

The shape of eParticipation: Characterizing an emerging research area

Abstract

The phenomenon of eParticipation is receiving increasing attention, demonstrated by recent technology implementations, experiments, government reports and research programs.

Understanding such an emerging field is a complex endeavour because there is no generally agreed upon definition of the field, no clear overview of the research disciplines or methods it draws upon, and because the boundaries of the field are undecided. Using conventional literature review techniques, we identify 131 scientific articles considered important for the field's theoretical development. This sample provides the starting point for a grounded analysis leading to the development of an overview model: the field of eParticipation seen from a researcher's perspective. The model provides structure for understanding the emerging shape of the field as well as an initial indication of its content. It also provides the basis for developing research agendas for the future.

Keywords: eParticipation, eGovernance, eDemocracy, eGovernment

Introduction

E-participation involves the extension and transformation of participation in societal democratic and consultative processes mediated by information and communication technologies (ICT), primarily the Internet. 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. Wikipedia adds

eParticipation is a recently invented term meaning “ICT-supported participation in processes involved in government and governance”. Processes may concern administration, service delivery, decision-making and policymaking. EParticipation is hence closely related to e-government and (e-)governance.

Democracy and the formal political process are fundamentally dependent on effective communication and informed decision-making about public issues amongst citizens, politicians, officers and other stakeholders who may be impacted by political decisions (Habermas, 1996; Van Dijk, 2000). Governments may seek to promote participation in order to improve the efficiency, acceptance and legitimacy of political processes. Citizens, non-governmental organizations, lobbyists and pressure groups may demand participation to promote their own interests, either within the established political system or outside it through activism and opinion forming. Many forms of ICT with the potential to support participation are readily available (or in development). Examples include chat technologies, discussion forums, electronic voting systems, group decision support systems and web logs (blogs). The combination of the various stakeholders’ interest in participation and the development of the technological infrastructure has resulted in many new projects designed to utilize the potential of ICT to increase communication and participation in political processes (Bekkers, 2004; Best & Krueger, 2005; Curwell et al., 2005).

eParticipation activities are not new, but rather an evolution of many existing activities given an extra push by the widespread deployment of the Internet. Nor is the research investigating and supporting these activities new; it can rather be seen as a development and refocusing of existing research fields. Nevertheless, many factors prompt a more detailed investigation of the term and the research work, suggesting that eParticipation is becoming an independent area of interest in its own right. These factors include many practical activities initiated by governments (such as

eEurope 2005 (http://europa.eu.int/information_society/eeurope/2005/index_en.htm), government reports (Fagan, Newman, McCusker, & Murray, 2006; Jansen, Dowe, & Heimann, 2006), the emergence of companies specializing in eParticipation technologies (such as Partecs Participatory Technologies (<http://www.partecs.com/>)), and targeted research programs (resulting in major research efforts such as The European Network of Excellence Demo-net (<http://www.demo-net.org>)). A Google search on the term returned over 72,000 hits. Although the term is only slowly maturing in the academic literature (Chang, 2005; Dutton et al., 1984; Macintosh & Smith, 2002) and is currently less established than other related terms such as eDemocracy and eGovernance, it is reasonable to assume that it may soon emerge as an independent research area with its own particular focus.

Many strands of existing research may contribute to a better understanding of eParticipation, and to the development of future research directions. However, the range of potential source contributions to a poorly defined, evolving research area is large, and this paper aims to develop a much needed structure and conceptual clarity by synthesizing relevant research. The objectives of this paper are therefore to:

1. identify a relevant source body of literature for the emerging field of eParticipation
2. analytically model eParticipation research to increase our understanding of the current shape of the field
3. identify important research themes and issues based on the model and the core literature

Research methodology

Literature reviews are an important part of the development of a field (Webster & Watson, 2002). They offer the opportunity to synthesize and reflect on previous theoretical work, thus providing

secure grounding for the advancement of knowledge. Webster and Watson suggest that the elements of a good literature review include a structured approach to identifying the source material and the use of a concept matrix or other analytical framework leading to a coherent conceptual structuring of the topic. However, reviewing an emerging field with poorly defined boundaries and research styles poses special problems. These problems include both the selection of literature (where for example few authors use the term ‘eParticipation’ even where they are clearly writing about it), and the analysis (where it may be difficult to understand what kind of analysis model should be adopted, and from which supporting discipline). We chose to solve these problems by providing an outline concept for eParticipation (which could later act as a set of criteria for inclusion of articles in the study), by defining a set of search terms, and by using a grounded analysis strategy. The next sections elaborate these strategies.

eParticipation: Outline concept

The term eParticipation is composed of two elements: “e” and “participation.” Participation can be understood generally as joining in, either in the sense of taking part in some communal discussion or activity, or in the sense of taking some role in decision making (more common in the theory of management, economics and politics). Though there are many theoretical discussions involving participation (for example, participatory management, participatory economics, participatory design, community participation, participatory action research), eParticipation is normally associated with some form of political deliberation or decision-making. Participation can take place within the formal political process (for instance voting), or outside it (for instance political activism). Our literature search concentrates on political participation in the decision-making sense, though not excluding direct attempts to influence the decision-making process (activism, opinion forming), and covers participation both within and outside the formal

political system. The ‘e (lectronic)’ in eParticipation has a clear association with earlier ‘e’ disciplines (eBusiness, eGovernment), and refers to the use of new information and communication technologies (particularly the Internet), with the implication that the technology has the ability to change or transform.

The transformation from government to e-Government involves mediating the relationships between three spheres of governance (political, civil, and administrative) with information technology (Grönlund & Horan, 2005). eParticipation can principally be understood as technology-mediated interaction between the civil society sphere and the formal politics sphere, and between the civil society sphere and the administration sphere. The focal point of eParticipation is the citizen, i.e. the purpose of eParticipation is to increase citizens’ abilities to participate in digital governance (including participation in the political process and transformation of digital government information and services). Other groupings of citizens such as voluntary organizations and businesses are also relevant in this context, as are other decision making systems (such as organizational decision-making) but are not the principal focus. Technology mediated interaction between the formal politics sphere and the administration sphere does not involve citizens and is therefore less in focus in eParticipation. Technology mediated interaction between the civil society sphere and the administration sphere is particularly relevant where:

- 1) citizens are included in the planning and/or development of some form of government reform
- 2) citizens are included in the planning and/or development of new digital government services.

Efforts internal to the three spheres may also be relevant to eParticipation especially where they relate to diffusion of eParticipation technologies or the underlying digital infrastructure, or technology mediated opinion forming.

As a research area eParticipation is closely related to, but distinct from, other research areas. Macintosh (2004) suggests that the eDemocracy field consists of two sub-areas: eVoting and eParticipation. Whereas eDemocracy concerns itself with strengthening the mechanisms of representative democratic decision making through technology, eVoting and eParticipation focus on the means for doing this, either directly through technology assisted voting, or, in the case of eParticipation, through support for citizen involvement in deliberation and decision-making processes. eDemocracy often concerns itself with normative accounts of how democracy should, or ought to develop (in relation to technology trajectories) (Coleman, 2007) and with structural democratic relationships in society. eParticipation better defines a set of technology facilitated participatory processes, both deliberative and decision-oriented (which may or may not be democratic, or even in the political arena). eVoting, in contrast, focuses on one particular participatory process common to all representative democracies, and in particular its technology assist – the way that technology helps to enact the process.

Article selection strategy

Articles were selected by searching in three major library databases (ISI – Web of Science, EBSCO Host and IEEE Explore) following the guidelines suggested by Webster and Watson (2002). The eParticipation field is still unconsolidated in terms of having a clearly defined set of key outlets, making it difficult (and controversial) to select a limited number of major journals as the primary source for identification of literature as suggested by Webster and Watson (2002). Still, the three databases mentioned above is considered to provide good coverage of the

phenomenon as they cover more than 8 000 journals in the science, social science and humanities fields - including the major IS journals (as ranked by IS World) and important public administration journals such as Government Information Quarterly and Public Administrations Review. In addition, a number of relevant conference proceedings (e.g. HICSS) are covered. A list of search criteria was developed iteratively by the three researchers. Initially, the keywords eParticipation, eDemocracy and eInclusion were used to identify relevant literature. Then, a scan of the titles, keywords and abstracts of the initial results lead us to further extend our search using common phrases found in the initial sample. The following 3 areas were searched:

- e-Democracy, using additional search phrases:
 - eDemocracy, electronic democracy, democracy and Internet, democracy and information system, digital democracy.
- e-Participation, using additional search phrases:
 - eParticipation, electronic participation, e-Government and participation, e-Governance and participation, e-consultation, e-petition
- e-Inclusion, using additional search phrase:
 - digital divide and participation (within the results of digital divide since digital divide returned more than 450 hits)

This method resulted in a library consisting of 651 references. The titles and abstracts were scanned by one of the authors to identify articles lying within the outline concept for eParticipation (see above), resulting in a library of 250 relevant papers. Next, two of the researchers independently did additional scannings of the abstracts and titles of the 250 relevant papers to identify a set of highly relevant eParticipation literature according to the initial concept outline. Each paper was assigned a relevance score ranging from 1 to 10 where 10 equaled a clear match with our concept outline. The results from the two independent scannings were

compared, resulting in a list of 131 papers that had all been assigned a relevance score of 10.

These 131 papers are considered highly relevant to eParticipation and represent a core sample of eParticipation research. 84 full text files were retrieved for further analysis. The paper selection process ended March 2006.

Analysis strategy

The library of 84 full text files and 47 additional abstracts is largely textual and in principle form a document that can be analyzed by any recognized form of textual analysis. In the absence of any immediately relevant super-ordinate analysis model, we chose a form of grounded content analysis (Berelson, 1952; Silverman, 2001). Content analysis provides ‘a relatively systematic and comprehensive summary or overview of the dataset as a whole’ (Wilkinson, 1997). It operates by observing repeating themes, and categorizing them using a coding system. Categories can be elicited in a grounded way (built up from the data) or come from some external source (for example a theoretical model). In our case, we identified common repeating themes (keywords) from the 131 titles and abstracts of the papers. We grouped them to provide a two-tier classification scheme that was recorded in a spreadsheet, and used the classification scheme to build a model of the literature. The process was then iteratively refined by analyzing the 84 full text articles to develop the classification scheme and the related conceptual model. The objective was to provide a rather simple overview model that could provide

1. structure to help researchers understand the overall field of eParticipation and thus increase the ability to position their own work in a cumulative research paradigm (given by the top level of the hierarchical keyword scheme organized as a model), and
2. a preliminary account of the contents of the field (given by the lower level of the hierarchy).

The resulting model is given in section four below. The analysis and model form the basis for a discussion of prominent themes and research issues. The classification scheme also provides the headings and sub-headings for the following analysis of the field.

Limitations

Although the literature search strategy applied in this study returned more than 650 initial hits related to eParticipation, the strategy has some limitations. First, using academic databases to identify the sample literature excludes potentially relevant reports and white papers from governments, NGOs and consultancy firms. The inclusion of such material could have provided additional breadth and insights to our understanding of eParticipation. Second, although some important conference proceedings (e.g. HICSS) are represented in the databases we searched, others are not. For instance, neither the International Conference on eGovernment (eGov) nor the European Conference on eGovernment (ECEG) proceedings are covered in any of the databases we searched. Here too, additional insights may be found that can supplement and enhance our understanding of eParticipation. In particular, conference proceedings can provide current information on new developments as conference papers in general are developed and published quicker than most journal articles. While acknowledging the limitations of the literature selection process, we consider our sample to provide a good overview of the field of eParticipation both because of the amount of papers analysed and the quality of the papers (mostly journal papers). We leave it to future research to validate and elaborate on our findings by extending the reference literature.

The eParticipation field

This section outlines the eParticipation field by exploring its actors, activities, contextual factors, effects, and evaluation approaches. It also outlines the theories and research methods used in the study of eParticipation.

eParticipation actors

Various actors participate differently in eParticipation initiatives, so knowledge of their characteristics may be an important prerequisite for developing targeted eParticipation initiatives. The actors addressed in the literature can be divided into the following groups.

Citizens

Citizen participation is the principle focus for much of the research on eParticipation. However citizens are often discussed in relation to other stakeholder groups. The relationship between citizens and politicians is widely discussed, focusing on the interaction between the two groups (Chadwick & May, 2003; Hudson-Smith, Evans, & Batty, 2005), on how participation varies between these stakeholder groups (Clift, 2000), and on discussion of their specific roles (Fernández-Maldonado, 2005). The Internet and other ICT developments offer new opportunities for participation (Berman & Witzner, 1997; Gross, 2000; Hacker, 2004; Luhrs, Albrecht, Lubcke, & Hohberg, 2003) and may empower citizens in the political discourse (Klein, 1999).

Politicians

Though much discussed as a group in relation to citizens, politicians are rarely the main focus of attention. Two exceptions are Jensen (2003b), who argues that the presence of individual politicians was a major reason for success achieved in a discussion forum, and Sæbø and Päivärinta (2005), who discuss the importance of addressing politicians (as well as citizens) when

designing online discussion forums. Politicians are usually analyzed as a group, often seen as being a central part of political campaigning (Conhaim, 2000; Howard, 2005; Rushkoff, 2004).

Government institutions

Internet-based eParticipation initiatives may be seen as tools and instruments for new modes of governance (Bingham, Nabatchi, & O'Leary, 2005) and for integrating civil society groups with bureaucracies (Chadwick, 2003). The administration is highlighted in studies focusing on specific services where citizens are included, such as geographical information system (GIS) based services (Al-Kodmany, 2000; Elwood, 2001; Snellen, 2001), planning processes (Kangas & Store, 2003), and federal rulemaking (Carlitz & Gunn, 2002). The role of the administration is discussed in more general terms by Grönlund (2003), in a study illustrating how different municipalities developed different eDemocracy services.

Voluntary organizations

E-based services are seen as a new opportunity for input not only from citizens, but also from voluntary organizations (Berman & Witzner, 1997). Grass roots movements may organize and coordinate more easily by using the Internet (Park, 2002), and by building grass root networks (Bacard, 1993), which may lead to online activism (Khanna, 2005). The organization of the protests against the World Trade Organization (WTO) meetings in Seattle (DeLuca & Peoples, 2002) is an example of this new form of activism, where television, Internet and the other technologies played an important coordinating role. Taylor and Burt (2005) argue that voluntary organizations have a growing significance and will act as intermediaries in the delivery of eParticipation. Jensen (2003a) discusses whether government sponsored initiatives are more successful than private initiatives in shaping conditions for democratic dialogue.

eParticipation activities

eParticipation activities are here considered as a social practice (for instance voting) associated with a technology (for instance electronic voting technologies). In many cases, the social practice is an established and recognized political form or genre, such as the political debate meeting, which can be modernized or facilitated by the use of technology. Many of the potential technologies are Internet-based and are often adaptations of well-known technologies (such as chat technologies).

eVoting

eVoting has received increased attention in the literature as the development of new ICT tools open up new voting opportunities. A distinction can be made between electronic machine voting; the use of machines for voting in a fixed place, and electronic distance voting; the opportunity to vote by the use of ICT from different locations (Svensson & Leenes, 2003).

Kenski (2005) investigated who will benefit; will eVoting revitalize society as a whole, or will it primarily benefit already privileged groups? eVoting represents an opportunity to increase political participation (Padget, 2005; Smith & Clark, 2005), whilst others argue that there is little evidence that eVoting leads to increased voter turnout. The primary reason for developing eVoting systems is therefore considered to be financial (Oostveen & van den Besselaar, 2004). The latter argument is also supported by expected reductions in transaction costs (Prosser, Kofler, & Krimmer, 2003) and reduction of errors (Smith & Clark, 2005).

Security and trust are found to be important issues related to eVoting. The potential for achieving political influence through fraud or error must be eliminated if trust is to be achieved from citizens (Oravec, 2005; Puigserver, Gomila, & Rotger, 2004; Xenakis & MacIntosh, 2005). Thus trust is dependent on technological factors (Oravec, 2005; Puigserver, Gomila, & Rotger,

2004), but also on social context, which varies between countries (Svensson & Leenes, 2003). eVoting systems might also influence and require changes in laws and regulations (Drechsler & Madise, 2002; Prosser, Kofler, & Krimmer, 2003).

Several research challenges exist in the eVoting area. There is a need to investigate more thoroughly the effects of eVoting systems on democratic processes (Drechsler & Madise, 2002; Kenski, 2005; Oostveen & van den Besselaar, 2004). Technological solutions addressing security concerns (Prosser, Kofler, & Krimmer, 2003) are needed, and bridging the digital divide (Oostveen & van den Besselaar, 2004; Smith & Clark, 2005) is an important issue. Users' trust must be addressed and eVoting systems must also be adapted to different social context (Svensson & Leenes, 2003). Thus, eVoting still raises more questions than answers:

...although most respondents expect that eVoting may improve (especially local) democracy through a combination of voting technologies with technologies for supporting deliberation and information dissemination, it remains unclear how this should be done. More detailed studies into political participation and the subtle roles of ICT's herein are needed, as this can inform the design of adequate technologies for e-democracy. (Oostveen & van den Besselaar, 2004, p. 61)

Online political discourse

Increased deliberation and participation in the political discourse may increase citizens' opportunities for agenda setting (Aikens, 1998). Citizens may be more directly included in policy making through using ICT for communicative purposes (Bekkers, 2004) and are increasingly involved in rulemaking (Carlitz & Gunn, 2002). Online deliberation is seen as an opportunity to include grass-root movements more directly (Padget, 2005) despite some evidence that the use of ICT has limited effects on grass-root activities (Rimmer & Morris-Suzuki, 1999).

Best and Krueger (2005) found that people participating online and offline share the same characteristics, except for age. Elderly people tend to participate more in traditional offline deliberation than younger. However, age does not independently influence participation in terms of online deliberation. Jensen (2003b) found that online participants are well-educated and already politically active. Thus going online does not *per se* alter the balance between the information rich and information poor (Norris, 2001). Online deliberation requires technology skills (Albrecht, 2006) and may therefore even worsen the digital divide (Dutta-Bergman, 2005).

A major research challenge is how to connect online political discourse to more traditional channels. DiMaggio et al. (2001) argue that online discourse should be seen as a supplement to traditional channels. Dialogue should be supported when designing these services, rather than focusing on one-way information exchange (Koch, 2005). Continuous development is required to keep the services updated (Sæbø & Paivarinta, 2005), providing the basis for sustained relevance (Roeder, Poppenborg, Michaelis, Marker, & Salz, 2005), and sustainability (Tsaliki, 2002).

Online decision-making

eParticipation projects related to online decision-making are more directly connected to the decision-making process than services related to political discourse. Online decision-making implies an explicit link with political decision-making through the use of ICT and is seen as a potential avenue for increasing political participation (Berman & Witzner, 1997; Ogden, 1994).

The debate echoes concerns raised in the eVoting literature: some consider online decision-making an opportunity to reinvent public participation (Chang, 2005; Pino, 1998) whereas others focus on the potential negative impact of providing further decision-making possibilities for the already advantaged (Albrecht, 2006; Chadwick & May, 2003).

Increased participation may be achieved by involving citizens more directly in planning processes (Hudson-Smith, Evans, & Batty, 2005). Al-Kodmany (2000) investigated how a Geographic information system (GIS) could be used to increase citizen's influence on neighborhood planning. Others focus on how to include feedback from citizens in the real political decision-making process (Lourenco & Costa, 2006; Whyte & Macintosh, 2003), and document and communicate this effect (Shulman, Schlosberg, Zavestoski, & Courard-Hauri, 2003). Politicians' desire to participate in online decision-making may be symbolic; that is more focused on visibility than on handing over responsibility or power to citizens (Klijn & Koppenjan, 2000).

Several research challenges can be identified concerning online decision-making. The digital divide is a focus for concern (Al-Kodmany, 2000; Albrecht, 2006; Gimmler, 2001), with few suggestions on how to address this concern. Online decision making is seldom embedded in eGovernment strategies (Bekkers, 2004; Kakabadse, Kakabadse, & Kouzmin, 2003) and the impact of citizen participation is hard to identify (Gimmler, 2001). Thus strategies are needed for structuring online deliberation into real decision-making (Lourenco & Costa, 2006) and for connecting online and offline communication services (Hudson-Smith, Evans, & Batty, 2005). Regulation is also problematic, since the legal framework for online decision making activities is poorly developed (Bingham, Nabatchi, & O'Leary, 2005; Prosser, Kofler, & Krimmer, 2003).

eActivism

eActivism describes the efforts of voluntary organizations (Taylor & Burt, 2005; Trench & Odonnell, 1997) and interest groups to use ICT to promote their special interests or viewpoints. They seek to influence the political process (DeLuca & Peebles, 2002; Schneider, 1996; Siapera, 2004; Siapera, 2005) by using technological means to promote their interests.

Siapera (2004) investigated 45 websites for activist organizations supporting immigration and asylum seekers and found that no deliberation or dialogue could be identified, only expressive, strategic or instrumental communication. DeLuca and Peeples (2002) also discuss how the communication form on activist websites differs from the liberal deliberation ideal.

A major research challenge is to understand how eActivism will influence public authorities' communication with a wider audience (Lusoli & Ward, 2004; Taylor & Burt, 2005). eActivism activities are often said to indirectly influence the political process by presenting more objective information than government authorities (like the Minnesota E-Democracy project Clift, 2000), or by presenting an interest group's interpretation of an issue without interference from the political elite (like the WTO protest activism DeLuca & Peeples, 2002). To what extent such activities really increase the opportunities of citizens (rather than the activists themselves) to participate may be questioned (Schneider, 1996), and further research is still needed to deepen the understanding of such connections.

eConsultation

Consultation is a two-way relationship between citizens and government, providing a feedback mechanism from public authorities to citizens (OECD, 2003), normally on government set agendas. eConsultation focuses on how to increase input from the different stakeholders in government; from citizens (Beynon-Davies, Williams, Owens, & Hill, 2004; Jensen, 2003b), from companies (Beynon-Davies, Williams, Owens, & Hill, 2004), or from societal groups (Chadwick & May, 2003) such as young people (Macintosh, Robson, Smith, & Whyte, 2003; Whyte & Macintosh, 2001).

The research focuses on how to increase the level of participation (Beynon-Davies, Williams, Owens, & Hill, 2004) and how to include new societal groups (Chadwick, 2003).

Roeder et al. (2005) argue for the importance of both internal and external relevance of the online consultation process. Transparency is also found to be of high importance (Whyte & Macintosh, 2001) as well as the design of the eConsultation services (Macintosh, Robson, Smith, & Whyte, 2003). Jensen (2003b) found that, even where many contributions were made to the consultation, new groups were not mobilized, and politicians had a tendency to dominate.

Further research is needed to explore what influence online consultation really has on real decisions being made (Shulman, Schlosberg, Zavestoski, & Courard-Hauri, 2003).

eCampaigning

Only a few articles in the sample focus on eCampaigning. The established political elite may use Internet technologies to raise money, organize volunteers and gather intelligence on voters (Howard, 2005), or, more specifically, to campaign for one specific candidate (Rushkoff, 2004).

Political campaigners seem to be reluctant to utilize the interactive features of Internet technologies (Stromer-Galley, 2000). The potential loss of control and ambiguity of campaign communication may explain why more interactive (thus more democratizing) features of the Internet medium are avoided (Stromer-Galley, 2000). eCampaigning may deepen democracy by offering richer data about political actors from a diversity of sources, but citizenship may become thinner “in terms of the ease in which people can become politically expressive without being substantively engaged” (Howard, 2005, p. 153).

ePetitioning

ePetitioning is also discussed in only a few articles in our sample. In ePetition systems, citizens sign a petition online proposing an issue for consideration by the political system (Prosser & Muller-Torok, 2002). The connection with the formal political process is important: for instance, a certain number of signatures may force the legislature to discuss the subject, allowing citizens

direct influence over the political agenda. Research on the issue is apparently sparse, apart from the implementation of the Scottish e-petition system (Wojtas, 2000) and a discussion of voting procedures for ePetition systems (Prosser & Muller-Torok, 2002).

Contextual factors

In this part of the analysis we identify recurring discussions in the literature which are difficult to characterise as eParticipation activities, but nevertheless represent important features of the context in which these activities take place, and thus influence their outcomes.

Information availability

With reference to the outline concept (in the Introduction section), we argue that pure information exchange activities lie outside the scope of eParticipation because there is no participative element. However, the information background to political discourse, whether technology-enabled or not, is an important part of the landscape of eParticipation. Some studies discuss the connection between information exchange and eParticipation and are thus included here.

To increase participation in the virtual public sphere, Polat (2005) argues that Internet information sources and communication media need to be present. Well-organized information sources are an important prerequisite for information retrieval and thus participation in decision making processes (Moreno-Jimenez & Polasek, 2003). Without equal distribution of information, the differences between the information-poor and the information-rich may further increase, resulting in unequal opportunities to participate in democratic processes (Norris, 2001).

The relation between information availability and political engagement is further studied by Bimber (2001) who found little connection between increased access to information and increased engagement. He argues that the information revolution does not prove salutary for increased political participation. Steyaert (2000) argues that local government web-sites are

primarily one-way information streams to citizens as customers, carrying the risk that Internet services will support electronic government shops, rather than communities.

Infrastructure

A major driving force in the eParticipation area is the widespread adoption of the Internet. Without this electronic infrastructure eParticipation services could not have been developed (Chadwick, 2003). The Internet is often taken for granted rather than explored. It is either present or absent, and often considered as a unitary technology (“the Internet”) (Aikens, 1998; Ainsworth, Hardy, & Harley, 2005; Berman & Witzner, 1997; Dutta-Bergman, 2005; Jensen, 2003b), rather than a diverse collection of infrastructures delivering an even more diverse collection of technologies.

Grönlund (2002) studied the Swedish government’s establishment of infrastructure and found that different implementations of ICT on the emerging electronic infrastructures may result in varying directions of development. Koch (2005) is pessimistic over the prospect of extending participation through Internet-based technologies, arguing that the infrastructure (the Internet) is designed for one way delivery of political text, not for enabling public dialogue. These commentaries suggest that the infrastructure characteristics may influence the potential outcomes of eParticipation initiatives. Thus, infrastructure should not be taken for granted in eParticipation studies.

Underlying technologies

eParticipation systems are normally applications of established technologies, rather than major technological innovations. These underlying technologies have their own development trajectory which is largely independent of eParticipation. These trajectories therefore influence which

technological opportunities are available for eParticipation solutions. The shape of the underlying technologies is found to influence citizen participation (Gross, 2000).

Online forums are utilized in many eParticipation projects (Aikens, 1998; Ainsworth, Hardy, & Harley, 2005; Bekkers, 2004; Hagemann, 2002; Huang, 1998). Tsaliki (2002) focuses on how to design technology for increased interaction in eParticipation projects, while Sæbø and Päivärinta (2005) argue that there is a need to design systems in a way that allows dynamic development continuously meeting the requirements from different stakeholders. Other examples of underlying technologies include GIS, web logs (blogs) and data-mining. Elwood (2001) argues that GIS fosters changes in community planning and urban revitalization. Blogs are expected to improve participation in the public debate (Johnson & Kaye, 2004). Data mining techniques allowing automatic searches of large quantities of data may have the potential to improve the diffusion of rich information (Howard, 2005).

Though our outline concept identifies technology as an important factor in eParticipation, few of the identified research contributions primarily address technology. The literature sample focuses heavily on social activities or patterns, and tends to ignore detailed technical aspects.

Accessibility

Accessibility is an important contextual issue recurring throughout the literature. Access to information, to infrastructures, to technologies and to technological competences underpins eParticipation (DiMaggio, Hargittai, Neuman, & Robinson, 2001). Inequalities of access, summarized as the digital divide (Stansbury, 2003), threaten to undermine eParticipation efforts by further privileging the already privileged. The “critical gaps in society among different groups in the context of their access to new media and technology“ (Dutta-Bergman, 2005, p. 89) may lead to social inequalities (Norris, 2001). The digital divide may influence the outcome of ballots

(Oostveen & van den Besselaar, 2004), and fraud and inaccessible voting systems may compromise citizens' basic democratic rights (Oravec, 2005).

Disabled groups are easily discriminated against in the online environment. Fully accessible services for all citizens remain an elusive goal (Jaeger & Thompson, 2004). Compared to the increased awareness of equal access to information and services in the physical world, Wadded (2000) argues that we now face growing barriers to equal access on the World Wide Web. Since accessibility is a significant law and policy issue, it is important to focus on accessible Web-design to avoid sustaining the digital divide on the basis of disability (Wadded, 2000).

Policy and legal issues

eParticipation initiatives may require changes in policy and law (Kosmopoulos, 2004). Researchers refer to the need for changes (Kosmopoulos, 2004; Prosser, Kofler, & Krimmer, 2003), without necessarily stipulating what they should be. One exception is Bingham et al. (2005) work, which investigates legislative and judicial issues in the development of political process.

Governmental organization

The organization of governments may both influence, and be influenced by the introduction of eParticipation activities (Bekkers, 2004). Relationships to external organizations may change. A trusted third party is seen as a necessary condition for introducing eVoting services (Puigserver, Gomila, & Rotger, 2004). Taylor and Burt (2005) discuss the role of voluntary sector organizations, arguing that these organizations will become important intermediaries in the delivery of eDemocracy services.

Chadwick and May (2003) argue that ICTs are reshaping governance, state and democracy, without being specific about the characteristics of such changes. Others argue that changes in organizational structures will, or should occur when introducing eParticipation (Bekkers, 2004; Bingham, Nabatchi, & O'Leary, 2005; Chadwick & May, 2003). Watson and Mundy (2001) argue that customization is needed when such services are implemented. Fulla and Welch (2002) try to identify ways that different communication feedback mechanisms influence organizations. They argue that future research “should not only seek to better identify the types of change that occur as a results of virtual communication in organizations, communities and relationships, it should also begin to develop more explicit causal models” (Fulla & Welch, 2002, p. 10).

eParticipation effects

eParticipation initiatives are launched with particular purposes in mind, in order to achieve desired outcomes or provide some kind of benefit. This section investigates both the kind of effects that are sought, and some of the conclusions that researchers reach about how far these desired changes are realized.

Civic engagement effects

Engagement effects represent extension of the scope and reach of participation when facilitated by technology. More participators, new participators, new forms of participation and more contributions are generally assumed to be beneficial.

The dynamics of power and politics are found to be complex (Aikens, 1998) and there are few indications that new voices are more easily heard in online discourse (Albrecht, 2006). The use of ICT tools such as GIS systems may empower new groups to participate in decision making processes (Elwood, 2001), but lack of representativity is a major obstacle for the development of

online public spheres (Dahlberg, 2001; Schneider, 1996). Chang (2005) argues that eParticipation can increase the exchange of free political expressions and lead to formation of active cyber groups. The availability of better information on the Internet should decrease the threshold for becoming politically expressive (Aikens, 1998). However, Bimber (2001) investigates whether accessibility of political information leads to more political engagement, and finds little correlation. Virtual interactivity, including feedback mechanisms may not only lead to changes in citizen participation in the political debate, but may also change the relationship between government agencies and citizens and thus have considerable effects on the internal structures and work processes of government agencies (Fulla & Welch, 2002).

Deliberative effects

Deliberative effects define, more qualitatively, the way that participation is expressed. The ideal is often connected to a liberal democratic view of reasoned debate, in which discussions are conducted in a fair, egalitarian and factual way.

Hagemann (2002), for instance, found that discussions in two Dutch political forums were unrepresentative, opinionated and poorly argued. He argues that these discussions are not deliberative and therefore do not further democracy.

Democratic effects

Both engagement and deliberative effects also contribute to an important discussion in the literature concerning the impact of eParticipation on democracy. Does eParticipation influence the democratic development of society, and if so, are those developments positive or negative. This last assessment is closely tied to a normative vision of which democratic improvements are desirable. Many commentators share the opinion of Jensen (2003b), who argues that the Internet can contribute to revitalizing the public sphere. However, more pessimistic voices are concerned

that the Internet may lead to information clutter, and that political information may become distorted and simplistic (Noam, 2005). Skepticism is also expressed by Koch (2005), pointing out that “ the Internet is a place filled with political artifacts, largely without discourse and dialogue”. As such, it has the potential to undermine democratic practice” (Koch, 2005, p. 159).

eParticipation evaluation

A significant strand of the literature seeks to evaluate whether or not desired eParticipation effects are realized. The acquisition of this understanding is challenging since there is no generally agreed upon set of evaluation criteria. eParticipation efforts may also fail or have negative outcomes. Evaluations are often based on single empirical case studies with only limited references to other studies in the field. Various criteria are adopted for these evaluation efforts.

Quantity of participation

The most common evaluation criterion in the eParticipation area is the quantity of participation. The number of online participators, and/or contributions can be counted (Aikens, 1998; Jensen, 2003b; Rose & Sæbø, 2005). Participation can be evaluated in more detail, e.g. by looking at how many postings are added by different contributors. Hagemann (2002) found that electronic debates initiated by two Dutch political parties were dominated by a small number of participants contributing many postings.

The above examples illustrate a research challenge for such evaluations, namely: what are the quantitative success criteria for participation? Are the 300 contributors in Jensen’s (2003b) study few, or many? There are no comparative studies with traditional offline initiatives in our literature sample, though this would seem to be a useful way to evaluate.

Demographics of participants

The demographics of participants are also evaluated. As mentioned previously, Best and Krueger (2005) investigated the representation of Internet political participants and found that online discourse participants resemble those offline participants: Age was an exception, however; elderly people tend to participate more in traditional offline deliberation than younger people. For online deliberation, age does not independently influence participation.

Further research is needed to increase understanding of the characteristics of participants. This can be used to customize eParticipation initiatives, and to address potential democratic deficits.

Tone and style in the online activities

The tone and style of online postings are evaluated. Jensen (2003b) finds that contributions added in online discussion forums were characterized by openness, respect for other opinions, a respectful tone, and well-organized argumentation. These characteristics are normally seen as pre-requisites for a well functioning public sphere, leading Jensen (2003b) to conclude that online discussion forums may be seen as virtual arenas for the extension of the public sphere.

eParticipation theories and research methods

eParticipation is an eclectic research field that brings together a number of different disciplines, fields and research areas. This is typical for emerging research areas, and often implies that:

1. the area does not have its own well-developed theories and methods, but is dependent upon borrowing and adapting them from its parent disciplines, and
2. there is no general agreement concerning appropriate theories and methods, but rather an eclectic and ad-hoc mixture.

The disciplines that are most frequently represented in the literature sample are political science, political and social theory, public administration, and sociology, with a smaller number of contributions from a variety of other disciplines including information systems, computer science, communications, urban planning, environmental management, and science and technology studies. Democracy models (e.g. Held, 1996) are commonly used for distinguishing forms of participation (Bingham, Nabatchi, & O'Leary, 2005; DiMaggio, Hargittai, Neuman, & Robinson, 2001; Hoff, Lofgren, & Torpe, 2003; Lourenco & Costa, 2006; Lusoli & Ward, 2004) whereas Habermas' (1996) account of the public sphere supplies a philosophical background for studying participation (DiMaggio, Hargittai, Neuman, & Robinson, 2001; Gustafsson, 2002; Lourenco & Costa, 2006). Researchers draw on many other relevant theories, but these appear more sparsely, often appearing in only in one article. Bingham et al (2005), for instance, rely primarily on institutional and governance theories, drawing on the work of Frederickson (1991; 1997; 1999), amongst others. DiMaggio et al. (2001) refer to innovation diffusion theory (Rogers, 1995), media effects (Bell, 1977 [1980]), the network society (Castells, 1996) and social capital (Putnam, 2000), amongst a host of others. Actor network theory (1987; 1993) is the theory of choice for Grönlund (2002), whereas de Tocqueville's account of citizen associations (Tocqueville, 1937, 1945) underpins Klein (1999).

There is little evidence of shared theoretical background, with the possible exception of the theories from political science and political philosophy. Theories are used on an ad-hoc basis; by particular researchers who adopt a particular theory for a particular research tasks. Many researchers mention articles in the field that relate to their theme, without committing themselves to a particular theory. Also, many authors are content with contributing empirical material with little or no theoretical foundations, relating instead practical examples or case histories of technology implementations.

The choice of research methods amongst eParticipation researchers is also eclectic and inherited from the many parent disciplines. Most common in our sample are survey methods (Best & Krueger, 2005; Bimber, 2001; Jensen, 2003b; Lusoli & Ward, 2004; Moreno-Jimenez & Polasek, 2005; Roeder, Poppenborg, Michaelis, Marker, & Salz, 2005; Stromer-Galley, 2000) and case studies (Drechsler & Madise, 2002; Fulla & Welch, 2002; Gibson, 2001; Grönlund, 2002; Macintosh, 2004; Park, 2002; Prosser, Kofler, & Krimmer, 2003; Roeder, Poppenborg, Michaelis, Marker, & Salz, 2005; Stromer-Galley, 2000; Tambouris & Gorilas, 2003; Westholm, 2002). However, the case studies were usually illustrations of particular experiences (such as an eDemocracy project), without much (or any) explicit consideration of the application of the case study method.

Several research projects can be characterized as action research (Al-Kodmany, 2000; Evans, Kingston, & Carver, 2004), even though they do not explicitly reference, or use known action research frameworks or techniques. The researchers using some form of content or discourse analysis (Bingham, Nabatchi, & O'Leary, 2005; Huang, 1998; Jensen, 2003b; Macintosh & Smith, 2002; Sæbø & Päivärinta, 2005) took more care to explain and justify their research method. Another recognizable genre of article was the national state-of-the-art (Chadwick, 2003; Drechsler & Madise, 2002; Hoff, Lofgren, & Torpe, 2003), sometimes achieved by analysis of government policy.

Examples of genuine theoretical argumentation (e.g. Bingham, Nabatchi, & O'Leary, 2005; DiMaggio, Hargittai, Neuman, & Robinson, 2001) were rare, whereas the use of references to support the authors' opinions was not. The absence of a recognizable research method is rather widespread, particularly in articles which relate a case history from a personal perspective, compare eParticipation examples, report a research program, or describe a technology prototype. In some cases, this may simply be because the authors failed to describe the method they used.

As is to be expected in a very young research area, there is (as yet) little consistency or continuity in the choice of theories or research methods. There is no evidence of the emergence of a theory, or theories of eParticipation, whereas there is a considerable focus on the empirical examples.

The shape of eParticipation

In this section, we draw together the strands of the analysis in the previous sections into an overview model – essentially a model of the core literature (or research endeavours) in the field of eParticipation. The model is given in Figure 1.

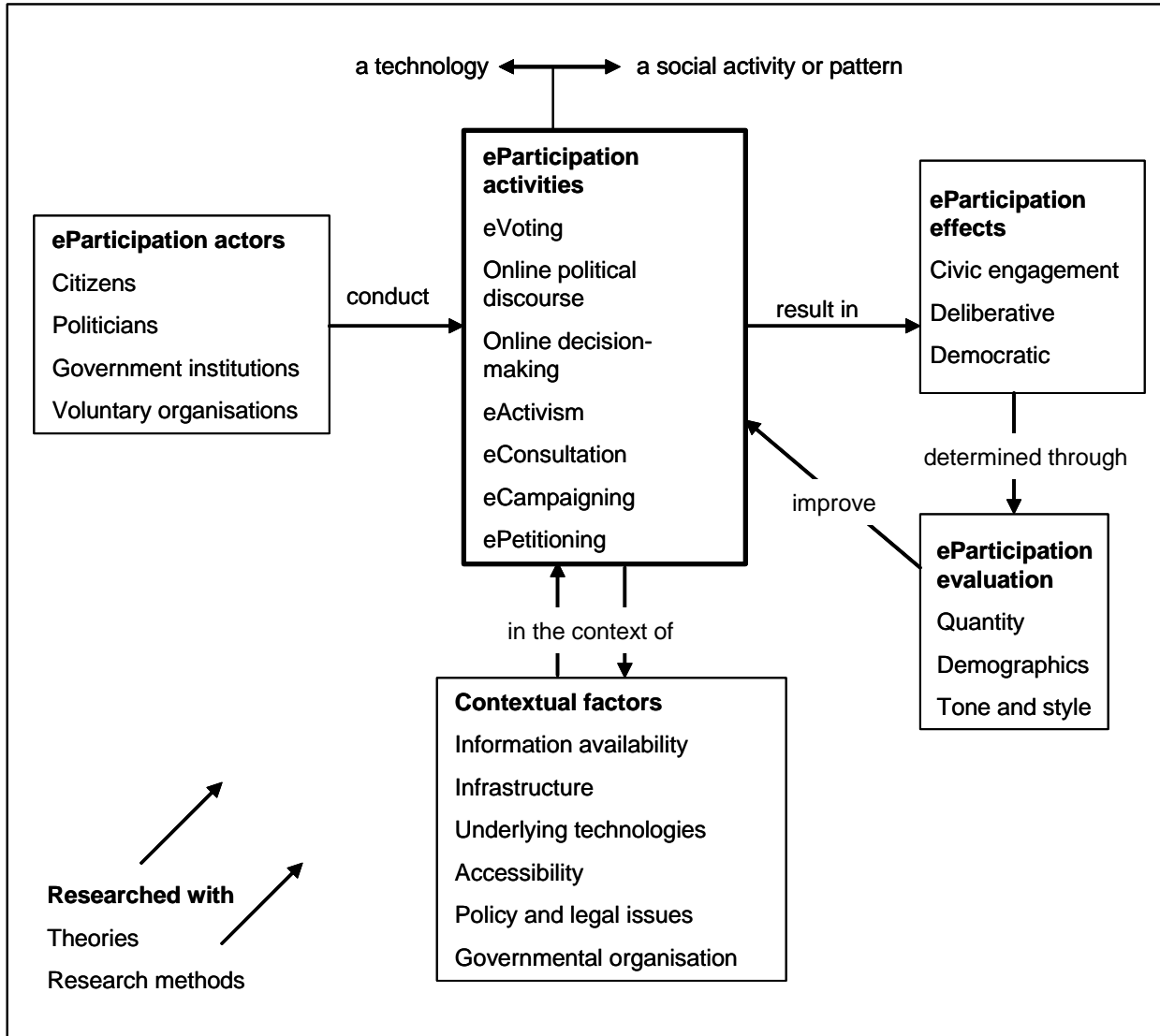


Figure 1. The shape of the eParticipation field

Central to the model are eParticipation activities. These are conceptualized as social activities or patterns of behavior (such as voting, attending a political meeting, petitioning) associated with an enabling technology (usually Internet based). The technology facilitates or mediates the extension or transformation of the activity, often meaning that:

1. more or different people can participate, and/or

2. the effect of the activity is magnified or focused at new actors, and/or
3. the form of the activity itself is altered.

Technologies are often adaptations of existing technologies already in use (debate forum) but can also be purpose built (voting systems). One characteristic of all such technologies is that they are dependent on technical and conceptual infrastructures, such as the World Wide Web. We identify eVoting, online political discourse, online decision-making, eActivism, eConsultation, eCampaigning and ePetitioning as significant activities in our literature sample. A variety of technology applications support the social activity, including custom-built voting systems, political chat rooms, political discussion forums, community decision support systems, political blogs and the geographical information systems used for urban and environmental planning.

eParticipation activities are carried out by actors. These are normally characterized in this literature as different stakeholder groups (e.g. citizens and politicians). Actors are responsible for taking part in the various activities (voting, for example), but also for developing the activities and the associated technologies, and for responding to the outcomes of participation activities. Much of the literature adopts rather generalized accounts of politicians and citizens as the principle actors of eParticipation, reflecting an understanding of participation as an accommodation between citizens and their elected representatives. However there is also focus on government institutions (which both promote and respond to eParticipation) and voluntary organizations, whose political agendas which often represent nodes of participative pressure or influence.

eParticipation activities are always carried out in particular contexts, and these contextual factors are normally reported in the research and considered important for the outcome of the activity. For instance, online deliberation is conducted in a particular community with a distinct culture and social orientation, who have varying educational backgrounds, computer literacy

skills, and access to the Internet. Although none of these environmental factors can be considered an activity, many of them are quite important to the outcomes of the activity. One would, for instance, expect a survey of the effects of an online deliberation to control for some or all of these factors. Central to our literature base are:

- Information availability – reflecting the need for reliable information about governance and society as the basis for deliberation, agenda forming and decision making in the participation cycle.
- Infrastructure – representing physical and conceptual systems underpinning eParticipation activities such as cables, internet protocols, routers, multi-channel delivery, democratic structures and deliberation conventions.
- Underlying technologies - such as: GIS, web logging, semantic web, web ontologies, data mining, security and encryption algorithms, digital signature, automated textual analysis and computer supported visualization. These technologies lie below the surface of the systems and interfaces that are apparent to actors, but are nevertheless important for facilitating the more visible technologies.
- Accessibility - the issue of unequal access to eParticipation tools because of geography, social or economic conditions, development status, technology literacy, social grouping, age or disability - often discussed as the digital divide.
- Policy and legal issues – concerning the formal governance backdrop which enables and constrains eParticipation, and which may need to develop to facilitate eParticipation development.

- Governmental organisation – reflecting the organisational structure and administrative forms of governance which enables and constrains eParticipation and which may also need to develop.

eParticipation activities are considered to result in outcomes or effects. These effects are important in the literature because they establish the rationale for using resources to carry out the activities. Thus an online political debate forum might be focused on engaging young people in the political process (the effect), and whether it does or not can be evaluated. Effects considered important include the engagement of civil society in the democratic process, the improvement or widening of political deliberation, and changes to the shape or structure of societal democracy.

These effects can be measured or described using many of the instruments common in social science research. The most common parameters for evaluation are measures of quantity of participation (as a marker for civil engagement), demographics (often employed to find out which groups in society are engaged, or benefit) and tone and style (considered a qualitative marker for deliberative effects). These evaluations are important for understanding eParticipation activities, for justifying funding for them, and for learning how to do them better.

Finally, eParticipation research is conducted with the help of particular theories and methods. As with many young research communities, the theories and methods are quite disparate and often have a rather practical focus (on developing a particular eParticipation activity in a community). Theories of social and political participation, of the relationship between technology and social practice, of embedding social practice in technology and implementing the resulting technologies in communities are important for this research. Research methods including survey and content analysis, action research, and case study method are similarly important. The research area displays little consistency or agreement over theories or methods (which normally echo the researchers' background), and probably needs to develop some more

commonality in research style to improve communication between researchers from different disciplines.

An eParticipation research agenda

We have earlier introduced research challenges under the various sections to which they relate. Here, we isolate recurring themes in these challenges and develop them into a more general research agenda for the field.

The normative agenda

Normative research concerns reaching better understandings of the objectives and goals of eParticipation initiatives. The forms, structures and purposes of democratic participation are much discussed in the literatures of political science and political philosophy. However these understandings are partially and inconsistently transferred to the eParticipation literature.

Without consistently and clearly articulated democratic objectives, practitioners are left to initiate projects with the weak justification that eParticipation is a necessary and worthy activity. The lack of well-considered objectives may contribute to a relatively poor success rate, and certainly makes initiatives hard to evaluate.

The instrumental agenda

Whereas normative research leads to better understanding of longer term democratic goals, instrumental research involves determining the tools and methods which are appropriate for pursuing these goals. Here researchers have the task of understanding the different contexts of eParticipation, and developing better frameworks, procedures, methods and software tools for varying contexts and objectives. This research has the objective of improving the practice of

eParticipation. Where it produces standards – theoretically and empirically justified good practice which can be transferred from one situation to another – it can also be normative.

One issue that combines both normative and instrumental research is accessibility. Inequality of access to technology, of participation opportunity, and in technology and participation competence, is widely discussed throughout our literature sample. Here normative research addresses the question of who should be empowered to participate. Instrumental research focuses on improving the competences and developing eParticipation tools and methods which can empower the disenfranchised.

The descriptive agenda

There is a continuing need for descriptive eParticipation research, of which there are already many examples (particularly cases). There is a need to improve the quality of such descriptive work, but there is also a need to fill in gaps in our existing knowledge. Examples of such knowledge requirements are:

- knowledge of citizens as eParticipation actors, particularly a more detailed understanding of citizens' eParticipation habits across gender, nationality, social grouping, and cultural background
- understanding the roles of other eParticipation stakeholders, including politicians, government institutions (as sponsors of eParticipation initiatives), businesses, and software vendors
- understanding the role of eParticipation in the political decision making process
- learning from spontaneous political participation activity on the net (i.e. that which is not sponsored by government)

The evaluative agenda

The evaluation of eParticipation is an important form of eParticipation research. Evaluation partly depends on articulated objectives, and clear democratic ideals, and on the development of criteria against which eParticipation initiatives can be judged. It is thus dependent on the normative research previously discussed. Many of the research contributors assess the relative ease of use of the technology, whether eParticipation has positive or negative effects, whether it increases the quality or quantity of participation, and so on. However there is little agreement, or discussion of what constitutes a valid evaluation criterion, the different roles of qualitative and quantitative evaluation, which indicators should be measured, and how results can be interpreted as successful or not. This has the consequence that it is difficult to compare eParticipation initiatives, (which are either not evaluated, or evaluated in different ways), and thus difficult to derive the learning necessary to improve future activities.

The technology agenda

Though we defined an eParticipation activity as consisting of a technology enabling a social activity or pattern, the focus of attention is very unequally distributed in our literature sample. This may also be a reflection on the key words used for deriving the sample.

Whereas social activities and patterns are discussed extensively throughout the literature, (participation forms, democratic models, social and political background, deliberation etc.) technology is rarely the main focus of an eParticipation study. The most prominent exceptions address eVoting technology. Here, security and trust are examined from a technical point of view (Oravec, 2005; Puigserver, Gomila, & Rotger, 2004). Currently the technological component of eParticipation is rather taken for granted - for instance as a unitary artifact which is either present or not. This is exemplified by studies which try to determine the effect of the Internet on some

aspect of the democracy. Here the Internet is treated as a uniform technological artifact distinct from other computing and communication media – a somewhat naïve position. Obviously relevant technical computing issues such as web ontology, semantic web, interoperability, security, decision support, data mining, language translation and computational linguistics were hardly, if ever mentioned in our literature study. Most of the eParticipation software tools discussed, are relatively trivial adaptations of existing technologies - without much technological innovation. The research agenda opens the question of how to develop innovative eParticipation tools – perhaps tools that do not much resemble those we know today.

The theoretical and methodological agenda

An emerging cross disciplinary research field offers an eclectic use of research methods and theories. This is not surprising as it brings together researchers from various knowledge areas with different research traditions. However, eclecticism is challenging for a research area, because it limits the ability of researchers to understand each other's work and to co-operate. Without common methods or theories, comparison and cumulative learning becomes difficult.

Emerging fields have, by definition, no mature theory of their own. Theories are therefore borrowed from established parent disciplines. Eclecticism means that theories are selected on an ad-hoc basis, not from the standpoint of the individual researcher, but from the standpoint of the field as a whole. There is therefore a need for explicit consideration of which theories are appropriate, and some focus on, and development of those theories. Typically in this field this may consist of adding a theorization of the role of the technology medium to an existing socially-oriented theory of participation. There is a further need for studies which aim to develop independent theory for the field, perhaps through grounded analysis of data.

Each of the five agendas developed in the previous sections implies particular methodological challenges. Normative research is often conducted through discursive theoretical argumentation, often following the logical development of propositions in common philosophy and the European tradition of social and political theory which is abstracted from empirical concerns. The instrumental research agenda requires a solid foundation in action research. Many forms of descriptive research are appropriate to the next agenda, but they all require more explicit consideration to data collection and analysis than are presently common in the literature sample. Case study methodology is reasonably well developed and could be more explicitly used to strengthen the presentation and analysis of the field's many case histories. Many eParticipation research questions which have a broad scope (such as national evaluations) require survey techniques, which are mainly used descriptively in our literature sample. Most of these data collection and analysis techniques are also appropriate for the evaluation agenda, but require a normative foundation and the development of explicit judgment criteria. Technology research is often conducted theoretically, with a foundation in mathematics and mathematically oriented disciplines such as computer science.

Each of these methodological approaches requires an explicit relationship to theory – often missing in the many empirical accounts of eParticipation projects in our literature study.

Conclusion

In this paper we provide an initial account of the emerging research area of eParticipation (we have used the terms field and area rather loosely and interchangeably, without any particular significance). The study is based upon a grounded analysis of 131 scientific articles derived from defined premises: an initial outline concept and an article database search. The article sample represents one suggestion for a core literature for the field - a good starting point for researchers

wanting to study eParticipation, rather than a definition of which literature is relevant or irrelevant. As mentioned previously, limitation of the research concerns the circular relationship between the choice of keywords (which defines the article sample), and the consequent account of the field. A different sample of articles might thus lead to a somewhat different account of the field. However, in the absence of an established field with agreed terms of reference, this problem is unavoidable.

Grounded analysis of the article sample leads to identification of categories denoting important, frequently occurring themes, later organized into a model representing eParticipation as a field of scientific enquiry. This model represents a preliminary account of the field, and should help researchers to position their own work in relation to existing research. The field is immature and rapidly changing, so the model should also be regarded as a starting point rather than a definitive account. Despite this, we argue that the model provides a defensible overview of the current state of the field, and should help with establishing a cumulative research tradition. The model can further be used as an analytical tool to help understand forthcoming empirical work.

A further contribution of the paper is the development of a preliminary research agenda for the field, based on the analysis and the resulting model. The agenda identifies six necessary areas of research: normative, instrumental, descriptive, evaluative, technological and theoretical/methodological.

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