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The Democracy Network

DEMO-net: Deliverable 5.1

Report on current ICTs to enable Participation

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Abstract:
Information and communication technology is increasingly being used to enable participation in decision-making processes in Europe. The aim of this report is to structure and document the current use of ICT to enhance participation. The report provides an initial analytical framework to investigate ICTs in eParticipation contexts. It further details technologies as basis for eParticipation tools. Subsequently, tool categories and the most common underlying technologies are being detailed. Some relevant aspects of successful deployment of ICT in eParticipation areas are introduced as well.

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Table of Contents

LIST OF TABLES

LIST OF FIGURES

Executive Summary

The use of information and communication technology (ICT) based tools is increasingly being explored to enhance participation in decision-making processes in Europe. The aim of this report is to identify and describe the current use of ICT tools and technologies to promote and enhance participation. By assessing the current ICT use in eParticipation contexts, a baseline is formed for further advances in the area.

eParticipation tools can involve a considerable variety of underpinning technologies and application platforms. This deliverable develops an appropriate framework to describe ICT methods, tool categories and technologies currently used in eParticipation. Technologies such as webcasting, chat, discussion forums, online opinion polling, online surveys, ePanels, ePetitioning, webblogs, etc are already in relatively common use for eParticipation. Depending on the tool and its use they are based on a number of technologies and are delivered through a variety of channels such as PCs, digital TV and mobile phones.

In this deliverable, the current use of ICT tools and technologies in the context of policy engagement and active participation of citizens in democratic decision-making is being studied.

The structure of this report is as follows:

Chapter 2 develops an analytical framework to investigate eParticipation tool categories and technologies. The framework distinguishes among participation areas, which can be used to describe eParticipation tools in specific democratic contexts, actors in eParticipation contexts, level of engagement and stage in the policy lifecycle the tool or technology is being explored.

Chapter 3 provides an overview of the tool categories and it develops an analysis template to investigate tool categories based on the proposed analytical framework introduced in section 2.

Chapter 4 briefly investigates technologies for eParticipation. It provides a general understanding of technologies exploited in certain tool categories for eParticipation. Furthermore, initial thoughts on emerging technologies to be explored in advanced eParticipation tools are described.

Chapter 5 represents the core part of this deliverable and it descries a number of eParticipation tool categories. Thereby, a distinction is made among core eParticipation tool categories, eParticipation categories that are not specific to eParticipation yet heavily used, and basic tools to support eParticipation.

Chapter 6 considers preconditions for successful deployment of eParticipation tools and technologies, such as interoperability, licence policies (e.g. open source), maintainability of the tool or technology and security.

Chapter 7 concludes the report with some reflections and an outlook to investigations in the deliverables to come (D 5.2 on emerging technologies and D 5.3 on eParticipation projects).

1 Introduction

The overarching objective of *DEMO-net* is to strengthen scientific, technological and social research excellence in eParticipation by integrating the research capacities of individuals and organisations spread across Europe. The intention is to advance the way research is carried out in Europe with respect to quality, efficiency, innovation and impact to overcome the currently fragmented approach to eParticipation in this important European research area. The network with this overall objective will provide a major contribution to the strategic goals set by the European Council.

Deliverable D5.1 forms part of DEMO-net's Work package 5 (WP 5). The overall objective of WP5 is to support the implementation of two main pillars of the IST FP 6[1]: a) stimulating research and development of ICT so as to master the technologies that will drive future innovation and growth; and b) promoting the widest and best possible use of ICT-based products and services by all citizens. With this in mind there are 5 objectives of WP 5:

1. To understand the existing tools and technologies used for eParticipation
2. To analyse the technical challenges of eParticipation and the need for new technical approaches to support new services and promote active citizenship.
3. To utilize the methods of Knowledge Management for large-scale eParticipation and to support the quality of citizens' involvement and to support the back-offices to extract citizens' inputs in an effective and high-quality way.
4. To develop standards and an ontology for information structuring in eParticipation tools. This will be realised by focusing on important technical issues such as natural language processing, ontology and the use of open standards for meta data and data exchange standards for eParticipation tools, independent of the tools used
5. To develop the community of researchers and liaise with socio-technical researchers.

Task 5.1, and this deliverable, addresses objective 1 above, i.e. to understand the existing tools and technologies used for eParticipation.

eDemocracy and eParticipation are relatively new terms and as yet there are no agreed definitions. To provide a common understanding of ICT use in eParticipation contexts for the deliverable at hand, we herewith sketch some of the published definitions and slightly different interpretations of the widely used terms eDemocracy and eParticipation.

For instance Hacker and van Dijk (2000: p1), using the term 'digital democracy' as opposed to eDemocracy, discuss the emergence of the concept and how technology is shaping democratic practices. They define digital democracy as 'a collection of attempts to practice democracy without the limits of time, space and other physical conditions, using ICT or CMC[2] instead, as an addition, not a replacement for traditional 'analogue' political practices.' In this regard ICT have the ability to strengthen the progress of democracy and deliberation by breaking through the drawbacks of traditional participation.

[1] http://cordis.europa.eu/fp6/sp1_wp.htm

[2] These terms were expanded earlier in the reference as Information and Communication Technology and Computer-Mediated Communication

Trechsel *et al* (2002) propose the following working definition of eDemocracy that goes more into detail of how democracy can be enhanced: 'e-Democracy consists of all electronic means of communication that enable/empower citizens in their efforts to hold rulers/politicians accountable for their actions in the public realm. Depending on the aspect of democracy being promoted, eDemocracy can employ different techniques: (1) for increasing the transparency of the political process; (2) for enhancing the direct involvement and participation of citizens; and, (3) improving the quality of opinion formation by opening new spaces of information and deliberation.' Therefore eDemocracy also promotes the need for accountability of those elected.

Less focusing on the supervision of representatives but more on positive effects on them and democracy itself, Macintosh (2004) gave a definition of eDemocracy relating it to the technologies that can be adopted as: 'concerned with the use of information and communication technologies to engage citizens, support the democratic decision-making processes and strengthen representative democracy. The principal ICT mechanism is the internet accessed through an increasing variety of channels, including PCs, both in the home and in public locations, mobile phones, and interactive digital TV. The democratic decision making processes can be divided into two main categories: one addresses the electoral process, including eVoting, and the other addressing citizen eParticipation in democratic decision-making.' Macintosh emphasizes eParticipation as main part of eDemocracy and points out the importance of ICT and their channel variety, what leads back to the objectives of this deliverable.

Within DEMO-net, we will further investigate the definitions at a later stage, when the scope of the research and application aspects will have been understood more comprehensively. As the above definitions show, there is still quite some diverse understanding of the area, depending on which discipline the definition has emerged from.

In this deliverable, the current use of ICT tools and technologies in the context of policy engagement and active participation of citizens in democratic decision-making is being studied.

2 Analytical Framework to Investigate the Role of ICT in Participation

The field of eParticipation is a new and rapidly evolving one. As in any other new field distinct experts may have different opinions on the most important areas of eParticipation, as well as on the tools and underlying technologies most pertinent in this field. A growing number of publications investigate the area with varying descriptions of the tools and methods. To name but a few: Coleman and Götz, 2001, Macintosh et al, 2002.

To identify the role of ICT in participation we sketch an initial analysis framework as illustrated in Figure 1 (Tambouris E. et al, 2006). Starting point of consideration of this first approximation to study ICT in participation are the "traditional" participation domains. When speaking of eParticipation, we assume that these areas are supported with ICT, i.e. categories of tools for participation. Further on, we assume that these tools are based on certain technologies.

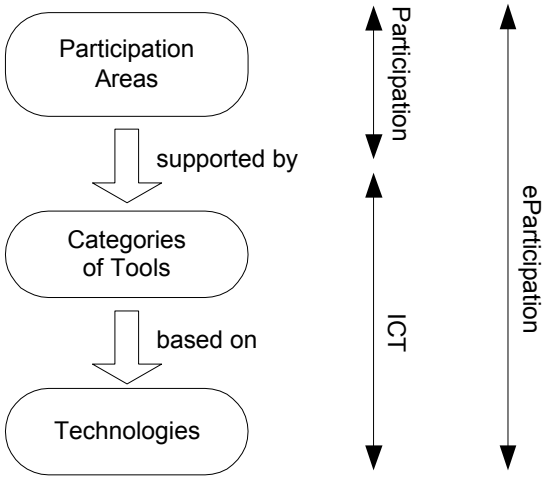

Figure 1. The DEMO-net analytical framework to investigate eParticipation tools and technologies

The initial analysis framework will be developed further when specific eParticipation projects will be considered under task 5.3 (resulting in deliverable D 5.3). Deliverable 5.1 investigates ICT tools and technologies for certain participation areas as defined in Deliverable 4.1.

The methodology we have used to conduct the analysis contains the following steps:

1. Determine the main areas of participation in the democratic process, including the level of [active] participation. This should include all traditional participation areas, without caring about any ICT support.
2. Determine the relevant ICT support in terms of tool categories and technologies. The use of these tools and technologies in the domain of participation actually constitutes what is being called eParticipation.

The first step is based on preliminary work conducted under WP4 and is detailed in sections 2.1 and 2.2. The second step comprised the categorisation and analysis of tool categories and technologies in the context of eParticipation. It will be detailed in chapter 3 (tool categories) and chapter **Fejl! Henvisningskilde ikke fundet.** (technologies).

2.1 Participation Areas

For analytical purposes, we have employed citizen participation areas that are based mainly on Deliverable 4.1. WP4 conducted a survey which identified 23 specific activities in which eParticipation researchers were involved. These ranged from using participatory design techniques for the design of systems to assessing political impact. From this list of research activities we have derived a list of 13 practical areas of deployment of ICT to support eParticipation. These are presented in Table 1.

Table 1: Summary of Participation areas

Information Provision	ICT to structure, represent and manage information in participation contexts
Community building / Collaborative Environments	ICT to support individuals come together to form communities, to progress shared agendas and to shape and empower such communities.
Consultation	ICT in official initiatives by public or private agencies to allow stakeholders to contribute their opinion, either privately or publicly, on specific issues
Campaigning	ICT in protest, lobbying, petitioning and other forms of collective action (except of election campaigns, see electioneering as participation area)
Electioneering	ICT to support politicians, political parties and lobbyists in the context of election campaigns
Deliberation	ICT to support virtual, small and large-group discussions, allowing reflection and consideration of issues
Discourse	ICT to support analysis and representation of discourse
Mediation	ICT to resolve disputes or conflicts in an online context
Spatial planning	ICT in urban planning and environmental assessment
Polling	ICT to measure public opinion and sentiment
Voting	ICT in the context of public voting in elections, referenda or local plebiscites

Understanding these participation areas in terms of which tools and technologies might be relevant and which are already deployed in practical application, one also has to differentiate the level of active participation.

2.2 Level of Participation Addressed

In this field we record the level of participation addressed by the tool. With respect to level, there are a number of different classification schemes proposed for eParticipation in the literature:

- The OECD study (2001) identifies three levels of participation. It argues that democratic political engagement must involve the means to be informed

(Information), the mechanisms to take part in the decision-making (Consultation) and the ability to contribute and influence the policy agenda (Active Participation) (cf. Coleman and Gøtze, 2001):

Information: a **one-way** relationship in which government produces and delivers information for use by citizens.

Consultation: a **two-way** relationship in which citizens provide feedback to government. It is based on the prior definition of information. Governments define the issues for consultation, set the questions and manage the process, while citizens are invited to contribute their views and opinions.

Active participation: a relationship based on **partnership** with government in which citizens actively engage in defining the process and content of policy-making. It acknowledges equal standing for citizens in setting the agenda, although the responsibility for the final decision rests with government.

- Based on the OECD schema, Meyer (cf. IBM report, no date provided) proposes four levels of public involvement: information, consultation, engagement and collaboration.
- Another schema of three different levels of eParticipation is proposed by Macintosh (2004): e-enabling, e-engaging and e-empowerment. E-enabling refers to supporting those who would not typically access the internet and take advantage of the information available there by addressing the issues of accessibility and understandability of the information presented. E-engaging has to do with allowing deeper contributions from a wider audience in order to support mainly deliberative debates on policy issues (Macintosh, 2004). Finally, e-empowerment is more concerned with active two-way participation as is mentioned by OECD.
- Yet another schema is provided by the International Association for Public Participation (IAP2) accommodating five levels of traditional participation with increasing level of public impact: Inform, Consult, Involve, Collaborate and Empower. The five levels aim at reaching the following public participation goals[3]:
    - *Inform* aims at providing the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.
    - *Consult* is to obtain public feedback on analysis, alternatives and/or decisions.
    - *Involve* is about working directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.
    - *Collaborate* is about partnering with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.
    - *Empower* is to place final decision-making in the hands of the public.

[3] http://www.iap2.org/associations/4748/files/spectrum.pdf

All the schemas mentioned are lacking in the fact that a lot of information flow is initiated by Citizens and NGO's to government, or reversed to what is described in these schemas. A typical one way relationship initiated by the citizen is an ePetition.

To assess the currently available ICT for eParticipation contexts, we have analysed and tried to merge these schemas. The result is reflected in the following schema to express the level of engagement in eParticipation:

- eInforming refers to a one-way channel that provides information from either government such as official websites or Citizens such as ePetitions.
- eConsulting is a limited two-way channel where official initiatives by public or private agencies allow stakeholders to contribute their opinion, either privately or publicly, on specific issues.
- eCollaborating is a more enhanced two-way channel. It acknowledges an active role of all stakeholders in proposing and shaping policy - although the responsibility for the final decision rests with officials.
- eEmpowering refers to the placement of the final decision in the hands of the public. E.g. legally binding referenda.

The four-level schema needs further elaboration in the work-package tasks to come and within the whole eParticipation community to ensure community agreement. In the course of the joint research activities, DEMO-net will investigate the various details, intensity of engagement and distinct levels of participation in the policy lifecycle, and, hence, will validate this schema.

2.3 Actors in Different Participation Areas

In order to complete the analytical framework, we also need to understand the actors or stakeholders of certain participation areas. We herewith turn specifically to the ICT enabled participation areas and record both, the actors that benefit from using a certain participation tool and those who are responsible or moderating/administering the participation tool.

Possible actors / stakeholders in participation initiatives will typically include government ministers, elected representatives, government employees responsible for implementing policy, policy-makers, businesses, civil society organizations (CSOs) as well as individual citizens. In addition both the government body and the engaged stakeholders may call on multi-disciplinary teams of specialists to support the process. In other words what other specialists are required to support the management and use of the tool category. Also, the type and size of the 'target audience' of invited citizens and/or (self-selected) public that the tool category could potentially support needs to be understood.

Above types of stakeholders have been categorised by Fung, 2006 (presented from the more exclusive to the more inclusive):

- *Expert Administrators*: This category of users refers to technical experts selected by the politicians.
- *Elected Representatives*: This obviously refers to those elected to represent citizens' interests.

- *Professional Stakeholders*: These participants are paid representatives of organized interests and public officials.
- *Lay Stakeholders*: This category refers to unpaid citizens who have a deep interest in a public concern and are willing to represent those having similar interests or perspectives but choose not to participate.
- *Randomly Selected Recruits*: This group addresses the problem of descriptive representativeness of the general population.
- *Non-Randomly Selected Recruits*: This group is used in exercises to enhance participation especially among subgroups that are less likely to participate.
- *Self-selected Participants*: This means that a participation exercise is open to all those wishing to participate. Although this is the most frequent case, it fails to represent the larger public since wealthier and better-educated people tend to participate more.

Fung (2006) also proposes the diffused public sphere as another category which in the case of eParticipation tends to collide with self-selected participants. This is due to the fact that although the eParticipation exercise is diffused by mass media and informal venues of discussion, the users participating are still those who wish to participate and have the ability to access the channels required.

The categories of the facilitators and moderators of the tool include expert administrators, elected representatives, private and civil society organizations.

Above indications show once more that there is no unique categorisation so far. To reach a common understanding of the eParticipation research and practitioner community on the stakeholders and actors in eParticipation, we will further elaborate these approaches of stakeholder classifications.

2.4 Stage in the policy lifecycle of participation

eParticipation tools can be employed in distinct stages of policy processes. Researchers have argued that citizens will be better able to influence policy content through participating earlier in the process. eParticipation exercises that are close to the draft policy stage are likely to place higher demands on citizens' ability to understand technical and legalistic statements (OECD 2003). For that reason the resources invested in clarifying the background information and making it suitable for the target audience will be higher. Howlett and Ramesh (1995, p11) have set out the following five high level stages in policy-making:

1. **Agenda setting**: refers to the process by which problems come to the attention of governments.
2. **Policy formulation**: refers to the process by which policy options are formulated within government.
3. **Decision making**: refers to the process by which governments adopt a particular course of action or non-action.
4. **Policy implementation**: refers to the process by which governments put policies into effect.

5. **Policy evaluation**: refers to processes by which the results of policies are monitored by both state and societal actors, the result of which may be re-conceptualization of policy problems and solutions.

A slightly different approach has been developed by Macintosh in OECD (2003, p. 34). The author introduces the following five high-level policy stages:

1. **Agenda setting**: establishing the need for a policy or a change in policy and defining what the problem to be addressed is.
2. **Analysis**: defining the challenges and opportunities associated with an agenda item more clearly in order to produce a draft policy document. This can include: gathering evidence and knowledge from a range of sources including citizens and civil society organizations; understanding the context, including the political context for the agenda item; developing a range of options.
3. **Formulating the policy**: ensuring a good workable policy document. This involves a variety of mechanisms which can include: formal consultation, risk analysis, undertaking pilot studies, and designing the implementation plan.
4. **Implementing the policy**: this can involve the development of legislation, regulation, guidance, and a delivery plan.
5. **Monitoring the policy**: this can involve evaluation and review of the policy in action, research evidence and views of users. Here there is the possibility to loop back to stage one.

Overall, the concepts seem to be similar. However, the eParticipation community has yet to come up with an agreement of the semantics of the distinct phases.

In respect to analyse the use of eParticipation tools and technologies, it should also be noted that particular eParticipation tools and technologies may support more than one of above policy stages.

3 Tool Categories

A number of software applications, products, tools and components have been used in eParticipation projects. These range from weblogs and alert mechanisms to the more sophisticated consultation platforms. Macintosh, Coleman and Lalljee (2005) have developed an 'eMethods Guide' for public authorities. It included the description of thirteen types of tools, which have been used for eParticipation. This list has been expanded with further tools and clustered as follows:

- Core eParticipation tools as demonstrated in Table 2
- Tools extensively used in eParticipation, but not specific to eParticipation as demonstrated in Table 3
- Basic tools to support eParticipation as demonstrated in

Table 4.

Table 2: Core eParticipation Tool Categories

Tool Category	Brief Description
eParticipation Chat Rooms	Web applications where a chat session takes place in real time, which is especially launched for eParticipation purposes
eParticipation Discussion forum/board	Web applications for online discussion groups where users, usually with common interests, can exchange open messages on specific eParticipation issues. Users can pick a topic, see a "thread" of messages, reply and post their own message
Decision-making Games	These typically allow users to view and interact with animations that describe, illustrate or simulate relevant aspects of an issue; here with the specific scope of policy decision-making.
Virtual Communities	Web applications in which users with a shared interest can meet in virtual space to communicate and build relationships; the shared interest being within eParticipation contexts as introduced in section 2.1
Online Surgeries	Web applications specifically designed to support elected representatives to engage with the citizens they represent
ePanels	Web applications where a 'recruited' set, as opposed to a self-selected set, of participants give their views on a variety of issues at specific intervals over a period of time
ePetitioning	Web applications that host online petitions and allow citizens to sign in for a petition by adding their name and address online
eDeliberative Polling	Web applications which combine deliberation in small group discussions with random sampling to facilitate public engagement on specific issues
eConsultation	Web applications designed for consultations which allow a stakeholder to provide information on an issue and others to answer specific questions and/or submit open comments
eVoting	Remote internet enabled voting or voting via mobile phone, providing a secure environment for casting a vote and tallying of the votes (other types of electronic voting are available, but for the purposes of this report we focus on internet voting)
Suggestion Tools for (formal) Planning Procedures	Web applications supporting participation in formal planning procedures where citizens' comments are expected to official documents within a restricted period

It can be argued that the first four categories in Table 2 are not specific to eParticipation, i.e. these could be assigned as well to Table 3. With the view of the tools being explored for specific participation purposes as introduced in section 2.1, though, we consider a more focused investigation of these categories relevant.

Table 3: Tools extensively used in eParticipation, but not specific to eParticipation

Tool Category	Brief Description
Webcasts	real time recordings of meetings transmitted over the internet
Podcasts	publishing multimedia files (audio and video) over the Internet where the content can be downloaded automatically using software capable of reading RSS feeds
Wiki	Web applications that allow users to add and edit content collectively
Blogs	Frequently modified web pages that look like a diary as dated entries are listed in reverse chronological order
Quick polls	Web-based instant survey
Surveys	Web-based, self-administered questionnaires, where the website shows a list of questions which users answer and submit their responses online
GIS-tools (Map-server for maps and plans)	Web applications that support information provision and enable the users to have a look at maps underlying planning issues and to use them in various ways

Table 4: Basic tools to support eParticipation

Tool Category	Brief Description
Search Engines	Web applications to support users find and retrieve relevant information typically using keyword searching
Alert services	One-way communication alerts to inform people of a news item or an event, e.g. email Alerts and RSS Feeds
Online newsletters	One-way communication tools to inform a general audience or a pre-registered audience of specific news items and events.
Frequently asked questions (FAQ)	A 'tree' of questions and answers that can be searched using keywords or by inputting a question or statement
Listservs	
Web Portals	Websites providing a gateway to a set of specific information and applications
Groupware tools	Tool environment to support computer-based group works

The list of tool categories explored to create a basic ICT environment to enable eParticipation as shown in

Table 4 is not exhaustive. Yet, these tool categories were considered the most relevant for eParticipation contexts. We are aware of the fact that further basic tools may be used as well in certain eParticipation contexts and environments. Although not in table 4. Listservs, the email-based tools, are perhaps the most frequently used tool by citizen grassroot groups and NGO's to organize themselves to push policy-making and public involvement. Further analysis and a more comprehensive and inclusive understanding of the field might be needed to validate the chosen categories.

Above tool categories form the basis for the subsequent investigations in chapter 5. Before providing an in-depth description of each tool category within an eParticipation context, a template to describe the eParticipation tool categories is introduced. It bases on the analytical framework as proposed in chapter 2.

3.1 Template to describe eParticipation Tool Categories

To describe the tool categories identified in section 3.1 in sufficient detail and to enable tool categories to be compared and contrasted, we employ a description template as shown in

Table 5. It is based on the initial analytical framework developed by Macintosh (2004) and has been further elaborated for the purpose of the analysis of ICT for eParticipation within the context of DEMO-net.

Table 5: Dimensions to describe and compare eParticipation tool categories

Criteria for description	Explanation
General description	Brief description as given in Table 2, Table 3, and Table 4
Participation area	Participation areas where the tool category is relevant as grouped and detailed in section 2.1.
Direction of communication	Level of participation as introduced in section 2.2
Stakeholders	Distinct actors as introduced in section 2.3 using a tool category for specific purposes such as: • To use the tool category in a certain participation area and direction of communication • To provide content for a certain participation area • To manage the use of the tool in a certain participation area
Stage in policy cycle	Tool category supporting in one or more stage(s) in the policy lifecycle as introduced in section 2.4: (1) agenda setting [includes awareness and problem perception], (2) policy formulation, (3) decision-making, (4) policy implementation, (5) policy evaluation.
Special concerns / Rules of engagement (owner/provider and/or end-user)	The typical level of security available and what amount of personal information is required for using the tools need to be understood. Questions to address include: Can users be made aware of how the personal information they enter will be used and who will have access to it? What, if any, authentication of the user is supported? To ensure the eParticipation tool category has the potential to reach a wider audience there is a trade off between making it easy for any member of the public to participate and asking them to provide details of who they are before or after doing so. A registration process enables the users to be identified and contacted at a later date, for example with feedback or information on any follow-up initiative. Also, demographic questions could form part of the registration process to support the analysis and evaluation of the exercise (related to the dimension 'evaluation'). Furthermore, requirements from the users' side in order to use the tool are being described (e.g. having a PC and an internet browser). It describes also what stakeholders can and cannot do with the tool.
Accessibility of the tool (owner/provider and/or end-user)	Extent to which stakeholders are realistically able to access and make use of the tools in this category: o Level of experience and skills needed to develop, to add content and to use. Such information helps to provide a better understanding of resource implications and level of technical competency required; o Access for users with disabilities; Are appropriate standards such as the Web Accessibility Initiative guidelines (www.w3.org/wai) applied and implemented to ensure accessibility for all (WAI conformance level the tool category is implemented in; we are aware of the fact that it is difficult to provide precise information of WAI level of conformance for a tool category but an indication is useful); o Languages the tool may be used in – given the number of spoken languages across Europe and the associated number that must be legally support in various EU countries; indication of whether a specific tool category is available in a range of languages;
Channel availability	Channel(s) the tool category is available in, for example, PCs, mobile phones, and interactive digital TV.
Technologies used in building the tool	Technologies mentioned, e.g. web server, database management system, application server, hardware dependencies, technical realization (e.g. web-application to use in browser) – see also chapter **Fejl! Henvisningskilde ikke fundet.** for a more detailed discussion on technologies
Evaluation of the tool	Implications for evaluating any associated eParticipation activity are examined. As such, the tool categories are examined for any inbuilt evaluation data collection mechanisms, for example, exit questionnaires, ability to generate web-usage statistics, etc.
Further information, examples of tools, practical application of tools in this category	URL and whether (and where) further (also critical) information about applications and their performance is available (references to articles, books etc.)?

The investigation of the deliverable at hand is the starting point of studying the ICT tools and technologies in eParticipation. In further analysis, specific projects and solutions of applications, tools and technologies will be investigated (e.g. in Task 5.3). Consequently, further relevant dimensions to categorise, describe and compare tools and technologies for eParticipation contexts may be investigated. These could include reflections on the outreach of a certain eParticipation application, tool or technology, i.e. the extent to how many people are being addressed and how many citizens are effectively using the tool. Furthermore, information about the property rights, license type and conditions of use (e.g. open source, GNU, full license, ASP model) might be provided for specific tools, applications or technologies (which are not reasonably arguable for tool genres as such). Likewise, information of price ranges and where the solution could be obtained could be provided.

Before presenting more detailed descriptions of eParticipation tool categories (cf. chapter 5) according to the schema introduced in

Table 5, we reflect categories of eParticipation technologies.

4 Current Technologies Used in eParticipation Tools

As shown in the overall framework in Figure 1, eParticipation tools can be based on a number of diverse technologies. Establishing a definitive list of technology categories is a complex task and the use of the word 'technology' even becomes open to criticism. Consequently, we focus on key aspects of technologies without grouping them into specific categories. Issues to be considered when studying tool categories for eParticipation include:

- the necessary underpinning hardware, for example, PC and/or MAC hardware or mobile devices.
- the necessary operating system such as Microsoft Windows, MAC OS, Unix or Linux.
- the necessary transfer protocols (HTTP[4], SMTP[5], FTP[6], Telnet[7], NNTP[8], etc. [9]) over the Internet.
- basic text formats to tag and mark up web content such as HTML, XML, XHTML, etc.
- the user interfaces as such, i.e. industry-standard web browsers to navigate through textual or graphical web content; for example, MS Internet Explorer, Mozilla Firefox, Opera, and Safari, WAP browsers.
- in more innovative eParticipation tools, advanced plug-ins (such as java applets, Java Scripts, CGI scripts, Active Server Pages, Ajax, etc.) are used. [10]
- next generation tools base on semantic web technologies such as web services.
- whether proprietary databases or other data management systems are required, for example, Microsoft SQL Server or Oracle.
- whether word/document processing technologies are used, for example, Adobe Acrobat, Microsoft Word or OpenOffice.
- whether streaming media technologies[11] are used, for example, RealPlayer, Macromedia Flash, Shockwave or QuickTime.

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[4] HyperText Transfer Protocol to transmit hyptertext over networks (the standard protocol of the Web)

[5] Simple Mail Transport Protocol for distributing electronic messages and files to one or more electronic mailboxes.

[6] File Transfer Protocol to transfer text or binary files between an FTP server and client

[7] Facilitating the login to a computer host to execute commands

[8] Network News Transfer Protocol to distribute Usenet news articles derived from topical discussions on newsgroups

[9] Many other protocols are available on the Web. To name just one example of new technologies which will be further investigated in the emerging technologies work of D 5.2: the Voice over Internet Protocol (VoIP) allows users to place a telephone call over the Web.

[10] Plug-ins are (small) software programs to enhance Web browser capabilities to run or display a file, e.g. to play a video clip, to open a file, etc.

- content/textual analysis tools built within certain eParticipation tools or required to be used by them for full functionality to be addressed.
- the underpinning collaborative support/ groupware technologies incorporated into certain eParticipation tools.
- for certain spatial planning related eParticipation tool categories the type and level of GIS technology is important.

Given that this report describes 'tool categories' as opposed to specific tools it may be difficult to give a list of the precise technologies used per category in the subsequent analysis of chapter 5. Even when referring to a specific tool, a combination of technologies can be used to offer an innovative toolset for a certain participation area, or to support a range of participation areas as well as policy stages.

It should also be noted that the analysis of basic technologies for any kind of web application is out of scope here. Consequently, details on technologies are not provided in the report at hand. Advanced and emerging technologies having a high potential of being used in eParticipation contexts are being outlined in the following section. Yet, they will be treated more extensively in the upcoming deliverable D 5.2.

4.1 Initial Thoughts on Emerging Technologies in eParticipation Contexts

As already pointed out above, many technologies for eParticipation tools are not specific. Technologies may range from the simple web technologies such as HTML, HTTP, etc. to more advanced genres such as streaming media and mobile technologies.

In current times, new and innovative technology is progressing very quickly. Some key emerging technologies, which may bear a big potential for extensive future use in eParticipation contexts, have been identified in the course of the investigations to date. These examples are sketched in the following:

- Groupware and collaborative technologies

  Groupware is strongly related to the research domain of Computer Supported Cooperative Work (CSCW) and it is defined as computer-based systems that support groups of people engaged in a common task and that provide an interface to a shared environment Following this definition groupware technologies provide an environment for collaborative tasks which may even combine diverse technologies towards a comprehensive toolset for groupware, e.g.: videoconferencing, instant messaging, email, wiki, blogs, etc. Groupware can be divided into three categories: electronic communication tools, electronic conferencing tools, collaborative management tools.

  Such technologies bear a high potential to support distinct participation areas and different stakeholders in the various policy stages of eParticipation.

[11] Streaming media technologies offer a wide range of functionalities to create and implement entire multimedia services combining graphics, animation and sound. These enable to listen to audio and video over the Web, both pre-recorded and live.

- Semantic Web Technology

  The Semantic Web is the opportunity for providing, finding and processing information via Internet with the help of machines which are capable of dealing with the semantics of the information. Information is something meaningful to social actors who seek to enhance their knowledge in order to satisfy a specific concern or accomplish a specific task related to their particular context. The information in focus is considered to be heterogeneous in terms of syntax, structure, and semantics. The Semantic Web is a combination of technologies such as: *Explicit metadata* expressed with Resource Description Framework (RDF); *Ontologies,* which describe the main concepts of a domain and their relationships. Ontologies can be represented in some ontology language like RDF Schema or OWL. RDF Schema is a vocabulary for describing properties and classes of RDF resources, with a semantics for generalization-hierarchies of such properties and classes. OWL adds more vocabulary for describing properties and classes: among others, relations between classes (e.g. disjointness), cardinality (e.g. "exactly one"), equality, richer typing of properties, and characteristics of properties (e.g. symmetry), and enumerated classes; *Logical reasoning:* it makes it possible to draw conclusions from combining (meta) data with ontologies.

  These new technologies bear a huge potential for eParticipation support, especially in structured information provision and search, argument visualisation and complex decision-making structuring.

- Agent Technologies

  An agent is able to act, is autonomous, proactive, communicates with others, and perceives its environment (Bernon, C., Cossentino, M., Pavón J., 2005). An agent can determine which behaviour to follow (depending on its goals, its internal state and its knowledge from the environment) and not because someone else forces to do something.

  Agent technologies may be explored in various applications in eParticipation contexts.

  Applying agents enables quite naturally to: (1) capture deeper constraints on what services are willing to offer, thereby capturing richer requirements for service composition, (2) discover trustworthy services, (3) negotiate within teams of providers and (4) judge the compliance of service providers with their contracts regarding specific compositions.

  These features make the agent technologies also suitable to solve the problems in eParticipation domain

- Data Mining Technologies

  Data Mining (DM) can be defined as a "nontrivial extraction of implicit, previously unknown, and potentially useful information from data". DM is usually associated with an institution's need to identify trends and other useful patterns in a large set of data. The term data mining is sometimes used as a synonym to knowledge discovery of databases (KKD), but according to the standardized methodologies (i.e. CRISP-DM); data mining is only one step in the KDD process. The process of KDD includes data understanding, data preparation, modelling (data mining step), evaluation and deployment.

Data Mining technologies may e.g. be very useful in eParticipation contexts to extract and evaluate valuable knowledge of large discussion data.

- Natural Language Processing (NLP) Technologies

  Natural Language Processing (NLP) is a broad research field, combining methods of artificial intelligence and linguistics to study the problems of automated generation and understanding of natural human languages.

  From the eParticipation perspective, the application areas are natural language interfaces, information retrieval & information extraction, and automatic summarization.

- Privacy enhancing technologies (PET)

  Privacy-enhancing technologies (PET) are a collection of ICT to enhance the protection of personal data. PET help to protect personal information flowing over global public networks.

  In the context of eParticipation, the protection of private data to be transmitted is important. Consequently, PET play an important role in eParticipation contexts.

Among others, these technologies will be further investigated under task 5.2. Deliverable D 5.2 will focus especially on emerging technologies for eParticipation.

5 Analysis of Existing Tool Categories in eParticipation Contexts

In the following subsections existing tool categories as elaborated in chapter 3 are being described based on the template provided in

Table 5. The descriptions are grouped into the clusters of

- core eParticipation tool categories (cf. section 5.1);
- tools extensively used in eParticipation, but not specific to eParticipation (cf. section 5.2);
- and basic tools to support eParticipation (cf. section 5.3).

5.1 Core Tool Categories in an eParticipation Context

5.1.1 eParticipation Chat Rooms

Criteria for description	**Explanation**
General description	Web applications where a chat session takes place in real time. Chats provide a means for live question-answer panels between experts or government personnel and participants and also the opportunity for peer-to-peer interaction within communities.
Participation area	Chat rooms can support community building, collaboration, consultation and electioneering.
Direction of communication	Chats allow many-to-many communication, so it is a two-way communication (between groups and/or individuals). That enables consultation with sequences of questions, answers and also discussions.
Stakeholders	Elected representatives, government staff or experts as main actors and citizens as addressees. Providers can be governments, civil society organisations or other organisations that invite politicians or experts on an issue
Stage in policy cycle	Appropriate stage in policy cycle are (1) agenda setting and (2) policy formulation
Special concerns / Rules of engagement (owner/provider and/or end-user)	Moderation is required to allow young people (under 16's) to take part safely and to control any disruptive behaviour. Contrary to chat rooms in the internet, chats for eParticipation purposes are offered for a specific time-horizon, normally an hour at most. Often registration (in advance) is necessary or sensible. The chat room appeals because it allows users to freely interact with one another, an online discussion where participants post messages to others in this shared '*chat space'*. Each participant can normally see all other's responses and these often overlap; this is an important difference from a *discussion forum*, which offers a more structured approach to discussion as input is typically organised by 'threads'. This critical difference needs to be considered if the resulting discussion needs detailed analysis.
Accessibility of the tool (owner/provider and/or end-user)	Design and accessibility issues need to focus on how to follow the chat sessions and participate in them. It can be difficult to schedule a live question-answer panel involving experts and government personnel. Unless there is a record kept of the chat session analysing the interaction can be problematic. The human resource implications are relatively high. The technical competency is moderate to high. *Chat* is time-specific and limited. Some of the challenges of *chat* are that it can be somewhat difficult to arrange; timing things to suit all concerned, and ensuring that all people are aware of the opportunity. Often times and locations of chats are broadcasted over TV or Radio. This effects higher numbers of participants and even allows to address a specific target-group. A representative or expert, who took part in the programme, could get involved in the online discussion afterwards. The *chat* tool also must be designed and supervised/ moderated to ensure safe.
Channel availability	mainly accessed through PCs, but also (web-)clients for mobile phones do exist (problem of text input)
Technologies used in	Application server with web-frontend and/or standalone client (often in connection with

building the tool	instand messaging technology) are in use. Although chat rooms have typically been text based they increasingly offer the option of employing video and audio streams.
Evaluation of the tool	They can be difficult to evaluate as the main focus is on whether the participants enjoyed the exercise and were satisfied with the responses from the expert panel.
Further information, examples of tools, practical application of tools in this category	http://chat.yahoo.com/ http://www.chatdanger.com/

5.1.2 eParticipation Discussion Forum/Board

Criteria for description	**Explanation**
General description	Web applications for an online discussion group where users, usually with common interests, can exchange open messages. Users can pick a topic, see a "thread" of messages, reply and post their own message
Participation area	Supports all participation areas except "polling" and "voting".
Direction of communication	Interaction can consist of two-way discussions as well as argumentation on partnership level. So it could be a tool for consultation and collaboration.
Stakeholders	Elected representatives, government staff or experts as main actors and citizens as addressees. Providers can be governments, civil society organisations or other organisations that invite politicians or experts on an issue
Stage in policy cycle	Appropriate stages in policy cycle are (1) agenda setting [includes awareness and problem perception], (2) policy formulation [analysis + information], and (5) policy evaluation). They have the potential to support interaction, thought, deliberation, debate and allow for a full discussion, potentially useful for the development of complex policy.
Special concerns / Rules of engagement (owner/provider and/or end-user)	A clear 'conditions of use' statement is required which can be followed by both moderators and participants. Besides it should be described (and planned before starting) how the results will be used for the further political process, a commitment of the political authorities is helpful. Discussion forums are distinguished from chat rooms by structured interaction around the threads and that extends normally over a period of days or weeks rather than hours. When used for consultations, each forum should last between 4 to 12 weeks to increase participation and also to re-visit the forum and reply to others with a definite time restriction to keep discussion focussed as potential users know that they have to make their statement within a specific time-horizon. For some discussion forums, registration is necessary. Staff time and skills are required to moderate (at least for legal reasons), support and facilitate such discussion, as well as the content analysis skills to analyse contributions and produce reports to embed the results into the political process and to give feed-back to the users.
Accessibility of the tool (owner/provider and/or end-user)	If registration is required care should be taken not to make the process too onerous and time consuming. Design and accessibility issues need to focus on how to follow the discussion threads and post comments and replies easily.
Channel availability	mainly access over PC-based web browsers
Technologies used in building the tool	Typically a program which runs on a web-server able to handle a large number of contributions, depending on the scale. Postings are typically stored in a database. More sophisticated means can be integrated (e.g. ratings and pollings to focus the discussion). Because means of authentification can range from anonymous to registration via digital signature and forums can be supported by several facilitators, they need a sophisticated system of user-rights-management in the backend.
Evaluation of the tool	Content analysis of what is said in the forum is sometimes necessary but time consuming. Statistics are helpful about specific page uses.

Further information, examples of tools, practical application of tools in this category	http://www.tellparliament.net http://www.civicinfo.bc.ca/phpbb2/index.php http://www.danmarksdebatten.dk

5.1.3 Decision-making games

Criteria for description	Explanation
General description	These typically allow users to view and interact with animations that describe, illustrate or simulate relevant aspects of an issue. The user can be presented with a graphical representation of a place or situation and various options that, when selected, change the representation in some way to simulate the effect of real-life decision-making.
Participation area	Decision-making games can be used to describe a situation or an upcoming decision in a user friendly and interactive way. So all areas could more or less benefit from this category.
Direction of communication	Decision-*making games* are typically designed for individuals rather than groups of players. They allow two-way communication, where the 'owner' sets the tasks and questions and the users respond. However, there are some multi-user games where the players/participants adopt roles and characters that are represented online as cartoon like figures. Participants exchange messages following rules to select a course of action that represent a decision-making process involving some element of cooperation or competition.
Stakeholders	Similar to survey questionnaires for the development of content, but games can require considerable resources to develop the system therefore the expected lifetime of the engagement exercise needs to be considered. Resource implications are high. The technical competency required is also high.
Stage in policy cycle	Usually in the Policy agenda setting and formulation stages.
Special concerns / Rules of engagement (owner/provider and/or end-user)	For quiz type games any responses that form part of the game are not usually shared with others. Where games are designed to be multi-user explicit rules will be required. The content, level of difficulty and types of interfaces are dependent on the target audience. The overall design of the *game* is important, as it has to be visually attractive and entertaining whilst being realistic and informative.
Accessibility of the tool (owner/provider and/or end-user)	Web accessibility guidelines need to be followed, which may be more difficult given that games generally have to be visually attractive and entertaining. The *game* format is likely to be appealing to those who already access computer-based games, particularly young people. However, when used by young people it will be necessary to create a safe system of access whereby individual usernames and passwords are allocated.
Channel availability	Through the technical requirements of games (esp. multimedia), the PC is the main device for usage. However, mobile phones or even Digital-TVs could present simple game versions in the future.
Technologies used in building the tool	Web application which include various, graphical environments, multi-media, etc and usually require high bandwidth access and a PC with good graphics and high screen resolution. There are a variety of game types. Players are used to, and expect, good interaction and graphics.
Evaluation of the tool	Analysis of usage statistics and exit questionnaires.
Further information, examples of tools, practical application of tools in this category	http://simcity.ea.com/ designed to let players build and manage a city where activities range from deciding on the position of power plants to governance. http://www.youngtransnet.org.uk/main/home.htm designed to let children and young people consider sustainable transport issues. http://www.demgames.org/ designed as part of the Local eDemocracy National project.

5.1.4 Virtual Communities

Criteria for description	Explanation
General description	Web applications in which users with a shared interest can meet in virtual space to communicate and build relationships

Participation area	Virtual community websites can be used to support a whole range of participation areas, but particularly community building.
Direction of communication	The aim is to build partnership for decision-making.
Stakeholders	Needs a champion to facilitate and coordinate the activities of the virtual community.
Stage in policy cycle	All stages are applicable but particularly the agenda setting for new policy and the evaluation stage where the need for a major change in policy has been highlighted.
Special concerns / Rules of engagement (owner/provider and/or end-user)	Such a web site typically provides background information and should be organised specifically to support an issue, a range of connected issues or a geographical area.
Accessibility of the tool (owner/provider and/or end-user)	Trust, trustworthiness and community-building aspects should all be addressed in designing the application. If registration is required care should be taken not to make the process too onerous and time consuming. Other comments as for the above tools apply.
Channel availability	Main mean of interaction will be a PC. Mobile phones and digital TV could be used in order to keep track of the ongoing process and therefore would mainly work as information clients.
Technologies used in building the tool	There is typically a web site that should directly support engagement by allowing users to contribute online using a combination of the above tools.
Evaluation of the tool	Need to ensure involvement of the community and other stakeholders in assessing the effectiveness.
Further information, examples of tools, practical application of tools in this category	www.communitybuilders.nsw.gov.au/ http://www.bbc.co.uk/dna/actionnetwork/ https://minn.gardabaer.is/GoPro.Community.User.UI.WebApplication/Open/gardabaer.html

5.1.5 Online Surgeries

Criteria for description	**Explanation**
General description	Web applications specifically designed to support elected representatives to engage with the citizens they represent.
Participation area	Online surgeries can be used to support a whole range of participation areas, but particularly campaigning and electioneering.
Direction of communication	Platforms which support elected representatives engage with their constituents. Representatives offer online surgeries as an alternative to face-to-face meetings in their constituency office as a consultation (two-way) or maybe even collaboration with stakeholders (partnership).
Stakeholders	The elected representative has to be responsible for content and ensuring correct level of engagement
Stage in policy cycle	All stages are applicable but particularly the agenda setting for new policy and the evaluation stage where the need for a major change in policy has been highlighted.
Special concerns / Rules of engagement (owner/provider and/or end-user)	If registration is required care should be taken not to make the process too onerous and time consuming. Other comments as for the above tools apply
Accessibility of the tool (owner/provider and/or end-user)	The simplest just offer an online form to ask a question or make a statement, where the more sophisticated provide access to tools such as newsletters, chat, discussion fora. The elected representative is the main content provider and therefore needs adequate skills to easily add news and information.
Channel availability	To allow a sophisticated interaction and to assure efficiency, a PC is the only feasible channel.
Technologies used in building the tool	These are basically web sites with various web applications that provide access to eParticipation tools described above. They vary as to the scope of functionality.

Evaluation of the tool	Need to ensure involvement of the community and other stakeholders in assessing the effectiveness.
Further information, examples of tools, practical application of tools in this category	http://www.derekwyattmp.co.uk/pages/home.asp?i_PageID=1810 http://annmckechinmp.net/online-surgery.htm

5.1.6 ePanels

Criteria for description	**Explanation**
General description	Web applications where a 'recruited' set, as opposed to a self-selected set, of participants give their views on a variety of issues at specific intervals over a period of time
Participation area	eConsulting and eParticipation - comments are sought in order to gauge opinion and solicit ideas.
Direction of communication	Online surveys may be used and in such cases there is no interaction between participants and they do not see the responses from other panel members. ePanels can be organised specifically to support intensive engagement, by providing background information, and directly supporting engagement
Stakeholders	Where surveys are included, personnel with skills in designing and analysing these are required – similar to surveys above. Where discussion fora are included the comments above apply. An additional point is that a representative audience familiar with the use of technology needs to be recruited and sustained. This may require incentives such book tokens or shop vouchers being offered.
Stage in policy cycle	Policy: agenda setting, analysis and formation stages. Service: need and design of a service.
Special concerns / Rules of engagement (owner/provider and/or end-user)	Typically, members do not see the responses from other members. However sometimes a discussion forum is included in which case the issues regarding fora listed above need to be taken into account.
Accessibility of the tool (owner/provider and/or end-user)	Access by allowing invited participants to contribute online using any combination of the above tools. If registration is required care should be taken not to make the process too onerous and time consuming. Other comments as for discussion fora and surveys apply.
Channel availability	PC (through the complexity of the application)
Technologies used in building the tool	As for discussion fora and surveys.
Evaluation of the tool	The panel can be issued with evaluation questionnaires.
Further information, examples of tools, practical application of tools in this category	http://www.askbristol.com http://www.communitypeople.net/epanel_software.htm

In future developments of ePanels, a range of tools may be combined to provide larger functionality and to cover a wider field of application. Such other tools incorporated in ePanels can be used to supplement and broaden the contributions. Examples are e.g. discussion forums, which enable discussion between members.

5.1.7 ePetition tools

Criteria for description	**Explanation**
General description	Web applications that host online petitions and allow citizens to sign in for a petition by

	adding their name and address online
Participation area	The participation area that can be supported is specifically "campaigning".
Direction of communication	
Stakeholders	Personnel with moderate IT skills need to be able to upload and manage the petitions. Moderator may be required for discussion forum. A named point of contact must be identified to receive petitions and check their legality. Resource implications moderate. Technical competency moderate to high.
Stage in policy cycle	All stages are applicable (besides decision making) but particularly the agenda setting for policy.
Special concerns / Rules of engagement (owner/provider and/or end-user)	Needs names and addresses to be checked and if discussion forum is incorporated this will need moderation. Data protection and privacy issues are applicable as users are providing their names and addresses. In fact that ePetitions are only informing the Council about an issue, as opposed to presenting an issue that will become legally binding, the level of checking does not need to be the same as for eVoting. Typically requires a citizen to submit their name and address using a form. For integrated discussion forums, please see the relevant area.
Accessibility of the tool (owner/provider and/or end-user)	Names and addresses need to be checked but as Web accessibility guidelines need to be followed.
Channel availability	Could be realized over any system that has an uplink channel and the option to define name and address.
Technologies used in building the tool	Web application requiring database. Additional features can enhance the quality of ePetitions themselves and the transparency of the ePetitioning process (e.g. informing about the rationale for the ePetition). An integrated *discussion forum* can also be incorporated to allow users to voice their support or concerns for the ePetition.
Evaluation of the tool	Analysis of usage statistics and exit questionnaires.
Further information, examples of tools, practical application of tools in this category	http://epetitions.scottish.parliament.uk/list_petitions.asp and www.parliament.qld.gov.au/EPetitions_QLD/HTML/EPetitions.htm http://www.bristol-city.gov.uk/item/epetition.html and http://e-petitions.kingston.gov.uk/

5.1.8 eDeliberative polling tools

Criteria for description	Explanation
General description	Web applications which combine deliberation in small group discussions with random sampling to facilitate public engagement on specific issues
Participation area	Mainly in deliberation and polling.
Direction of communication	Consultation and involving (two-way)
Stakeholders	This is resource intensive and requires personnel who are skilled in social research methods. Resource implications are high. Technical competency required is high.
Stage in policy cycle	All aspects of policy and service definition where in-depth, informed debate is required by a recruited representative sample.
Special concerns / Rules of engagement (owner/provider and/or end-user)	Moderation and facilitation is required. Clear rules of engagement are required. Resource intensive and requires personnel who are skilled in social research methods. Resource implications are high.
Accessibility of the tool (owner/provider and/or end-user)	If registration is required care should be taken not to make the process too onerous and time consuming. Other comments as for discussion fora and surveys apply.
Channel availability	Mainly via Internet. Mobile channels with smart PDAs may have a big potential in the future.
Technologies used in building the tool	Web services. Databases. A variety of the above tools, namely *surveys* and *discussion fora*, are used to support such e*Deliberative polling*.
Evaluation of the tool	The eDeliberation members can be issued with evaluation questionnaires. These questionnaires can be circulated at the beginning of the process and after deliberation has taken place. The results can be analysed to demonstrate the effect of the deliberation process.
Further information, examples of tools, practical application of tools in this category	http://cdd.stanford.edu/polls/docs/summary/ Also, a US funded research project exploring large scale online deliberative polls see the Picola Project at http://communityconnections.heinz.cmu.edu/picola/index.html

5.1.9 eConsultation Tools

Criteria for description	Explanation
General description	Web applications designed for consultations which allow a stakeholder to provide information on an issue and others to answer specific questions and/or submit open comments
Participation area	Mainly used for consultation.
Direction of communication	Allowing a 2-way communication to specifically support policy consultations.
Stakeholders	The content is provided by the policy owners and the consultation is typically managed by trained consultation staff. The consultation may target a selected audience or be completely open.
Stage in policy cycle	Appropriate stage in policy cycle: (2) policy formulation [analysis + information], (3) decision-making
Special concerns / Rules of engagement (owner/provider and/or end-user)	A clear 'conditions of use' statement is required which can be followed by all participants. Besides it should be described (and planned before starting) how the results will be used for the further political process, a commitment of the political authorities is helpful. The tool typically allows the consultation owner to design different types of consultations, allows information about participants to be gathered, and may also allow for feedback to be

	provided. Staff time and skills are required to moderate, support and facilitate any discussion as a part of the consultation. Content analysis skills to analyse contributions and produce reports to embed the results into the political process and to give feed-back to the users. Registration is usually necessary
Accessibility of the tool (owner/provider and/or end-user)	The consultation owner needs to appreciate how to design the consultation and add the relevant content. The tool will either provide the necessary work processing and questionnaire development or allow these to be input from other resources.
Channel availability	Mainly via internet and PC.
Technologies used in building the tool	A web application which may include a range of other tools listed above. The size of the target audience and the expected number of contribution need to be considered in choosing the technology. Comments are typically stored in a database. User registration application is required.
Evaluation of the tool	It is possible to have inbuilt evaluation data collection mechanisms (e.g. exit questionnaires, ability to generate web-usage statistics)
Further information, examples of tools, practical application of tools in this category	http://www.demos-project.org/index_demos_in_hamburg.html http://www.madridparticipa.es/

5.1.10 eVoting Tools

Criteria for description	**Explanation**
General description	Remote internet enabled voting or voting via mobile phone, providing a secure environment for casting a vote and tallying of the votes (other types of electronic voting are available, but for the purposes of this report we focus on internet voting)
Participation area	Clearly support the voting participation area.
Direction of communication	A rather simple form of two-way relationship, where the citizen gets engaged.
Stakeholders	The stakeholder responsible for the voting provides the content, the initiative may be managed by the same person or more usually a team comprising policy advisors and evoting specialists.
Stage in policy cycle	Voting may take place at (1) agenda setting to decide which agenda item to take forward, or possibly (3) at final decision-making.
Special concerns / Rules of engagement (owner/provider and/or end-user)	As stated above this varies considerably depending the security required for the type of voting. The level and type of security will depend on the type/importance of the specific voting initiative.
Accessibility of the tool (owner/provider and/or end-user)	Again this varies depending on the type of tool but typically requires specialist support.
Channel availability	In the case of this report we are concerned with remote electronic voting where the voter can cast their vote from any location with access from the internet through PCs, PDA, iDTV, mobile phone.
Technologies used in building the tool	Voter identification and authentication system, vote tallying system, vote reporting system. Various methods can be used to identify the voter, for example, pin numbers, biometrics, digital signatures.
Evaluation of the tool	Most evoting tools have an in built audit facility
Further information, examples of tools, practical application of tools in this category	http://www.vvk.ee/engindex.html http://www.eucybervote.org/trials.html

5.1.11 Suggestion tools for (formal) planning procedures

Criteria for description	Explanation
General description	Web applications supporting participation in formal planning procedures where citizens' comments are expected to official documents within a restricted period. The users can give their written (or painted) formal comments on the basis of original planning documents with regard to specific paragraphs in the text, maps or tables.
Participation area	This category of tools supports involvement in the participation area "consultation".
Direction of communication	Information and consultation (two-way)
Stakeholders	The content in terms of legal information (official documents that are discussed) is provided by the administration, the tool is managed by that part of administration that is in charge of the specialist planners in cooperation with the IT administration. It is managed by the IT-department of an administration (mainly on the local and regional level). Users are individual citizens, companies and associations.
Stage in policy cycle	The stage in policy cycle this tool is mainly used is (2) policy formulation (both analysis + information).
Special concerns / Rules of engagement (owner/provider and/or end-user)	Internet access and usual browser necessary on users' side. Normally, users have to register but that is not a must and depends on the legislation the specific process is based upon. Authentication is possible by password/login access.
Accessibility of the tool (owner/provider and/or end-user)	Users need patience to use all functionalities if they are not used to. Input of content has often been outsourced to a tool-provider.
Channel availability	PC-based
Technologies used in building the tool	These tools are normally composed of various components partly available on the web for free, partly not. Basic technologies needed are web server, database management system, application server, map-server. On users' side, good and fast access (at least DSL) is necessary.
Evaluation of the tool	Any inbuilt evaluation data collection mechanisms (e.g. exit questionnaires, ability to generate web-usage statistics)
Further information, examples of tools, practical application of tools in this category	http://entera-online.com/009_demoprojekt/ (in German)

5.2 Tool Categories extensively used, but not specific in an eParticipation Context

5.2.1 Webcasting tools

Criteria for description	Explanation
General description	Real time recordings of meetings transmitted over the internet. They allow people to watch and listen to events such as meetings/debates of Community groups Parliamentary debates, or Council Committees.
Participation area	Webcasts are supporting information provision. Moreover, enhanced webcasts can support consultation and polling.
Direction of communication	As the content is delivered from a single source to many viewers the type of communication is one-to-many (i.e. one-way). However, there is the possibility for some interaction with enhanced webcasting which provides features that for example allow people to participate in polls, fill in feedback forms or access documents and other information related to debates (two-way).
Stakeholders	Mostly elected representatives in debate; citizens as listeners or sometimes participants.
Stage in policy cycle	Typically viewing debates on agenda setting, policy formulation (including analysis and information) and decision making.
Special concerns / Rules of engagement (owner/provider and/or end-user)	Generally none. If interaction is offered, some kind of authentication might be necessary. Webcasts are typically viewed in real-time and can last over an hour but they can also be archived to allow people to view them at a later time.
Accessibility of the tool (owner/provider and/or end-user)	Need to consider duration of webcasts as users may have to pay for their internet connection. The viewers need an appropriate internet real-time player. The technical competency required by the user is moderate and mainly concerns the initial access to the real-time player. Should have a link to where viewers can download a real-time media player. Bandwidth which the target audience has access to needs to be considered. In areas where broadband is not yet available, consideration should be given to how long participants will have to stay on line and the associated costs or inconvenience of tying up their telephone line. Archived webcasts should be indexed to allow viewers to navigate them more easily. Webcasts can be run in-house, then the provider needs highly skilled technical personnel, but this could also be outsourced to a Webcasting Service Provider. Implies significant initial investment. The on-going resource implications are moderate to high.
Channel availability	Mainly based on PCs as multimedia and high bandwidth is required. Emerging mobile channels (WLAN, UMTS) and digital TV could widen range in the future.
Technologies used in building the tool	Web application; streaming media technology (a streaming server is cost-intensive for the provider); (web) camera
Evaluation of the tool	Requires evaluation over time and is likely to be dependent on the issue being broadcast.
Further information, examples of tools, practical application of tools in this category	http://www.lga.ukcouncil.net/ www.holyrood.tv/committee.asp http://dowire.org/wiki/Webcasting_exchange http://www.public-i.info/ http://www.reykjavik.is/DesktopDefault.aspx/tabid-241/

5.2.2 Podcasts

Criteria for description	Explanation
General description	publishing multimedia files (audio and video) over the Internet where the content can be downloaded automatically using software capable of reading RSS feeds
Participation area	information provision
Direction of communication	One-way communication provision.
Stakeholders	Podcasts can be provided and used either by politicians and political organisations or by community groups and citizens.
Stage in policy cycle	Usually agenda setting.
Special concerns / Rules of engagement (owner/provider and/or end-user)	Generally none, unless users have to subscribe. There may be some rules concerning how interaction is governed if emails and texts are replied to.
Accessibility of the tool (owner/provider and/or end-user)	Depends upon the nature of the content – podcasts could be made to be more accessible through multimedia subtitling. Content provision requires some level of expertise. Use of content is relatively simple. Relatively high bandwidth is required if the user wishes to download a number of podcasts and a suitable device capable of replaying the content such as an iPod. Fairly high bandwidth is required, as is a site capable of syndicating content and storage (1 minute = 1Mb) Third party podcasting websites are available where users can post their podcasts. Content needs to be provided by an information supplier but due to ease whereby content may be produced at low cost. Citizens listen and can post emails or text messages which may be replied to in subsequent casts.
Channel availability	PC is mainly needed to download and watch, but content can be automatically loaded onto mobile devices (such as iPod) to listen and/or watch everywhere.
Technologies used in building the tool	web technology (push technology: content delivery from a server to a client); audio or multimedia software for producing multimedia files; alert mechanisms; possibly mobile devices (digital audio player). Enhanced podcasts can include chapter marks, photos or links. Video-Podcasts deliver video files.
Evaluation of the tool	Number of subscriptions; Requires evaluation over time
Further information, examples of tools, practical application of tools in this category	www.itunes.com www.podcastnetwork.com http://www.mypodcastcenter.com/directory/Podcasts/Political_Podcasts/

5.2.3 Wiki

Criteria for description	Explanation
General description	Web applications that allow users to add and edit content collectively
Participation area	All areas were information and discussions are useful, but especially information provision and consultation.
Direction of communication	Providing an active two-way partnership environment to progress issues.
Stakeholders	The ease of use makes this an inclusive technology for the wide range of possible stakeholders.
Stage in policy cycle	As Wikis allow for collaborative writing, they lend themselves to being used in many different parts of the policy making process. There is the issue of what happens once a decision has been made and you only want comments upon this – it is possible to lock some Wiki content.

Special concerns / Rules of engagement (owner/provider and/or end-user)	This can vary. Some Wikis have strict moderation policies, others are less restricted, dependant upon the user group. It is generally the case that a clear statement of the rules of engagement makes for a more effective collaborative experience.
Accessibility of the tool (owner/provider and/or end-user)	Moderate to high technical expertise is required to set up the tool on a server. Once set up, simple to use and to edit, technical competence required is very low. They are typically easy to use and do not require knowledge of HTML, using their own simplified form of markup. As the Wikipedia becomes more prevalent, people's familiarity with the idea of an editable website (often without requiring registration) lowers the initial barrier to participation. Often users feel reticent about adding content, but prolonged use increases confidence.
Channel availability	Full size web browser is needed to add and edit content. Reading is also supported over diverse mobile devices.
Technologies used in building the tool	Web application, a database and text processing support. Some may track changes made and provide a discussion forum for challenging edits.
Evaluation of the tool	Count the number of page views and page edits particular pages in the Wiki; come up with a metric of "collaboration" – how much mediation is required to come up with content which users can accept? Questionnaire about users maturity with wiki, whether they found it useful/helpful.
Further information, examples of tools, practical application of tools in this category	www.wikpedia.org http://www.sourcewatch.org/ http://engaginggov.net/News/HomePage

5.2.4 Blogs

Criteria for description	**Explanation**
General description	Frequently modified web pages that look like a diary as dated entries are listed in reverse chronological order
Participation area	Weblogs can support all participation areas except voting.
Direction of communication	By presenting a story-telling environment and focusing on experiences of, for example, councillors, government officials, and community groups can help participants appreciate other perspectives and help form their own opinion
Stakeholders	Content can be provided by politicians, experts (e.g. journalists) or by citizens. As blogs use a conversational style of documentation others can add comments, but the page is focused on the author's point of view.
Stage in policy cycle	Blogs are suitable for all audiences. Appropriate stages in the policy cycle are (1) agenda setting, (2) policy formulation (including analysis), and (5) policy evaluation.
Special concerns / Rules of engagement (owner/provider and/or end-user)	Generally none, but the author of the blog can set options for discussion, for example whether a password is needed before a comment is allowed, whether a comment has to be approved before publishing etc. A clear 'conditions of use' statement is required in order to prevent spam. Weblogs require dedication from the blog owners to publish their entries on a regular basis - sometimes daily. Without this commitment users (readers) will not continue to return to the blog for information. Blogs that deal with specialised or localised content are more successful and durable than those covering every subject.
Accessibility of the tool (owner/provider and/or end-user)	Blogs are, like conventional websites, hosted on servers and accessible by keying in a web address (URL) into an internet browser. There are a number of weblog systems that can be used rather than having to build one's own. The resource implication for the blog owner is moderate to high, but the technical competency is relatively low. Web accessibility guidelines should be followed. There is a growing familiarity of, and appeal for, the blog 'diary' format. The familiarity on a diary format may help users navigate the site. As users are generally just viewing the blog,

	required technical competency is low to moderate.
Channel availability	Besides the use of PCs, there are possibilities to fill blogs on the way with a mobile phone (e.g. by MMS).
Technologies used in building the tool	Web application; database; mechanisms for cross-referencing content like trackback and pingback; alert mechanisms like RSS or Atom. There are different types of blogs depending on the way content is delivered or written. Blogs may comprise text, photos (photoblog), videos (vlog), links (linklog) or audio (audioblog) and they can be written by mobile devices like mobile phones or PDAs (moblog).
Evaluation of the tool	Functionalities for extensive web statistics can be added; a feedback questionnaire could be placed on the weblog home page asking whether the user found the information they were looking for, how often they visited the blog, etc.
Further information, examples of tools, practical application of tools in this category	www.richardallan.org.uk www.lynnefeatherstone.org/blog.htm www.readmyday.co.uk/blogs/maryreid.php www.blogger.com http://www.hansardsociety.org.uk/assets/Final_Blog_Report_.pdf http://www.hansardsociety.org.uk/assets/Weblogs_pamphlet-_a_powerful_voice_for_campaigns.pdf

5.2.5 Quick Polls

Criteria for description	**Explanation**
General description	Web-based instant survey. Typically, they allow participants to select one answer from a list of alternatives in response to a simple statement of question.
Participation area	This category of tools supports involvement in all participation areas except voting.
Direction of communication	A tool of consultation (two-way) but in fact not contributing any weighty policy debate.
Stakeholders	Providers (government, politicians, political parties, NGOs, CSOs…) They require personnel to develop the questions and analyse responses.
Stage in policy cycle	Appropriate stages in policy cycle are (1) agenda setting and (5) policy evaluation. For closed user groups it can also be used in the (2) "policy formulation"-stage to get quick atmospheric pictures.
Special concerns / Rules of engagement (owner/provider and/or end-user)	There is usually no way to stop participants responding more than once. A user's answers are generally not disclosed to others except as statistical totals, which are displayed on completion. Usually conducted over a relatively short timescale (several days to weeks) and often replaced by a new quick poll. The results of previous quick polls can be archived and accessed by users at a later date.
Accessibility of the tool (owner/provider and/or end-user)	Web accessibility guidelines need to be followed. A cheap and straightforward mechanism. Resource implications are low and the level of technical competency should be similarly low, but this depends on the actual software. Advantages of *quick polls* are that they collect quantifiable data that is easy to analyse and understand, they require a minimum of staff time and skills and involve users in a funny way.
Channel availability	Usually via Internet; Advanced ones via mobile communication or even Digital TV
Technologies used in building the tool	Web application, either database and/or spreadsheet capability
Evaluation of the tool	Through analysis of the answers received.
Further information, examples of tools, practical application of tools in this category	www.scripts.com/perl-scripts/poll-and-voting-scripts www.westminster.gov.uk/councilgovernmentanddemocracy/councils/contactsconsultationandfeedback/quickpoll/ http://www.biotechnology.gov.au/index.cfm?event=poll.showResults http://www.hands-online.org/cobo-hands/FaqDomanda.do?idSessione=S20060801173012863rC&idMenu=1021

5.2.6 Surveys

Criteria for description	Explanation
General description	Web-based, self-administered questionnaires, where the website shows a list of questions which users answer and submit their responses online. They can be used to research views, attitudes and experiences of participants either through a sampled approach or through an open invitation to respond. Surveys are commonly implemented around a number of close-ended questions, typically with ordered response categories, and some open-ended questions. As such a survey is a structured approach to eliciting responses to a range of pre-identified options, which together with any responses to open-ended questions, are generally not disclosed to other participants except as statistical totals. Website surveys can be designed to allow elaborate skip patterns through questions, pop-up instructions per question, drop down boxes providing an extensive list of alternative answers, and even alternative designs and plans to choose from.
Participation area	Participation areas that can be supported is mainly "consultation" while in principle this tool category can be used in all other participation areas except "voting", "deliberation", "discourse", and "information provision".
Direction of communication	Consultation (two-way)
Stakeholders	Providers are government, politicians, political parties, NGOs, or CSOs. Requires personnel with skills in designing and analysing surveys. The list of questions and possible answers needs careful consideration so as not to lead to bias. The results usually require statistical analysis.
Stage in policy cycle	Appropriate stages are (1) agenda setting (2) policy formulation, and (5) policy evaluation.
Special concerns / Rules of engagement (owner/provider and/or end-user)	A user's answers are generally not disclosed to others except as statistical totals. (But providers can analyse individual answers of a small sample if they use log files.) Some online survey software includes additional features for participants, for example, a 'progress bar' and a facility 'to stop and save' so that participants can complete the survey at a later time. In some tools it is possible to jump from one question to another, to distinct among pages, or the transfer into statistical software such as SPSS, and the avoidance to repeat answers. Advantages of *surveys* are that they collect quantifiable data that is easy to analyse and understand.
Accessibility of the tool (owner/provider and/or end-user)	Developers require specialist skills. The list of questions and possible answers needs careful consideration so as not to lead to bias. The results usually require statistical analysis. The management of a survey usually requires a minimum of staff time and skills. Users tend to be used to surveys and require no special skills.
Channel availability	PC-based
Technologies used in building the tool	Web application; some form of web based programming language; database, also possibility a statistical analysis. Otherwise, survey responses can be automatically transferred to a database so that further analysis and reporting can be carried out.
Evaluation of the tool	Through analysis of the answers received and the total number of responses.
Further information, examples of tools, practical application of tools in this category	www.surveymonkey.com www.snapsurveys.com/software/softwareprof.shtml

5.2.7 GIS-tools (Map-server for maps and plans)

Criteria for description	Explanation
General description	Web applications that support information provision and enable the users to have a look at maps underlying planning issues and to use them in various ways
Participation area	Information provision related to spatial planning
Direction of communication	Most commonly One-way communication (information provision) but interactivity is surfacing (favourite place mapping)
Stakeholders	Content provision usually by the government (or subcontractors) if official maps are the basis. Other content providers possible depending on the issue. Tool can be managed by the content providers or by external providers. Users are normally those with deeper interest in governmental politics.
Stage in policy cycle	Appropriate stages in policy cycle are ((1) agenda setting [includes awareness and problem perception], (2) policy formulation [analysis + information], (3) decision-making, and (5) policy evaluation).
Special concerns / Rules of engagement (owner/provider and/or end-user)	Since official data are affected, governments normally would mirror their data and/or put them into demilitarized zones to avoid misuse. For users, normally no authentication mechanism is necessary.
Accessibility of the tool (owner/provider and/or end-user)	Since normally the size of maps is a crucial problem, these tools need a medium level of skills at the providers' side. Disability friendliness is still a problem for maps because for blind users they are not visible and it is normally not possible to put the content of a map into an alternative text. Bandwidth which the target audience has access to needs to be considered. On users' side, good and fast access (at least DSL) is necessary.
Channel availability	The channel is the PC (due to image processing and bandwidth).
Technologies used in building the tool	GIS-tools are normally composed of various components partly available on the web for free, partly not. Basic technologies needed are webserver, database management system, application server, map-server. These tools can also be combined with others, such as "suggestion tools" or "discussion forum".
Evaluation of the tool	Exit questionnaires possible and ability to generate web-usage statistics.
Further information, examples of tools, practical application of tools in this category	http://grass.itc.it/ (OpenSource GIS) http://www.entera-online.com/013_verden/ (in German)

5.3 Basic Tool Categories to support eParticipation

Some of the following tool categories are heavily being used in various contexts not specific to eParticipation. However, since these also play an important role in the support of eParticipation, we describe some of them with a focus of eliciting their specific role in eParticipation contexts.

5.3.1 Search Engines

Criteria for description	**Explanation**
General description	Web applications to support users find and retrieve relevant information (web pages) typically using keyword searching
Participation area	Useful for background information that can promote all participation areas.
Direction of communication	Mainly used for pure one-way information, but can influence consultation process with policy specific information.
Stakeholders	• With regard to adding content, the search engine tool will crawl specific websites and index relevant pages • Can be useful to all stakeholders whether government or citizen
Stage in policy cycle	As a general purpose information finding tool they could be used at all stages in the policy cycle.
Special concerns / Rules of engagement (owner/provider and/or end-user)	It is possible to include a search engine in your own website, what many government websites actually do.
Accessibility of the tool (owner/provider and/or end-user)	• Most internet users are familiar with general purpose search engines using simple keyword searches • Many search engines offer a variety of languages
Channel availability	Search engines are usable over browsers on PCs and mobile Phones or PDAs.
Technologies used in building the tool	Most search engines are available on most web browser. Some offer advanced features such as translation for a number of languages. The search engines will typically collect and index web pages using special programmes such as 'spiders' and 'robots'.
Evaluation of the tool	Accepted measures of information retrieval performance, such as 'recall' , 'precision' and 'mean reciprocal rank' can be used
Further information, examples of tools, practical application of tools in this category	http://www.govspot.com/shortcuts/searchengines.htm http://www.firstgov.gov/

5.3.2 Alert Mechanisms – email alerts and RSS Feeds

Criteria for description	**Explanation**
General description	One-way communication alerts to inform people of a news item or an event, e.g. email Alerts and *RSS*[12] Feeds. This saves the users from having to check manually their favourite websites or their news reader for updates.
Participation area	Supported participation area is information provision

[12] Really Simple Syndication

Direction of communication	These are one-way communication alerts to inform people of a news item, an event, or a new policy consultation.
Stakeholders	Politicians, political institutions, community groups providing online information and any end-users stakeholder with an interest.
Stage in policy cycle	Relevant to all stages where stakeholders need to be informed about policy issues.
Special concerns / Rules of engagement (owner/provider and/or end-user)	Users will need to sign up or be subscribed to the alert mechanism; therefore privacy of information needs to be considered. There should be facilities where users can unsubscribe and also change their profiles. The web site owner then has the responsibility for sending the relevant emails. When a new entry is added to a website the RSS feed will typically save its title, a short abstract and link to the full content.
Accessibility of the tool (owner/provider and/or end-user)	Suitable for most audiences. The provider needs to put in place various alert mechanisms that will suit different audiences. They need to decide on content and depending on which mechanism arrange for distribution. If registration is required this should be kept as simple as possible. Web accessibility guidelines should be followed. On the provider side resource implications are low; the technical competency is moderate to high. On the end-user side the technical competency is low.
Channel availability	RSS Feeds only on PCs, alters can reach mobile phones by eMail or SMS
Technologies used in building the tool	web application; web syndication formats like RSS or Atom
Evaluation of the tool	Number of subscriptions.
Further information, examples of tools, practical application of tools in this category	email alert example: www.parliament.uk RSS alert example: www.bristol-city.gov.uk/item/epetition.html http://www.rssgov.com/ Free rss service: http://www.bloglines.com/

5.3.3 Online Newsletters

Criteria for description	**Explanation**
General description	Information on specific news items and events on a regular basis to a general audience or a pre-registered audience (for specific community newsletters, etc.).
Participation area	Online Newsletters are supporting information provision, which in turn supports a number of participation areas such as campaigning and electioneering.
Direction of communication	One-way communication to inform an audience of specific news items and events.
Stakeholders	Suitable for most stakeholders as both content providers and readers. In some cases readers are given the opportunity to contribute 'reader's letters'. For example, community group newsletters and political group newsletter.
Stage in policy cycle	Relevant to all stages where stakeholders need to be informed about policy issues.
Special concerns / Rules of engagement (owner/provider and/or end-user)	Typically users have to register to receive the newsletter, providing a varying amount of personal information depending on the specific newsletter; therefore privacy of information needs to be considered.
Accessibility of the tool (owner/provider and/or end-user)	Typically a current web browser or email client; in cases also, possible word processing technology, such as adobe Acrobat reader.
Channel availability	Every device that is able to receive eMail. This includes PCs and mobile phones.
Technologies used in building the tool	Web application; mailing list manager; word processing technologies; may include an alert service

Evaluation of the tool	Number of subscribers
Further information, examples of tools, practical application of tools in this category	http://dowire.org/index.php http://www.cipfa.org.uk/panels/centgov/newsletter.cfm http://www.diggov.org/news/dgonline/dgonline_0904.jsp

5.3.4 Web Portals

Criteria for description	**Explanation**
General description	Websites providing a gateway to a set of specific information and applications
Participation area	As they provide a gateway function, they may support a range of participation areas.
Direction of communication	Web portals offer a variety of 1-way and 2-way communication mechanisms.
Stakeholders	Local, regional and national levels of government provide web portals, also NGOs and the voluntary sector are starting to provide portals.
Stage in policy cycle	Relevant to all stages where stakeholders need to be informed about policy issues.
Special concerns / Rules of engagement (owner/provider and/or end-user)	For the portal itself this is not usually applicable as they are open to all users, however applications they point to may require user registration
Accessibility of the tool (owner/provider and/or end-user)	Typically a current web browser, otherwise other software which might be required is usually available for downloading from the portal. The majority of government agencies in the US and across Europe now have web portals.
Channel availability	Some portals offer special access for mobile phones (over wap) besides that through PC-browser.
Technologies used in building the tool	They provide a gateway to a range to applications such as e-mail, discussion boards, search engines, etc
Evaluation of the tool	Number of visits, the length of time a user stays o the portal, number of repeat visits, number of sites linked, number of available applications
Further information, examples of tools, practical application of tools in this category	http://www.planningportal.gov.uk/england/genpub/en/ www.direct.gov.uk http://www.workwithus.org/ http://www.nordpol.dk/ http://ec.europa.eu/yourvoice/index_en.htm

5.3.5 FAQ: Frequently asked questions

Criteria for description	**Explanation**
General description	A 'tree' of questions and answers that can be searched using keywords or by inputting a question or statement
Participation area	They support information provision.
Direction of communication	One-way communication where *FAQs* provide a way to present factual information that can be grouped under questions and answers.
Stakeholders	All types of government and civil-society organisations may wish to inform their user-base with FAQs. Typically developed through viewing various log reports of previous questions asked on a specific subject.
Stage in policy cycle	Relevant to all stages where stakeholders need to be informed about policy issues. Particularly useful where there have been a large number of existing queries about the issue.
Special concerns /	*FAQs* on their own are usually not sufficient to communicate the relevance of a complex

Rules of engagement (owner/provider and/or end-user)	issue. A secondary navigation system can be provided to navigate through logical sub-groups in long lists of *FAQs*.
Accessibility of the tool (owner/provider and/or end-user)	Depending on the stability of the subject area the resource implications range from low to moderate. The technical skills required to set up and maintain the FAQ depend on the specific tool used but can be time consuming to set up initially and needs maintaining as new questions and new answers arise over time and old Q/A pairs become redundant. Untrained users can be assisted by supporting questions in 'natural language'. Need to consider how many Q/A pairs are needed to explain the issue and what level of detail is required. Should include a facility for users to notify FAQ owner if the answer to their question cannot be found.
Channel availability	Mainly used with PCs but can also be accessed with mobile phones, if the user interface is suitable.
Technologies used in building the tool	Typically a basic web application. Text editor is required to write the FAQ. Some FAQs are starting to offer a NLP interface.
Evaluation of the tool	Could include a short exit questionnaire asking if answer was found, how easily and if level of detail in the answer was sufficient. Also could use accepted measures of information retrieval performance, such as 'recall', 'precision' and 'mean reciprocal rank'.
Further information, examples of tools, practical application of tools in this category	www.faqs.org/faqs/ www.parliament.uk/faq/faq.cfm

6 Preconditions for successful deployment of eParticipation Tools

Current investigations of eParticipation tools and technologies have revealed that many solutions are still being used in isolation. We envision that advanced eParticipation applications will comprise a comprehensive set of tools and technologies which have been introduced in this report or which will be introduced in the next deliverables of workpackage 5.

In this respect, a number of important issues directly connected to the successful deployment of eParticipation tools and technologies have to be considered. Such aspects regard the technical infrastructure, the selection of software and tools as well as the end-user interface and channel delivery.

6.1 Integration and interoperability in eParticipation Tools

One could list a large number of aspects implying cooperation among public administrations and cooperation with their stakeholders on the basis, and by means of advanced ICT. Cooperation and collaboration means have become the prime objective in the networked society. eParticipation projects have to ensure integration and interoperation of a variety of tools and technologies, of processes and information models owned by distinct stakeholders. Successful implementation starts with providing a smooth interaction among the internal applications and back-office systems. Apart from that, interoperation among systems of distinct institutions and stakeholders have become of high importance in a networked knowledge economy and knowledge society (cf. e.g. Wimmer and Traunmüller, 2002, Traunmüller and Wimmer, 2003).

To enable cooperation (either in terms of collaboration or coordination), two approaches can be identified: integration and interoperation. Integration has been defined as "the forming of a (temporary or permanent) larger unit of government entities for the purpose of merging processes [and systems,] and/or sharing information" (Klischewski 2006). The European Commission has defined interoperability as "the means by which the inter-linking of systems, information and ways of working, whether within or between administrations, nationally or across Europe, or with the enterprise sector, occurs" (EC: Linking up Communities). Klischewski and Scholl further stress that systems and applications that interoperate are characterized by the following aspects: independency, heterogeneity, and control by different jurisdictions/ administrations or by external actors; yet also cooperation in a predefined and agreed upon fashion. Likewise, Wimmer et al (2006), stress that interoperation can only be reached by means of open standards, whereby interoperation needs to be addressed on technical, semantic and organizational level alike.

As can be recognised, interoperability is to be addressed on several levels. Summing up current discussion on interoperability (see e.g. Bellman (2004), Benamou et al (2004), Guijarro (2004), Tambouris and Tarabanis (2004), Traunmüller and Wimmer (2003), Wimmer and Traunmüller (2002), Wimmer et al (2006), or discussions of IDABC[13]), the

13 http://europa.eu.int/idabc/en/document/3761 (2004)

following levels are key to enable communication and cooperation among systems and services:

- technical interoperability: Linking computer services and systems together so that the systems and applications are able to communicate with each others based on standardised interfaces and commonly used standardised metadata, document formats, communication protocols, technologies and open standards. Also, technical security, authentication and identification means need to be interoperable. Examples of technical standards are Web Services, UDDI, Java, XML, SOAP, HTTP, SOA, etc.
- semantic interoperability: Establishing a unique meaning of exchanged data, information and procedures. Only through such commonly agreed unique understanding, the information can be processed in a meaningful manner. Thereby, standardised data definitions, process models and object description frameworks are being used. Examples are XML Schemas, RSS, RDF Schemas, Ontologies in advanced standard description languages (such as RDF(S) OWL DAML+OIL, etc.), process specifications in standard languages such as BPMN, BPEL, UML, etc.
- organisational interoperability: This level of interoperability – the most complex one – is concerned with aligning business processes and information architectures with organisational goals. Furthermore, overall agreements are settled on organisational and legal level to enable processes to co-operate beyond organisational and state borders.

All three levels of interoperability deserve equal attention in order to make systems communicate with each other and to link up governmental and democratic systems and services beyond organisational and national borders.

To reach comprehensive interoperability in the context of eParticipation among the various stakeholders (cf. section 2.3), the used eParticipation tools (chapter 4) have to interoperate seamlessly, since they often complete one another in various combinations.

6.1.1 Implication for eParticipation Tools

As pointed out before, interoperation and integration play an important role in eParticipation systems and applications. Until now, only a few initiatives are known to the DEMO-net consortium to investigate interoperability in democratic processes and to align different ICT tools and technologies for eParticipation areas.

To list an example: The "Local e-Democracy project"[14] aims to create the building blocks to help UK local authorities to deliver local eGovernment. The project is performed in the context of the ODPM, supported by 22 National Projects of the UK government. In the context of the project, an attempt is made to provide generic approaches that will enable local authorities to undertake eParticipation projects. Yet, no explicit treatment of issues arising from technological and methodological diversity is made.

In order to understand, implement and manage interoperation of information and processes, tools and technologies in eParticipation contexts, further work is required. In the following, initial directions are provided towards this.

[14] www.e-democracy.gov.uk

In order to realize all the phases of a public dialogue, from information to decision-making and evaluation, a mixture of tools is utilized. These tools are usually not part of a unified platform resulting in the absence of a common look and feel, in handling data in a heterogeneous manner and in providing diverse operations for realizing common processes.

Hence, at a process level, the range of tools and technologies that are utilized in eParticipation scenarios impose a strong need for integration in order to support the entire policy/service lifecycle in a seamless manner. The main goal is the citizens not to experience any technology break as they progress in the policy lifecycle (cf. section 2.4), and the authorities to have an efficient and unified manner to manage information and processes of eParticipation.

At a data level, information exchange with citizens occurs via a variety of tools and interaction forms. Heterogeneous data created from this process are difficult to handle and process efficiently in a semi- or fully automated manner.

A clear need is arising for commonly agreed information models that will enable the structured interaction between citizens, politicians and authorities, the efficient processing of collected information by applying a variety of analysis techniques, and the effective information exchange among different organizations.

In parallel, semantic enrichment with domain vocabularies and ontologies may set the basis for advanced functions including among others automated processing, effective retrieval and information sharing.

Compliance of software, especially of OSS, with open standards on interoperability is necessary in order to minimize cost and effort of integration and to avoid lock-in with specific applications, as one will see in the next section.

6.2 Open Source and Free Software

The use of Open Source Software (OSS) in eGovernment contexts is currently actively debated within political agendas at all levels of Government. The European Commission has published a guide to promote the migration to OSS[15],[16]. All around the world people are increasingly finding value in Open Source Software/ Free Software (OSS/ FS), programs with open source code for inspection and alteration. OSS licenses give users the freedom to run the program for any purpose, to study and modify the program, and to redistribute copies without paying charges to previous developers.
The best known OSS within governmental settings are operating systems such as Linux[17], web servers such Apache[18], databases such as MySQL[19] or application servers like Tomcat for Java applications[20]. Also OpenOffice.org is increasingly being used as

[15] http://europa.eu.int/idabc/en/document/2623
[16] http://europa.eu.int/information_society/activities/opensource/index_en.htm

[17] http://www.linux.org/

[18] http://www.apache.org/

[19] http://www.mysql.com

[20] http://jakarta.apache.org

alternative for proprietary office products. Web browsers like Firefox[21] provide an alternative to browse the world wide web. The Open source academy website[22] provides case Studies of a number of Open Source implementations both in Local Government, schools and business in the UK and Europe. Table provides an overview of the most common areas of OSS, available software, and market shares.
OSS has been changing the software industry, as it offers a chance to move away from a monopolistic model based on proprietary software (mainly closed source or limiting the use of provided source) towards a more openly competitive model based on open source. The two largest systems vendors, IBM and HP, are dropping their own operating systems in favour of OSS-based environments and SUN is rapidly moving towards an even more OSS oriented position[23].

Table 6 Market share of most common OSS software

Application area	OSS Product	Market position
Server operating system	Linux	Growing fast, Possible most used (50%)
Webserver	Apache	Most used, 65%
DBMS	MySQL, PostgreSQL	Growing fast
Tools for development	Eclipse	Widely used and growing
Office suite	OpenOffice.org, KOffice	Rapid spread in public sector and amongst students
Communication tools	Mozilla Firefox, Thunderbird, Evolution	Widely used

6.2.1 Relevance to eParticipation

The greatest benefit of using OSS in eParticipation is the open code which can ensure the necessary transparency for successful democratic alternatives. The openness of the code to inspection by any interested party shall ensure increased transparency, which is seen as a necessary factor for effective democracy. Consequently, Open Source software has to be considered as an alternative to proprietary software for infrastructure implementations[24].

On the basis of the empirical evidence and experience reported from OSS government trials sites in the UK and elsewhere[25], there are however also some caveats to be considered when deploying OSS:

- The main obstacles to widespread implementation of Open Source software are:

  for *desktop applications*, the current lack of complex functionality which can affect ease of migration and interoperability for some organisations;

[21] http://www.firefox.org

[22] http://www.opensourceacademy.org.uk/solutions/casestudies

[23] http://spartakan.wordpress.com/

[24] http://www.intelcitiesproject.com/wcm-site/jsps/index.jsp?type=docDetails&cid=5503&lg= Thorleifsdottir, A et al,

[25] http://www.ogc.gov.uk/embedded_object.asp?docid=1003914

for *business applications*, the lack of Open Source products to compete with large-scale proprietary enterprise-level products;

- Adoption of Open Source software can generate significant savings in hardware and software costs for infrastructure implementation. Yet, the use of OSS can also heavily increase the maintenance costs. From the point of view of total costs of ownership (TCO), studies are promoting OSS as well as proprietary solutions.
- Apart from increased maintenance costs, the adoption of Open Source requires investment in planning, training of users, and development of skills for implementation, support and maintenance, and detailed consideration of migration, sustainability and interoperability issues.
- As major software suppliers adopt open source software as part of their strategies, the risk increases that the goals of the open source movement — user freedom to use, modify, and distribute software — will be undermined. Vendor strategies support these open source goals to varying degrees, from willing participation to dominated partnerships[26].

6.3 Security and privacy in eParticipation contexts

With the increasingly complicated and evolving technology platforms in use today comes a steady stream of security breaches, holes and vulnerabilities that is not likely to abate in the near future. Most of these can be controlled with conscientious application of security updates and patches, but the mere appearance of vulnerability can often be much more serious than actual damage caused, since the entire process is based on trust; trust between citizens, politicians and administrative officials, and trust in the technology. Once that trust is in question, all bets are off.

If the user's reasonable expectations of security are not met, or if the measures are overly high, participation will not be effective either due to lack of trust or impatience with the system (usability problems).

A proper balance between security, usability and transparency is to be achieved. Crucial functionality of security measures cover among others the required identification, authentification, authenticity, non-repudiation, prevention from fraud and misuse, prevention from spying and phishing, and prevention from denial of services. On the other hand, eParticipation services need to be easy to use, simple and without time-consuming procedures to make stakeholders participate. In this respect, a recent OECD (2003) report states the following requests:

- Balancing the need for straightforward, anonymous access to systems, with the need to collect personal data for various reasons such as authentication and evaluation.
- Balancing the needs for standard, generic interface features with the need to reflect the expectations of a variety of target audiences.

As can be noticed, properly understanding security requirements in eParticipation contexts requires careful investigation of aspects such as:

- levels of authentication feasible and required (anonymous participation, unauthenticated user, fully authenticated user (e.g. with PIN, PIN/TAN, PKI and

[26] http://www.forrester.com/FirstLook/Vertical/Issue/0,6454,557,00.html

identification token via smartcards, digital certificates, mobile phones, or biometric solutions, etc.)[27]

- level of encryption required (e.g. using Secure Sockets Layer, VPN, encryption technologies such as AES, DES, Triple-DES) to protect sensitive information
- security means of systems in organisational environments (e.g. firewalls, access control, etc.)
- protection of data investigations to ensure privacy vs. exploiting modern facilities of knowledge mining and knowledge extraction;
- understanding the impact of surveillance and means of surveillance including tracing of who has expressed which opinion, who opposes an opinion, voting for or against a certain issue, etc.
- level of transparency required / wanted for stakeholders to facilitate participation (cf. e.g. Čas and Peissl 2002)
- equipment required to use certain security and privacy enhancing technology
- scalability of security and privacy enhancing technologies in respect to the overall aims of eParticipation functionality

Even if the EC currently funds a range of projects investigating electronic identification, above issues are barely addressed yet; surely not in eParticipation contexts. Further research is needed to understand these aspects of trust, privay and security.

6.3.1 Relevance in eParticipation

Traditional democratic processes barely happen with anonymous participation, except of voting (and even there, citizens need to identify themselves before they can give their ballots). In many countries, the participatory democratic tradition is by named users attending meetings and other such activities relating to policy formulation and implementation. When designing eParticipation systems, such circumstances need to be carefully understood.

Especially in respect to motivate actors in eParticipation contexts to participate via ICT means, too much security will scare away the users, i.e. the overall aims of more active participation through ICT channels would not be achieved.

Since, current solutions of security, trust and privacy heavily interfere with requests of usability, simplicity, commodity, and motivation for active participation, these interrelationships and mutual impacts of weaknesses in the one or other direction need to be well understood for the design and deployment of successful eParticipation systems. Consequently, further research is required urgently to understand these aspects.

[27] For further details on user authentification, the reader is referred to e.g. Kulkami 2003, who categorizes the methods of user authentication as: something you know (PIN), something you have (smartcard, digital certificate), or something that is part of you (e.g. iris scan, finger prints, ...)

6.4 Multi-channel access in eParticipation contexts

In its recent strategic communication i2010[28], the European Commission stresses the aim of an inclusive European information society by providing a better quality of public services, which are accessible for all also through a 'single point of access'. In this context, the accessibility of services through a range of communication channels becomes crucial.

In IDA (2004), a channel is defined as "a means for users to contact public administrations (inbound) or for public administrations to contact their users (outbound) with the aim of acquiring or delivering public services. This includes the use of web-based technologies, telephony, paper media or face-to-face contacts; applications of these technologies such as the internet, eMail, SMS, call centres or the counter; and devices to access the applications such as a personal computer, mobile phone, kiosk or digital TV".

In an eParticipation context, this means that participation to participatory processes is possible through multiple [virtual and/or physical] channels such as

- Physical counter or participation arenas
- Fax
- Internet
- Kiosks
- WAP
- Mobile
- Digital TV
- etc.

Factors such as cost and management impact the decisions of organizations to implement certain channels. Some guidelines to implement services via certain channels are[29]:

- Rate the features of the available channels.
- Rate the service provision requirements for each service type.
- Match the channel features and the service provision requirements.
- Investigate the channel preferences of potential users and use the results to fine-tune the selection of channels that meets the general user requirements.
- Determine whether the remaining channels are technically and organizationally appropriate to deliver the services.
- Determine which channels will realize the best public value, based on (expected) costs and benefits.

Ultimately, it should be mentioned that the suitability and usefulness of channels depends on a range of factors, out of which technology is only one element. Additional features that could affect the service channels assessment could be: directness, usability,

[28] http://ec.europa.eu/information_society/eeurope/i2010/docs/communications/com_229_i2010_310505_fv_en.doc
[29] http://ec.europa.eu/idabc/en/document/2603/5588

accessibility and inclusion, speed, security and privacy and availability. To realize their potential value, though, channels also need to be properly implemented and operated.

As a matter of fact a channel can sometimes change the users' perception of a service. When users have a free choice between different channels to access a service, they will choose the channel that realizes the highest relative value for them, by means of a high quality, usability, accessibility, flexibility, cost-efficiency and effectiveness.

In multi-channel eParticipation offers, the back-office structure needs to secure service integration in order to avoid inefficiency and inconsistency. Caldow (2001) points out several risks of providing offers through different channels: inconsistencies such as different data formats or interfaces, inconsistency in data, processes and decisions, lack of information in a channel, etc.

Apart from that, the suitability of a channel to convey certain information or to execute certain ways of discussion or decision-making, is not generally given. Aspects to consider are among others the bandwidth, the reliability of connection, the processing power, the options of the device's interface and the user mobility. The channel limitations have to be understood in relation to the aims of eParticipation services and the user interface of the end-devices to be used.

Further investigations are needed to properly understand the impact of multiple channels in eParticipation systems. Also the trend towards technology and channel convergence should be exploited in this area.

6.5 Usability and Design of eParticipation User Interfaces

In many ways new technologies provide greater opportunities for access to information and active participation in communities as well as in social and political life. However, how to provide eParticipation tools in a user-friendly and effective way is not so simple. Usability of the applications, tools, channels and devices through which eParticipation should take place in virtual space, need therefore to be designed properly.

In computer science and human-computer interaction, the user interface (of a computer program) refers to the "graphical, textual and auditory information the program presents to the user, and the control sequences (such as keystrokes with the computer keyboard, movements of the computer mouse, and selections with the touch-screen) the user employs to control the program.[30]"

When offering eParticipation services via electronic channels, these services and information offers need to be simple, effective, easy-to-use and functional. Also the look-and-feel as well as the fun-factor should not be underestimated. Already in the 1990s, Nielsen (1993) and Sneiderman (1997) have defined usability guidelines, which area as well settled in several ISO standards, among others: ISO 9241, ISO 13407, ISO/IEC 9126. The guidelines detail learnability, efficiency, memorability, error-handling, satisfaction, functionality and reliability as key usability requirements.

[30] en.wikipedia.org/wiki/**User**_interface

eParticipation implies an extended use of information and communication technologies and tools by citizens. However not all tools and technologies are easily accessible to all groups of citizens, because of cultural, physical and economic differences. This fact could increase the risk of digital divide in eParticipation.

In a current EU project, USE-ME.GOV[31], usability is investigated in the context of accessibility to new eGovernment services at any time and anywhere through the use of mobile communications and Internet technologies. However, usability is a key criterion in exploiting ICT for the benefit of the distinct stakeholders. Especially in eParticipation contexts, where a heterogeneous group of citizens should actively participate in policy discussions and participatory decision-making in virtual space, further research is needed to develop proper interaction interfaces.

6.6 Maintainability and sustainability of eParticipation tools

Sustainability and ease of maintenance are further important aspects for successful deployment of eParticipation applications and tools. According to IEEE 83, maintenance refers to the modification of a tool or technology after its deployment. It aims at fixing bugs, adding functionality, and/or improving performance, efficiency or other quality attributes. Sustainability is seen as the measure to secure successful use of an implementation after deployment. Only if a tool is being used for a certain time, and continuation is secured, the investments have been successful.

So far, most existing eParticipation solutions have been pilots or small-scale eParticipation projects with a temporary funding. The success of future eParticipation tools and technologies requires that projects reach beyond pilots. Consequently, strategies and means to guarantee sustainability become important. Maintenance instruments and measures have to be elaborated alike.

[31] USability drivEn open platform for MobilE GOVernment, http://www.usemegov.org/

7 Conclusions and Next Steps

Information and communication technologies are increasingly being used to enhance participation in decision-making processes in Europe and worldwide. The report at hand investigated the current use of tools and technologies to promote eParticipation. Thereby, different aspects of technologies and tools have been studied. In order to understand these aspects, an analytical framework has been developed, which

- describes the role of ICT in democratic participation,
- describes the areas of participation where ICT can be exploited,
- categorizes tools for their actors,
- distinguishes according to the level of engagement,
- and the policy lifecycle.

Based on the analytical framework, different tools and technologies used in eParticipation contexts (either in research or as a pilot or real application) have been studied and introduced.

Based on the analytical framework and the introduction of various tools and technologies for eParticipation, a reflection of preconditions for a successful deployment has been given. Such aspects are integration, interoperability, open source, security, user interfaces and multi-channel solutions, maintainability and sustainability.

In order to realize all the phases of a public dialogue, from information to decision making and evaluation, a mixture of tools is required. These tools are usually not part of a unified platform resulting in the absence of a common look and feel, in handling data in a heterogeneous manner and in providing diverse operations for realizing common processes. Comprehensive and powerful eParticipation solutions require also smooth integration with administrative solutions and contexts, interoperability among heterogeneous systems and automated information and workflow processing. Unfortunately, investigations in interoperability and standards for eParticipation are not yet addressed extensively in research and practice.

The range of tools and technologies that are utilized in eParticipation scenarios impose a strong need for integration in order to support the entire policy lifecycle in a seamless manner. The main goal is that the citizens do not need to experience any technology break as they progress in the lifecycle and the authorities to have an efficient and unified manner to manage information and processes of eParticipation.

A clear need is arising for commonly agreed information models that will enable the structured interaction between citizens, politicians and authorities, the efficient processing of collected information by applying a variety of analysis techniques, and the effective information exchange among different organizations. Compliance of software, especially of OSS, with open standards on interoperability is necessary in order to minimize cost and effort of integration and to avoid lock-in with specific applications.

Transparency is the key to real democracy; therefore it is highly recommended that the infrastructure of eParticipation solutions be open for source code inspection.

In parallel, semantic enrichment with domain vocabularies and ontologies may set the basis for advanced functions including among others automated processing, effective retrieval and information sharing.

eParticipation implies an extended use of technological tools by citizens. Viewing the many solutions available within the area of eGovernance the effectiveness of the solution is shown to be dependant upon the user interface. However not all technologies are easily accessible to all groups of citizens, due to cultural, physical and economic differences. This fact can increase the risk of digital divide in eParticipation. A multi-channel approach can mitigate this risk and facilitate citizens to take part in a public and social life and to participate to the political decision process.

The user must see a definite asset in using the service such as increased convenience, productivity, lower fees, extended deadlines, faster responses and increased quality of life. Portal or web, proprietary or open source; the technology is not the problem as long as the solution is functional and provides the user with the efficiency and effectiveness requested.

Democratic and participative processes can be initiated by a varied poll of stakeholders, the main origin of such processes being either government or public initiatives.

The introduction of eGovernance to public administration is a path for the modernisation of processes within and between administrations in order to improve service and participation towards an Information Society. The use of ICTs can be used to increase the trust in government and democracy by increasing the openness, transparency and accountability in governmental and democratic processes.

To ensure participation, the representative government must be committed to take the input of the citizen to a serious consideration and provide feedback to the participants, which again is an interesting challenge for further technological advancement to make the ultimate of knowledge gathered and shared.

In final conclusion, the report at hand has elicited an urgent need to get a better understanding of the tools and technologies available for distinct eParticipation contexts. Apart from that, the wider consequences, scope, preconditions and user needs as well as user expectations of using the tools in eParticipation contexts have to be properly investigated. The lack of comprehensive solutions and the problem of single micro-solutions calls for a stronger effort to further investigate available tools and technologies in eParticipation use-contexts in order to advance eParticipation towards mature innovative means to facilitate and spur democratic participation and decision making.

The report at hand (D 5.1) forms the backbone for further advances in the area of eParticipation. In the next phase of the workpackage, new and emerging technologies are being identified and investigated to assess their potential usage in eParticipation (resulting in D 5.2). In further work, the two workpackage outcomes (D 5.1 and the D 5.2) need to be revisited and in the next phase of the Project, further focused investigation in eParticipation tools and technologies is required.

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