citizen does not participate because he has a bad image of the government, and the government does little to change that

image. In fact, research shows that there is sometimes no interest for politicians in promoting greater citizen participation (Mahrer and Krimmer, 2005). This causes barriers to participation to continue to exist. Technical barriers depend on government commitment and impede the participation of people who would like to participate (OECD Publishing, 2009). Non-technical barriers make 'people who may' not want to participate. This keeps the citizen and government apart and feeds the cycle of non-participation. Overcoming this bad image of the government and greater confidence in the government will only happen from the citizen-government interaction. A first step has to be given. The government can take the first step and be more reliable to the citizen, or the citizen can take that first step and get more engagement from the government and politicians. The contribution that researchers can make is in the study of mechanisms that promote greater participation so that the citizens take that first step.

In answering the second question, we noticed that the role of government is still central to promote citizens' participation. The promotion of participation will take place using the various existing technologies, with which the citizen is already accustomed. The government should also plan ways of disseminating awareness and encouraging citizens to participate. However, as we have seen, politicians are not always interested in greater citizen participation (Mahrer and Krimmer, 2005). To promote greater participation, the government may propose laws that help to resolve barriers to participation (Vidiasova et al., 2017). This happened in Brazil, with the national policy of social participation. It is important to note that the Brazilian Government proposed this law only after a series of popular demonstrations. However, it is not enough to create laws or use technology. Often government platforms are created just to pretend that government wants citizen participation, but they allow citizens to participate in irrelevant issues (UN, 2003). If governments are not interested in promoting greater participation, researchers and those already engaged should help to stimulate public interest. Thus, citizens must press the government to use the technologies with which citizens are already accustomed. The citizen should also charge the government to allow the society to participate in the decision-making process, thus promoting a cycle of participation.

Less but not least, the third research question. Although it is something that attracts users, games and gamification can have a high maintenance cost for the government since it is necessary to meet different user profiles (Thiel, 2016). This may be unfeasible for the Brazilian Government. In the games industry a quick update is observed because users get bored. Therefore, social networks seem the most interesting approach. Today social networks reach large portions of the population and should be considered in e-participation initiatives. By observing the literature it became clear that the solution to low participation pass through integrating with existing social networks. Bonsón et al. (2015) affirm that the use of social networks to enable contact between citizens can be characterised as a normal practice. Thus, social networks offer possibilities for more sustained interaction between citizens and their local authority (Ellison and Hardey, 2013). For Lidén (2016), the solution would be to replace expensive e-participation technologies with cheap and freely available social media data. In addition, in social media, many citizens contribute their views on politics without having to be stimulated or encouraged by a specific e-participation initiative (Bright and Margetts, 2016). The article by Ceron and Negri (2016) gives a sample of what could be achieved. This article implements a technique called supervised aggregate sentiment analysis to show how Twitter data could be used to stimulate interaction between politicians, civil servants, and the general public during the policy-making cycle. Using two case studies from Italy,

they show how Twitter could be used both to choose between different options when formulating policies and to provide insight into citizen opinion during the implementation phase of the policy.

Another motivation to bring the public to the policy-making process, however, is to increase public acceptance of policies. In this regard, it should be remembered that social networks and other types of big data are essentially 'passively' contributed: people can express their views on politics, but not necessarily expect them to be collected and aggregated in policymaking. This type of passive contribution contrasts sharply with mechanisms such as electronic participatory budgeting: where citizens make a deliberate decision to sign up for a forum and then make a conscious choice between policies. Therefore, while big data may have the potential to improve policy-making, it will not increase public acceptance of developed policies because citizens will not necessarily realise that they were involved in the policy-making process. Only if this aspect can be remedied – if participation in big data can be something that citizens themselves see as a means of actively contributing to the political process – big data will actually show potential to replace electronic participation as a way to engage citizens in public politics.

There are limitations to using social networking data. Decision makers cannot be assured at any stage of the discussion that the contributors are eligible to discuss the matters considered (Porwol and Ojo, 2017). Severo et al. (2016) also highlight the following limitations of social networking data: widely available but perhaps biased and unrepresentative; often made available at low cost, but sometimes with restrictive licenses in re-use; created from the bottom up, open to all forms, but also open to fraud and distortion. For these reasons, Viscusi and Batini (2016) believe that the government should not only use data from social networks. In fact, governments themselves have significant amounts of administrative data, which can also be reused and used through the movement towards 'open data'. Researchers can contribute by researching ways to overcome these difficulties. In addition, ways to take advantage of citizens' presence in social networks and to take them to the platforms of government participation should be studied. One must consider that even though the citizen to access the platform of participation it will not stay there if he did not realise the benefits of their participation.

On the other hand, the research we are conducting seeks to use social networks as a means to disseminate VESP. What we want to do is take advantage of the fact that the citizen already uses social networks. The research is based on the social influence theory (Kelman, 1974) and we intend to use digital influencers to disseminate VESP and encourage their followers to use it. Social influence theory is one of the theories associated with social behaviour that are used in research related to environments such as social media (Ngai et al., 2015). The term social influence used by Kelman (1974) refers to socially induced behavioral changes. Social influence occurs whenever a person changes his or her behaviour as a result of the induction of another person or group (the influencing agent). Induction occurs whenever the influencing agent offers or makes available to a person some kind of behaviour and communicates something about the likely effects of adopting such behaviour. For example, in the context of VESP, one person (influencing agent) could suggest the other (target of influence) to participate in a voting (induced behaviour) to reach a certain objective (probable effect). In the context of VESP, induction is deliberate and intentional, with the influencing agent trying to persuade, expressing expectations or providing guidance to the person.

Behaviour change is the result of induction to the extent that the person's behaviour after induction is different from what would have been in the absence of such induction. In the context of VESP, the change that the social influence would bring in the behaviour of the person influenced would be the awareness (or knowledge of a situation) of what was being treated in the VESP, which would not have occurred if he or she had not been aware of the issue. Digital influencers can be used to induce this behavioural change and make their followers to participate in VESP. However, it must be borne in mind that there are costs (time, reputation and others) for influencers, which may discourage them from influencing their followers to participate. Therefore, we will use questionnaires with digital influencers to understand these costs. Our goal is to propose a mechanism to reduce these costs and stimulate influencers. We will also use questionnaires with followers to understand how influencers could lead them to participate in VESP.

6   Conclusions and future work

This article presented a systematic review to understand the electronic participation of citizens in VESP. Systematic reviews are useful to identify and consolidate work to date and guide future research. The conclusions reached are an important step towards expanding the body of knowledge about e-participation.

There is still a gap to be filled with specific solutions for citizens' engagement in VESP. This review showed that one of the reasons for the non-participation of the citizen in these environments is the lack of knowledge of the environments. The study by Ferro and Molinari (2010) also concluded that only activists (3 to 5% of the population) participate in electronic consultations. These data refer to the social influence theory and the possibility of using influential users to get other users to participate in these environments.

6.1   Limitations

The search protocol was used in two large databases, IEEE Xplore and Scopus. Papers that are not indexed in these databases were not captured. The unavailability of papers in both databases prevents them from contributing to the topic, even if they have potential to do so.

Data sources such as Google Scholar, and academic theses and dissertations on the topic, are not used by this study. The protocol could not be executed in Google Scholar, which even in advanced search mode does not admit the whole search string. Although to date there is no database that indexes thesis and dissertations and can be used for searching whole strings, such thesis and dissertations often do generate papers that can be captured in the databases that were used.

Data extraction was performed by only one researcher, which may increase the risk of threats to internal validity. Finally, as an emerging field, there is a scarcity of works addressing engagement of citizens in virtual environments. Even so, this paper offers many important observations that represent a significant starting point for future research on this topic, as presented in the following section.

6.2 *Directions for future research*

The first opportunity for future research lies in re-execution of the protocol, to capture references to more recent work that extends the search space chronologically. This could also include adding other keywords into the string and other search engines, such as Google Scholar and Association for Information Systems Electronic Library (AISeL), in an attempt to retrieve documents only indexed by these machines, which would extend the search space geographically. Finally, the search can also be expanded to include: books, thesis, dissertations and technical reports. Although the systematic approach adopted ensures the reliability and completeness of this study, it can be amplified by these extensions.

In recent years, we have seen the use of social networks as a place of political discussions and exposition of ideas. However, it can be seen that such discussions are limited to a social network that, despite being an important space for discussion, does not favour citizen participation in the decision-making process. VESP, on the other hand, not only provides the discussions but also provides a more effective social control. It is thus perceived the need to combine social networks and VESP taking advantage of the potential of each environment in stimulating citizen engagement. Thus, using the possibility of users engaged in VESP influence others who only use social networks to use the VESP. Thus, these influenced users would participate in the decision-making process.

As future work, we intend to create a solution for citizen engagement in VESP. It is observed that one of the most promising approaches cited in the literature for engaging users in online environments is the use of social influence. Social influence occurs when a person changes his behaviour because of the induction of another person or group (the influencing agent). In the process of social influence, the influencing agent offers a behaviour to the person and communicates to him the likely results if he adopts this behaviour.

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