

JRC Scientific and Technical Reports



The Future of eGovernment An exploration of ICT-driven models of eGovernment for the EU in 2020

Authors: Valerie Frissen, Jeremy Millard, Noor Huijboom,
Jonas Svava Iversen, Linda Kool, Bas Kotterink,
Marc van Lieshout, Mildo van Staden,
and Patrick van der Duin

Editors: David Osimo, Dieter Zinnbauer, and Annaflavia Bianchi



EUR 22897 EN - 2007

The mission of the IPTS is to provide customer-driven support to the EU policy-making process by researching science-based responses to policy challenges that have both a socio-economic and a scientific or technological dimension.

European Commission
Joint Research Centre
Institute for Prospective Technological Studies

Contact information

Address: Edificio Expo. c/ Inca Garcilaso, s/n. E-41092 Seville (Spain)

E-mail: jrc-ipts-secretariat@ec.europa.eu

Tel.: +34 954488318

Fax: +34 954488300

<http://www.jrc.es>

<http://www.jrc.ec.europa.eu>

Legal Notice

Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use which might be made of this publication.

A great deal of additional information on the European Union is available on the Internet.

It can be accessed through the Europa server

<http://europa.eu/>

JRC38073

EUR 22897 EN

ISBN 978-92-79-06697-9

ISSN 1018-5593

Luxembourg: Office for Official Publications of the European Communities

© European Communities, 2007

Reproduction is authorised provided the source is acknowledged

Printed in Spain

Preface

This study is part of the ongoing work on eGovernment carried out at the IPTS-IS Unit¹ in support of DG Information Society and Media and its research and policy development activities, towards the European Research Area, mainly the 7th Framework Programme (FP7) for Research, Technological Development and Demonstration Activities.

Recent IPTS work in this field focussed mainly on two issues: the content and the organization of eGovernment research. A first study,² carried out in 2006, analyzed the status and the perspectives of the eGovernment research challenges for the enlarged European Union. It showed that eGovernment appears to be a growing multi-disciplinary but fragmented research field, which is in the process of consolidation in order to maximize both its scientific and policy relevance. A second study,³ carried out in the framework of the EGOVERNMENT project, presents an integrated view of how eGovernment research is organised and funded in the Member States of the EU, at national and regional levels. The results show that eGovernment research is funded through fragmented funding streams, generally belonging to research programmes in the field of IST applications, but also within programmes for eGovernment implementation. While eGovernment is indicated as being the main priority for research in IST applications, actual funding of eGovernment research programmes is less than 1% of spending in eGovernment implementation programmes. However, alternative funding instruments, such as public procurement and institutional funding, are important.

The present study takes the long view and seeks to provide input for longer-term strategic planning in this area by identifying emerging trends and opportunities for enhancing governments and governance in 2020, which could be made possible by the continuing rapid evolution of new information and communication technologies.

Such an endeavour needs to proceed carefully. The trajectory of technological progress is inherently uncertain. The patterns of social adoption of technology, of what will be accepted and widely deployed in what ways, are even more difficult to predict. And a wide array of variable factors conditions the challenges for government and governance that the future holds in store. All these technological, social, economic and political unknowns need to be considered carefully to arrive at an educated guess of what is possible, what appears desirable and what could be done to get us there.

Accordingly the project is broken down into different steps and aims to answer the following questions:

- Which technologies might provide significant stimulus to new forms of eGovernment, enabling new functionalities, useful both for improving existing activities and introducing new ones?
- Which will be the main characteristics of the eGovernment environment in 2020?
- How are roles and tasks of different actors changing in these future arrangements? How are public values for governance affected?

¹ Based in Seville, Spain, the Institute for Prospective Technological Studies (IPTS) is one of seven scientific institutes of the Joint Research Centre (DG JRC) of the European Commission. Its "Information Society" Unit carries out policy-oriented research on the future impact of ICT in Europe.

² "Towards the eGovernment Vision for the EU in 2010: Research Policy Challenges", 2006, EUR 22635, available at www.jrc.es

³ "eGovernment research in the EU; overview report", 2007, available at www.egovernet.org

- What measurement frameworks and indicators are suitable to capture these new trends and assess governmental performance?
- What are the implications for eGovernment research and policy formulation?

Drawing on a mix of research methods and sources, including desk research, consultations with experts, mini-case studies, verification workshops and online scenario-building exercises, the contractors, TNO and DTI, have been asked to address these questions in the following sequence:

First, in order to assess what is possible, the study identifies a list of the promising technologies to influence governance in 2020 on basis of the criteria of maturity and transformational potential (summarized in section 2.3).

To clarify what is desirable, the project team has then drawn up a comprehensive and differentiated catalogue of the roles, functions and normative objectives that commonly attach to collective governance (section 2.2).

In a third step, the possible is then linked to the desirable to map out and envision a number of transformational 'hotspots', where technological promise matches most closely the aspirations of good governance (section 2.4).

To make these narratives of future ICT-enabled models of governance more robust their relative relevance is then assessed against different scenarios of social and economic background conditions (section 3).

The result is a set of feasible, desirable and also sufficiently plausible depictions of how ICT could help to transform governance in Europe by 2020.

These are:

Extreme Transparency In 2020 it will be extremely difficult for government to hide from citizens, businesses and civil organisations; and for citizens to hide from government. Highly networked individuals and action groups can quickly expose government operations. Conversely, government can exploit the transparency of citizens in an increasingly connected world to radically alter the balance in policing and law enforcement.

Fading boundaries The intertwining of C2G, G2B and G2G networks and the resulting mutual dependence are giving rise to new, more inclusive forms of 'citizen government' and community driven business (web 2.0). However, these developments are blurring roles and responsibilities raising questions of accountability.

Enhanced intelligence Interactive and shared forms of government coupled with proliferating sensor networks present eGovernment with an unprecedented level of detail on socio- economic and environmental data to pro-actively develop new citizen-centric services. However, responsible stewardship of sensitive information is required as the 'market' value of the data increases.

Finally, for each of these "hotspots", the report provides a possible measurement framework, related research challenges and policy options in order to better trace progress towards, capture and support these developments (section 4, 5 and 6).

With all these deliverables insights the study hopes to shed some light on the future challenges and opportunities for eGovernment and assist policy-makers in responding to these challenges in a proactive manner.

Contents

Executive Summary	1
1 Introduction.....	15
2 Hot spots of ICT driven government innovation.....	19
2.1 Introduction.....	19
2.2 A taxonomy of tasks and roles of government.....	19
2.3 Transformative technologies.....	25
2.4 Hot spots of government innovation driven by ICT	29
2.4.1 Transparency provoking change	36
2.4.2 Changing the accountability paradigm.....	38
2.4.3 New forms of policing and law enforcement.....	39
2.4.4 Changing the privacy paradigm	41
2.4.5 New countervailing powers.....	42
2.4.6 Networked government.....	44
2.4.7 Intelligent and pro-active government	45
2.5 Conclusions – possibilities for empowerment	47
3 The future of eGovernment.....	49
3.1 Scenarios: scope and trends	50
3.2 Constructing the scenarios	50
3.3 Four scenarios for future eGovernment	52
3.3.1 Scenario 1: OUR EUROPE.....	52
3.3.2 Scenario 2: WE, THE MARKET	54
3.3.3 Scenario 3: MY COMMUNITY	55
3.3.4 Scenario 4: ME, MYSELF AND I.....	56
3.4 The influence of hot spots in the scenarios	57
4 Measuring Impact	63
4.1 The current context of eGovernment impact measurement	63
4.1.1 General context	63
4.1.2 European context.....	65
4.1.3 Generic evaluation issues.....	69
4.2 A new type of measurement framework tool.....	70
4.3 Applying the measurement tool to the hot spots	72
4.3.1 Transparency provoking change	74
4.3.2 Changing the accountability paradigm.....	76
4.3.3 New forms of policing and law enforcement.....	78
4.3.4 Changing the privacy paradigm	79
4.3.5 New countervailing powers.....	81
4.3.6 Networked government and new stakeholders.....	83
4.3.7 Intelligent and responsive government	85
5 Research challenges	89
5.1 Research themes.....	89
5.2 Key research challenges.....	94
5.3 Extreme Hot spots.....	97
5.3.1 Extreme transparency.....	99
5.3.2 Fading boundaries	102
5.3.3 Enhanced Intelligence	104
5.4 Concluding remarks	105

6	Conclusions and policy recommendations	107
6.1	Introduction	107
6.2	Synthesis	107
6.3	Policy recommendations	109
6.3.1	General policy challenges	109
6.3.2	Hot spot related policy challenges	111

Appendices

Appendix 1: Overview of maturity and deployment of technologies.....	117
Appendix 2: Sources used for the scenario exercise (trend analysis)	119
Appendix 3: Longlist of experts for the scenario exercise	121
Appendix 4: References to chapter 3.....	123
Appendix 5: References to chapter 4.....	125
Appendix 6: List of participants validation workshop	127

Executive Summary

The Institute for Prospective Technology Studies (IPTS) has asked TNO and the Danish Technological Institute (DTI) to carry out a study which aims to provide European policy makers with strategic insights for future policy on eGovernment. The study aims to *analyse the potential of disruptive technology trends - and especially ICT - in providing challenges and opportunities for new models of eGovernment, public governance, public administration and democracy*. It builds on a vision on eGovernment for 2010,⁴ which was developed by IPTS. The study acts within the political framework of the Lisbon objectives and the construction of the European Research Area.

The IPTS eGovernment vision for 2010 was developed as a result of a workshop in March 2004 in Seville. This vision points at the role of eGovernment as an *enabler* for better government, articulated around ‘two pillars’: the first being the pursuit of cost-effectiveness and efficiency, and the second the creation of public value. The approach in our study takes this vision as starting point and attempts to look further forward (to 2020). This study approaches the two pillars not as independent and equal pillars, but rather as ‘means’ and ‘ends’, with the interrelationship that this implies. This means that the *creation of public value* is the ultimate goal, and efficiency and effectiveness are only means to realise this higher end. Public value is related to the *outcomes* of eGovernment (on a broader economic, social and institutional level), and thus goes further than mere public sector or public service modernisation, which is the usual more narrow focus of eGovernment (research).⁵

The study also attempts to look beyond the current deployment and use of ICTs by governments and public administration, and particularly focuses on ‘disruptive’, or with a more positive connotation, ‘promising’ technologies: technologies which we assume will contribute to the *transformation* of (future) governmental tasks and activities. Promising technologies are those technologies which are both drivers and enablers of fundamental governmental change, needed to cope with future societal challenges. Transformative technologies may lead to a significant change in the existing establishment, open the gate to new players, lead to new institutional arrangements, change the value chain and relationship between actors and bring in new solutions to the complex problems that current governments are facing.

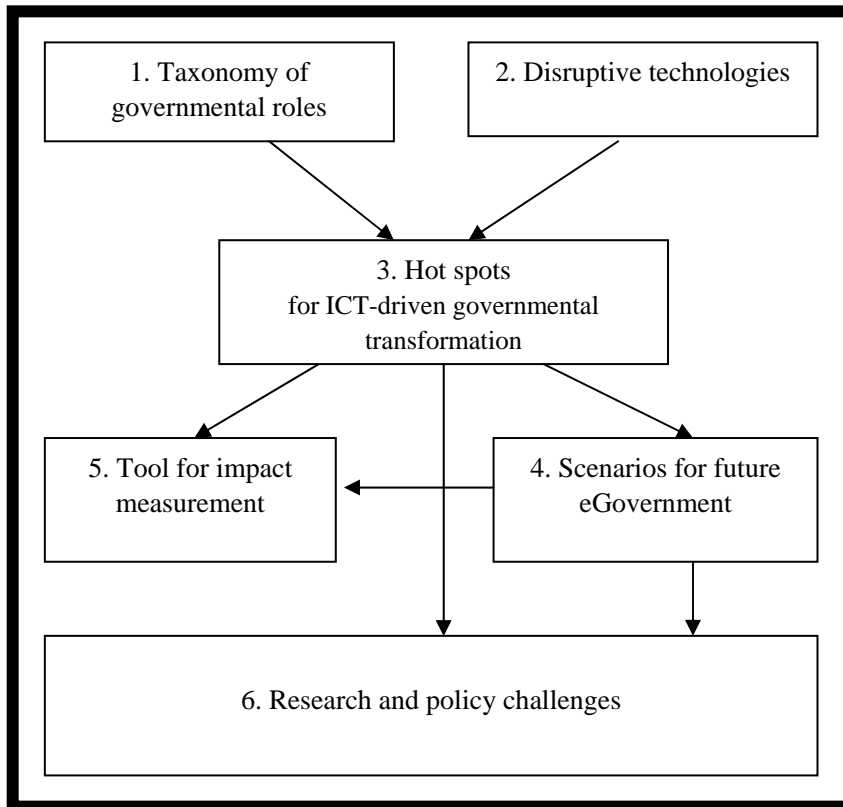
The general objective of the study can be broken down into the following more detailed goals and research steps:

1. To build a taxonomy which describes the main existing and potential government activities, tasks and actions, which may be supported and enhanced by new applications and new use of ICT.
2. To identify, select and analyse those disruptive ICT technology trends which may have a transformative impact on future governmental tasks and roles.
3. To explore the potential innovation impact of new disruptive ICT technology for governmental roles and tasks (combination of 1 and 2).
4. To build – through a scenario exercise – the potential institutional, economic and social changes in the ways in which governance, public administration and democracy might be fulfilled.
5. To study the adaptability of the tools for measuring the impacts and changes envisaged within eGovernment activities, to the scenarios the evolution of technologies.
6. To draw research challenges and policy recommendations based on the hypotheses formulated by the study.

⁴ European Commission (2004), “eGovernment in the EU in the next decade: vision and key challenges”, C. Centeno, R. van Bavel and J.C. Burgelman, Final Draft version, August 2004, DG JRC, Institute for Prospective Technological Studies, Seville, Spain.

⁵ See Millard, J. 2003, ePublic services in Europe: past, present and future – research findings and new challenges, prepared for the European Commission’s Institute for Prospective Technological Studies (IPTS), Seville, Spain, September 2003. Available from: <http://www.cordis.lu/ist/about/socio-eco.htm> and <http://www.beepgovernment.org>

Figure 1: Relation between project steps



Each of these goals has been the starting point for a specific study, which have been reported in six different research sub-reports containing most of the detailed and rich case-related material on which the analysis is based. The report you are reading now is the synthesis report, which brings together the main results and key conclusions of these different studies.

1.

The first step was to develop a taxonomy of key governmental roles, tasks and activities, which could be supported and enhanced by ICT. We have developed an overarching framework which reflects historical transformations in public values since the establishment of democratic constitutional states in Western countries. This framework⁶ is depicted as a ‘house of values’, an edifice to which new storeys and rooms have been added and furnished over the course of centuries. Each storey of this house originated as a result of the major societal transitions that occurred during previous centuries. Whereas in the 18th century liberal values were central, in the 19th and the 20th centuries Western democracies evolved towards fully fledged welfare states. The dominant model on which these 20th-century welfare states were built is the Weberian bureaucracy of which functional division, centralisation and hierarchy are key characteristics. The characteristics of the Weberian bureaucracy, however, do not fit too well with ICT trends such as horizontalisation, decentralisation and the intertwining of activities and tasks. On the other hand, basic values of the foregoing centuries, such as integrity, legitimacy, accountability and equality remain of key importance for future government. Hence, a major challenge for governments is to reinvent models of government in such a way that they match current and future ICT trends and – at the same time – ensure existing and future values of good governance.

Each storey in our ‘house of values’ represents certain public values. The value or ‘ends’-based framework is broken down at a highly detailed level into ‘means’, which refer to the roles, functions and activities of

⁶ Inspired by among others: Bovens, M and Loos, E (2002) The digital constitutional state: democracy and law in the information society, *Information Polity*, Vol. 7, No. 4, 2002, pp. 185-197.

government that contribute to the realisation of these layered ‘ends’. We have distinguished between the following values:

1. *Liberal values* (18th century): covering constitutional and subsidiarity structures; the legal framework: law, regulations and rules; law enforcement, defence and security; personal justice; and individual rights.
2. *Democratic values* (19th century): covering citizenship; democratic participation through representation; democratic participation through direct engagement; engaging private interests; and developing the plural society.
3. *Social values* (20th century): covering how needs for and responses to socio-economic support are determined; service design and production; service delivery; inclusion of all; environmental sustainability; place development and quality of life.
4. *Empowerment values* (21st century): covering how citizens, communities, groups and interests in society can be empowered to further their own as well as collective benefits; extending subsidiarity and reciprocity; governance coherence and balance; transparency and openness; ethics and accountability; trust; empowering the public sector as an individual actor; empowering the private sector; personalising services for individual users; and empowering the individual service user.

The fourth layer particularly represents the *future* 21st century model of public values and government roles and a stage of transformation, which is now – at the start of the 21st century – only rudimentarily beginning to take shape. Our first conclusion, therefore, is that a *shift towards empowerment* represents the most important transformation of governmental roles in the coming decades.

2.

In step 2 we have identified ‘promising’ technologies that may contribute to the enhancement of (future) governmental tasks and activities. Obviously, what can be seen as *promising* depends on what one wants to accomplish. As stated, from our perspective promising means ‘creating public value’ (in an efficient and effective way). Due to, among other factors, technological changes, the context in which government has to ensure these values has changed. In the past century, the industrial society has transformed into an information society. Traditional government, originally built on principles of the industrial society, is less and less able to face the complex demands and problems of the information society. The ‘stove-pipe’ architecture of public administration, but also a changing power balance in the political arena, hampers governments in fulfilling their tasks and in gaining citizens’ trust.⁷ In this light we consider promising technologies to be necessarily *transformative* technologies; technologies which enable the governmental scenery to change in such a way that societies are more able to cope with these emerging societal challenges. Transformative technologies may lead to a significant change in the existing establishment; open the gate to new players, lead to new institutional forms, change the value chain and relationship between actors and bring in new solutions to the complex problems that current governments are facing. In literature the notion ‘transformative’ – when related to technologies – is often called ‘disruptive’.^{8,9}

Which technologies have this potential? One way of looking at this is to say that particularly the (large scale) deployment of technology is transformative.¹⁰ However, not *all* technologies have a transformative

⁷ Fukuyama, F., *The Great Disruption, Human Nature and the Reconstruction of Social Order*, Touchstone, New York, 1999.

⁸ [Christensen](#), C.M., *The Innovator’s Dilemma: When New Technologies Cause Great Firms to Fail*, Harvard Business School Press, Boston, Massachusetts, 1997

⁹ In the FISTERA project disruptive technologies were defined as: *technological evolutions that lead to a disruption; this is a significant change in the scenario involving actors and the rules of the game* (WP2 Key European Technology Trajectories, First Report on Key European Technology Trajectories, 30 September 2003).

¹⁰ Carlota Perez, *Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages*, New York: Edward Elgar, 2003.

impact when they are widely used; they must also have an intrinsic potential to become transformative. In our view, transformation can be enabled by high deployment of *existing* and by the introduction and use of *new* disruptive technologies. However, in the governmental realm, a lot of existing technologies with transformative potential are not fully deployed yet and thus have not been able to fulfil their innovative potential yet. Therefore, we expect that in the coming 10 to 15 years transformation will largely result from a process of adaptation and assimilation of existing technologies. Whereas in other sectors far-reaching deployment of existing technologies (such as social software and mobile devices) is or has already taken place, the exploitation of these technologies in government lags behind.

In short, in order to select technologies we have defined a transformative technology as a technology which:

- is broadly deployed,
- has an intrinsic transformative potential,
- has reached a certain stage of maturity and
- has the potential to stimulate disruption.

First we prepared a long list of technologies, with a group of technological experts from TNO, focusing on the disruptive potential of the technologies themselves. Then we clustered and reduced this long list focusing on the disruptive potential these technologies may have for governmental functions. This has led to the selection of the following key technologies:

- mobile devices (PDAs, wearable computers, MP3-players, mobile phones)
- intelligent agents (and robotics),
- sensors
- language processing technologies
- semantic technologies
- serious games
- RFID and biometrics,
- ICT infrastructures (WiFi, WiMAX, Broadband),
- web 2.0 technologies (social software)
- GRID

3.

The first two steps culminated in an analysis in which the roles and tasks of governments, as described in the taxonomy, were confronted with the characteristics of promising technologies. This has resulted in the identification of what we have labelled ‘hot spots’ of governmental transformation. The hot spots were selected using the following criteria:

- (a) a combination of a mature technology with a governmental role
- (b) which leads to governmental transformation
- (c) within the majority of EU member states, and
- (d) within the timeframe of 15 years.

Deployment and maturity of technologies were studied by gathering in-depth data on usage and usage barriers, market perspectives, application range and technological maturity (see also Appendix 1). The transformative and disruptive potential has been understood as a *complete change* of someone or something. (An example is the emergence of new balances of power, the adoption of new paradigms, the engagement of new stakeholders or institutional changes). The *significance* of a change determines whether a change is transformative or not; changes have to be large enough, general enough, and durable enough to affect considerably the character of (a setting of) organisations and to be called transformative. The four layers of governmental roles and responsibilities we identified in task 1 were used to assess the transformative impact of the technology, while justifying our assessment with literature, argumentation or

examples. This has resulted in the identification and clustering of combinations of roles and technologies into seven ‘hot spots’ (see the ‘clouds’ in table 7) of this report:

Transparency provoking change

ICTs are generally supposed to stimulate transparency. Promising technologies influence transparency in many ways:

- PDAs and mobile phones, which face a pervasive and still increasing popularity, enable ubiquitous access to all kind of information resources.
- Web technology, workflow and knowledge management systems stimulate the creation and dissemination of digital information.
- Technologies such as intelligent agents and semantic web support access to highly personalised information.
- Infrastructural technologies such as broadband, WiFi and WiMAX support high-speed and large-bandwidth data exchange.

Technology-driven increased transparency will have a wide range of impacts. Firstly, it will affect the power balance between governments and citizens (G2C) which will be based more on information symmetry and thus will increase the possibilities of citizens to exert effective control over their governments. Secondly, transparency will impact the relation between governmental agencies (G2G): it will stimulate and sometimes force governmental organisations to align their policies and procedures. It may increase competition between governmental agencies as well. Transparency may furthermore transform governmental culture, as it pushes governments towards opening up their traditionally quite closed and hierarchical organisation culture. Transparency may finally weaken the position of governments, as it will become more vulnerable to criminal activities.

Changing the accountability paradigm

In line with increased transparency, ICTs will also force governments to continuously account for their policy and decision making. Furthermore, and more fundamentally, new – more distributed – forms of accountability need to be developed. A broad range of technologies are expected to impact accountability in several ways:

- The decentralising character of web technology and social software will stimulate cross-boundary cooperation and the involvement of new stakeholders and therefore asks for new forms of accountability.
- Opportunities provided by technologies such as workflow, knowledge management systems and intelligent agents to computerise procedures and decision making may support a clear and unambiguous practice.
- The monitoring rationale of technologies such as workflow and knowledge management systems may increase the quantification of the accountability process.

The growing deployment of these technologies drives a trend towards networked models of government. This development will raise new questions on existing accountability constructions in EU Member states. Moreover, ICTs may strongly enforce accountability mechanisms. More and more accessible public sector information enables citizens to monitor government and to hold government practitioners and politicians accountable for their actions. Finally, ICTs may also provide governments with effective tools to fight corruption. Those EU member countries, which face a high level of administrative corruption, may profit from technologies, such as workflow systems, in order to combat corruption.

New forms of policing and law enforcement

Many of the promising ICTs we have distinguished increase the surveillance capabilities of governments, but also change the set of actors involved in law enforcement tasks. The large scale deployment of these technologies will affect the ability and the way in which the state exerts its role in the domains of law enforcement, defence and security.

- PDAs, digital cameras, etcetera, extend existing the overall surveillance capacity and enable improved direct intervention in cases perceived to conflict with the prevailing rule of law. They enable new stakeholders in matters of law enforcement and security which may lead to a decentralisation of (police) tasks.
- Mobile infrastructures such as WiMax, WiFi, and Broadband enable operating staff of public authorities to remain fully connected to the virtual infrastructures present within offices, adding to the self-reliance capacity of operating staff and thereby changing work processes and the work flow within public authorities.
- The decentralising character of social software enhances the opportunity for and capacity of individuals to actively engage in public affairs and influence decision making processes.
- Enabling technologies such as RFID and sensors provide the opportunity to create fully automated surveillance systems and thereby extend and improve existing surveillance and monitoring capacity.

As a result, both private organisations (such as security firms) and citizens will be increasingly involved in law enforcement tasks. Boundaries between stakeholders will become blurry. Law enforcement is increasingly pervasive (cameras, photos, etc.) and can be carried out more effectively (by using robots, RFID, etc). ICTs not only increase the possibilities to gather data but also to manipulate data (and thus evidence in court ruling).

Changing the privacy paradigm

The majority of the technologies we selected affect privacy. Most of the mentioned technologies are enablers of sophisticated and unnoticed data and information gathering. They enable the gathering of very detailed personal data, the construction of profiles that may be used to identify specific groups of people, as well as the tracking and tracing of people. This may take place in real time or in virtual space, on the basis of aggregated data. The role of technology in safeguarding the right to privacy is ambiguous: technologies are both a potential protector and an offender of privacy. On the one hand, government will be able to monitor individual citizens in greater detail, which increases possibilities of privacy infringements. On the other hand, ICTs may empower citizens to combine forces and to promote and protect their privacy interests. The sophistication of developing ‘avoidance technologies’ and technologies to remain anonymous in electronic communication practices (or in search techniques) will also increase.

New countervailing powers

Many of the promising technologies show a potential to open-up traditional forms of democratic involvement in governance, and to develop new ways to engage with individual citizens, communities, and advocacy/interest groups. These may thereby be empowered to become a new type of countervailing power to government. This can both supplement and change existing power structures in government itself, as well as in established power centres in the private and institutional sectors.

- Social software and social network tools are potentially revolutionary as they offer relatively cheap, easy to use and rapid means to informal as well as formal groups to organise themselves, develop common agendas, implement actions, and exert pressure on other power centres and stakeholders.
- This effect is even enhanced by the use of mobile devices, which enable the organisation and coordination of interest group activities in a *just in time, just in place* way.
- Similarly, the use of gaming, language processing and semantic technologies by groups can be transformative in the sense that new competences and new types of understanding and interpretation of information can be developed, which can underpin collective action.

The strengthening of bottom-up, often informal democratic involvement and the countervailing power which this engenders may cause a shift in the existing power balance between individuals, civil society, social movements and government. In terms of more far-reaching impacts, these technologies contribute to an on-going fragmentation of interests and thus of the system of political representation and a shift towards a more fluid, single issue or single event based politics with less institutional coherence. This is coined by

Bimber as 'accelerated pluralism'.¹¹ On the other hand the effect of this trend may also be that it will bind people more tightly together in social networks and thus enforce their position as countervailing power.

Networked government

This hot spot points to the trend that the horizontal, decentralized and location/time-independent character of technologies will increasingly drive networked, decentralized and multi-stakeholder models of government. The key technologies which drive and support this trend are:

- Infrastructural network technologies such as WiFi, WiMax, broadband and web technologies, which support the ubiquitous seamless connectivity and distribution of systems and services between stakeholders, including users.
- GRID, knowledge management and workflow technologies supporting the optimisation and interoperability of ICT resources amongst stakeholders by stimulating standardisation of languages, application, interfaces, etcetera, which could lead to organisational realignment, re-structuring and process innovation.
- The role of social software, social network tools, and technologies for decentralised service creation, all of which enhance bottom-up and personalised communication and information sharing. This promotes de-centralised and networked collaboration, participation and alternative service provision, which in turn stimulates new forms of organisation and changes to power balances.

When governments increasingly work together with other stakeholders, organisational and institutional arrangements and structures along the value chain have to change. A need for appropriate constitutional and political frameworks, legal and regulatory conditions, and mindsets and cultures will arise. The respective technologies can assist in transforming the organisational processes and resources of the actors and agencies involved, and, crucially, join them together to provide integrated and interoperable systems.

Intelligent and responsive government.

Here the focus is on the greater capacity of governments to collect, store, process and apply information. More and more useful information is being produced through knowledge-based, intelligent systems and is diffused in all kinds of societal networks, as well as across the public sector itself. This enables governments to design, produce and deliver higher quality and much better targeted and responsive services which are precisely tailored to meet the needs of specific individuals or groups. Promising technologies which are most relevant in this context are:

- Wearables, sensors, intelligent agents, robots, RFID, biometrics, GRID, and new tools for storage and retrieval which identify, collect and store information and make it available to government for intelligent processing.
- Knowledge management systems, semantic web, web technologies, plus PDAs and other mobile devices enable governments to convert information to intelligent knowledge and services, and thus to increase the responsiveness of government through new product and service innovations, and to deliver services to different types of users in new ways.

The identification, data collection, storage and processing technologies described above could develop into an *ambient technology* and thus an *ambient government environment*. Here, public systems and services will be everywhere, fully interoperable (in both technical and non-technical terms), and instantly and unobtrusively accessible through constant monitoring via network sensors and receptors of who is where, and what their needs are in changing situations. In such an ambient intelligent space, it will be even more important that governments ensure the reliability, resilience and pervasiveness of networks, Open source and open standards will be essential ingredients. Moreover, ensuring inclusion of all and the development of new forms of digital rights management will be important issues here.

¹¹ Bimber, B (1998) The Internet and Political Transformation: Populism, Community, and Accelerated Pluralism, *Polity*, Fall 1998 issue, Vol. XXXI, Number 1, pp. 133-160.

We have concluded earlier that the shift towards empowerment represents the most important transformation of governmental roles in the coming decades. What we have seen by now is that ICT-related innovations are particularly important for driving this shift: each hot spot clearly shows signs of this empowerment trend: taken together the transformations described in the seven hot spots all cumulatively contribute to this shift. Different technologies support individuals in acquiring knowledge, organising themselves, to create, to produce and to deliver anytime and anywhere –. and thus: to be informed about government, to participate in public debates, to hold government accountable and to produce and deliver services that hitherto were collectively provided. It is particularly this empowerment trend which will affect the *raison d'être* of governments. In the seven hot spots we found the following strong indications for this shift:

- *Transparency*: as citizens and other stakeholders become better-informed and more aware of governmental activities they are better equipped (empowered) to directly address governments about their needs;
- *Accountability*: networked forms of governance enable citizens and other stakeholders to exert influence on the process of accountability but at the same time requires them to take responsibility for shared activities;
- *Policing and law enforcement*: both private and civic players are more and more enabled to take over policing and law enforcement roles, leading to co-production of roles or – in a more radical scenario – to a certain marginalisation of governments as law enforcers;
- *Privacy*: technologies are both a potential protector and offender of privacy; in the same vein, the role of government is ambiguous: intrusive in collecting more personal data; protective in offering protective measures; citizens become more empowered to keep control over personal data themselves;
- *Countervailing powers*: new forms of democratic participation contribute to enhancement of countervailing strategies; these forms are highly dynamic and volatile, highly pluralistic and fragmented and challenge the traditional mode of representative democracy;
- *Networked government*: by increased sharing of authority, bypassing of traditional hierarchies and vertical institutes, co-operation within government and with external stakeholders, external stakeholders are empowered and roles for government changes;
- *Intelligent government*: technological tools enable a shift towards a more responsive government, heading for service leadership, user-oriented character and context-awareness.

4.

Future models of government depend upon the way future trends will manifest themselves. Therefore, in the next step we have explored four scenarios for which the time horizon is the year 2020. The scenarios describe the consequences of promising ICT-developments for new eGovernment services and new eGovernment models in the wider context of related *social, economic, institutional and organisational* trends. Based on desk research we have made a list of trends with a high degree of uncertainty, but with a possible high impact on eGovernment. Sixty European experts (see Appendix) participated in a survey to select the trends with the expected highest uncertainty and largest impact. Their input was used to construct the axes of the scenarios. The scenarios vary on two highly uncertain factors that may have a large impact on future models of government: 'cultural diversity' and 'citizen involvement'. These two factors were selected by the experts as the most uncertain variables with the largest impact. When combining the extreme manifestations of these two factors (cultural homogeneity versus cultural heterogeneity and low versus high involvement of citizens), four images of government emerge in which we have taken the future activity of the hot spots into account in terms of their potential impacts in 2020. Experts were invited to engage in the creation of the scenarios in a two-stage process. In the first round, they were invited to comment on the generic descriptions of the contextual factors in each scenario. In the second, 'fine-tuning' stage, we asked them to further reflect on the scenarios which were then complemented with descriptions of the 7 hot spots described in earlier reports for this project. We asked them to comment on the following issues:

- In the Our Europe scenario, European culture in 2020 is coherent and homogeneous with a high degree of consensus on the future development of the European society. Democratic participation is high and citizens are overall quite involved in what their political representatives do: they are

well informed and able to express their needs. They critically follow their governments but in a constructive manner. Ambient government increasingly anticipates citizen needs. Government is focused on being efficient and effective in delivering personalised services. Because individuals and action groups, empowered with advanced personal media tools, can easily scrutinise and expose government operations, transparency and accountability have become the norm in and across government operations. A major challenge is to balance flexibility in projects and operations with this increased accountability. The potential for large-scale data mining by national governments and businesses is strongly regulated by EU privacy acts. eGovernment and eBusiness systems are designed around data sharing directives agreed at EU level. Intelligent devices comply with open EU standards to signal privacy incompatibilities when exchanging biodata. Governments receive extremely fine-grained, geographically-specific feedback on all their actions from all stakeholders and a kind of continuous referendum on key issues is emerging. To ensure concerted action there is a great need for common pools of knowledge and consistent and balanced interpretation across all spheres of government.

- In the We, the Market scenario, the private domain is by far the most important. People have come to rely on the structuring capacity of the market, which goes hand in hand with a transparent government that focuses on core tasks. Citizens are complacent and are hesitant to hold their governments responsible for their performance. Citizens have sacrificed their rights for data protection in exchange for job security in a volatile economic decade. Market parties manage this information to execute outsourced law enforcement tasks. Government's role is reduced to being a watchdog, as more and more key services are delivered through public/private partnerships. Many public services (health, public transport, education) have been 'outsourced' to the market as well with only a marginal role for public authorities. The market considers (personal) data as a commodity with a market value which skews the balance between privacy intrusion and market benefits. Privacy has become a trade-off mechanism between supply and demand. The market is in the lead when it comes to collecting, providing and exploiting the smart data needed to provide highly sophisticated and intelligent services and to create the ambient intelligent environment needed to support these. Companies use 'Google' business models, which can be characterised by smart ways of exploiting the collective intelligence present in societal networks. Democratic participation is low: people trust government. Checks and balances within the political system are primarily oriented towards enabling insight into costs and benefits. Government has outlawed the use of strong cryptography. The power of civil society groups to scrutinise business is curbed in new EU and national regulation. Businesses can sue activist groups if their image is tarnished.
- In the My Community scenario, the key characteristic of society is cultural, religious and political diversity. Units of governments cooperate in instant and horizontal networks which cause complex constructions of shared responsibilities. Thus accountability structures are very complex and opaque. Participants in governmental networks and citizens dispute responsibilities. Governments have substantially decentralised their tasks and activities; local communities and municipalities are the key actors in the public arena. Highly networked individuals and action groups mesh with business, which together dominate formerly traditional government domains. Governments influence and budgets are shrinking, and working in government has an increasingly bad image. ICTs have provided citizens with powerful tools to blow the whistle on government in terms of law enforcement and have empowered them to organise counter-surveillance and alternative forms of law enforcement. Successful online security firms and citizens' initiatives have taken over many traditional government functions in law enforcement. Citizens endorse an approach that prevents the ability to centralise the storage of personal data. As a result, service provision is fragmented and best accessible to those who can afford it. New cryptography technologies make it easy to scramble and disrupt aging ambient government technologies. The traditional model of representative democracy has been abolished and replaced by models based on deliberation, direct democracy and minority interests. Small collectives of loosely organised non-state actors muster power beyond the control of government. Their power depends on widely dispersed communities

that support them. These communities spring up and die out quickly making it difficult for government to develop any long term policies.

- The Me, myself and I scenario is characterised by low engagement and high – almost individualised – diversity. Low engagement drives a general attitude of minding your own business. There is little room for consensus building and a general distrust among all actors in society. Citizens care little about transparency and accountability. Surveillance and law enforcement are the key roles of government. For government, security is a perfect excuse for lack of accountability. Privacy is increasingly sacrificed in favour of security. Citizens are reluctant to reveal personal data to government. For some, personal data is a market commodity: depending on the services offered, citizens are willing to let their personal data be used for specific purposes (profiling, tracking, social network analysis and the like). “Clientelism” and one-to-one politics have become the corner stones of the democratic system. The role of governments in networks for public service provision has become quite marginal. In this scenario individual citizens use their personal budgets to organising key services, often through inside tracks with government. ICTs have enabled a high degree of personalisation of services which as a result are organised on a one-to-one basis in client-provider relationships between individual citizens and private companies or community providers. This fragmented services system makes good services hard to come by and expensive. Large sections of the aging European society have difficulties accessing key services such as dental care and affordable housing.

5.

Following the foregoing steps in the analysis, a future-oriented framework for measuring the benefits and impacts of eGovernment is presented. ‘Future oriented’ implies that this tool takes into account likely future transformations and new demands on eGovernment. In this case this means that the tool is specifically applied to the hot spots, as they represent our analysis of the key challenges for future eGovernment. This has been done in a concrete and pragmatic manner, providing a concrete indication of what could be measured when addressing the specific hot spots.

6.

Finally, and taking together the key points from all the research steps in the other research work, we have set out to identify the research challenges related with the new developments of eGovernment and to formulate policy recommendations. By research challenges we mean scientific blind spots; research themes or questions that will be relevant for future models of government and that are relatively new and underexposed. Policy recommendations are understood here as key challenges for future policy that derive from the identified research themes or from the trends or questions arising from the previous research tasks. Because the subjects of the five previous steps are rather divergent (vary from inventories of tasks and technologies to scenarios and impact measurement tools) and the interrelations between the tasks are manifold and versatile, we have chosen to identify the key research and policy challenges by using the hot spots as structuring element. We have first used the hot spots to identify the research challenges and have also taken into account here how relevant they are for the four scenarios.

As the seven hot spots show significant synergies, dependencies and overlap, and to bring a strong focus in the final concluding chapters, the hot spots have been further condensed into three relatively independent ‘extreme’ hot spots for ICT driven governmental transformation. For each ‘extreme’ hot spot we have first formulated the key research challenges (also based on input from experts taking part in a final validating workshop).

Extreme transparency

of government operations and functions on the one hand prompts close scrutiny of government accountability by citizens, business and civil groups. On the other hand, transparency of citizen activities raises serious issues of privacy. In both cases there are many new opportunities for due and undue police

surveillance and other law enforcement strategies. This has raised the following key issues for research (broken down into more detailed challenges in the chapter):

- How can the performance of more qualitative tasks of government be measured?
- What new forms of accountability (e.g. being responsible, giving account, holding accountable) fit the new models of networked government?
- What are good indicators to monitor the potential threat to privacy as a result of networked and intelligent government?

Fading boundaries

between government and its main counterparts in society are a signpost of the new ways in which government functions are being shaped. Coalitions of state and non-state actors (countervailing powers) play an increasing role in the implementation of government tasks. In research terms the following challenges come to the fore:

- What are the ways in which government can facilitate eParticipation and eDemocracy?

Enhanced intelligence

embodies the hot spots of an *intelligent* and *networked* government that exploits but also guards the many new sources of information gathered through granular interactive networks that now reach into every corner of society.

- What are the ways in which government can manage the overload of information as a result of ‘ambient government’?

Finally, in the last and concluding chapter we have also used these extreme hot spots as the starting point for identifying key policy challenges and recommendations. But apart from these hot spot-related recommendations, we have also formulated some more general policy recommendations, which can be seen as pre-conditional for realising the ICT-driven models of eGovernment which we have described in this study;

General policy challenges

Political challenges

- Policy strategies and actions need to be based on an explicit value based *vision* on future eGovernment, which specifically takes into account the realisation of empowerment values.
- Future eGovernment models need to go beyond mere public service and public sector modernisation, and need to be based on a willingness to fundamentally change governmental operations, institutional arrangements and culture. In this sense the development of *incremental transition paths* is necessary, possibly based on different migration scenarios. This involves a need to look beyond short-term political agendas and implementation issues.
- The trend towards an increasingly networked eGovernment, will involve *cooperation and coordination at all levels of government and with new stakeholders and new intermediaries* at (and across) the local, regional, national and European level. This stresses the need for administrative and regulatory trans-European harmonisation to ensure ‘interoperability’ both at the organisational and the technological level.
- This harmonisation is also important to address the potential risks of an ambient, all knowing government, particularly to *ensure data protection (security and privacy) rights* of citizens and businesses.
- These kind of long-term and integrative transitional approaches require univocal *political commitment and strong leadership* with an impact on every level of government.

Technological challenges

- Ensure technological *interoperability and standardisation*.
- Governmental transformation requires back office re-organisation and one-stop shop approaches, which in turn require substantial *process and workflow redesign* that needs to be translated into

new *information architectures*. An extra challenge is that these new architectures need to be *flexible and open* in order to be sufficiently user-centred and dynamic.

- This also involves a stronger investment in technologies that enable *smart ways of cooperating and sharing or producing knowledge* ('collective intelligence', open source and open content, collaborative computing tools etc), among relevant stakeholders in this more networked environment.
- Ensure that networks and services are *accessible to all* both on the level of *infrastructures* as on the level of *services* and the necessary (user friendly) *interfaces* (usability).
- Stimulate the use of technologies which are designed to cope with potential *information overload* (e.g. use smart search engines, tagging technologies etcetera that are developed in social networks and in the context of user generated content)
- Reduce the *dependency on ICT-infrastructures* and related services or build in necessary safeguards (this requires an approach to cope with 'critical information infrastructures').

Socio-economic challenges

- The most important challenge will be to create the conditions for a *truly citizen- and user-centred* public service provision, which addresses empowerment values. This involves:
 - A highly developed awareness of citizens' and businesses' *needs* ('ambient government'): ambient government involves deep, personalised and pro- active knowledge about quite diverse user needs and the ability to translate these into highly diverse services, interfaces and access channels. It also point to the need to constantly monitor user needs, user experiences and user satisfaction;
 - Building *trust* through being transparent, responsive and accountable ('transparent government'); but trust also depends heavily on the ability to ensure security and privacy of personal data.
 - Diminishing the *regulatory barriers* for both citizens and businesses to be independent, self-organising and self-regulating ('light government').
 - Ensuring that public services are equally *accessible* to all European citizens and business ('inclusive government').
 - The latter also involves increasing the *awareness* of the potential benefits of eGovernment services. Currently, the level of deployment of eGovernment services is low, and there is strong evidence that lack of awareness of eGovernment services is the main barrier to take-up. Carefully targeted promotion and awareness campaigns should promote the overall benefits, calm the fears, and give general information about what is involved technically, where to find and how to use services. One aspect should be wider use of charters / codes of conduct / SLAs, etc.
- Another important challenge will be to create the *conditions for collaboration, coordination and knowledge sharing*, necessary for 'networked government'. Future government will increasingly be built on public-private partnerships and will involve new intermediaries in the public service delivery chain and in democratic processes. As a result, new governance structures and shared forms of accountability and transparency need to be designed. Furthermore, smart and efficient ways of sharing and producing knowledge between these different stakeholders will be increasingly important.

The more specific hot spot related challenges (described and elaborated in greater detail in the chapter) are:

Policy recommendations for 'extreme transparency'

- Transparency of governmental actions should be embedded in the design of ICT systems.
- Simplify regulations and procedures.
- Avoid redundant private data collection.
- New charters and codes should be developed on distributed electronic public sector transparency, accountability and privacy, where and how it applies and for whom.

- Promote and develop ICT-supported systems building on the collective intelligence of different stakeholders to stimulate and enhance networked models of policing and law enforcement.

Policy recommendations for ‘fading boundaries’

- Engage citizens in the design of eGovernment applications in order to make them more citizen-centred.
- Develop charters and codes on public electronic access and input to the public sector decision- and policy-making process, feedback on that input including the results and reasons for use/non-use, and the expected behaviour and skills of civil servants and elected representatives in this context. This should include the rights and responsibilities of all stakeholders.

Policy recommendations for ‘enhanced intelligence’

- Encourage cooperation and data sharing and cooperation between governmental departments and between government and other stakeholders (including citizens themselves).
- While encouraging cooperation between governmental departments/with other stakeholders (including the private sector and the civil society) in collecting, storing and exploiting data, at the same time develop policies on how these actors are allowed to use personally identifiable information. Policies need to be formulated in which the roles and responsibilities of government, civil society and business in the handling of potentially sensitive information are clearly articulated and in which shared standards for quality are articulated.

Government needs to be at the vanguard of semantic web and intelligent agent technologies to manage the flows of information that are coming their way.

1 Introduction

The Institute for Prospective Technology Studies (IPTS) has asked TNO and the Danish Technological Institute (DTI) to carry out a study which aims to provide European policy makers with strategic insights for future policy on eGovernment. The study aims to *analyse the potential of disruptive technology trends - and especially ICT - in providing challenges and opportunities for new models of eGovernment, public governance, public administration and democracy*. The study builds on a vision on eGovernment for 2010,¹² which has been developed before by IPTS. It acts within the political framework of the Lisbon objectives and the construction of the European Research Area.

The IPTS vision on eGovernment vision for 2010 was developed as a result of a workshop in March 2004, which took place in Seville. This vision points at the role of eGovernment as an *enabler* for better government, articulated around ‘two pillars’: the first being the pursuit of cost-effectiveness and efficiency, and the second the creation of public value. The approach in our study takes this vision as starting point and attempts to look further forward (to 2020). This study approaches the two pillars not as independent and equal pillars, but rather as ‘means’ and ‘ends’, with the interrelationship that this implies. This means that the *creation of public value* is the ultimate goal, and efficiency and effectiveness are only means to realise this higher end. Public value is related to the *outcomes* of eGovernment (on a broader economic, social and institutional level), and thus goes further than mere public sector or public service modernisation, which is the usual, more narrow, focus of eGovernment (research).¹³

The study also attempts to look beyond the current deployment and use of ICTs by governments and public administration, and particularly focuses on ‘disruptive’, or with a more positive connotation, ‘promising’ technologies: technologies which we assume will contribute to the *transformation* of (future) governmental tasks and activities. Promising technologies are those technologies which are both drivers and enablers of fundamental governmental change, needed to cope with future societal challenges. Transformative technologies may lead to a significant change in the existing establishment, open the gate to new players, lead to new institutional arrangements, change the value chain and relationship between actors and bring in new solutions to the complex problems that current governments are facing.

The general objective of the study can be broken down into the following more detailed goals and research steps:

1. To build a taxonomy which describes the main existing and potential government activities, tasks and actions, which may be supported and enhanced by new applications and new use of ICT.
2. To identify, select and analyse those disruptive ICT technology trends which may have a transformative impact on future governmental tasks and roles.
3. To explore the potential innovation impact of new disruptive ICT technology for governmental roles and tasks (combination of 1 and 2).
4. To build – through a scenario exercise – the potential institutional, economic and social changes in the ways in which governance, public administration and democracy might be fulfilled.
5. To study the adaptability of the tools for measuring the impacts and changes, envisaged within eGovernment activities, to the scenarios the evolution of technologies.
6. To draw research challenges and policy recommendations based on the hypotheses formulated by the study.

¹² European Commission (2004), “eGovernment in the EU in the next decade: vision and key challenges”, C. Centeno, R. van Bavel and J.C. Burgelman, Final Draft version, August 2004, DG JRC, Institute for Prospective Technological Studies, Seville, Spain.

¹³ See also Millard, J. 2003, ePublic services in Europe: past, present and future – research findings and new challenges, prepared for the European Commission’s Institute for Prospective Technological Studies (IPTS), Seville, Spain, September 2003. Available from: <http://www.cordis.lu/ist/about/socio-eco.htm> and <http://www.beepgovernment.org>

Each of these goals has been the starting point for a specific study, which has been reported in six different research sub reports.¹⁴ The report you are reading now is the synthesizing report, which brings together the main results and key conclusions of all these different studies.

In chapter 2 we present what we have called 'hot spots' of future ICT-driven government innovation. These hot spots have been developed through a two-step research process. First, we have developed a taxonomy describing key governmental roles, tasks and actions which could be supported and enhanced by ICT. The starting point for this taxonomy was an overarching conceptual framework which reflects historical transformations in public values since the establishing of the democratic constitutional states in Western countries. The framework consists of four important layers of societal values. The fourth layer – in which ICTs play a crucial role – particularly reflects *future* societal values which we expect to have a major impact on government and governance in the 21st century.¹⁵ In our taxonomy, values are seen as the 'ends' to which (e)government should be contributing. We make a distinction here between liberal values, democratic values, social values and empowerment values. The 'means' are the roles, tasks and more specific activities of government. As in our view empowerment values will be characteristic for the 21st century, we conclude that government innovations particularly need to address empowerment values. Second, we have identified 'promising' technologies, by which we refer to technologies that are able to *transform* future government. The two ingredients for transformation are the ability of a technology to provoke new approaches and the potential to be deployed on a large scale. This research task resulted in an overall description of 19 technologies, which have been clustered into the following key technologies: *mobile devices* (PDAs, wearable computers, MP3-players, mobile phones) *intelligent agents* (and robotics), *sensors, language processing and semantic technologies, serious games, RFID and biometrics, ICT infrastructures* (WiFi, WiMAX, Broadband), *web technologies* (social software) and *GRID*. The confrontation of key governmental roles, as described in the taxonomy, with these transformative technologies led to the identification of seven hot spots, which can be seen as the leading thread which runs through and connects all the other chapters. These hot spots are:

1. Transparency provoking change
2. Changing accountability paradigms
3. New forms of policing and law enforcement
4. Changing the privacy paradigm
5. New countervailing powers
6. Networked government
7. Intelligent and pro-active government

In chapter 3 we present four scenarios for future ICT-driven government, for which these hot spots have provided important input to assess the robustness of the hot spots in different future contexts. The question how eGovernment will evolve in the coming decade is evidently not only influenced by technological developments – as we have explored in the foregoing chapter The question how eGovernment will evolve depends also on a wide range of contextual factors, such as social, cultural, institutional and economic trends. The scenarios are situated along two scenario-axes which form the framework in which the scenario-stories have been placed: cultural diversity and citizen involvement. The scenario-axes point to the extremes of a (possible) future trend or development. These two scenario-axes are chosen by experts, who have weighed and assessed both uncertainty and expected impact for eGovernment of several factors. When combining the extreme manifestations of the two chosen factors (cultural homogeneity versus cultural heterogeneity and low versus high involvement) four explorations of government models in 2020 emerge: 'Our Europe', 'We the Market', 'My Community' and 'Me, myself and I'.

¹⁴ An URL where these sub-reports may be found will be published later.

¹⁵ Empowerment values in our analysis represent the 21st century focus in what constitutes key public values: this does not imply that they substitute liberal, democratic and social values, but build on them and to a certain extent challenge them and force them to being adapted.

In chapter 4, a framework for the measurement of the benefits and impacts of eGovernment in this changing field is presented. It consists of a an articulation of the levels of policy objectives linked by an intervention logic, an understanding of exogenous factors, as well as an examination of policy effectiveness, policy efficiency, and of policy utility, sustainability and transferability. The policy objectives are iteratively linked according to an objective hierarchy, starting from inputs, outputs, and outcomes to impact. At each objective level different examples of measurement criteria are described. This approach is applied to each of the individual hot spots in the form of concrete indications of how the impact of these hot spots may be measured.

The final chapters of this report focus on the challenges provided by this analysis of future ICT-driven models of eGovernment. In chapter 5 we first sketch the key research challenges. The catalytic effect of disruptive technologies on the evolution of key government functions, combined with the societal trends as represented in the scenarios, may drive new research agendas. By research challenges we understand scientific *blind spots*; research themes or questions that will be relevant for future models of government and that are relatively new and underexposed or under researched. The seven hot spots show significant synergies, dependencies and overlap. To account for these effects and to focus the formulation of policy recommendations, the hot spots have been further condensed into three relatively independent *extreme* hot spots:

- (1) extreme transparency,
- (2) fading boundaries and
- (3) enhanced intelligence.

Finally, in chapter 6 we focus on the policy recommendations that may result from our analysis.

2 Hot spots of ICT-driven government innovation

2.1 Introduction

The first work package of the ICT-driven models of eGovernment research captured the following three research tasks:

1. To build a taxonomy which describes the main existing and potential government activities, tasks and actions, which may be supported and enhanced by new applications and new use of ICT.
2. To identify, select and analyse those disruptive ICT technology trends which may have an transformative impact on future governmental tasks and roles.
3. To explore the potential innovation impact of new disruptive ICT technology for governmental roles and tasks (combination of 1 and 2).

This chapter gives an overview of the key research findings that resulted from these three research steps.

2.2 A taxonomy of tasks and roles of government

The first step of the research entailed the creation of a *taxonomy* of main existing and potential government activities, tasks and roles which could be transformed (weakened or strengthened) by the deployment of new technologies. To be able to reveal relatively new transformative potential, an overview of governmental roles and tasks as comprehensive as possible has been created. Each separate task of this overview has - in subsequent research steps - been confronted with transformative technologies in order to find new, disruptive combinations of technologies and governmental tasks (see also paragraphs 2.2 and 2.3 of this chapter).

The taxonomy is primarily grounded in the *structure of the European digital constitutional state*, proposed by Bovens.¹⁶ This structure is portrayed as a 'house', an edifice to which new storeys and rooms have been added and furnished over the course of centuries. Each storey of this house originated as a result of the major societal transitions that occurred during previous centuries. Although the house's foundations had been laid earlier, it began to assume a well defined shape during the 18th century with the development of the liberal constitutional state. This thus becomes the first layer, or the ground floor, and consists of a number of 'rooms', such as liberty, legal protection, the rule of law, etc., which have as their central focus the protection of citizens from government as well as from each other. In the 19th century, a second layer was added, consisting of the democratic constitutional state where the focus is on civic participation in government. This included, according to Bovens, political rights, the parliamentary system and the separation of politics from administration. The 20th Century provided the social layer as it saw the enactment of the first social legislation with the key emphasis on the protection by government of citizens against an assortment of socio-economic calamities, expressed in a number of broadly formulated social constitutional rights. This required a whole array of social and economic regulation, including the regulation of competition, of industrial relations, and of the provision of goods and services in the context of the so-called welfare state.

The structure of Bovens is founded on legal principles, law and regulation that have been enacted over the years by democratic constitutional states. As in western democracies all governmental tasks have to be based on formal, administrative legislation - a requirement of the constitutional principle of legitimacy - the historical evolution of governmental *tasks* can be based on the structure of Bovens. Along with the growing body of states' and citizens' rights and obligations the number of governmental tasks expanded the past few centuries; western democracies evolved from small liberal to full-fledge welfare states.

¹⁶ Bovens, M and Loos, E (2002) The digital constitutional state: democracy and law in the information society, *Information Polity*, Vol. 7, No. 4, 2002, pp. 185-197.

In the following figure the layers of the house of values are depicted:

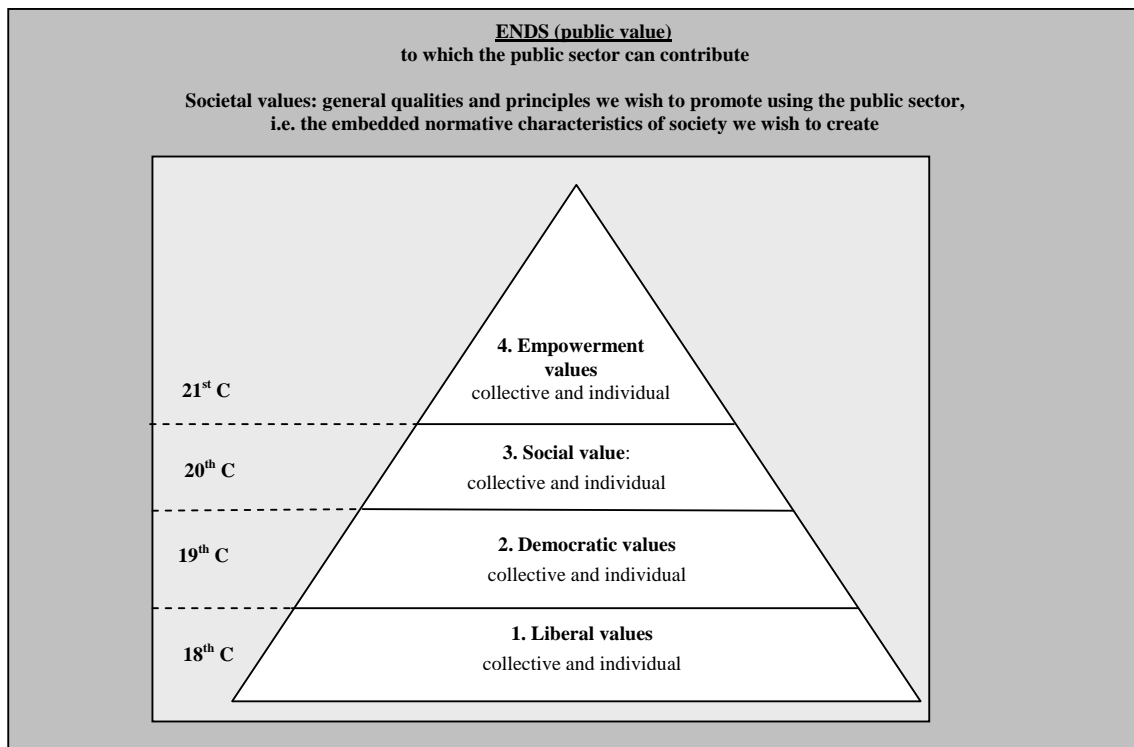


Figure 1: Taxonomy structure: the house of values

1. *Liberal values*: covering constitutional and subsidiarity structures; the legal framework: law, regulations and rules; law enforcement, defence and security; personal justice; and individual rights.
2. *Democratic values*: covering citizenship; democratic participation through representation; democratic participation through direct engagement; engaging private interests; and developing the plural society.
3. *Social values*: covering how needs for and responses to socio-economic support are determined; service design and production; service delivery; inclusion of all; environmental sustainability; place development; and quality of life.
4. *Empowerment values*: covering how citizens, communities, groups and interests in society can be empowered to further their own as well as collective benefits; extending subsidiarity and reciprocity; governance coherence and balance; transparency and openness; ethics and accountability; trust; empowering the public sector as an individual actor; empowering the private sector; personalising services for individual users; and empowering the individual service user.

The historical structure provided by Bovens is a well-elaborated but not sufficient model to reveal all relevant government tasks; also a distinction should be made between governmental tasks related to the *collective* and the *individual*. A governmental task may be the building and maintenance of public infrastructure, but may also encompass of the provision of an individual, disabled citizen with good housing conditions. The role of government thus is not only to create society's collective sphere but also to nurture and support the individual sphere, thereby also tackling issues of potential and actual conflict and trade-off between the two. It could be argued that the collective-individual dichotomy, and thereby the potential conflict, becomes increasingly important as European society attempts to develop 'empowerment' values in the 21st Century. This involves, for example, the re-shaping if not undermining of contemporary

politics and democratic structures because of the increasing recognition of what we term the ‘power gap’, and the need to go ‘beyond formal democracy’. ‘Empowerment’ implies, of course, giving individuals, communities and interest groups more power, choice and freedom in the context of increasing diversity and pluralism, so that retaining the balance with the collective interest could become even more difficult but also more critical if our societies are to remain stable and prosperous. According to Rifkin, the notion of the collective focuses largely on responsibility between individuals in society, whilst the individual focuses largely on the rights that each individual or individual group has. Rifkin also contends that “new technologies are so de-centralised and democratised but at the same time so globally connective that they foster both extreme individuation and extreme integration concurrently.”¹⁷ Hence, the distinction between collective and individual tasks is made in this study to be able to draw conclusions as regards the various effects technologies may have on collective and individual governmental tasks.

We have added the empowerment layer to house of values because the empowering capacity of technologies – e.g. self-organisation, users becoming producers – is likely to drive fundamental change of values underlying governmental tasks and activities and thus change existing paradigms in the public domain. This new empowerment layer will hence be introduced, explored and discussed in section 2.5. In the 21st Century the focus is increasingly on values which incorporate public and civil interests, space, culture and sanctuaries, i.e. outside the logic of the market and individual profit, and beyond most of the current roles of the formal public sector. The empowerment domain is thus seen more and more as wider (possibly much wider) than the public sector and government. It now also includes and actively promotes civil society, the active support of which we can now argue should be a main priority of government perhaps for the first time.

The governmental roles and tasks identified per layer of the house of values:

Table 1: Liberal governmental roles/tasks

'ENDS' Liberal values	'MEANS'	
	Roles	Tasks
Collective liberal values	Constitutional and subsidiarity structures	Constitutional arrangements
		Subsidiarity
	Legal framework: law, regulations and rules	Legal framework, law and rule-making
		Rule of law, legality and legal protection
		Developing different types of rules
	Law enforcement, defence and security	Law enforcement
Defence and security		
Individual liberal values	Personal justice	Justice and due process
		Redress
	Individual rights	Liberal rights
		Human rights

¹⁷ Rifkin, J (2004) “The European dream: how Europe’s vision of the future is quietly eclipsing the American dream”, Polity Press, Cambridge, UK, p. 365. See also Aigrain, P (2003) The individual and the collective in open information systems, an invited talk at the 16th BLED Electronic Commerce Conference, 9-11 June 2003: <http://www.debatpublic.net/Members/paigrain/texts/icoic.html>.

Table 2: Democratic governmental roles/tasks

'ENDS' Democratic values	'MEANS'	
	Roles	Tasks
Collective democratic values	Citizenship	Defining and informing citizenship
		Linking different types of citizenship
		Developing new citizenship concepts
	Democratic participation through representation	Suffrage, voting and elections
		The role of the representative and the primacy of politics
		The role of the citizen elector
		New forms of representative democracy
	Democratic participation through direct engagement	The democracy value chain
		Dialogue and discourse
		Opinion polling and public opinion assessment
Individual democratic values	Engaging private interests	Supporting interest groups and issue-based politics
		Private interest contributions to rule-making
	Developing the plural society	Plurality of individuals
		Plurality of individual groups
		Plurality of individual beliefs and values
		Plurality of places and territories
		Constructing and maintaining a landscape of plurality

Table 3: Social governmental roles/tasks

'ENDS'	'MEANS'	
	Social values	
	Roles	Tasks
Collective social values	Determining needs and responses	Balancing demands and needs
		Business case
		Networking, coordination and jurisdiction
		Joined-up public sector for joined-up and shared services
	Service design and production	Value-chains
		Developing content
		Public, private and civil sector partnerships
	Service delivery	Delivery strategy
		Channel strategy
		Initiation and control of public sector services
	Inclusion of all	Identifying disadvantaged socio-economic groups
		Coordinated public intervention at different levels
		Contextualising inclusion
		Design for all
		Special assistance
		Universal access and skills
		Including disadvantaged businesses
	Including civil servants	
	Environmental sustainability	Legal and regulatory frameworks
		Providing data and information
		Shifting perceptions and awareness
	Collective infrastructures	Electronic infrastructures
		Transport and mobility infrastructures
		Energy and utility infrastructures
Individual social values	Place development	Place-specific public policies, infrastructures and services
		Place competition and innovation
		Developing and exploiting resources and assets
		Developing and exploiting clusters and networks
		Creating jobs and income
		Fighting place disadvantage
	Quality of life and living conditions	Improving health and care services
		Providing educational and training services
		Providing leisure, recreational, cultural and environmental amenities
		Social security, pensions and reducing poverty
		Public safety and tranquillity, and reducing crime
		Consumer protection
		Creating place identity and belonging

Table 4: Empowerment related governmental roles/tasks

'ENDS' Empowerment values	'MEANS'	
	Roles	Tasks
Collective empowerment values	Empowering communities	Supporting social enterprise and social entrepreneurs
		Supporting knowledge generation in learning communities
		Providing local area agreements between the public and community sectors
	Extending subsidiarity and reciprocity	Developing 'double devolution' and closing the 'power gap'
		Providing social justice and advocacy
		Promoting the independence, accountability and viability of communities
	Ensuring governance coherence and balance	Ensuring subsidiarity and reciprocity beyond formal democracy
		Determining the extent of centralisation to achieve minimum standards, simplicity and efficiency
		Determining the extent of de-centralisation to achieve pro-activeness, subsidiarity and diversity
		Promoting the networked public sector
		Finding the 'sweet-spot' in a complex adaptive system
		Promoting the nexus-based public sector
		Balancing simplicity with complexity
	Ensuring transparency and openness	Balancing stability with change
		Balancing rights with responsibilities
		Generating public information and making it freely available
		Promoting total transparency and openness
	Ensuring ethics and accountability	Ensuring pro-active decision-making
		Protecting legitimate interests from transparency and openness
		Promoting the public service ethic
		Promoting accountability
		Developing codes and charters
		Ensuring universal service
Promoting trust	Promoting the government as arbiter/referee	
	Finding new forms of accountability when government is just one player amongst many	
	Promoting confidence	
Individual empowerment values	Empowering the public sector as an individual actor	Providing mediation and reciprocity
		Coping with risk and scale
		Improving public sector efficiency and effectiveness
		Providing leadership
		Promoting flexible working
		Promoting flexible skills
		Promoting process innovation in the public sector
		Promoting product and service innovation in the public sector
		Promoting organisational innovation in the public sector
		Promoting knowledge management and organisational learning
		Supporting decision- and policy-making
		Promoting the re-deployment of resources in the public sector
		Finding the appropriate role for market mechanisms and choice in the public sector
Promoting user-driven innovation in the public sector		

'ENDS' Empowerment values	'MEANS'	
	Roles	Tasks
Empowering the private sector		Supporting the private sector through outsourcing and partnerships
		Supporting growth and competitiveness in the private sector
Personalising services for individual users		Ensuring user segmentation
		Ensuring awareness and responsivity to changing user needs
		Personalising services through close government-citizen relations
		Personalising services through pro-active delivery
		Personalising services through intermediation
		Developing intermediary business models
		Ensuring the management and accountability of intermediaries
Empowering the individual service user		Providing for individual self-service
		Determining the role of pro-sumerism and dis-intermediation
		Providing individualised security and identity

The next step of the research consisted of the selection of technologies that may provoke transformation and an exploration of the effects of these technologies on current governmental tasks.

2.3 Transformative technologies

The aim of research task 2 was to identify promising technologies that might contribute to the enhancement of (future) governmental tasks and activities. Obviously, what can be seen as *promising* depends on what one wants to accomplish. In the case of government the aim could be described as ‘creating public value’, and related to this: to create public value in an efficient and effective way. Public value, in turn, depends on what members of a society consider valuable. In most western democracies equality, openness, welfare and stability are generally seen as ‘public values’. However, the context in which government has to ensure these values has changed. In the past century the industrial society has transformed into an information society. This transformation has also had a substantial impact on governments. Traditional government, which was originally built on principles of the industrial society, is less and less able to face the complex demands and problems of the information society.¹⁸ The stove-pipe architecture of public administration, but also the changing power balance in the political arena, hamper governments in fulfilling their tasks and in gaining citizens’ trust.¹⁹ In a changing society, promising technologies for governments are thus necessarily *transformative technologies*; technologies which enable the governmental scenery to change in such a way that societies are more able to cope with emerging societal challenges. Transformative technologies may lead to a significant change in the existing establishment; open the gate to new players, lead to new institutional forms, change the value chain and relationship between actors and bring in new solutions to the complex problems that current governments are facing.²⁰

¹⁸ See for example Bovens, M., *The digital constitutional state: Democracy and law in the information society*, Amsterdam University Press, 2003, Fountain, J.E., *Building the Virtual State, Information Technology and Institutional Change*, 2001 and Goldsmith, S. and D. Eggers, *Governing by network. The new shape of the public sector*, Brookings Institution Press, 2004.

¹⁹ Fukuyama, F., *The Great Disruption, Human Nature and the Reconstruction of Social Order*, Touchstone, New York, 1999.

²⁰ Within the FISTERA project disruptive technologies were defined as: *technological evolutions that lead to a disruption; this is a significant change in the scenario involving actors and the rules of the game* (WP2 Key European Technology Trajectories, First Report on Key European Technology Trajectories, 30 September 2003).

The next question to be answered is: which technologies have this potential? One way of looking at this is to say that not technology in itself is transformative, but the deployment of technology.²¹ For example, the development of the Global Positioning System (GPS) did not lead to radical change in itself, but *the widespread use* of GPS - for navigation purposes for example - led to a fundamental shift in involved actors, new markets and solutions. When technology is fully exploited throughout the society, the effects are likely to be much larger and longer lasting. As Carlotta Perez (2003) has argued: *The full fruits of the technological revolutions that occur about every half century are only widely reaped with a time-lag. Two or three decades of turbulent adaptation and assimilation elapse, from the moment when the set of new technologies, products, industries and infrastructures make their first impact to the beginning of a 'golden age' or 'era of good feeling' based on them*".²²

On the other hand, not *all* technologies have a transformative impact when they are widely used; they must also have an intrinsic potential to become transformative. In literature the notion transformative - as understood in this research - is often called "disruptive", for instance by Clayton Christensen.²³ According to Christensen disruptive technologies are novel technologies that bring completely new approaches and products to the market place. Ironically, they are often also 'innovations that result in worse product performance, at least in the near term'. Yet, disruptive technologies always improve in performance and eventually make obsolete - or at the very least overshadow - the previous conventional technology. In addition, and most importantly, they lead to some *new applications* to which the current conventional technologies did not have an inherent capacity to contribute. Examples of disruptive technologies and conventional technologies that were overshadowed are: transistors versus vacuum tubes and (in read-write memory) flash memory versus random access memory disks. Arguably, human ability to travel to the moon and safely back was enabled by the development of the transistor and would have been significantly more complex had vacuum tubes been the only electronic technology available.²⁴

Concluding, characteristic for a transformation is:²⁵

- (a) technologies that bring new approaches to the market place, and
- (b) the large scale deployment of those technologies.

Transformation can be enabled by the deployment of *existing* and *new* disruptive technologies. An example of the first is gaming technology and nanotechnology and biotechnology are examples of the latter.²⁶ In the governmental realm, a lot of existing technologies that have transformative potential are not fully deployed yet.²⁷ That is why experts expect that - the coming 10 to 15 years - transformation will mainly result from a process of adaptation and assimilation of existing technologies. New combinations of existing technology and disciplines may impact the disciplines. For example, the use of gaming technology in the education

²¹ To put this in perspective, with "transformative" we do not mean that the deployment of technology in itself *determines* transformation but has the potential to - together with other factors such as skills and prevailing values - stimulate or enable transformation.

²² Carlota Perez, *Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages*, New York: Edward Elgar, 2003.

²³ [Christensen](#), C.M., *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*, Harvard Business School Press, Boston, Massachusetts, 1997.

²⁴ [Riordan](#), M., Hoddeson, L., *Crystal Fire: The Invention of the Transistor and the Birth of the Information Age*, W.W. Norton & Company, New York, 1997.

²⁵ Again we want to stress here that transformation is not only determined by technological, but also other cultural, sociological, institutional, legal factors.

²⁶ Arensman, R, Emerging Technologies, Nano-imprint makes its mark, in: *Electronic Business*, Vol, 31, page. 42-47, 2005. And: Kaslow, D.C., A potential disruptive technology in vaccine development gene-based vaccines and their application to infectious diseases, Volume 98, Issue 10, October 2004, Pages 593-601. Gerde, V.W. and R. Mahto, Disruptive technology and interdependence: The relationships of BioMEMS technology and pharmaceutical firms, Volume 15, Issue 1, February 2004, Pages 73-89. Kiili, K., *Digital game-based learning: Towards an experiential gaming model*, *The Internet and Higher Education*, Volume 8, Issue 1, 1st Quarter 2005, Pages 13-24.

²⁷ See for example Evans, D., and Yen, D.V., *E-Government: Evolving relationship of citizens and government, domestic, and international development*, *Government Information Quarterly*, In Press, Corrected Proof, 14 February 2006 and Torres, L., Pina, V. and Acerete B., *E-government developments on delivering public services among EU cities*, *Government Information Quarterly*, Volume 22, Issue 2, 2005, Pages 217-238.

sector may impact current learning paradigms.²⁸ Therefore, in our research we will primarily focus on the deployment of existing technologies that have the potential to transform.

Building on the argumentation as described above, the criteria to identify technologies are:

1. the technology is developed and applied by governments or in the private sector; within the private sector application may be more widespread than in the public sector given the potentially high number of involved individuals;
2. the ability of the technology to bring new approaches to the market place and;
3. the potential to be deployed on a large scale

From the long-list of almost hundred technologies (see appendix) we selected – based on the criteria as described above – the following 18 technologies with a transformative potential:

²⁸ Kiili, K., *Digital game-based learning: Towards an experiential gaming model*, *The Internet and Higher Education*, Volume 8, Issue 1, 1st Quarter 2005, Pages 13-24.

Table 5: Promising technologies

Technology	Summary of argumentation
PDA	<ol style="list-style-type: none"> 1. Existing technology that is limited applied by governments (mainly in the policing and healthcare sectors). 2. The technology enhances the communication, organisation abilities and information position of individuals and groups of individuals and could therefore stimulate new (forms of) organisation and change the information power balance. 3. The technology is mature and has the potential to be deployed on a larger scale by governments.
Wearable computers	<ol style="list-style-type: none"> 1. Existing technology that is limited applied by governments (mainly in the defence sector). 2. Enhances the communication, organisation abilities and information position of individuals and groups of individuals and could therefore stimulate new (forms of) organisation and change the information power balance. 3. However still relatively immature, the technology has the potential to be further developed the coming 15 years and to be deployed on a larger scale by governments.
MP3-Players	<ol style="list-style-type: none"> 1. Existing technology that is limited applied by governments (mainly Podcasting by politicians). 2. Enhances the information position of individuals and could therefore stimulate new information power balances. 3. The technology is mature and has the potential to be deployed on a larger scale by governments.
Mobile phones	<ol style="list-style-type: none"> 1. Existing technology of which some functionalities are fully applied (communication among governmental practitioners) but of which some functionalities are not fully applied (communication between government and citizens). 2. Enhances the communication, organisation abilities and information position of individuals and groups of individuals and could therefore stimulate new (forms of) organisation and change the information power balance. 3. The technology is mature and has the potential to be deployed on a larger scale by governments.
Robotics	<ol style="list-style-type: none"> 1. Existing technology that predominantly is applied in the entertainment and automobile industry (and by some governments for rescue purposes). 2. Could stimulate a shift in tasks, roles and processes. Robots may take over tasks that up to now have been carried out by people, but may also support individuals to carry out tasks that hitherto have been carried out by professionals. 3. The technology is maturing, however has the potential to be deployed on a larger scale by governments (for example in the healthcare sector).
Intelligent agents	<ol style="list-style-type: none"> 1. Existing technology that predominantly is applied in the defence industry. 2. Could stimulate a shift in tasks, roles and processes. Robots may take over tasks that up to now have been carried out by people, but may also support individuals to carry out tasks that hitherto have been carried out by professionals. 3. The technology is maturing, however has the potential to be deployed on a larger scale by governments (for example in the policing, social security and healthcare sector).
Sensor technology	<ol style="list-style-type: none"> 1. Existing technology that is increasingly applied by governments for surveillance purposes. 2. Could stimulate a shift in tasks, roles and processes. Sensors may take over tasks that up to now have been carried out by people, but may also support individuals to carry out tasks that hitherto have been carried out by professionals. 3. The technology is relatively mature and has the potential to be deployed on a larger scale by governments.
Language processing	<ol style="list-style-type: none"> 1. Existing technology that is maturing and that is predominantly used in the telecom industry 2. Enhances new communication between individuals and computers and therefore new products, services and processes. 3. The technology is maturing, however has the potential to be deployed on a larger scale by governments (for example in the policing, social security and healthcare sector).
Serious games	<ol style="list-style-type: none"> 1. Existing technology that is mainly used for entertainment purposes. 2. Enables new approaches and shifts in existing paradigms (for example learning paradigms). 3. The technology is mature and has the potential to be deployed on a larger scale by governments.
RFID	<ol style="list-style-type: none"> 1. Existing technology that is mainly deployed by the retail industry. 2. Enhances transparency (tracking and tracing of people, animals and objects) and therefore could result in changing power balances. 3. The technology is mature and has the potential to be deployed on a larger scale by governments (for example for tracking and tracing purposes).
Biometrics	<ol style="list-style-type: none"> 1. Existing technology that is increasingly deployed by governments for identification purposes. 2. Enhances transparency (tracking and tracing of people, animals and objects) and therefore could result in changing power balances. 3. The technology is mature/maturing and has the potential to be deployed on a larger scale by governments.

WiFi	<ol style="list-style-type: none"> Existing technology that is highly deployed by some EU governments. Strengthens mobility, the access to information and services and therefore could result in new products, new market players and new processes. The technology is mature and has the potential to be deployed on a larger scale by EU countries that are lagging behind in the deployment of WiFi.
WiMax	<ol style="list-style-type: none"> Existing technology that mainly is deployed in trials. Strengthens mobility, the access to information and services and therefore could result in new products, new market players and new processes. The technology is maturing and has the potential to be deployed on a larger scale.
Broadband	<ol style="list-style-type: none"> Existing technology that is highly deployed by some EU governments. Strengthens mobility, the access to information and services and therefore could result in new products, new market players and new processes. The technology is mature and has the potential to be deployed on a larger scale by EU governments that are lagging behind in the deployment of Broadband.
Web technology	<ol style="list-style-type: none"> Existing technology of which some functionalities are highly deployed by governments (information), but of which some functionalities (communication and transaction) are not fully deployed yet. Enforces the communication and creation ability of individuals and groups of individuals and therefore could stimulate new forms or organisations, new processes and changes in power balances. The technology is mature and has the potential to be deployed in a broader way (more functionalities).
Social software	<ol style="list-style-type: none"> Existing technology that is mainly deployed in the private sphere (mySpace, Bebo, etc.) Enforces the communication and creation ability of individuals and groups of individuals and therefore could stimulate new forms or organisations, new processes and changes in power balances. The technology is mature and has the potential to be deployed on a larger scale by governments
GRID	<ol style="list-style-type: none"> Existing technology that is predominantly used in the research sector. Enables new forms of usage of computer resources and therefore could lead to new forms of organisation, processes and new products. The technology is mature/maturing and has the potential to be deployed on a larger scale by governments.
Semantic technologies	<ol style="list-style-type: none"> Existing technology that is mainly deployed in the private sector. Enhances the information position of individuals and organisations and therefore could lead to new processes, new organisations and new power balances. The technology is maturing and has the potential to be deployed on a larger scale by governments.

The next research step entailed the confrontation of these identified transformative technologies with the tasks and activities inventoried in research task 1. The aim of this confrontation was to reveal future governmental transformations that are supported or driven by ICTs.

2.4 Hot spots of government innovation driven by ICT

Having identified the governmental roles and tasks and the potentially transformative technologies, we are now in the position to link the two together and identify to which governmental transformations they may give rise to. The premise underlying this research objective is that ICT can be a driving force for change within governments. The main question for this section is thus: *which governmental transformations will be driven by which ICTs?*

In order to identify ICTs that will stimulate governments to transform, a conceptual framework has been developed, capturing the essential dimensions of transformative technologies (see also section 2.3). A transformative technology is a technology which:

- is broadly deployed,
- has an intrinsic transformative potential,
- has reached a certain stage of maturity and
- has the potential to stimulate disruption.

Furthermore transformation should take place *within the coming 15 years* and *within EU member states*. Therefore we defined the following four criteria for the identification of hot spots for ICT-driven changes in government:

- (a) a combination of a mature technology with a governmental role
- (b) that leads to governmental transformation
- (c) within the majority of EU member states, and
- (d) within the timeframe of 15 years.

Deployment and maturity of technologies were studied by gathering in-depth data on usage and usage barriers, market perspectives, application range and technological maturity (see also Appendix 1). The transformative and disruptive potential has been understood as a *complete change* of someone or something.²⁹ An example is the emergence of new power balances, the adoption of new paradigms, the engagement of new stakeholders or institutional changes.³⁰ The *significance* of a change determines whether a change is transformative or not; changes have to be large enough, general enough and durable enough to considerably affect the character of (a setting of) organisations and to be called transformative.

The four layers of governmental roles and responsibilities we identified in task 1 have been used to assess the transformative impact of the technology, while justifying our assessment with literature, argumentation or examples. In table 6 we have positioned these hot spots in a matrix that presents the identified roles of governments (task 1) vis-à-vis the eighteen identified technological transformations (task 2).

²⁹ See for example Longman Dictionary or Webster Dictionary <http://www.m-w.com/>.

³⁰ See for example Pollitt, Ch. And G. Bouckaert, *Public Management Reform, A Comparative Analysis*, Oxford University Press, 2000, Altshuler, A.A. And R.D. Behn, *Innovation in American Government. Challenges, Opportunities, Dilemmas*, Brookings Institution Press, Washington, 1997, Goldsmith, S. and D. Eggers, *Governing by network. The new shape of the public sector*, Brookings Institution Press, 2004.

Table 6: Overview of expected transformations per governmental role, leading to identification of hot spots

Nr.	Governmental role	Expected transformation driven by transformative technologies
Collective liberal values		
1	Constitutional and subsidiarity structures	<p>Majority of technologies are not expected - within a timeframe of 15 years – to substantially change strong traditions of democratic constitutional states. The principle of trias politica or the actual separation of the executive, legislature and judiciary powers remain unchallenged.³¹</p> <p>As regards subsidiarity, mature technologies that have a decentralising character and that are expected to have an exponential deployment - such as social and creative software - may affect the subsidiarity principle (the principle which states that matters ought to be handled by the lowest or smallest competent authority).</p>
2	Transparency and openness	<p>The majority of mature technologies (e.g. broadband, social software, web technology, PDAs) stimulate transparency which, in turn, can lead to power shifts in the relation between governments and citizens. This is identified as a hot spot: “Transparency provoking change”.</p> <p>Various examples of increased transparency in the public domain can be given such as information about the quality of hospital care, and even on the adoption process of electronic patient records.³² http://www.medcom1-4.dk/. According to physicians this transparency is an important incentive for hospitals to start digitalising their patient data</p>
3	Ethics and accountability	<p>Mature technologies are likely to stimulate transformation of the conception of accountability in EU member states in the coming 15 years. This is identified as a hot spot: “Changing accountability paradigms”.</p> <p>Mature technologies (e.g. web technology, knowledge management systems and social software) put serious questions to the preservation of the well-known Weberian principles for a bureaucracy. They have effects on jurisdictional boundaries, office hierarchy and accountability and responsibility. The line between actions taken by governments and actions taken by citizens or stakeholders becomes thin and therefore a reconsideration of the conception of accountability and responsibility is necessary. As governance structures become more horizontal and networked, there will be an increasing need for more horizontal systems for accountability.</p>
4	Legal frameworks: law regulation and rules	<p>It is not expected that the law-making process, which is based on innate democratic and good-governance values, will be changed by ICT the coming 15 years. The process may become more efficient, effective or more accurate, but the character of the process, the underlying values, the division of power and the institutional structures will not significantly change.</p> <p>Furthermore, technology in general may lead to new or changed legislation. Most governments of EU countries extended the notion of “information” in existing legislation in the sense that not only written but also digital information is captured by the law.³³ Several countries, and also the European Union, have adopted new regulation regarding the Internet, Patent Law, Copyright, Digital Civil Rights and Privacy.³⁴</p>
5	Law enforcement, defence and security	<p>Most of the mature (and also maturing and immature) technologies will - in one way or the other – affect the law enforcement, defence and security role of government. The accumulation of all the expected changes is likely to transform in the coming 15 years and therefore is considered to be a hot spot: “New forms of policing and law enforcement.”</p> <p>Social software, wearables and creative soft- and hardware are likely to stimulate power</p>

³¹ The advocacy group <http://www.geenonschuldigenvast.nl/> used social software and creative soft- and hardware to gather evidence against a certain court ruling, which led to a reevaluation of the case by an independent commission of judges.

³² See <http://www.ziekenhuizentransparant.nl/>, <http://www.kindenziekenhuis.nl/> and <http://www.medcom1-4.dk/>.

³³ See for example: Hof, S. van der, Prins, J.E.J., Leenknecht, G., Brandsen, T., & Vries, M. de (2004). *Over wetten en praktische bezwaren, Een evaluatie en toekomstvisie op de Wet openbaarheid van bestuur*. Tilburg: Universiteit van Tilburg.

³⁴ <http://www.edri.org/>

		shifts, or at least to involve new players, in the policing task of governments. There are several evidence based examples of citizens taking over policing tasks, such as the Street Champions Project in the United Kingdom. ³⁵ Furthermore, mature technologies, such as PDAs, Sensors, RFID, Semantic Web strongly widen and enforce the possibilities for authorities in carrying out policing tasks. Some of these technologies enable more efficiency while carrying out the same task, while other technologies also stimulate cross-organisational cooperation, decentralisation or centralisation. ³⁶
Individual liberal rules		
6	Personal justice	Most of the underlying values of personal justice - an open transparent and fair application of the rule of law (in such a way that the law is visibly seen to be upheld in relation to individual cases and personal liberty) and redress (independent ruling on trivial cases) - are not likely to change the coming 15 years. However, social software may empower new actors to play a role in ensuring personal justice. Together with the expected change in the individual rights (described in the next section) that are strongly related with personal justice, this will stimulate substantial transformation. This trend is therefore identified as a hot spot .
7	Individual rights - privacy	It is not very likely that ICT will change the majority of existing individual rights within democratic constitutional states such as the right to be treated equally, the freedom of speech, the right to vote, the right to own property and the right to full legal and due process rights and to habeas corpus. ³⁷ However, there is one important individual right or value that is slowly but significantly changing: the right to privacy . RFID, Biometrics but also social and creative software, are making private life increasingly transparent. The protection of privacy of citizens will in the future become more difficult, while on the other hand private data will be increasingly available for governments, private companies and other citizens. The growing amount of available data and the rising possibilities of governments to combine data make citizens more vulnerable to improper use, change power balances and therefore is identified as a hot spot : "Changing the privacy paradigm".
Collective democratic values		
8	Citizenship	There is no convincing evidence that mature technologies are likely to transform the concept of citizenship the coming 15 years in the EU member states. Citizenship - the legal right of belonging to a particular country and therefore granting certain rights and having certain responsibilities – may be (and in some countries has already) expanded to the virtual world, yet the underlying democratic and law enforcement values remain unchanged.

³⁵ <http://www.streetchampions.org.uk/test/>. The Birmingham City Council empowers citizens to supervising their neighbourhood by training and equipping them with electronic devices. The involvement of citizens in policing tasks not only stimulates far-reaching forms of decentralisation but also leads to new stakeholders, new power balances and new discourses on authenticity and reliability of items of evidence.

³⁶ <http://okfirst.ocs.ou.edu/> The US social software called OK-FIRST is exploited in order to empower local emergency managers to make proactive decisions by providing them with real-time, integrated information

³⁷ New technologies have in some countries resulted in additional or extended Civil Rights, such as the right to access certain personal digital information, the freedom of expression through digital devices, freedom of information, freedom from discrimination on governmental websites. However, most of this new legislation is in line with the traditional Human Right values and therefore not transformative. <http://www.edri.org>.

9/10	Democratic participation through representation and engagement	<p>There is no indisputable answer to the question if mature technologies will fundamentally change the governmental role of “democratic participation through representation” the coming 15 years in EU countries. Wearables, such as PDAs, mobile phones (and in the future electronic textiles and gesture pendants), may provide citizens with highly personalised political information or services (anytime and anywhere), but these technologies do not necessarily drive transformation of participation through representation. Power balances and institutional structures stay intact.</p> <p>Nevertheless, in a few cases an increase in participation can be showed. Most of these examples are eVoting initiatives.³⁸ Most of these cases show that, the political issues the group promotes or campaigns against are very concrete, focused and may have a direct impact on the involved individuals (Giddens labelled these forms of commitment and engagement ‘life politics’,³⁹). This trend of emerging countervailing powers is expected to continue and grow the coming 15 years in EU member states and therefore is identified as a hot spot: “New countervailing powers”.</p>
Individual democratic values		
11	Engaging private interest	Governments support interest groups and issue-based politics and private interest contributions to-rule making. According to Bimber, ⁴⁰ a model of ‘accelerated pluralism’ is at work in which the Internet contributes to the on-going fragmentation of the present system of interest-based politics and a shift toward a more fluid, single-issue group politics with less institutional coherence. Because this governmental role of engaging private interest is strongly related to the democratic participation role, we identified this as one hot spot (see previous paragraph).
12	Developing the plural society	The governmental role of developing the plural society encompasses tasks of ensuring plurality of individuals, plurality of individual groups, plurality of individual beliefs, values and plurality of places and territories, constructing and maintaining a landscape of plurality but also the deliberation between diverse groups. Mature technologies such as web technology, PDAs, social and creative software will transform the societal landscape the coming decades: they drive fragmentation – the bonding among homogeneous groups – but they also serve as bridges between heterogeneous groups ⁴¹ . It is however questionable if these societal transformations also stimulate governmental transformation.
Collective social values		
13/14/15	Determining needs and responses, service design, production and delivery	<p>Various mature technologies are likely to drive transformation of service delivery roles in EU member states the coming 15 years in two ways: changing institutional structures and power shifts. This is identified as a hot spot: “Networked government”.</p> <p>To start with the institutional change: the horizontal, decentralized, location and time independent character of technologies (such as WiFi, PDAs, social and creative soft- and hardware) stimulate the decentralisation of operations, centralisation of standards and trans-organisational cooperation, and leads to inter-organisational structures (networked government). Furthermore, mature technologies - such as social software and creative soft- and hardware - drive a shift in existing power balances.⁴²</p>
16	Inclusion of all	The recently published SOCQUIT study of the European Commission concludes that some mature technologies (such as web technology) may widen the gap between the “haves” and the “have-nots” in EU countries in the coming decades. ⁴³ Other reports

³⁸ See for instance European Commission, 2005, “World’s largest Internet election successfully conducted in the Netherlands”, eGovernment News, 28 March 2005, IDABC eGovernment Observatory: <http://europa.eu.int/idabc/egov>

³⁹ Giddens, A. 1991, *Modernity and Self- Identity. self and Society in the Late Modern Age*. Cambridge: Polity Press

⁴⁰ Bimber, B (1998) The Internet and Political Transformation: Populism, Community, and Accelerated Pluralism, *Polity*, Fall 1998 issue, Vol. XXXI, Number 1, pp. 133-160.

⁴¹ See for example Frissen, V., *Civil society in the digital world: challenges for politics and government*, Report for the Dutch Ministry of Interior Affairs, Den Haag: Ministry of the Interior.

⁴² See for instance www.pledgebank.com, initiated by the Young-think thank in the UK in June 2005, which supports citizens who start so-called “citizen initiatives”.

⁴³ SOCQUIT, Deliverable 6, Report of literature and data review, including conceptual framework and implications for IST, Editor: Rich Ling, Telenor

		point to a growing “digital divide” as well. ⁴⁴ It is however not likely that the relation between government and stakeholders or the institutional structure of governments in itself will change.
17/18	Environmental sustainability and collective infrastructure	<p>A combination of globalisation of environmental and collective infrastructure questions and the enabling function of technologies may – in the coming 15 years - stimulate trans-national cooperation to ensure environmental sustainability and collective infrastructures. This is identified – together with the following role - as a hot spot: “Intelligent and pro-active government”.</p> <p>The need for cross-border eCooperation because of the borderless nature of pollution and environmental problems is increasing, just as the need to provide suitable data and information to a large number of stakeholders.⁴⁵ Examples are the environmental management of the Danube river basin, and the TEMSIS initiative straddling the Saar-Moselle regions of France and Germany.</p>
Individual social values		
19/20	Place development and quality of life and living conditions	<p>Technologies impact the “place development” and “quality of life and living conditions” roles of government in several ways. Together with the previous role they form a hot spot (see hot spot previous role).</p> <p>First of all, technologies such as knowledge management systems, social software and wearables stimulate collaboration between various governmental agencies and thus may lead to institutional change. Web technology and broadband can also be used to harmonise social security systems, or at least make them interoperable.⁴⁶</p> <p>Less transformative technologies as Broadband, lap-tops and WiFi can contribute to a more efficient, effective or accurate carrying out of governmental tasks. These technologies can stimulate sustainable transport by providing new learning and working environments, and simulations of transport networks in the early phases of policy making.</p>

In a more synthesized form this has led to the identification of seven **clusters** of future ICT-driven governmental transformations, which we have labelled ‘hot spots’ (see table 7).

⁴⁴ See for example European Commission, *eInclusion revisited: the local dimension of the information society*, DG Employment, SEC, 2006

⁴⁵ Beep project (2003), “Good ePractice”, with over 300 cases on eGovernment, Work and Skills, the Digital SME, Social Inclusion, and Regional Development: <http://www.beepknowledgesystem.org>; PRISMA (2003), Good Practice in eGovernment, including eAdministration, eHealth, eServices for all – treating all users equally, eEnvironment, eTransport, eTourism, eGovernment Innovation in the Knowledge Economy, eGovernment in selected EU Accession States, eDemocracy, and eStrategies for Government: <http://www.prisma-eu.org>.

⁴⁶ European Commission official interview, July 2005, undertaken in the context of Millard (2005).

Table 7: Overview of relations between technologies and governmental roles (see table 4 and 5 for fully readable list of technologies and roles)

Technology	PDA	Wearable	MP3-Play	Mobile P	Robots	Intelligen	Sensors	Language	Games	RFID	Biometric	Wi-Fi	WIMAX	Broadban	Web tech	Social sof	GRID	Semantic
<i>Collective liberal values</i>																		
1 Constitutional and subsidiari	N	N	N	N	N	N, probabl	N	N	N	N	N	N	N	N	N/y, differs	N/y, differs	N	N
2 Transparency and openness	Y	Y	Y	Transparency provoking change				Y	Y, could be	Changing accountability paradigm				Y	Y	N	Y	
3 Ethics and accountability	Y	Y	Y	Y	Y	Y	Y	Y	Y, ethics in	N/y	Y	N	N	N	Y	Y	N	N
4 Legal frameworks: law, regul	N	N	N	N	N	y	May be	N	N	N/y	N/y	N	N	N	N/y, differs	N/y, differs	N	N
5 Law enforcement, defence a	y	y	y	y	Y, security	Y	y	New forms of policing and law enforcement				y	y	Y	Y	y	Y	
<i>Individual liberal values</i>																		
6 Personal justice	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N
7 Individual rights	N	N	N	N	N	N	N	N	N	y	Y	Changing privacy paradigm				y	y	N
<i>Collective democratic values</i>																		
8 Citizenship	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N
9 Democratic participation thou	y	y	y	y	N	N	N	y	N	N	N	N	N	N	Y	Y	N	N
10 Democratic participation thro	y	y	y	y	N	N	N	y	y	N	N	N	N	N	New countervailing powers			N
<i>Individual democratic values</i>																		
11 Engaging prive interest	y	y	y	y	N	N	N	y	N	N	N	N	N	N	Y	Y	N	N
12 Developing the plural society	N	N	N	N	N	N	N	y	Y, game cd	N	N	N	N	N	y	y	N	Y
<i>Collective social values</i>																		
13 Determining needs and resp	y	y	y	y	y	y	N	y	y	y	y	N	N	N	Y	Y	Y	Y
14 Services design and product	y	y	y	y	y	y	y	y	y	Networked government				Y	y	Y	Y	Y
15 Service delivery	Y	Y	Y	Y	y	y	Y	y	N	y	y	y	Y	y	Y	Y	Y	Y
16 Inclusion of all	y	y	y	y	N	N	N	y	y	N	N	y	y	y	y	y	N	y
17 Environmental sustainability	y	y	y	y	y	N	y	N	N	y	y	N	N	N	N	N	y	N
18 Collective infrastructures	y	y	y	Ingelligent and responsive government				y	N	N	y	y	y	y	N	N	y	N
<i>Individual social values</i>																		
19 Place development	y	y	y	y	y	N	y	N	y	N	N	N	N	N	y	y	N	N
20 Quality of life and living cond	y	y	y	y	y	y	y	y	N	N	N	y	y	y	y	y	N	N

Legend: Green, yellow and orange indicate maturity of technology (green being immature; yellow maturing and orange mature). “Y” indicates transformation (e.g. power shifts, institutional change, new paradigms); “y” means stimulate of change (products or processes). “N” means no change or transformation. Indicated areas label the seven hot spots that have been identified in the study.

The seven clusters or hot spots that are sketched in table 7 are:

1. Transparency provoking change
2. Changing accountability paradigms
3. New forms of policing and law enforcement
4. Changing the privacy paradigm
5. New countervailing powers
6. Networked government
7. Intelligent and pro-active government

In the next sections these hot spots will be described in more detail.

2.4.1 *Transparency provoking change*

ICTs are generally supposed to stimulate transparency. Government transparency does not only capture the government issues (such as healthcare and social security), but also the procedures (e.g. what steps to take to obtain a certain governmental service) and the existence of governmental policy, legislation, services etcetera. The majority of the selected technologies – whether broadband, WiFi, WiMAX, social software, web technology, workflow, systems, knowledge management systems, PDAs or mobile phones – may contribute to increased transparency of government. *Increased transparency*, in turn, may have several important impacts which could range from improved public accountability and democratic legitimation to a *power shift* in the relation between the state and its citizens. The ways in which these new technologies influence transparency are manifold:

- (a) **PDAs and mobile phones**, which face a pervasive and still increasing popularity, provide for ubiquitous access to information resources,
- (b) **Web technology, workflow and knowledge management systems** stimulate the creation and dissemination of digital information,
- (d) Technologies such as **intelligent agents and semantic web** support access to highly personalised information, and
- (c) Infrastructural technologies such as **broadband, WiFi and WiMAX** support high speed and large bandwidth data exchange.

Present-day situation

Most EU Member States have adopted transparency and freedom of information acts or programmes that aim to enlarge the openness and availability to the public of governmental information (information on services, procedures, budgets, financial statements, laws, rules, decisions, performance, etc.).⁴⁷ In each Member State freedom of information is organised in accordance with its national administrative laws and practices. Consequently, there are substantial differences between the actual levels of transparency of government information in EU Member States. This may be the extent to which governments make information available and the quality of the responses. Although several reports give insight into the legal status quo of electronic accessibility of governmental information, there are almost no studies that reveal the *actual deployment* of ICTs by EU countries *to enforce transparency*. A report by the eGovernment 2020 project, which gives an overview of strategic eGovernment topics per EU country, indicates that transparency enforced by ICTs is not high on the agenda of EU countries.⁴⁸

⁴⁷ See, e.g., Raxed, K., 2001, eDemocracy, Swedish Agency for Public Management, Sweden, 5 March 2001.

⁴⁸ The top 5 strategic eGovernment topics: Security and trust, eLearning, Co-operation between public and private sector, Added value service generating and delivery, Understanding user needs, user-centric delivery. eGovRTD2020, *Roadmapping eGovernment RTD 2020: Visions and Research Measures towards European Citizenship and Innovative Government*, Deliverable D1.1.: State of play, May 2006, p.72.

Future transformation in government

On the basis of empirical evidence, the following transformative effects can be discerned.

- Transparency may stimulate a *change in the power balance* between governments and citizens. An example is the website <http://www.ziekenhuizen transparant.nl/> which provides citizens with information on the performances of hospitals. The website www.youtube.com – a website on which people can publish videos, pictures and blogs – widened the lens on the Middle-East conflict.⁴⁹ Existence of these sites in the private domain may enforce governments to ensure authenticity, integrity, accuracy and completeness of certain information, as well as privacy.
- Transparency may stimulate changes in the *relation between governmental agencies (G2G)*. It may stimulate governmental organisations to align their policies and procedures and stimulate acting equally in equal situations. It may increase competition on performance between governmental agencies. In Denmark, Medcom - a federal governmental agency that stimulates the implementation of electronic health records in the Danish healthcare sector - publishes rankings of electronic health record adoptions of hospitals on their website <http://www.medcom1-4.dk/>.
- Transparency may transform *governmental culture*. Transparency may *weaken the position* of governments in relation to criminals and criminal organisations. This may be stimulated by publishing sensitive information over transport of hazardous materials for instance, or by publishing on-line information on dangerous activities within a neighbourhood (the presence of a firework factory). Transparency may affect the *perspective of citizens* on society.

Preconditions, barriers, risks

Some crucial remarks to the transparency premise have to be made. First, the extent to which governments will actually disclose information depends predominantly on their willingness to be transparent. Information symmetry (both citizens and governments having an equal information position) may be perceived and experienced as a threat of the position of governments and as jeopardising the interest of the organisation or the interest of individual civil servants.⁵⁰ Another consideration that has to be taken into account is the trend towards an increasingly complex, diverse and networked society. While ICTs stimulates structure and transparency, there is an opposite trend towards more complexity and therefore less transparency. A third consideration is that more and better information will not automatically lead to better informed individuals. The EU SOCQUIT study reveals that persons who have a large amount of social capital and who are highly educated use internet better to enlarge their social capital and to strengthen their information position.⁵¹ Therefore, eInclusion policies should respond to the many risks and opportunities that new technology opens up, and must embrace the often-distinctive needs of many different individuals and groups within society. Recently-released findings from the eUser project of the European Commission outline an 'emerging and widespread phenomenon' in the fact that almost half of eGovernment service users also act as social intermediaries: They help members of the family or friends in using services, or may even act on their behalf. As the use of such services requires considerable levels of technical skill and media literacy, there are reasons to believe that full supply of all citizens with online services can only be achieved through the use of intermediaries.⁵² Other key findings are that 55% of those who have used eGovernment services have positive views, although a considerable proportion (33%) of users experience at least one significant obstacle when using or trying to use online government services. One in three non-users who would like to use eGovernment is held back by insufficient computer equipment. Remaining barriers to eGovernment include the perceived need to discuss matters face-to-face with administration staff, concerns about the security and privacy of personal data submitted through the Internet as well as online services not being flexible enough to allow users to adapt them to their specific situation. Furthermore, the trend towards commercialisation of public sector information could endanger the

⁴⁹ <http://www.washingtonpost.com/wp-dyn/content/article/2006/07/24/AR2006072401355.html?referrer=emailarticle>

⁵⁰ See, e.g., Huijboom, N.M. and M. Staden, 2005, *The domestication of ICT in the public sector*, ID lab research.

⁵¹ SOCQUIT, Deliverable 6, *Report of literature and data review, including conceptual framework and implications for IST*, Editor: Rich Ling, Telenor.

⁵² The eUser study is funded by the European Commission's IST (Information Society Technology) programme to provide evidence of users' needs in relation to eGovernment, eHealth and eLearning.

fundamental democratic right of citizens to have access to public sector information free of charge or at marginal cost price.⁵³ A last consideration is the *coherence of government information*.⁵⁴ Having public sector information available does not necessarily mean that it makes government more transparent. Most governments of EU Member State have initiated projects to overcome fragmentation, yet it is questionable if they will succeed. Research shows that only few anti-fragmentation projects have paid-off.⁵⁵

2.4.2 Changing the accountability paradigm

A broad range of technologies are expected to impact accountability in several ways:⁵⁶

- The decentralising character of **web technology** and **social software** will stimulate cross-boundary cooperation and the involvement of new stakeholders and therefore asks for new forms of accountability.
- Opportunities provided by technologies such as **workflow, knowledge management systems** and **intelligent agents** to computerise procedures and decision making may support a clear and unambiguous practice.
- The monitoring rationale of technologies such as **workflow** and **knowledge management systems** may increase quantification of the accountability process.

The present-day situation

There is a fast growing range of examples of horizontal, networked government projects in Western democracies; projects in which government and stakeholders work - often in a non-hierarchical way – together.⁵⁷ In the UK as well as in the Netherlands, cooperation beyond governmental borders is one of the main components of modernisation programmes of the federal government.⁵⁸ Australia initiated several “networked government” projects, of which the largest is Centrelink, an initiative that assembles a wide variety of social services from eight different federal departments, as well as various state and territorial governments.⁵⁹ Governing by network often implies the weaving together of tasks of governments, non-profit and private organisations and therefore the entwining of responsibilities. This is not always recognized in sufficient detail.⁶⁰

Another way of looking at the accountability problem is to assess the extent to which governments in the present-day situation are being accountable; are accepting responsibility and give account for their action. One of the key indicators of failing administrative accountability is the level of abuse and corruption within the public administration. Recently some EU new member or candidate countries have started eGovernment projects to fight corruption.⁶¹ Overall, technology as a means to decrease corruption in government is not mentioned as a strategic future eGovernment topic by EU countries.⁶²

⁵³ See, e.g., Pas, J. and B. de Vuyst, *The use and re-use of Government Information from an EU perspective*, Proceedings of the 37th Hawaii International Conference on System Science, 2004; Aichholzer, G., and H. Burkert, *Public sector information in the digital age: between markets, public management and citizens' rights*, Edward Elgar, Cheltenham, UK.

⁵⁴ See for example: EBLIDA, *Public Sector Information: a key resource for Europe – Green Paper on Public Sector Information in the Information Society*, EC, 1998. Merrill Douglas, 2005, *In Quest of Coherence*, New York's CIO Council fosters an enterprise approach to IT development in state and local government. February 2005

⁵⁵ Zuurmond, A., 2003, *The Neglected State, a plea for a Copernican volt-face in the public sector*, University of Leiden.

⁵⁶ There is a close link with the hot spot on transparency. See that hot spot for additional information..

⁵⁷ Eggers, W.D. and S. Goldsmith, *Government by Network, The New Public Management Imperative*, A joint study by Deloitte Research and the Ash Institute for Democratic Governance and Innovation at the John F. Kennedy School of Government at Harvard University, 2004.

⁵⁸ The UK: <http://www.cabinetoffice.gov.uk/moderngov/>, the Netherlands:

<http://www.andereoverheid.nl/andereoverheid/web/>

⁵⁹ <http://www.centrelink.gov.au/>

⁶⁰ for example interview with Professor Nijboer, NRC Handelsblad, May 2006

⁶¹ See for instance <http://ec.europa.eu/idabc/en/document/5576/194>

⁶² eGovRTD2020, *Roadmapping eGovernment RTD 2020: Visions and Research Measures towards European Citizenship and Innovative Government*, Deliverable D1.1.: State of play, May 2006, p.72

Future transformation in government

New forms of collaborative government ask for the reinvention of accountability mechanisms. The European Commission, for instance, developed a “rights and risks” framework for identifying who had a legitimate stake in any project, and thus a right to be heard.⁶³ Many leaders in the field describe it as the trailblazing model for participatory accountability. But although some (mostly private) organisations and stakeholders are experimenting with new accountability models, it is not clear what the advantages and disadvantages of several models are and which models or mechanisms of future networked accountability would be desirable.⁶⁴ Technologies such as **workflow, knowledge management systems** and **intelligent agents** may enhance clear and unambiguous practice. Computerising of governmental processes offers opportunities to prevent civil servants from corruption and bribery. Several case studies of eGovernment applications report some impact on reducing corruption. Another example is the Bhoomi (meaning land) project of on-line delivery of land records in Karnataka (one of the 26 states of India), which demonstrates the benefits of making government records more open so that citizens are empowered to challenge arbitrary action. It also illustrates how automation can be used to take discretion away from civil servants at operating levels.⁶⁵

Preconditions, barriers, risks

The **detriments** of highly quantitative accountability models include a focus on easily visible and measurable aspects (including when these are presented as performance targets) at the possible expense of more invisible processes which could be just, or even more, important. For example, in the UK, a service code was established that all citizens should be able to see their local doctor within 48 hours for non-emergency consultation. Because of the pressure on local medical practices, this resulted in doctors’ secretaries refusing to make appointments more than 48 hours in advance even to those patients who wished to book a consultation on a specific day in the future. Overall, we want to emphasise that it is difficult to assess all factors that contribute to accountability changes, since these encompass a broad range of technologies and uses.

2.4.3 New forms of policing and law enforcement

The deployment of the majority of the selected technologies – whether mature or maturing technologies – will affect the ability and the way in which the state exerts its role in the domains of law enforcement, defence and security. They are expected to have an impact on these domains in the following ways:

- ICT user-end equipment such as **PDA**s and **digital cameras** extend existing surveillance capacity and enable improved direct intervention in cases perceived to conflict with the prevailing rule of law. It enables new stakeholders in matters of law enforcement and security which may lead to a decentralisation of (police) tasks.
- Mobile infrastructures such as **WiMax, WiFi**, and **Broadband** enable operating staff of public authorities to remain fully connected to the virtual infrastructures present within offices, adding to the self-reliance capacity of operating staff and thereby changing work processes and the work flow within public authorities.
- The decentralising character of **social software** enhances the opportunity for and capacity of individuals to actively engage in public affairs and influence decision making processes.
- Enabling technologies such as **RFID** and **sensors** provide the opportunity to create fully automated surveillance systems and thereby extend and improve existing surveillance and monitoring capacity.
- **Semantic technologies** enable more sophisticated surveillance systems that may enhance and improve searching through massive databases for specific correlations.

⁶³ A21, *Reinventing accountability for the 21st century*, 2005, www.accountability.org.uk/uploadstore/cms/docs/A21.pdf

⁶⁴ Collaboration can exclude as easily as it includes; and can be used to legitimise vested interests as it can erode or realign their power.

⁶⁵ Rajeev Chawla and Subhash Bhatnagar, Bhoomi: Online Delivery of Land Titles in Karnataka, India, http://www1.worldbank.org/publicsector/egov/bhoomi_cs.htm

The present-day situation

ICTs, such as **PDAs, mobile (camera) phones, and social software**, extend the surveillance capacity of the police considerably as the “eyes and ears” of the citizens are used. For example, after the London bombings, the police asked citizens to hand in relevant photo and video material. The material was used to provide vital clues as the search for forensic evidence was still going on.⁶⁶ ICT end-user equipment, such as **PDAs** supported by mobile infrastructures, creates new ways of working for governmental agencies, especially for operating staff. In the UK, the police started to use a mobile crime lab which enables real-time forensic investigation and analysis. Mature technologies, such as **sensors, biometrics and RFID** strongly widen and enforce the possibilities for authorities in carrying out their policing tasks and enable more efficiency. In the EU, several regulations are in place, aimed at the identification and localisation of cattle, sheep and goats, pigs, horses and pets.⁶⁷ As from 1 January 2008, using RFID-tags is obligatory in case of sheep and goats. It enables a fast tracking of suspicious animals in case of disease outbreaks such as Foot and Mouth Disease and prevents the need to slaughter the entire herd within a specific region. Another example is the use of sensor technology within an urban air polluting monitoring system.⁶⁸ **Robots** are increasingly used in situations which may be dangerous for ordinary people. In July 2006, the Department of Trade and Industry in the UK announced an investment of 16 million pounds to support a programme aimed at developing robots that is able to assist policeman and fire-brigades in reconnaissance and surveillance tasks.⁶⁹ Finally, **serious games** can be used for training purposes in the military, as well as police officers and other emergency services. The software of IncidentCommander⁷⁰ trains crisis managers and first responders with realistic simulation of real-world emergencies, crises and realistic management problems (such as time delays).

Future transformation in government

The deployment of technologies such as the **Internet, social software, mobile (camera) phones and creative hard- and software** will involve new stakeholders in the law enforcement scene. This may lead to the decentralisation of (policing) tasks, such as in the StreetChampions and Neighbourhood Watch projects.⁷¹ **Social software** provides a powerful platform for citizens to blow the whistle on malfunctioning government practices, rules or procedures. An engineer, working for the US coast guard control posted a video on YouTube to express his concerns about the level of security in coast guard patrol boats. Government was forced to react to the accusations and promised to investigate the allegations.⁷² This may result in new power balances. It is yet unclear how governments will handle the possibilities of citizens for “counter surveillance”. New actors will enter the scene which may lead to a *replacement* of existing law enforcement agencies; an interesting showcase is offered by Dutch citizens cooperating in creating ‘geluidsnet’, an alternative for official noise measurements.⁷³ By leveraging power to private organizations (be it organizations of citizens), the push towards the *privatization of security* will get a new impetus. This may lead to the *end of the supremacy* of government and industry in defining and maintaining norms. Preconditions, barriers, risks

The transformative potential will initially be in the correct embedding of this acquired information in the work flow processes of public organisations. This is not an easy job and relates to questions concerning safeguarding the reliability and authenticity of the evidence.

⁶⁶ See http://news.bbc.co.uk/2/hi/uk_news/4668675.stm

⁶⁷ Amongst others: Regulation 998/2003 (Pets); 21/2004 (sheep and goats); Regulation 911/2004 (cattle and buffaloes); Council Decision 2000/68 (horses, donkeys, zebras and their crossings).

⁶⁸ See <http://www.allhands.org.uk/2004/proceedings/papers/78.pdf>

⁶⁹ See <http://www.publictechnology.net/print.php?sid=5469>

⁷⁰ See <http://www.incidentcommander.net/>

⁷¹ Both projects – running in the UK, the USA and Australia – are directed at empowering citizens by surveillance capacity within neighbourhoods. See for instance <http://www.neighbourhoodwatch.uk.com/>

⁷² See <http://www.washingtonpost.com/wp-dyn/content/article/2006/08/28/AR2006082801293.html?referrer=emailarticle>

⁷³ See <http://www.geluidsnet.nl/>

The decentralisation of police (and other) governmental tasks will raise fundamental questions regarding the complementing, and potentially competing activities of governmental organisations and citizens. This implies that governments will have to rethink the (traditional) responsibilities of governments and of citizens when citizens “take over” governmental (police) tasks.

2.4.4 *Changing the privacy paradigm*

The majority of the selected technologies – such as **web technology, social software, RFID, biometrics, knowledge management systems, semantic web, intelligent profiling, workflow systems** – affect the privacy paradigm. The role of technology in safeguarding the right to privacy is ambiguous: technologies are both a potential protector and offender of privacy:

- They will lead to an increase in the amount of gathered – personal – data.
- The number of databases that will be created with personal data will increase.
- Technologies such as RFID will lead to a direct coupling of the physical space with the virtual space and can have an immediate impact on privacy.
- The sophistication of manipulating data (in the literary sense) will increase, enabling more sophisticated data search and profiling techniques.
- The sophistication of developing ‘avoidance technologies’ and technologies to remain anonymous in electronic communication practices (or in search techniques) will increase as well.

The present-day situation

Today, internet is often used as a medium in which one can freely communicate and can exchange opinions. Social software tools (Web2.0) show especially fast growth patterns.⁷⁴ Privacy is at stake, for instance because service providers are obliged to cooperate in keeping log-files of all e-mail and internet traffic for two years within Europe. Uploading video’s to the internet can result in requests from intelligence service to hand over information, for instance in case of videoing hooligan actions. In public transport, the collected data on mobility patterns is used to create profiles that may help to identify suspicious passengers, by establishing statistical relations with known suspects. In case of the London Oyster card, the availability of these data has led to an increase from seven requests in 2004 to over 243 requests in the first three months of 2006.⁷⁵ Semantic technologies, which are capable to a certain kind of intelligent understanding of the content that is captured in documents, may be of help in improving surveillance technologies.⁷⁶ Broadband, WiFi and WiMAX are generic technologies that influence the ease of data collection because of the ease of broadband communication. WiFi is sometimes used as a tracking device. By means of triangular measurement one is able to determine the location of a specific person. Privacy infringements are also related to security breaches in information systems. In the Netherlands, hackers showed on request the vulnerability of hospital systems. They were able to manipulate the data of 1.2 million patients (!) at one site.⁷⁷ The executive director of the World Privacy Forum, Pam Dixon, testified for a US state committee about the widespread occurrence of security breaches of (US-based) hospital information systems.⁷⁸

Future transformation in government

Technologies such as **social software, knowledge management systems, and web technology** may stimulate *shifts in power in the ‘privacy’ relation between government and citizens* in the sense that these technologies enable citizens to combine forces and promote their privacy interests. On the other hand, and more probable, *the power balance may also tip in favour of government*, as governments - due to technologies such as **RFID, Biometrics and semantic technologies** will have increased opportunities in

⁷⁴ See <http://www.sifry.com/alerts/archives/000432.html>

⁷⁵ See <http://newsvote.bbc.co.uk>

⁷⁶ See <http://www.newscientist.com/article/mg19025556.200?DCMP=NLC-nletter&nsref=mg%0A19025556.200>

⁷⁷ See ‘Het Medisch geheim gehakt’, De Volkskrant, 3 september 2005.

⁷⁸ See http://www.worldprivacyforum.org/testimony/NCVHStestimony_092005.

monitoring and surveying the whereabouts of its citizens. National Data Protection Agencies will check the compliance of government activities with existing laws and regulations. Civilian organisations will create their own watchdogs. Due to the growth in automatic and mostly unnoticed collection of personal data – for instance through increased use of surveillance cameras and through use of RFID based cards for public services – existing privacy laws may need to be revised. The European Article 29 Working group has advised to check the appropriateness of the European Privacy directive (95/46/EC) with contemporary developments in data collection practices.⁷⁹ Finally, the technological potential of using ICT to safeguard privacy should not be neglected. By appropriate use of encryption techniques and by alternative modes of organising information exchange processes, privacy can be secured. An example is the Digital Locker, proposed in the Netherlands (but not accepted) which enables citizens to exert control over their own data.⁸⁰

Preconditions, barriers, risks

The transformative potential will be in the correct embedding of the privacy dispute in appropriate legal frameworks and in an appropriate attitude towards collecting and use of personal data. The privacy paradigm itself needs to be revised, on the basis of legal, organisational and sociological premises with regard to the position of privacy in society. The trade-off with security measures (anti-terrorism) requires to be revised as well. This has a principal (privacy as a basic right) and a pragmatic aspect (privacy as negotiable concept).

2.4.5 New countervailing powers

Technologies of relevance for new countervailing powers are:

- The collaborative, participative and de-formalising potential of **social software and social network tools**, which can enhance the communication, organisational ability and the informational position of individuals and groups, and stimulate new forms of organisation and changes to power balances.
- The role of **PDAs and mobile devices** in enhancing the decentralisation and personalisation of communication and information sharing in organising and coordinating interest group activities.
- Opportunities provided by new applications of **electronic gaming, language processing and semantic technologies** for generating new ways for individuals and groups to create, learn together, use and share information and knowledge amongst themselves, and thus develop new types of organisations and power centres in the democratic landscape.

The present-day situation

Research has shown that, in spite of high expectations, ICT to date has not contributed impressively to redressing the democratic deficit and improving the ‘formal’ democratic relationship between citizens and government. It is mainly citizens who were already interested in politics and were already participating in debates or interactive processes who also participate in eDemocracy initiatives. Furthermore, there is serious doubt about the actual impact ICT has had on political processes. Further progress along the ICT-supported ‘democracy value chain’ – which sees information dissemination leading first to consultation by government, followed by active citizen participation and then by elections or direct decision-making – is yet to become apparent. In 2005 the world’s largest Internet voting to date was successfully conducted by the public water management authorities in two provinces in the Netherlands with a turnout of 2.2 million.⁸¹ And the ePetition system as used in the Scottish Parliament in Edinburgh has shown significant levels of use. In some contrast to the limited use of ICT for formal political participation, there is stronger evidence that more informal, bottom-up forms of engagement and participation by citizens, advocacy

⁷⁹ See http://ec.europa.eu/justice_home/fsj/privacy/docs/wpdocs/2005/wp105_en.pdf

⁸⁰ See <http://www.gba.nl/usercontent.aspx?id=7034&item=Folder&template=Folder.xsl>

⁸¹ European Commission, 2005, “World’s largest Internet election successfully conducted in the Netherlands”, eGovernment News, 28 March 2005, IDABC eGovernment Observatory: <http://europa.eu.int/idabc/egov>

groups and activists have been boosted considerably by ICT. An example is provided by Hamburg where the DEMOS initiative has successfully implemented three electronic discussion phases related to city planning and urban policy:⁸² There is also other evidence which shows that more bottom-up eParticipation initiatives can provide substantial benefits for citizens. The UK provides for many examples where ICT is helping the housebound, shift workers, young people, disadvantaged groups, etc.⁸³ It is also starting to be clear that such eDemocracy initiatives in the future (when fully deployed) may save public administrations financial resources, especially at local level, by engaging more citizens in local democratic processes for less money than traditional methods.

Future transformation in government

Social software and social network tools are potentially revolutionary as they could enable relatively cheap, easy and rapid informal, as well as formal, groups to form, organise, evolve agendas, agree and implement actions, and *exert pressure on other power centres and stakeholders*. To some extent this is starting to happen. As an example, in the Netherlands, a wiki⁸⁴ has been successfully used to explore new ways of forming public opinion. Similarly, there seems to be transformative potential for the use of **gaming, language processing and semantic technologies** by groups to develop new competences and new types of understanding and interpretation of information. This may stimulate a *shift in the existing power balance* between individual/group and government. An example is the online Cyber-Budget game launched by the French government on 8 June 2006.⁸⁵ Another example is the EU project EDEN, which is designed to develop natural language processing tools to facilitate access to governmental administrative data. One of the greatest potential transformations which **social software** and **social network tools** can facilitate is the *strengthening of bottom-up, often informal democratic involvement and the countervailing power* which this engenders. In this context, the activities of Greenpeace and Amnesty International are relevant. In explaining the developments at hand, two competing theories can be discerned. According to Bimber, internet contributes to the on-going fragmentation of the present system of internet-based politics and a shift towards a more fluid, single issue group politics with less institutional coherence. Bimber terms this ‘accelerated pluralism’.⁸⁶ Agre, in contrast, points at the numerous ways in which institution’s participants appropriate new technology and new services. He offers an explanation for how technology is used to bind people more tightly together in (often pre-existing) social networks.⁸⁷ Both fragmentation and amplification are likely to be relevant in different contexts and under different policies.

Preconditions, barriers, risks

ICT strengthens the formation and activities of non-governmental interest groups, whether from the community, from private interests or from established institutions. In most cases these are beyond formal democratic control, which raises the threat of descending into a form of street politics or mob rule. Existing capacities may set practical (if not legal or ethical) limits on participation. Too much participation may not be in the interests of democracy and not in the interest of the individual citizen, when leading to superficial, shallow, knee-jerk or populist participation. Just as serious is the ‘digital danger’ of trivialisation and short-termism which can result if direct voting or participation by internet were to be widely introduced. The

⁸² JANUS (2003), Progressing the Information Society: the role of government, workshop and proceedings of the JANUS (Joint Analytical Network for Using Socio-economic research) project, a research action supported by the Information Society Technologies Programme of the European Union, 2002-2004, 17 February 2003, <http://www.janus-eu.org>

⁸³ The UK’s Local eDemocracy National Project, see “Using eDemocracy to strengthen representative democracy” by Mary Reid, eVoice Project.(2005), International Political Forum on eDemocracy (<http://www.evoice-eu.net>), and “eParticipation: the view from the Local eDemocracy National Project” by Isabel Harding, European Institute of Public Administration (2005) Workshop “The digitisation of European public administrations: what’s the political dimension of electronic governance?”, Maastricht, 1 April 2005

⁸⁴ <http://www.wethepeople.nrc.nl>

⁸⁵ <http://news.bbc.co.uk/2/hi/europe/5060852.stm>

⁸⁶ Bimber, B (1998) The Internet and Political Transformation: Populism, Community, and Accelerated Pluralism, *Polity*, Fall 1998 issue, Vol. XXXI, Number 1, pp. 133-160.

⁸⁷ Agre, P.E (2002) Real-Time Politics: The Internet and the Political Process, *The Information Society* 18(5), 2002, pages 311-331: <http://dlis.gseis.ucla.edu/pagre/>

biggest concern however, is public apathy and lack of understanding of the democratic and political process. Useful evidence is starting to be collected as to how to break this democratic deficit challenge, such as people (especially young people) getting involved if they are approached in relation to specific issues of relevance and interest to them, and not just ‘consulted’. Finally, the examples illustrated in the previous sections, show the considerable potential, not yet realised, for eDemocracy to change the broader interactions between citizens and government, as well as improve the overall quality of decision-making and opening up new opportunities.⁸⁸

2.4.6 Networked government

In this hot spot almost the whole range of promising technologies is potentially relevant. However, the focus here is on those technologies which can support networking, de-centralisation, interoperability and alternative organisational configurations, such as the following:

- a) Networking infrastructural technologies such as **WiFi, WiMax, broadband and web technologies**, which support ubiquitous seamless connectivity and distribution of systems and services between stakeholders, including users.
- b) **GRID, knowledge management and workflow technologies** supporting the optimisation and interoperability of ICT resources amongst stakeholders by stimulating standardisation of languages, applications, interfaces, etc., which could lead to organisational realignments, re-structuring and process innovation.
- c) The role of **social software, social network tools and technologies for decentralised service creation**, all of which enhance bottom-up and personalised communication and information sharing. This promotes de-centralised and networked collaboration, participation and alternative service provision, which in turn stimulates new forms of organisation and changes to power balances.

The present-day situation

There is no doubt that public sector governance and services are being improved through the use of ICT in the context of increased collaboration between government and the private and civil sectors. An example is the cooperation of British Telecom with Liverpool and Roterham and with the county of Suffolk. British telecom invests considerably in shared service centres, in developing appropriate services, the service architecture and in training the staff.⁸⁹ This process has immediately produced efficiency savings and the reallocation of staff roles and jobs. In contrast to this, there are fewer successful examples of networking between different agencies and authorities in government in the provision of eServices. One of the few existing examples is the Irish child benefit system which has been transformed quite radically through inter-agency networking and the application of knowledge management systems. More advanced technologies such as WiFi are being rolled out usually in pilots and trials in order to learn how these networks can be of benefit to citizens and government. Living Labs Europe combines efforts of European cities to engage citizens in new wireless technologies and accompanying services.⁹⁰ Other examples relate to public places and spaces such as hospitals and railway stations. Though these are networks, they do not yet offer networked governmental services.

⁸⁸ European Commission (2004) eDemocracy Seminar, 12-13 February 2004, Brussels: http://europa.eu.int/information_society/activities/egovernment_research/doc/edemocracy_report.pdf; eVoice Project.(2005), International Political Forum on eDemocracy (<http://www.evoice-eu.net>), especially “eDemocracy master class” by Steven Clift, and “Using eDemocracy to strengthen representative democracy” by Mary Reid; European Institute of Public Administration (2005): Workshop “The digitisation of European public administrations: what’s the political dimension of electronic governance?”, Maastricht, 1 April 2005; Coleman, S. and Norris, D. (2005), “A new agenda for eDemocracy”, Oxford Internet Institute, Forum Discussion paper No. 4, January 2005; OECD, *Engaging Citizens in Policy-making: Information, Consultation and Public Participation*. PUMA Policy Brief No. 10, 2001 <http://www.oecd.org/pdf/M00007000/M00007815.pdf>; OECD, *Engaging Citizens Online for Better Policy-making*. Policy Brief, March 2003: www.oecd.org/publications/Pol_brief; Millard, J (2004) “ICTs and governance”, The IPTS Report, The Institute for Prospective Technological Studies (IPTS), a Joint Research Centre of the European Commission, Seville, Spain, Number 85, June 2004.

⁸⁹ Based on an interview with British Telecom undertaken by Jeremy Millard, Danish Technological Institute, 3 May 2005.

⁹⁰ See <http://www.livinglabs-europe.com/>

Future transformation in government

Networked infrastructural technologies (for example **WiFi, WiMax, broadband, web technologies**, etc.) support the connectivity and distribution of systems and services between stakeholders, including users and therefore may provoke institutional transformation. Significant institutional and organisational changes could include intra- and inter-governmental re-organisation and re-engineering, vertical integration and cooperation and horizontal integration. The optimisation and interoperability of resources amongst stakeholders (through the use for example of **GRID, knowledge management and workflow technologies**) enable organisational realignments, re-structuring and process innovation. According to EDS, future ‘information partnerships’ (i.e. between public, private and civil sectors), will provide better social outcomes.⁹¹ The promotion of de-centralised and networked collaboration, alternative governance structures and service provision (for example by using **social software, social network tools and technologies for decentralised service creation**) enhances bottom-up and personalised communication and information sharing, which in turn stimulates new forms of organisation and power balance changes. Wiki’s, blogging and games (Sims and HotDate) are prime examples. New forms of social entrepreneurship involve substantial changes in the ‘public value chain’ (new user-producer relationships, new definitions of what constitutes public value, etc. and the rise of new stakeholders creating this public value). Many, though of course not all, government users (citizens, businesses and civil servants) are no longer prepared just to be passive recipients of government and eGovernment services. Some experiments in the UK have already started applying this approach to the public sector,⁹² especially in health, education and crime.

Preconditions, barriers, risks

One precondition is the appropriate recognition of users once they have been included in designing new services. Questions regarding standards and quality of services will have to be answered, as well as the position of layman users vis-à-vis professional workers. Another challenge is that the public sector must grapple to avoid the simultaneous loss of knowledge and control over basic processes and over the competencies, decisions and policies needed to support these and which lie at the basis of all public services. Using these technologies to support the optimisation and interoperability of ICT and information resources could also impact the overall governance and service strategy, in terms of stakeholder partnerships, financing, the use or otherwise of market principles and offering users choice of channels and services. There is some evidence that we are on the edge of a major move towards the commoditisation of business processes,⁹³ and that this will also profoundly affect the public sector in the next five to ten years. Above all, the networked government attempts to achieve a balance between the ‘goods’ and ‘bads’ of centralisation and de-centralisation in specific times, places and contexts. Centralisation promotes minimum standards, simplicity and efficiency, whilst de-centralisation promotes pro-activeness, subsidiarity and diversity. Pilot studies show marked improvements in productivity in government when teams adopt revised information and knowledge handling techniques.⁹⁴

2.4.7 Intelligent and pro-active government

In the intelligent and pro-active government hot spot the focus is on the greater capacity of governments to collect, store, process and apply information. Promising technologies which are most relevant in this context are:

⁹¹ EDS (Electronic Data Systems Corporation) (2005), *Delivering modern services strategy: EDS input to first stages of eGovernment Unit consultation in the UK*, London, England.

⁹² Leadbeater, C (2005) “The user innovation revolution”, National Consumer Council, UK: <http://www.charlesleadbeater.net>.

⁹³ See, for example, Davenport, TH (2005) “The coming commoditisation of processes”, *Harvard Business Review*, June 2005, pp. 101-108.

⁹⁴ See ‘Bridging the divide’ by Tom Knight, *The Guardian*, 3 October 2002.

1. **Wearables, sensors, intelligent agents, robots, RFID, biometrics, GRID and new tools for storage and retrieval** which identify, collect and store information and make it available to government for intelligent processing.
2. **Knowledge management systems, semantic web, web technologies, plus PDAs and other mobile devices** which enable governments to convert information to intelligent knowledge and services, and thus to increase the pro-activeness of government through new product and service innovations, and to deliver services to different types of users in new ways.

For governments there are arguably two underlying objectives in increasing societal intelligence. First, collective intelligence of individuals, communities and businesses could be better used to obtain a deeper understanding of how to meet societal needs through higher quality and more pro-active services. Second, government can use such societal intelligence to better determine and implement policy in the longer term.

The present-day situation

At the present time there is little significant or large scale impact of ICT to enhance the intelligence and pro-activeness of government, despite the potential. Advanced technologies such as wearables are yet mainly found in the private sector. The use of sensors is more advanced in government. In the Netherlands (and other countries) sensors are used to measure the condition of dykes, and have partly taken over tasks of dyke inspectors.⁹⁵ Sensor technology is also exploited by local governments for refuse collection management.⁹⁶ In the case of intelligent agents and robots, the public sector again lags the private sector, although there is some progress. For example, in Bologna, Italy, intelligent agents are being developed which are capable of suggesting the most interesting public services to users by taking into account both user's exigencies/preferences and the capabilities of the devices they are currently exploiting.⁹⁷ Although there are now many examples of successful *intelligent storage, archiving and retrieval systems*, this remains an urgent problem in the public sector given the huge reservoirs of data being handled and the rapid changes in technology which tend to make existing systems rapidly out of date. Some progress is also being made in using knowledge management systems, semantic web, web technologies and PDAs, and other mobile devices, to increase the pro-activeness of government and to innovate new ways in delivering services to different types of users. An example is the Tennessee Valley Authority, the largest public electricity body in the USA, which uses a Semantic Information Management System, to manage and integrate their data assets.⁹⁸

Future transformation in government

There are many potential technology enabled transformations which could result from the vision of an intelligent and pro-active government. First and foremost, the identification, **data collection, storage and processing technologies** described above could develop into an *ambient technology environment*. This is an environment in which mobile devices support people by offering pervasive and intrusive intelligent services and in which gesture recognition and intuitive interfaces play a role. Multi-channel systems will become more important, especially where technology may be hidden but still supports the service, as will technologies which can facilitate the fine tuning of services and natural interfaces to meet the needs of specific individuals or groups. Technologies and their potential capabilities of this hot spot can also *open the potential for new product and service innovations*. By drawing on the totality of Public Service Information (PSI), potentially vast data resources could be tapped for new product and service innovations, requiring governments to change their way of working and collaborating.

⁹⁵ Glasgow H.B., Burkholder J.M., Reed R.E., Lewitus A.J. and J.E. Kleinman, (2004): Real-time remote monitoring of water quality: a review of current applications, and advancements in sensor, telemetry, and computing technologies, *Journal of Experimental Marine Biology and Ecology*, Volume 300, Issues 1-2, 31 March 2004, Pages 409-448 and IJkdike initiative of TNO the Netherlands, <http://www.tno.nl/>.

⁹⁶ www.senternovem.nl/mmfiles/afvalinfogids-04-systeemenvcm24-153246.pdf

⁹⁷ De Meo, P., Quattrone, G., Ursino, D. and G. Terracina, *A Multi-Agent System for the management of E-Government Services*, *IEEE/WIC/ACM International Conference on Intelligent Agent Technology* pp. 718-724.

⁹⁸ <http://www.tva.gov/>

Preconditions, barriers, risks

Intelligent and pro-active government can pose a ‘big brother’ threat of an overbearing, intrusive and interfering agency. The ICT technologies described in this hot spot could also be used for greater control. Another aspect of vulnerability is the abuse of information. As more information is stored, there are more possibilities for abuse by government itself, as well as by criminals and others who obtain illegal access to information. There are also potential dangers in moving back towards just single channel, only this time towards the ‘e’ channel, primarily for efficiency and cost saving reasons. This may exclude specific disadvantaged groups, be it because of a lack of resources, capacities or a negative disposition towards the e-channel. Except for providing mere access, an important quality criterion for the service offered is the match with the needs of these disadvantaged. This is even more important since without specific care there is a danger that most services will be tuned to the high included client groups.

2.5 Conclusions – possibilities for empowerment

According to the model, presented in the previous chapter, transformation occurring today will be primarily focused at the fourth layer, being the layer which identifies empowerment mechanisms growing in importance as a fourth asset of governmental roles. Transformations as have been described in the seven hot spots are manifest in the other three layers as well. The impact on *liberal values* is mostly present in the hot spots transparency, accountability, law enforcement and privacy. Liberal values deal with good governance mechanisms. Concepts as accountability, transparency and privacy will have to be revised. Horizontal systems of accountability may evolve, requested by empowered of citizen groups and NGOs who enforce more transparent modes of governance. The concept of privacy will be challenged and will lead to new models in which trusted third parties become intermediaries between government and citizens. The *democratic values* are impacted by new opportunities for citizens and citizen groups who find novel ways to express their viewpoints and to influence the political debate. The challenge for government is to find the proper balance between those who have the means to participate and those who are less or not involved. There is a danger that technology will strengthen the strongest and will weaken the weakest. The *social values* are impacted by the new technologies as well. People will be empowered to design and produce services and products themselves, and share them with others. Private surveillance systems are for instance more and more being introduced in neighbourhoods, taking over tasks of public professionals. Government will experience significant institutional change in all layers of governmental practice.

In all three layers the most significant transformation is however may be stimulated by the shift of the power from the institution towards the individual level – the so-called trend of the *empowerment of the individual*. In the seven hot spots we found the following indications for this shift:

- *transparency provoking change*: as citizens and other stakeholders become more well-informed and more aware of governmental activities they are better equipped (empowered) to directly address governments about their needs;
- *changing the accountability paradigm*: more networked forms of governance enable citizens and other stakeholders to exert influence on the process of accountability but at the same time requires them to participate in adopting responsibility for shared activities;
- *new forms of policing and law enforcement*: both private and civic players are more and more enabled to take over policing and law enforcement roles, leading to co-production of roles or – in a more radical scenario – to marginalization of the role of government
- *changing the privacy paradigm*: technologies are both a potential protector and offender of privacy; in the same vein is the role of government ambiguous: intrusive in collecting more personal data; protective in offering protective measures; citizens become more empowered to keep control over personal data themselves;
- *new countervailing powers*: new forms of democratic participation will contribute to enhancement of countervailing strategies; these forms are highly dynamic and volatile, highly pluralistic and fragmented and challenge the traditional mode of representative democracy;

- *networked government*: by increased sharing of authority, by-passing of traditional hierarchies and vertical institutes, co-operation within government and with external stakeholders, external stakeholders are empowered and roles for government changes;
- *intelligent and pro-active government*: technological tools enable a shift towards a more pro-active governments, heading for service leadership, user-oriented approach and context-awareness.

We can now get back to our initial picture of the ‘house of values’, which was presented in the beginning of this chapter. The fourth layer of societal values – empowerment values -more or less represents what we expect to be at the heart of governmental models of the 21st century. For the analysis of future ICT-driven models of eGovernment, this layer particularly represents the future of ‘public value’ and is in that sense the most challenging. At the same time – this layer builds on and challenges the other three layers in the house of values.

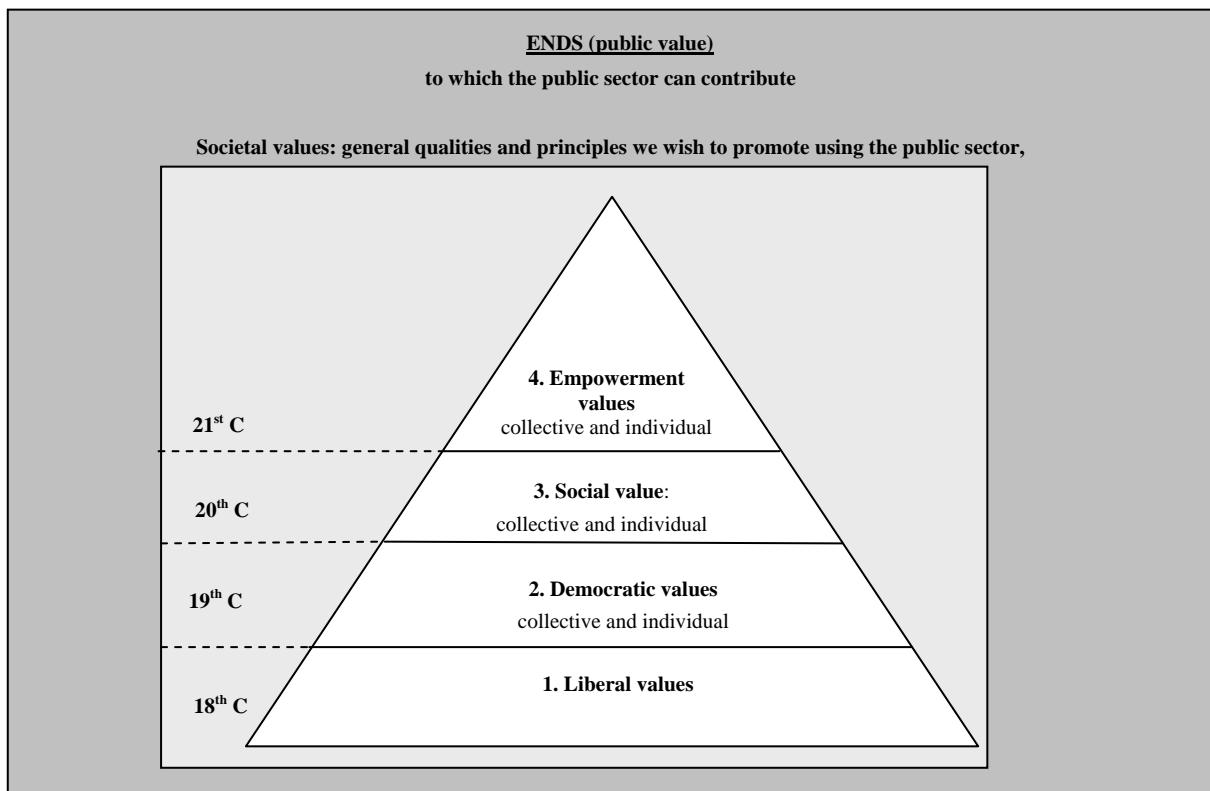


Figure 1 revisited: The house of values

In the next chapter we shall continue our exploration of future models for ICT driven government, by developing some scenarios on the future of government in 2020.

3 The future of eGovernment

In the previous chapter on hot spots we confronted the taxonomy of key governmental roles and functions with the disruptive technology trends, to define key areas for future ICT-driven innovation of government. We concluded that we expect these hot spots to lead to significant changes in government in the coming 15 years and to an overall shift toward government models based on ‘empowerment values’. The hot spots also provide us with important inputs for more developed views on the future of eGovernment in the form of scenarios, which are the subject of this chapter. Besides being influenced by disruptive technology trends, the question how eGovernment will evolve in the coming decade (2020) depends on a wide range of contextual factors, such as social, cultural and economic trends.

To decide which approach to the future and subsequently which method of futures research to adopt, we need to assess the uncertainty and complexity of developments surrounding eGovernment.⁹⁹ Firstly, we can say that developments with regard to eGovernment are as dynamic and therefore uncertain as developments with regard to its main technological constituents: telecommunication (mobile and fixed), information and communication technology (ICT) and content and (new) media. Berkhout & Van der Duin (forthcoming) list five developments in these areas: increase of bandwidth, unbundling of the telecommunication and ICT-industry, convergence with other business such as the media and the entertainment industries, new business models, and the development and introduction of new telecom and ICT-services.

In terms of an adequate methodology for assessing the future, the table below lists common foresight methodologies for different types of futures.

Table 8: Foresight methodologies

A clear enough future	Alternate futures	A range of futures	True ambiguity
Trend analysis Business watch Quantitative forecasting Judgmental forecasting	Scenarios Back casting Early Warning System	Scenarios Early Warning System Back casting	Event analysis

The uncertainty level of developments with regard to eGovernment is somewhere between ‘a clear enough future’ and ‘true ambiguity’. Both the time horizon of this project (i.e., 2020) and the interrelationships of different developments affecting eGovernment make the future of eGovernment too complex to consider it clear enough. On the other hand, eGovernment developments and the future to which they lead are not that uncertain and chaotic that we can speak of ‘true ambiguity’ with regard to the future(s). A situation with (possible) alternate futures and a range of futures seems to be most applicable to eGovernment. The scenario-method, therefore, in this case seems to be a good choice. This method is not an uncommon method in other eGovernment research (e.g., Van der Duin, Janssen & Wagenaar, 2006; Georg Aicholzer, 2005; Gartner, 2005).¹⁰⁰

The scenario method is perhaps the most frequently mentioned and widely used future research method, and is also known as scenario thinking, scenario learning or scenario planning. A popular method of building scenarios is the variant first reported by the Rand Institute and later copied by well-known organizations such as Shell and Global Business Networks. The hallmark of this variant are four scenarios, defined by four quadrants resulting from two axes, which correspond to the most uncertain and high-impact trends or variables relevant to the (business) issues at hand. Given the relatively distant time horizon (2020), the scenarios are meant to project beyond certain trends and developments to get a view on

⁹⁹ For this, a number of other eGovernment scenario studies have been reviewed. For a complete list see Appendix 4.

¹⁰⁰ The other two methods of futures research mentioned here, ‘back casting’ and ‘early warning system’ can also be used in these ‘uncertainty’ situations’. However, the application of these methods does not lead to possible future visions.

potential new trends and constellations of trends which might foster creativity. Since the scenarios inform policy making regarding eGovernment, they should provide a platform or background against which new policy initiatives can be discussed and initiated. The scenarios are meant to start a ‘strategic conversation’ (Van der Heijden, 1996) around eGovernment.

3.1 Scenarios: scope and trends

The time horizon is the year 2020. The scenarios need to describe the consequences of promising ICT-developments for new eGovernment services and new eGovernment models in the wider context of relevant *social, economic, institutional and organisational changes*. Therefore, the first step to take is to make an analysis of these contextual changes. Based on desk research the project team identified the most important trends and developments within the social, economic, institutional and organizational domain. Cultural, demographical and ecological trends are not considered separately but their impact on the aforementioned domains is considered where required. First we need to make a distinction between relatively certain and uncertain trends. The latter are particularly important in designing the axes for the scenario exercise. In this study the following trends are considered relatively certain: ageing, immigration, urbanization, global warming and rising energy demands.

The desk research identified a large number of uncertain trends (taken from other studies on the future of eGovernment, some of which were scenario-studies; see Appendix 1), which were clustered into the following list of key trends with a possible strong impact on eGovernment:

- “the individualisation trend (focus on the demands of the individual and emphasis on self-reliance and personal independence) will continue“
- “citizens will increasingly accept that governments collect and use personal data for carrying out their tasks“
- “governmental institutions of EU member countries will increasingly be privatised“
- “the EU member countries will experience a technological growth as expressed in a rise of investments in R&D and technology”
- “the political engagement of citizens will increase”
- “the control of the EU over EU member countries will grow”
- “a homogeneous European culture will emerge”
- “the trust of citizens in government will increase”
- “within EU member countries economic values will prevail over social values”
- “the EU member countries will experience an economic growth
- “the trust of citizens of EU member countries in technology will increase”
- “the technological standardisation of interfaces of eGovernment applications will increase”
- “the international political stability will decrease”
- “the trend towards decentralisation of governmental tasks will increase”
- “citizens' mobility across borders will continue to grow”
- “pressures on public budgets will diminish”

For the construction of the axes in a scenario exercise the selection of trends with a high uncertainty and a large impact on eGovernment is crucial. Sixty experts participated in a survey to select the trends with the highest uncertainty and largest impact on eGovernment.

3.2 Constructing the scenarios

Selection of the axes

In this project we aim to develop four scenarios to look at the future of eGovernment. In each of these scenarios a coherent and consistent possible picture of the future needs to be described that is based on (possible) developments in society, politics, the institutional sphere, the economy and in the

technological domain. The scenarios are situated along two so-called scenario-axes. These scenario-axes form the framework in which the scenario-stories (consisting of the trends in society, politics and so on) have been placed. The scenario-axes point to the extremes of a (possible) future trend or development. The selection of axes is based on the classification and weighing of trends by experts, which was presented in the foregoing section. If we count the trends of both tables we can construct a top 5 of trends with the highest level of uncertainty and the highest level of impact:

1. “a homogeneous European culture will emerge” (14,87)
2. “the political engagement of citizens will increase” (13,56)
3. “the trust of citizens in government will increase” (13,43)
4. “citizens will increasingly accept that governments collect/use personal data for carrying out their tasks” (13,31)
5. “pressures on public budgets will diminish” (13,3)

Consequently we have chosen ‘citizens engagement’ and ‘cultural homogeneity’ as the key dimensions to vary our scenarios on. The citizens’ engagement dimension corresponds with the second trend “the political engagement of citizens will increase.” It also links with “the trust of citizens in government will increase”. In our view, lower trust leads to lower political involvement vice versa. The cultural dimension corresponds with the first dimension “a homogeneous European culture will emerge”, but there is also a link with the last two dimensions. If “citizens will increasingly accept that governments collect/use personal data for carrying out their tasks”, citizens increasingly share more of the same values on this topic, suggesting a more homogenous culture on this aspect. By taking the extremes of both dimensions two scenarios can be constructed. The two scenario-axes, therefore, are:

- **High vs. low level of citizens engagement:** this is the extent to which citizens (and companies) are involved in political (democratic) and societal processes.
- **Homogenous culture vs. heterogeneous culture:** this is the extent to which citizens of Europe agree on the role and future of Europe and the extent to which they share norms and values.

These two axes delineate four areas. Each area represents a consistent 'picture of the future', or rather a 'story of the future'. Each story must be plausible and feasible and must incorporate several of the earlier described contextual dimensions (social, economic, organisational and institutional). Each scenario must differ significantly from the present situation and from each other. This results in the following 4 scenarios:

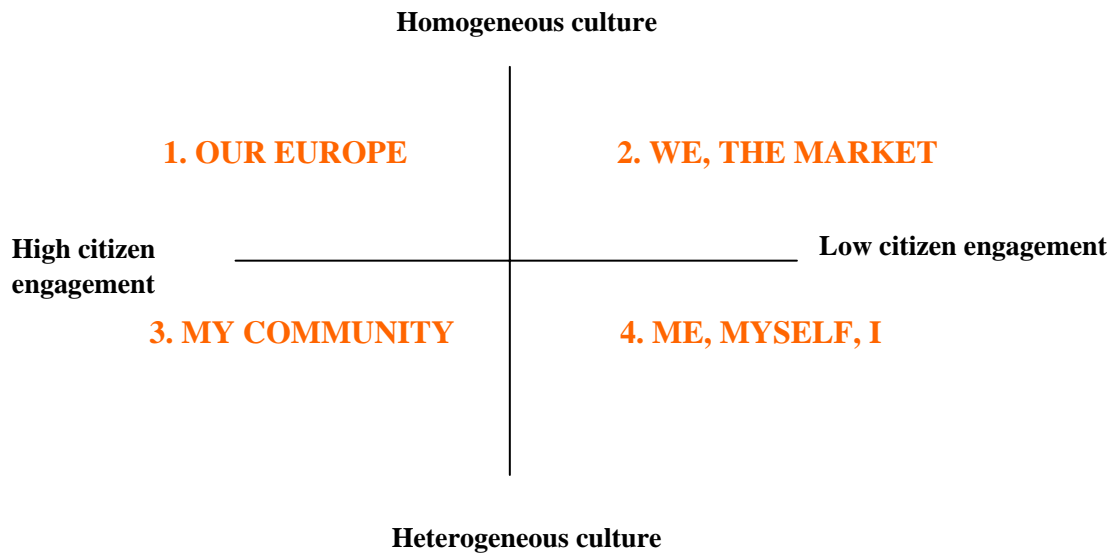


Figure 2: Validation of the scenarios: a two-step approach

Experts were invited to engage in the creation of the scenarios in a two stage process. In the first round they were invited to comment on the generic descriptions of the contextual factors in each scenario. In the second, ‘fine-tuning’ stage we asked them to further reflect on the scenario’s which were then complemented with descriptions of the 7 hot spots described in earlier reports for this project. We asked them to comment on the following issues:

1. Do you consider the hot spots to be proper descriptions of future governmental roles within the respective scenarios?
2. Do you have suggestions to enrich, alter or complement the roles described through the hot spots?

The results of the scenario exercise are described in the next section.

3.3 Four scenarios for future eGovernment

3.3.1 Scenario 1: OUR EUROPE

Homogeneous culture and high citizen engagement

Society

In 2020, European society can be characterized as loyal and dedicated. Citizens are eager to develop new initiatives, but also to raise their voices to express feelings of discomfort if public services do not meet their standards. This scenario represents a shift that has taken place over the years. In the first decade of the 21st century many citizens lost faith in their governments, who in their experience have moved too strongly towards market inspired governance disregarding major societal issues such as disintegration, exclusion, insecurity, and failing public services. In those days the market rhetoric prevailed in public service delivery, focusing on efficiency, productivity and effectiveness. Citizens were regarded as customers.

In the following decade (2010-2020) European policy has been redirected towards the restoration of trust. Government-citizens relationships improved, because more emphasis was put on transparency and accountability and on engaging citizens in decision making processes. More than before, market forces are critically weighed against what benefits they will bring to citizens. Citizens started to believe in the benefits

of a united Europe. In 2020, most citizens possess extensive 'digital skills' which enable them to cleverly use ICTs for strategic objectives. 'Citizen empowerment' means that the average citizen is very well informed. 'Our Europe' shows a remarkable shift towards a more coherent and homogeneous culture with regard to the construction and future of the European society. Although there are (still?) cultural differences between different countries and regions in Europe, a common interest in a united Europe is something which binds all European citizens.

Politics

The political structure in 2020 is characterised by *transparency and openness*. To not drown in huge bureaucracy, the demand for greater transparency translated into greater simplicity. There is a high level of political homogeneity. Most governments have been reduced to a small amount of Ministries, focusing on key societal issues. Many issues are now covered at the European level. All of this contributed to the simplicity and clarity of the political system. Self-regulation has in the first decade of the century shown to be to be a sign of weak government. The outsourcing of governmental tasks, including measures for self-regulation, has not been very successful. As a result the concept has devaluated and stronger government regulation was increasingly called for. By lowering the entry barriers for citizens to vote, participate and really become politically active, the 'level of democracy' has increased. In 2020 disparities between Eastern and Western Europe have levelled off.

Institutions

The [institutional](#) structure is mainly focused on simplicity and related to this *efficiency and effectiveness*. Government officials are being judged on how fast and well they can service their citizens and citizens have the opportunity to serve themselves if this is more effective. The institutional structure is as simple as possible due to the presence of much information about citizens *intelligent government* (or at least an *all-knowing government*) has come within reach. For better or worse people are less concerned with possible abuse of private information.

Economy

The motto for the European economy in 2020 is: "one market, one state". Market issues are no longer just taken care of by the market itself but are also subject to (new) political and legal measures. Due to the Europeanisation of the economy, national markets or economies play a far less important role than before. Economic growth is high because the coordination between the different parts of Europe has resulted in smooth trade flows between the members of the EU. The European economy is catching up with the Chinese and American economy. Due to greater homogeneousness consumer tastes are colliding; product differentiation is focusing on product lining and skinning. Establishing efficiency and economies of scope have become strong strategies for the future.

Technology

Technological innovation is fast paced in 2020. New scientific insights and technology are quickly transformed into innovations. Technological standards are mainly de facto standards created and pushed on the central European level developed in cooperation with Asian League countries. Due to the (cultural and political) integration within Europe, entrepreneurs face fewer uncertainties with regard to exploiting new knowledge and technology.

3.3.2 Scenario 2: WE, THE MARKET

Homogeneous culture and low citizen engagement

Society

In this society the private domain is by far the most important domain. The public sector is only important in as far as it enables the proper functioning of the private domain. Due to the successful rise of the ‘Asian Tigers’ in the first decade of the century, European economy was thrown in decline. This has led to a period of transformation in which pressure from the private sector resulted in a strong and one sided focus of government on primarily serving the growth of the European economy. Market thinking became the dominant force in determining the organization of European society. People cooperated gave up on privacy and social rights in the hope to find jobs. Governments and the market work closely together in service delivery. However, market domination is exacerbating socio-economic divides.

Politics

The three levels of the political domain (the legislative, the executive and the supervisory power) all are directed towards ‘keeping the system running’ and focus strongly on operational excellence and goals such as efficiency, effectiveness and productivity, and by doing so organising a public sector which stimulates competitiveness and economic growth. The entire political system has become a technocratic system. The transparency of governmental activities is ensured, but there is not much citizen interest in the results of the permanently monitored services. Politics has been drastically depoliticized. The democratic task of voting once every four to six years does not lead to fierce political debates. Voters are not offered enthusiastic and appealing visions on the future of Europe.

Institutions

The demarcation between the tasks and responsibilities of the public sector and of the private sector is the result of a long process. Government is now organized in market-oriented pillars, service delivery is one of the main and most important assets of government, at any governmental level (local, national, regional). The administration is highly automated. Privacy has become an eroded concept: ambient intelligence has become part and parcel of a modern, lean style government. Governments in Europe have embraced technocratic models of ‘good’ governance.

Economy

Both the private and the public sector are disciplined by the market. The public sector adopted the logic of the market place. Public tasks are largely outsourced to private players, who are perfecting customized, just in time service delivery based on semantic government and ambient intelligence (the ‘Google business model’) to those who can pay. The private sector is the driving force of society. Transnational cooperation is furthered by an increasingly aligned public sector system that promotes exchange of goods and people within Europe. The differences between ‘old’ and ‘new’ member states have vanished – due to a strict economic approach. This was a politically and socially painful process of adjustment the effects of which are still felt across Eastern Europe.

Technology

To promote a level playing field in the market and to avoid fragmentation of technology platforms as a result of low engagement of civil society (and SME’s), governments in Europe are strictly enforcing interoperability, standardisation and harmonisation. Now Europe has become world leading in

economic terms, it is also leading in a number of international standardisation organisations and is able to push its own innovative technology.

3.3.3 Scenario 3: MY COMMUNITY

Heterogeneous culture and high citizen engagement

Society

In this scenario the key characteristic of society is *diversity*. Over the years, cultural, religious and political opinions, values and lifestyles of citizens of EU Member states have increasingly differentiated. People are bonding together in small communities. There is a growing alienation and polarisation between groups of people with different cultural or political backgrounds. Pressure groups and social movements, mobilised through new networks gather around specific global cultural or political issues. Trust in government and in other state and non-state actors is low. Because the structure of society and governmental institutions is very complex, *transparency* is lacking and mechanisms of *accountability* are inadequate or arbitrary. The ever growing complexity and opaqueness of government practices makes that there is ample room for corruption. The position of Europe as a political- administrative construct has weakened considerably, while the position of local and regional communities has become more prominent and influential.

Politics

Many citizens are *engaged* in politics, driven only by the interest of the community they belong to. All kinds of single issue parties have emerged; the majority of the population is member of a political party or advocacy. The debate is focused on everyday life issues or questions that arise the cultural and religious diversity. The political systems of EU Member States have evolved into forms of *multi-party and coalition* systems. This heterogeneous constellation of single issue actors is provoked and perpetuated by dysfunctional or poorly performing national and European governments. Citizen groups and other non-state actors expect little from government and are pursuing their own interests. The European Union still exists but is considered to have limited political relevance. Governance is increasingly based on 'negotiation politics'.

Institutions

Governments have had to substantially *decentralise* their tasks and activities; municipalities have become key actors in the public arena. Municipalities have come to rely on civil society, businesses, non-profit organisations and other organisations in *networks* in the execution of traditional government tasks. Public and private tasks, personal and professional life and real and virtual activities are increasingly intertwined. Decision processes and processes of service delivery in the public sector are complicated and cumbersome, because of a continuous competition between stakeholders. As public data are dispersed among several stakeholders and are not structurally exchanged between involved actors, there is no real treat of *privacy* infringement in this scenario

Economy

The Economy is very dynamic; international trade has increasingly been replaced by local trade as investors and municipalities tend to invest in *regional businesses*. There is a general trend of break-up of large enterprises into small companies. These small companies work together with partners in loosely organised networks. All kind of small, grass root companies pop-up, which quickly build a strong position with user-centred innovation as a key asset. Business strategies focus on the development of highly personalised products and services. End users are themselves actively engaged in production, distribution and marketing. Products are localised, reflecting cultural values and tastes thereby enforcing the *identity* and norms of the community they target.

Technology

The technological trend is characterised by sophisticated *customisation* and *differentiation* as a result of user-centred innovation, a trend that flourishes in the second decade of the millennium. Emphasis is on diversity, not on standardisation. Technology is seen as an enabler for self-expression and socialisation rather than as means to increase efficiency and effectiveness. Citizens use virtual spaces and social software to create their own businesses and to organise pressure groups.

3.3.4 Scenario 4: ME, MYSELF AND I

Heterogeneous culture and low citizen engagement

Society

In 2020, society can be characterised as *passive, detached and indifferent*. People have learned to take care of their own business and leave each other the freedom and space to develop their own interests, opinions and tastes. This has resulted in a society that is *colourful* and diverse but that lacks solidarity. Confidence in public administration and big business is at an all time low. Fear of repercussions from an intrusive, corrupt state prevents citizens from engaging in political activities.

Politics

Politicians and citizens relationships are driven by a lack of trust in 2020. Citizens have lost faith in the ideas and actions and focus their attention on informal, local and non-state activities. Citizens fear government intruding their *private* sphere. Politicians make little effort to ensure that their policies and institutions are *transparent* and *open*. *Democratic participation* is very low. The result is a kind of 'minimal state' focusing on law enforcement, defence and security.

In 2020, there are cultural and economic differences between Eastern and Western Europe persist. Eastern countries have formally integrated but experience little support from the 'old' Western European countries have not done much effort to support them. Left to their own devices and with help of new technologies the Eastern European political establishment returned to a surveillance model of government to ensure that citizens do not undermine their power.

Institutions

Since the lines of communication between government and citizens are at best one way, the dream at the beginning of the 21st century of a *networked* and *intelligent* government degenerated to a government of intelligent control. Citizens resist revealing private matters to a government they consider nosy and ineffective.

Economy

The conventional growth of the economy in 2020 is low. Quality is preferred above quantity. Those companies that are able to provide a portfolio that is customized or *personalized*, or that give consumers the impression that it is customized, are preferred above companies that provide mass products and services. Small is beautiful. In this scenario, owning a business instead or alongside a regular job is a common occurrence.

Technology

Inline with the economic development, technological innovation is fragmented and slow. Standardization is mainly taking place through market forces since legislative bodies do not have sufficient support. Technology advances are largely limited to the domains of law enforcement and policing.

3.4 The influence of hot spots in the scenarios

Four distinct scenarios have been developed to provide a dynamic backdrop for the development of alternative visions on the future of eGovernment. The scenario drivers (axes) *homogenisation of European culture* and *civil engagement* derive from the superposition of uncertain and high impact trends identified and confirmed by a range of experts on eGovernment, ICTs and societal transformation. ICT driven *hot spots* of eGovernment development have been evaluated for each scenario. Their impact can chiefly be summarised as follows:

Table 9

Scenario	Characterisation	Explanation
Our Europe	Utopia	The consequences of the hot spots on this scenario create an interesting sphere for governments; they exert control, citizens have a balanced view on privacy; politics may seem in control but ample means of engagement for citizens and business ensure there is a healthy interaction on the key themes in society.
We, The Market	Background government	Market parties are in the lead; government is facilitator and needs to prove its legitimacy. The Google self-proclaimed stewardship of public data demonstrates the take-over by private parties of public concerns. In the name of economic growth and job security citizens endure interference in private matters and exclusion.
My Community	Fluid Government	Everything is in flux. Government co-operates with market parties, but each activity needs to be negotiated with changing stakeholder groups. There is a continuous threat that events determine the political agenda and block efficient governance.
Me, Myself and I	Government's Sweat shop	Even more than in the previous scenario, government has to express its legitimacy and has to counter the well-determined self-interest of the population. Politics is ending up in a one-to-one power game between public authorities and individual citizens or NGO's.

A convergence of cultures?

Although the drivers *homogenisation* and *civic engagement* are considered independent for the purpose of this study it can be argued that ICT enabled mobilisation of civil engagement *in itself* can drive societies towards greater cultural homogenization. This argument is put forward convincingly by the theory of memetics.¹⁰¹ Memetics claims that cultural expressions (ideas, music, beliefs called ‘memes’) are selected for when they are transmitted horizontally between (networked) communities. People tend to copy successful¹⁰² memes and discard unpopular ones. With *more opportunities* to exchange ideas in an increasingly connected world a *gradual convergence* on specific cultural expressions could occur. The global appeal of soap series, Big brother, SUVs and Jamie Oliver be the first signs of this process operating at a global scale. Here, the broad media exposure ensures their popularity and success. With the proliferation of the Internet and social software, more and more people in Europe and across the globe are exposed to one another’s ideas. Social networks such as MySpace and YouTube effectively promote successful ideas and opinions. The videos listed in the top ten of You Tube enjoy massive popularity. Similarly, in spite of the massive number of websites on the internet, most people regularly visit only 3 to 5 sites. These sites too exercise a great influence on popular culture. The bad news is a potential loss of cultural diversity. The good news is that with new social networks promoting ideas becomes inexpensive and thus open to larger audiences.

The homogenisation of culture is likewise promoted when *civic engagement* in the political process is leveraged through social networking. The increased interaction of eDemocracy sites like *Writetothem* and *HearfromThem* by MySociety¹⁰³ would, according to memetics, drive a convergence on selected opinions and ideas among members of the public and politicians. In the political process of 2020 citizens, civil society groups, public agencies, businesses and business organisations in Europe will have a battery of tools and networks at their disposal to float their views and opinions. Only the most successful (i.e. ‘best copied’) cultural expressions will survive this battle of ideas and a more homogenous landscape will gradually emerge. This process will be far from concluded by 2020 but as a result of it we may have a more, not less homogenous society at European level.

In a quick poll at the validation workshop in Brussels one-third of the 25 experts voted Our Europe as the most desirable if not the most probable scenario. Half of the experts voted My community (or the preferred version *My communities*) as the most desirable *and* the most probable.

Our Europe

Based on relatively certain trends such as aging and immigration combined with high impact ICT trends and the homogenization effect that ICTs purportedly have when leveraging engagement of citizens (and government and business) **Our Europe** could be considered the long term default vision. By 2020 differences between East, West and South Europe will have reduced; English will be the established second language of all. The sphere of influence of a more homogenous Europe is spreading to CIS countries. Diversity within countries will remain where it reflects age and intrinsic personal differences (youngsters, musicians, intellectuals, etc) but diversity ‘between’ countries, in terms of citizen culture but also in terms of modes of government and business practices will gradually diminish.

If it is a desirable future we need to take a close look at eGovernment in the **Our Europe** scenario. As the hot spots seem to propel this scenario forward we can expect quite dramatic advances in eGovernment over

¹⁰¹ For a detailed account of memetics see for instance ‘The Meme machine’, [Susan Blackmore](#), 1999. Memes are the cultural equivalent of genes. Memetics applies the principles of evolution to cultural concepts (‘memes’) such as nursery rhymes and religion. There is a growing consensus among leading scientists that it provides a useful way of looking at the evolution of culture.

¹⁰² A successful meme (idea) is easy to copy accurately, relatively long lasting (sticky) and attaches itself to popular people in the community (writers, artists, politicians). E.g. Beckhams haircut but also supporting the Irak war in the US after 9/11.

¹⁰³ MySociety is the organization behind writetothem.com and hearfromyourmp.com

the coming 15 years. Although the general direction of eGovernment evolution – towards greater transparency and accountability for example - is not surprising, the *speed* of evolution could be. By 2020 the concept of transparency will be radically different from what it is today. *Extreme transparency* and *extreme accountability* will present new opportunities and challenges to governments (and citizens and business) in 2020.

The table below illustrates a few of these potential new ‘eGovernment’ challenges and opportunities for Our Europe in 2020.

Table 10

Hot spots	Purpose & Field	Key Technologies
Transparency	In 2020 it will be extremely difficult for government to hide from citizens. Highly networked individuals and action groups empowered with personal media tools can quickly expose any government operation. Ambient government is in an arms race with netizens. This may provoke risk-averse behaviour in governments stifling further public sector innovation.	Personal Mobile Video casting. Community operated sensor networks.
Accountability	Extreme accountability will be shadow of extreme transparency. Accountability will become implicit in and across government operations. The challenge is to balance flexibility in projects and operations with this increased accountability.	Nextgen Intelligent Workflow Systems. Evolving ISO standards.
Enforcement	It is unavoidable with the proliferation of electronic networks and navigation technology that in 2020 all European citizens are traceable 24/7. All this information can and will be mined anonymously for endorsed uses in line with the EU privacy acts. Individual offenders can be traced only by citizen-audited enforcement agencies. One example, with real-time vehicle monitoring, speed and traffic violations are history.	GPS 2.0, biometrics, RFID. Wearable ICTs.
Privacy/Ethics	All eGov and business systems are designed around Data sharing directives agreed at EU level. Intelligent devices signal privacy incompatibilities when exchanging bio-data. Highly sensitive genetic information is the subject of new EU directives.	Biometrics. Biotechnology.
Countervailing powers	Government will receive extremely fine-grained, geographically specific feedback on all its actions from all stakeholders. A kind of continuous referendum on key issues could emerge.	Sensor networks, Ambient Technologies. Mobile platforms
Networked G.	In 2020 each eGov department will amass a massive amount of dynamic data on their sector. To ensure concerted action there will be a great need for common pools of knowledge and consistent interpretation across all spheres of government.	Artificial intelligence, the semantic web.
Intelligent G.	The relevance of traditional learning systems will come under threat as pervasive gaming scenarios mix reality with virtual environments. Education systems will have to be overhauled to ensure European education stays on par with Asian education.	Pervasive and Alternative Reality gaming. Serious gaming. intelligent Agents.

The other three scenarios present equally possible futures but seem more dependent on external or singular events such as a wave of terrorism, sudden manifestations of global warming or the breakdown of good government in response for instance to separatist movements. Such events will undermine the process

towards a homogenous Europe as their impact will differ from region to region and from country to country. Barring cataclysmic events these effects would be profound but temporary. Hot spots in these scenarios will drive eGovernment away from EU goals such as the Lisbon i2010 objectives on Inclusion, Growth and Competitiveness.

Me Myself and I

The Me, Myself and I scenario is characterised by low engagement and high diversity. This is inline with the expectations of memetics. Low engagement of civil society will drive a polarization of opinions and a general attitude of minding your own business. There is little room for consensus building and a general distrust among all actors in society emerges. This scenario runs counter to what we would expect in an increasingly networked European community. Society has gone awry, something must have happened. Maybe governments started to dominate the new networks thereby provoking a sense of distrust among the general public. Excessive control of the new networks could also have been prompted by a wave of terrorism facilitated by new technologies. Non-state actors active in global terrorism succeeded in destabilizing global markets. Citizens and business have grown wary of exposing themselves and limit their activities and political discourse to the local community. The table below illustrates what the impact of these developments would be on eGovernment in this scenario.

Table 11

Hot spots	Purpose & Field	Key Technologies
Transparency	In 2020 it will be extremely difficult for citizens to hide from government. The fear of destabilizing acts of terrorism has driven citizens in a corner. eGovernment largely serves central government. Bottom-up innovation is absent. Even big business is reigned in. International actors are under close scrutiny. Business complies out of fear for market manipulation by non-state actors active in terrorism	Government operated sensor networks. Biometrics, Genetic profiling. GPS 2.0
Accountability	Security has become the excuse for a lack of accountability. The challenge is to balance flexibility in projects and operations with this increased accountability.	Nextgen Intelligent Workflow Systems.
Enforcement	Citizens have lost the arms race with ambient government. They try to hide their operations with cryptography technology released by a largely underground open source community. Many national laws now endorse the use of advanced genetic profiling databases and the real time monitoring of citizens to facilitate terrorism investigations.	GPS 2.0, biometrics, RFID. Cryptography.
Privacy/Ethics	Privacy is increasingly sacrificed for security. Supported by a battery of new legislation highly networked and intelligent government keeps a tab on every citizen. Citizens groups go underground and organize in small groups using highly advanced cryptography to protect their movements. Government has outlawed the use of strong cryptography but new ways of circumventing these keep on coming.	Biometrics. Biotechnology. Cryptography
Countervailing powers	Loosely organised networks of non-state actors succeed in manipulating global markets. Government now collects extremely fine-grained, geographically specific information on all stakeholders. New EU legislation allows monitoring suspect group behaviour across the EU. Business cooperates out of fear for global market contractions.	Sensor networks, Ambient Technologies. Mobile platforms
Networked G.	In 2020 each eGovernment department will amass a massive amount of dynamic data on civil society and business. To ensure concerted action there will be a great need for common pools of knowledge and consistent interpretation across all spheres of government.	Artificial intelligence, the semantic web.
Intelligent G.	A contracting European economy threatens the public sector services. EGovernment services limit themselves to administration and intelligence. Citizens comply out of fear for intelligent agents and intelligent profiling. They are extremely wary of openly organising themselves.	Serious gaming, intelligent agents. AI. Ambient Technologies

The final two scenarios ‘We the Market’ and ‘My community’ do not reflect the suggested correlation between engagement and cultural diversity. These scenarios may correspond to non-steady state situations imposed by extreme external developments.

In ‘We the Market’ engagement is low which seems at odds with increased engagement through proliferating new social networks. In spite of low engagement, culture is relatively homogenous. Instead of the result of societal trends this could be externally imposed. The European economy lost the battle of competitiveness to the Asian economies in particular China. The EU has passed far reaching legislation to restart the economy. Government is enacting and enforcing market oriented policies that promote business, sacrificing many collective benefits in the process. When the dust settles the EU economy is picking up again but citizens have paid the toll by relinquishing their say in political processes in order to hang on to their jobs. Government and the public sector have been hammered too and a great divide between rich and poor threatens to undermine the homogenous market inspired culture.

Table 12

Hot spots	Purpose & Field	Key Technologies
Transparency	In 2020 small eGovernment largely serves business. It is easy for business to operate across the EU. Regulation is reduced or harmonized to promote business. Pan European e-services primarily benefit e-business.	Government operated sensor networks. Biometrics, Genetic profiling. GPS 2.0
Accountability	Government accountability is relatively high as it learns to operate in a lean and business like manner. Business infiltrates government which is a further threat to citizens. Business exercise control over their employees. No job no singsong.	Nextgen Intelligent Workflow Systems.
Enforcement	Business uses government to protect their interests often over the backs of citizens. Video surveillance is wide spread.	GPS 2.0, biometrics, RFID. Cryptography.
Privacy/Ethics	Privacy is increasingly sacrificed to allow maximum freedom to business. Government has outlawed the use of strong cryptography.	Biometrics. Biotechnology. Cryptography
Countervailing powers	The power of civil society groups to scrutinise business is curbed in new EU and national regulation. Businesses can sue activist groups if their image is tarnished. Worse the existence of many of these groups now relies on online business banners.	New Media. Advertising 2.0 Mobile platforms
Networked G.	Information collected under new laws by networked government is made available to business for real time market modelling and to screen new employees	Artificial intelligence, the semantic web. Genetic profiling
Intelligent G.	A contracting European economy threatens the public sector services. eGovernment services limit themselves to administration and intelligence.	Serious gaming, intelligent Agents. AI. Ambient Technologies

The ‘My Community’ or My Communities scenario appealed to many experts in the validation workshop. In My Communities high engagement is mobilised and stimulated by the now ubiquitous new social networks. However, the increased interaction and exposure does not translate to a stable convergence of cultural manifestations. Instead European Societies are in a flux due to the onslaught of internal (between states) and global influences and the accelerating pace of innovation in social technologies. New concepts and technologies are succeeding one another very rapidly creating short term behaviour. Ideas burst onto the scene, are instantly popular (convergence) creating massive communities but then die out and are succeeded as quickly as they came. The interactions between civil society and government are too

ephemeral to result in a common converging culture. Anyone can be king for a day. Politics is extremely short term and polarized. Businesses come and go. Government can not keep up with developments in the global market. Momentum is with small business, local initiatives and even individuals (virtual kings and queens). There are no signs that things are letting up and societies slowly spiral out of (government) control. The days of traditional government are numbered.

Table 13

Hot spots	Purpose & Field	Key Technologies
Transparency	In 2020 government is becoming side note to online citizens culture. Highly networked individuals and action groups mesh with business to dominate traditional government domains. Government can not keep up and is increasingly exposed and vulnerable. Citizens effortlessly act out business and government roles. The distinctions are blurring.	Personal Mobile Video casting. Community and business operated sensor networks.
Accountability	Government influence and budget is shrinking. Accountability is less of an issue. Working in government has an increasingly bad image. Accountability is falling as attention turns away from government expenditure. This only reinforces the lack of trust in government.	None
Enforcement	This is the only domain left for government even though successful online security firms take over many traditional government functions. The judiciary and police operated relatively autonomously much to the discomfort of citizens. This feeds a growing distrust of government.	GPS 2.0, biometrics, RFID.
Privacy/Ethics	Government has lost the battle of privacy. New cryptography technologies make it easy to scramble and disrupt aging ambient government technologies.	Cryptography, Ambient technology
Countervailing powers	Small collectives of loosely organised non-state actors muster power beyond the control of government. However, their power depends on widely dispersed communities that support them. These communities spring up and die out making most collectives rather short-lived.	Mobile platforms, Semantic Web. Online gaming. Alternative reality.
Networked G.	In 2020 each eGov department will amass a massive amount of dynamic data on civil society and business. To ensure concerted action there will be a great need for common pools of knowledge and consistent interpretation across all spheres of government.	Artificial intelligence, the semantic web.
Intelligent G.	A contracting European economy threatens the public sector services. eGovernment services limit themselves to administration and intelligence. Citizens comply out of fear for intelligent agents and intelligent profiling. They are extremely wary of openly organizing themselves.	Serious gaming. Intelligent Agents. AI. Ambient Technologies

The scenarios Our Europe and My Communities are considered most relevant by the experts in the validation workshop. In both scenarios the transparency related hot spots (transparency, accountability, enforcement, privacy) play a key role. The balance of transparency between *netizens* and *eGovernment* could be a marker for how the two scenarios play out in different European regions. The government remains in control in Our Europe, while in My community its role is undermined as a result of advanced eParticipation. In My community the role of a *Networked* and *Intelligent Government* is in the end less relevant. In We the Market, business controls government and as a result privacy, enforcement and accountability hot spots are prominent. Finally, in Me, Myself and I, the individual takes over from the communities in an extreme form of *My Community*. The networked and intelligent government is driving individuals away from participation. Here, *Privacy*, *Enforcement* and the *Networked Government* are key hot spots.

4 Measuring Impact

4.1 The current context of eGovernment impact measurement

4.1.1 General context

In many developed countries to date, eGovernment has tended to enjoy a healthy level of political and financial support. This has been particularly because of the expectation that considerable cost savings can be made as part of public sector efficiency programmes, but also increasingly in recent years because of the perceived benefits for citizens and businesses and the support eGovernment can give to wider public policy impacts. However, it is only recently that the need to incorporate measurement and monitoring in eGovernment planning, implementation and policy evaluation has come to the fore, together with a change of emphasis from measuring eGovernment roll-out to a focus on benefits realisation. These benefits are seen as comprising two main types:¹⁰⁴

- Benefits for government itself, which are primarily based around efficiency gains obtained by ICT (internal process efficiency benefits).
- Benefits for users, for example citizens and businesses and wider society (external service/policy delivery benefits).

It has recently also been realised that it is important to be explicit about why impact measurement in eGovernment is being undertaken, i.e. whether its purpose is:¹⁰⁵

- a) retrospective achievement: letting policy makers know in comparative terms how their country or agency has performed in some eGovernment ranking
- b) prospective direction/priorities: assisting policy makers with strategic decision making about eGovernment. For some studies, prospective guidance may be more at the tactical level of individual eGovernment projects, for example, offering lessons learned or best practices for such projects
- c) accountability to citizens and civil society organisations: enabling governments and agencies to be held to account for the resources they have invested in eGovernment. Ministries of Finance may share an interest in this purpose. eGovernment officials may have their own purpose in using benchmarking in order to politically justify their investments.

Specifically, Heeks¹⁰⁶ stresses the importance of consciously linking eGovernment impact measurement to the policy lifecycle, as this clarifies both the need for it and the means of doing it:

- For policy makers entering the awareness stage, the demand might simply be for help in understanding what eGovernment is.
- For policy makers at the agenda-setting stage, demand might come more from those seeking to encourage adoption of eGovernment onto the policy agenda, focusing on the carrot of good news/benefits stories and the stick of poor comparative benchmark performance.

¹⁰⁴ Foley, P. (2005) *The real benefits, beneficiaries and value of eGovernment*, Public Money and Management, January 2005, CIPFA; Millard, J. and Shahin, J. et al (2006) "Towards the eGovernment vision for EU in 2010: research policy challenges", for the Institute of Prospective Technological Studies, Seville, Spain, European Commission, DG JRC, April 2006; Heeks, R. (2006) *Understanding and measuring eGovernment: international benchmarking studies*, Paper prepared for UNDESA workshop, "E-Participation and E-Government: Understanding the Present and Creating the Future", Budapest, Hungary, 27-28 July 2006.

¹⁰⁵ Heeks, R. (2006) *Understanding and measuring eGovernment: international benchmarking studies*, Paper prepared for UNDESA workshop, "E-Participation and E-Government: Understanding the Present and Creating the Future", Budapest, Hungary, 27-28 July 2006.

¹⁰⁶ Heeks, R. (2006) *Understanding and measuring eGovernment: international benchmarking studies*, Paper prepared for UNDESA workshop, "E-Participation and E-Government: Understanding the Present and Creating the Future", Budapest, Hungary, 27-28 July 2006.

- At the policy preparation stage, policy makers will likely demand an understanding of alternatives and priorities, comparisons with other countries and best/worst practices.
- Finally, at the evaluation stage, they may demand both comparative performance data and the reasons behind that comparative performance in order to move to learning.

A number of current measures of eGovernment and eGovernment impact are in use. At a global level the United Nations has developed an eGovernment Readiness Index, as opposed to an impact measurement approach, in order to take specific account of all countries including developing nations, many of which have only recently embarked on eGovernment programmes.¹⁰⁷ This index presents the state of eGovernment readiness using a composite measurement of the capacity and willingness of countries to use eGovernment for ICT-led development. Along with an assessment of the website development patterns in a country, the eGovernment readiness index incorporates the access characteristics, such as the infrastructure and educational levels, to reflect how a country is using information technologies to promote access and inclusion of its people. The measurement of eGovernment is an assessment of a state's use of internet and the World Wide Web (WWW) for provision of information, products and services; plus the level of telecommunication and human capital infrastructure development in a country. There are also a large number of examples of individual countries and companies measuring eGovernment, mainly in North America, Australasia and Europe.¹⁰⁸

Despite these developments, however, there remain at least three main challenges yet to be met by most eGovernment impact measurements to date:¹⁰⁹

1. Despite the search for cost savings, they often ignore the costs of online service provision. A cost-effective strategy would concentrate on introducing services where the greatest benefits and/or savings (or revenues) can be made. It may not be cost effective to provide some services online, or it may only be sensible to do so when sufficient users are forecast to use the eGovernment service. Without robustly calculated costs and benefits, eGovernment implementers will find it increasingly difficult to obtain political and public support. The priorities of government agencies and departments will differ, but sound evaluation (after investing in ICT) and business case (prior to investment) studies of the impact of eGovernment will enable policy-makers to compare benefits alongside other demands for public funds. Better measurement and evaluation will also highlight where efficiency gains or expenditure savings have been made. This will enable resources to be reallocated and it will be possible to share elements of good practice.
2. They tend to focus on the visible interface with users and to neglect more complex back-office changes, which could be significant in improving service quality or efficiency. Most eGovernment measurement still focuses on defining input/output indicators which, on their own, provide a picture which is too static and too limited, without properly capturing transformation processes and the outcomes of transformation. The difficulty in properly addressing transformation is the dynamic nature of processes. How can a quantitative measure properly capture an amorphous change in a set of features of the public sector? This difficulty is compounded when addressing an area such as eGovernment where very few experiences exist on relevant indicators describing and measuring development. Traditional statistics collected over the years by Eurostat and the OECD focus primarily on existing and available indicators for e.g. Internet and broadband penetration, number of services, portals, web sites, etc. None of these indicators have been able to properly capture transitions due to processes, and how they impact outcomes. This remains a largely unresolved challenge.

¹⁰⁷ United Nations (2005) Global eGovernment readiness report 2005: from eGovernment to eInclusion, United Nations, New York, 2005.

¹⁰⁸ For an overview see http://www.rso.it/notizie/Measurement_Framework_Compndium.pdf

¹⁰⁹ Foley, P. (2005) *The real benefits, beneficiaries and value of eGovernment*, Public Money and Management, January 2005, CIPFA; OECD (2005), *eGovernment for Better Government*, Organisation for Economic Co-operation and Development, Paris, 2005; OECD (2006), *eGovernment as a tool for transformation*, Organisation for Economic Co-operation and Development, Paris, 26-27 October, 2006; Millard, J. and Shahin, J. et al (2006) "Towards the eGovernment vision for EU in 2010: research policy challenges", for the Institute of Prospective Technological Studies, Seville, Spain, European Commission, DG JRC, April 2006;

3. They do not explicitly or clearly articulate the links between eGovernment and high level policy goals, nor justify the use of eGovernment in terms of how it can support and promote societal benefits and the public value of good governance.

4.1.2 *European context*

Up to the mid-2000s, most eGovernment benchmarking, including that sponsored by the European Commission (EC), was focused on measuring the supply side roll-out of eGovernment services. This is exemplified by the EC's benchmarking of online availability of 20 standard services across EU25 and their online sophistication, i.e. whether the service permits one-way or two-way interaction and/or transaction, including for example digital signatures and financial payments.¹¹⁰

However, the focus of attention has shifted dramatically over the last year to one of service use and take-up rather than only availability. New 'disruptive technologies' have emerged, such as intelligent agents, semantic web, web 2.0, and ambient intelligence, and new interfaces have become important, including interactive digital as well as mobile TV and advanced mobile interfaces. Issues surrounding multi-channel service delivery have also come to the fore, focusing not only on advanced ICT but also on how these interact with, and complement, more traditional channels like face-to-face, post and telephone call centres.¹¹¹

These advanced technologies and channel mixes can differentiate services and delivery to meet very specific user needs and diversity, providing them with the possibility of switching channels at appropriate points according to who they are, their changing needs and situation, and the specific task in hand. Other developments, like transformation of back-offices, the move to joined-up and seamless services, and the increasing emphasis on both public-private and public-civil partnerships all along the eService value chain (design, production and delivery), have also changed the focus of eGovernment and thus of how it should be measured. One proposal for an overall measurement model to accommodate these developments is illustrated in the figure below.

This emphasises that the specifics of a nation, a region or a local environment, should be taken into consideration by studying 'the structural landscape'. A readiness assessment for eGovernment programmes (national, local, organisational) should cover different technical and organisational building blocks, and outputs should be measured as combinations of supply indicators (availability, accessibility, etc.), organisational indicators (process redesign, data streamlining etc.), as well as use and impact indicators.

¹¹⁰ CapGemini (2006) *Online Availability of Public Services: How is Europe Progressing?* European Commission: Brussels, June 2006.

¹¹¹ Millard, J (2006a) *eGovernment for an inclusive society: flexi-channelling and social intermediaries*, International EGOV Conference 2006, DEXA, Krakow (Poland), 4-8 September, 2006.

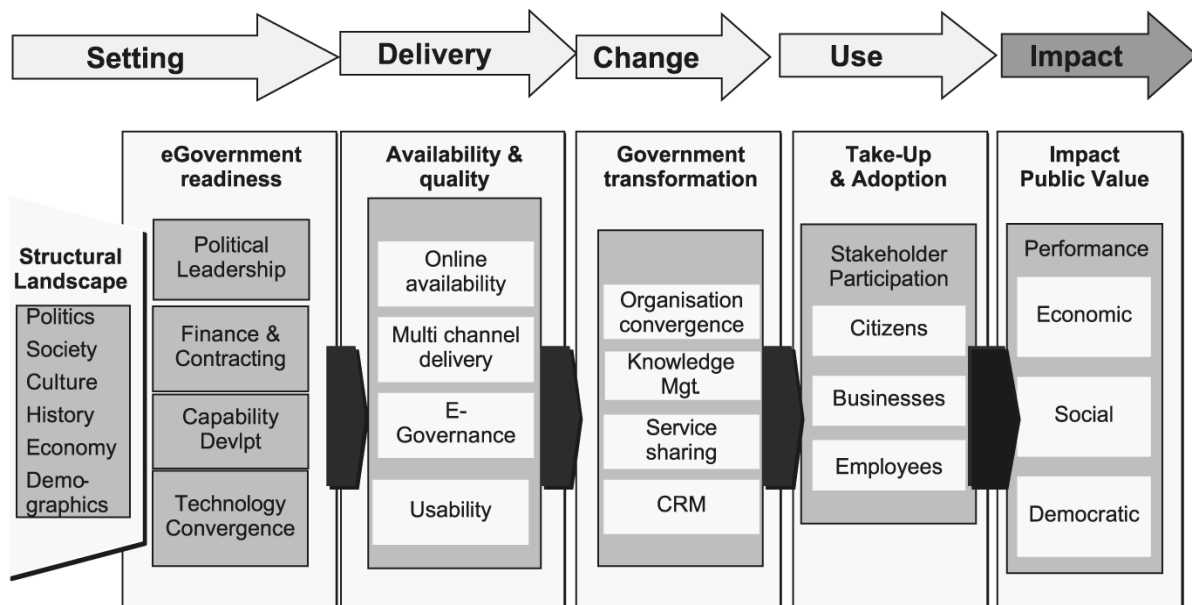


Figure 3: Holistic Measurement Model (Source: Cap Gemini)

Thus, as eGovernment services have transformed and new ways of measuring them have started to emerge, the EC's original supply-side oriented measurement framework is being examined to see how it should be adapted. The EC's 2003 eGovernment Communication¹¹² underlined "the need for further research into the economics of eGovernment, for a better understanding of costs and assessment of benefits and performances", and commissioned the eGEP study¹¹³ to develop a measurement model based on existing impact measurement approaches and as a tool for performance measurement on a programme and organisational level. This study has recently proposed an eGovernment Measurement Framework Model built around the three value drivers of efficiency, democracy, and effectiveness, and elaborated in such a way to produce a multidimensional assessment of the public value potentially generated by eGovernment, not limited only to the strictly quantitative financial impact, but fully including also more qualitative impacts. (See figure below.)

¹¹² European Commission (2003) 'The role of eGovernment for Europe's future' Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, Brussels, 26.9.2003, COM(2003) 567 Final.

¹¹³ eGEP (eGovernment Economics Project) Measurement Framework Final Version (April 2006): http://www.rso.it/notizie/D.2.4_Measurement_Framework_final_version.pdf.

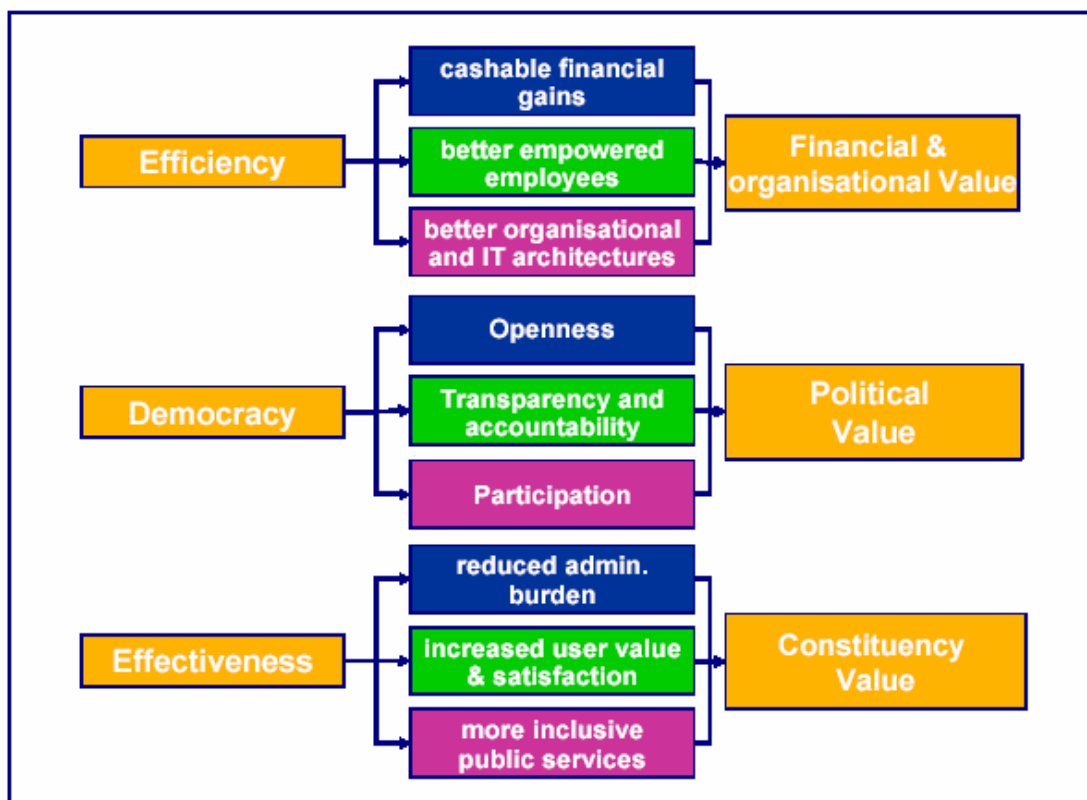


Figure 4: eGEP Measurement Framework Analytical Model

During the last six months, a new i2010 eGovernment measurement framework, endorsed by the EC and Member States in April 2006, has been developed for piloting in 2007 and roll-out in 2008, consisting of three main types of indicator:

1. availability and sophistication indicators (existing supply-side indicators supplemented with qualitative supply indicators focusing on user-centricity)
2. take-up indicators from the Eurostat Household and Enterprises surveys monitor¹¹⁴
3. impact indicators in terms of efficiency, effectiveness and democracy.

The new framework is also specifically designed to measure the five policy objectives of the eGovernment Action Plan:¹¹⁵

- No citizen left behind
- ii) Making efficiency and effectiveness a reality (this objective also includes measures for benchmarking and sharing)
- iii) Implementing high-impact key services
- iv) Putting key enablers in place
- v) Strengthening participation and democratic decision-making

Thus, new specific indicators are as shown in the following table.¹¹⁶

¹¹⁴ Eurostat (2005) e-Government 2004: internet based interaction with European businesses and citizens, Catalogue number: KS-NP-05-035-EN-N: http://epp.eurostat.cec.eu.int/cache/TY_OFFPUB/KS-NP-05-035/EN/KS-NP-05-035-EN.PDF

¹¹⁵ European Commission (2006) i2010 eGovernment Action Plan: Accelerating eGovernment in Europe for the Benefit of All, Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, COM(2006) 173 final, Brussels, 25 April 2006

¹¹⁶ From a presentation by Juan Arregui McGullion, DG INFSO, 28 June 2006, Brussels.

Table 14

1.1 Usage of eGov services by socially disadvantaged groups	3.1. % of public procurement (tenders) above the EU threshold <u>available</u> electronically
1.2. Public websites degree of compliance with international accessibility standards	3.2. % of public procurement above the EU threshold <u>carried out</u> electronically
2.1. User satisfaction with eGov services	4.1. (a) Number of transactional public services with legally binding eID and ((b) with mutually recognized eID within the EU and/or nationally)
2.2. Amount of information requested from citizens and businesses	5.1. e-Participation sophistication index
2.3. Number of transactional services fully completed online (net, SMS, Digital TV, kiosks) or automatically	5.2 Number of unique users of online forums

In addition, a user-centric complex indicator will be piloted in 2007:

Table 15

Convenience	How many data fields in form for transactional services?
Multiplatform	Are alternative delivery channels listed and explained?
Tracking and tracing	Is there a tracking and tracing system listed and explained?
Multilanguage	Is the national portal completely available in the different MS languages and at least for 75% in another EU language and in the language of the most important foreign community?
Integration	How many basic services are accessible through the national portal?
Accessibility / inclusion	Are sites compliant with international accessibility standards?
Support and mediation	Are there mediation services: are help-functionalities offered or resources available to help the citizen or business with this service?

4.1.3 Generic evaluation issues

The figure below shows the main elements of a generic policy evaluation system.

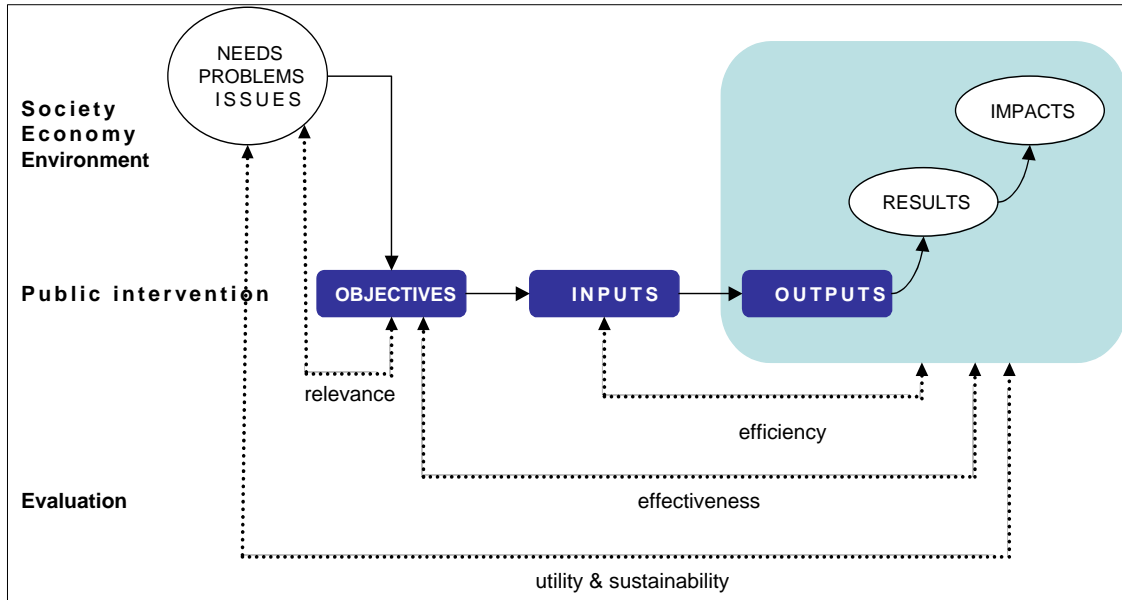


Figure 5: Key generic evaluation issues (Source: European Commission, 2000¹¹⁷)

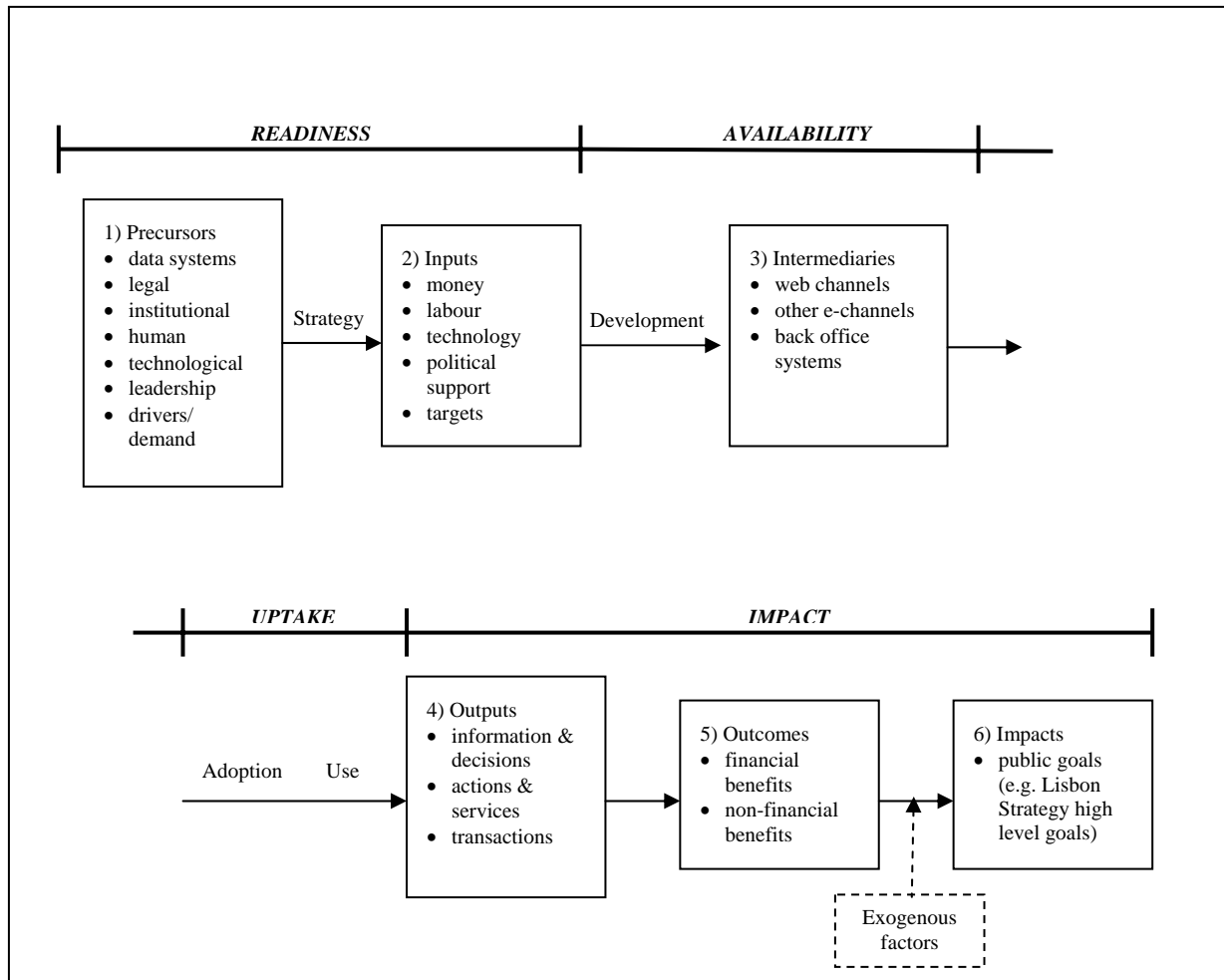
First, how the objectives of a given policy need to be derived from identified needs or problems, and evaluated for relevance. Next, how the objectives need to be translated in terms of inputs and activities using those inputs (though activities are not shown in the figure), which should then result in a set of outputs. Further, the efficiency of the policy can be assessed by relating the outputs produced to the inputs and activities employed. In addition, outputs should themselves lead to results and impacts, and the latter should then be evaluated against the original objectives to determine the policy's effectiveness. Finally, the overall utility and sustainability of the policy's impacts can be related back to the needs originally identified.

This is a useful overview in identifying key elements but is, on its own, not easily operationalised. A specifically eGovernment and more operational approach, based on the value chain of how eGovernment turns inputs into impacts, was illustrated by Heeks:¹¹⁸

¹¹⁷ European Commission (2000) "The new programming period 2000-2006: methodological working papers", Working Paper 3, "Indicators for monitoring and evaluation: an indicative methodology", DG Regional Policy, European Commission, Brussels.

¹¹⁸ Heeks, R. (2006) *Understanding and measuring eGovernment: international benchmarking studies*, Paper prepared for UNDESA workshop, "E-Participation and E-Government: Understanding the Present and Creating the Future", Budapest, Hungary, 27-28 July 2006. Note, for comparison purposes, some of the terms used by Heeks have been adjusted.

Figure 6: eGovernment value chain (Source: Heeks, 2006)



Heeks' approach takes elements from the standard method for developing and measuring policy impacts, i.e. through the levels of the LFA (Logical Framework Approach):¹¹⁹

1. Inputs (resources) used by activities (process, implementation), leading to
2. Outputs, which should meet so-called operational objectives, leading to
3. Outcomes (termed 'results' in some nomenclature systems), which should meet so-called specific objectives, leading to
4. Impacts, which should meet so-called general objectives.

The essence of this approach, also mentioned by Heeks with his inclusion of 'exogenous factors' between outcomes and impacts, is that to successfully proceed along the value-chain, various assumptions about the external world must be satisfied, each of which is also dependent on the amount of control exercised on this external world by the actors concerned. Basically, the number of important assumptions increases and the amount of control decreases along the value chain from inputs to impacts. There can also be feedback loops, but the basic model appears sound and has often been successfully applied in practice.

4.2 A new type of measurement framework tool

In order to capitalise on these recent developments, but also to address the challenges remaining, a new type of measurement tool for eGovernment is proposed which is future-oriented (i.e. takes account of likely future transformations and new demands on eGovernment) as well as operational. It derives largely from

¹¹⁹ Also used by McDonald & Teather (2002) in the context of S&T performance measurement.

the proposal made by Millard & Shahin,¹²⁰ although many aspects have been practised in other domains, and, in fact, it draws heavily on the impact assessment guidelines used by the European Commission,¹²¹ as well as sharing some elements of the approach proposed by Heeks.¹²²

For the task in hand, the specific objectives of this proposed framework are to:

1. Facilitate measurement, by identifying steps or levels of ICT use so that they are operationally amenable to measurement. Without this, there is no conceptualisation of different types or levels of impacts or of the difficulties of measurement, and no idea of any causality of the impacts being measured.
2. Be policy relevant, by explicitly linking these levels to high level policy goals through one or more intervention logics which attempt to show the connection between ICT use and desired impacts. This also serves to stress that measurement is not an end in itself and must have a purpose, and that this purpose must be made explicit. It shows that it is not the actual measurement score itself which is important but how and why the score was produced, i.e. there is a need to focus on what lies behind the score. In fact impact measurement loses its purpose if there is no clear understanding of how the various combinations of factors have produced the impact.
3. Take direct account not only of factors over which eGovernment policy makers and practitioners have control, but also of 'externalities' over which they have little or no control given that these can be significant in determining whether or not high level policy impacts are, in fact, achieved.
4. Understand for whom the measurement is for and how it will be used. For example, impact measurements are likely to be very different and used in different ways by:
 - policy makers (e.g. for designing and implementing policy and in which policy interventions to invest)
 - researchers (e.g. theorising and empirically testing public sector change)
 - practitioners (e.g. for understanding how to change public sector processes)
 - citizens and businesses (e.g. which school or hospital to choose or which region to invest in)

A diagram showing the main parts of the proposed new measurement framework, designed to meet these objectives, is shown below. It consists of a base level supporting three objectives levels, each of which contributes to the level above through an intervention logic. The uppermost level (level 3 in the diagram) consists of high level societal policy goals to which (e)government is designed to contribute.

The objectives levels in the diagram show factors over which the eGovernment policy maker has some control (although this decreases upwards through the levels) and which should be specified and measured. However, there are also two types of so-called externalities over which the policy maker has no direct control but which can be very important in moving successfully from lower to upper levels along the intervention logic, and which should therefore also be specified and measured:

- i) Disturbances resulting from other actions or policies which are necessary to meet the objectives, but which are not in place or unsuccessful. Other policies could also work against the eGovernment objectives. For example, policies related to economic development, infrastructure, education and training, policies by other economic sectors, actions by consumers, civil society, etc.
- ii) Missing the next level, due to the fact that structural or other factors are not in place or are not conducive. For example, legal, institutional and financial frameworks, the wider socio-economic and cultural environment, etc.

¹²⁰ Millard, J. and Shahin, J. et al (2006) "Towards the eGovernment vision for EU in 2010: research policy challenges", for the Institute of Prospective Technological Studies, Seville, Spain, European Commission, DG JRC, April 2006.

¹²¹ European Commission (2005b), Impact assessment guidelines, SEC(2005)XXX, 8 June 2005..

¹²² Heeks, R. (2006) *Understanding and measuring eGovernment: international benchmarking studies*, Paper prepared for UNDESA workshop, "E-Participation and E-Government: Understanding the Present and Creating the Future", Budapest, Hungary, 27-28 July 2006.

4.3 Applying the measurement tool to the hot spots

In this section, the proposed impact measurement tool is applied in turn to each of the hot spots from Task 3 of the present study. Although there is not space here to fully develop the framework, specific features are illustrated by concrete examples. The framework nevertheless remains important as a way of conceptualising, developing and operationalising impact measurement, and thus serves here to explain and justify the derivation and types of examples given.

An important point to note is that this measurement framework is both a conceptualising and operational tool. It provides a comprehensive framework for conceptualising policy development and implementation, and the role of impact measurement as part of this. It shows that impact measurement is not a separate add-on after the fact of policy making. At base, the framework provides a checklist for understanding policy impacts and how they can be measured. By articulating the framework, a fuller understanding is achieved of what is being measured and why, as well as of the operational difficulties of measurement which may mean that actual measurement must take short cuts, be ‘quick and somewhat dirty’ and be affordable. Conceptualising the components of the framework in this way also allows the caveats and risks of making any compromises in measurement to be made transparent, so that a judgement can be made about whether or not the value and usefulness of measurement is undermined. This, in turn, enables an acceptable trade-off to be found between the cost of ease of measurement, on the one hand, with its value and usefulness on the other. It thus changes the mindset and appreciation of those undertaking and interpreting impact measurement, even if the whole framework is not operationalised whether for reasons of cost or operational difficulty.

Levels of policy objectives and measurement (source: Millard & Shahin, 2006)

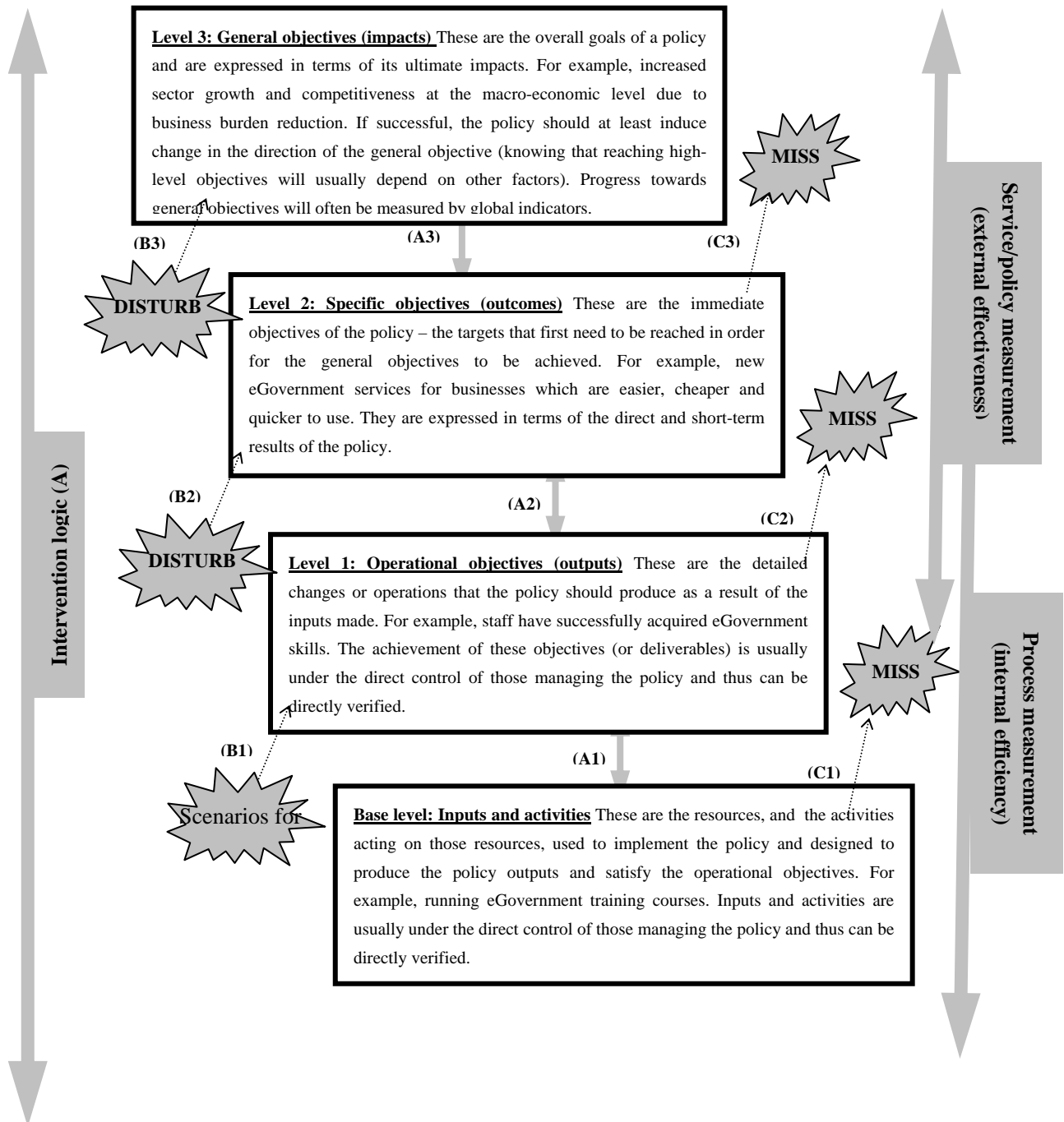


Figure 7: Levels of policy objectives and measurement

The following initial analysis of each hot spot focuses on two aspects. First, mapping the hot spot description to the framework, so that each level is clearly seen in logical progression. This dissection of the hot spot is useful in conceptualising the direction of causality and the types of impacts sought moving upwards through the levels. It is thus a powerful aid to understanding and provides a check on the overall coherence and argument of the hot spot. The hot spot texts themselves in Task 3 constitute the intervention logics, and, although they will not be re-visited here, this mapping exercise could be used to iteratively improve hot spot description and analysis. Second, some concrete examples are provided of the types of indicators which could be useful at level 2 in the framework diagram, as this is where the main hot spot themes are located. The importance of these examples is not to show fully operationalised indicators

(which can be done through standard procedures which do not need to be discussed here), but to provide a concrete indication of what could be measured.

4.3.1 *Transparency provoking change*

The components of the measurement levels for the “transparency provoking change” hot spot are shown in the matrix below. Positioning transparency as a desired outcome at the specific objectives level shows that it is typically accompanied by a large number of other specific objectives which directly support it, are complemented by it, and which cannot easily be separated from it. Without them, it is difficult to envisage a robust system of transparency. Thus attempting to isolate the specific role of transparency, however defined, is probably not useful, but rather it needs to be seen within the context of the other specific objectives shown in the matrix. A ‘transparency index’ composed of many of these objectives is therefore proposed, consisting of a suitable weighted combination of the following indicators per case, system or jurisdiction:

- Information type: the % of relevant information available electronically:
 - legal and regulatory
 - procedures to be following
 - clear and published lines of responsibility for each procedure or step, including when and by whom decisions are taken (precisely stated with ability for direct contact)
 - case history to date
- Information availability: the % of relevant information available electronically:
 - visibility (well signposted, e.g. on scale 1-5)
 - comprehension (understandable by lay person, e.g. on scale 1-5)
 - relevance and completeness (direct relevance to type of case with all necessary but no unnecessary information, e.g. on scale 1-5)
 - speed of access (number of clicks)
 - timeliness (date given)
 - authenticity and source (source named and justified according to legal / procedural reference, plus direct access to source)
- Interaction and assistance: the % of relevant information available electronically:
 - automatic facility for basic information queries
 - ease of access to human-mediated query (email, phone, in-person) e.g. on scale 1-5
 - access to all personal user information held by the agency with possibility to change or comment and ability to follow-up
 - tracking and tracing: real time access to case status (where in procedure, who responsible, what pending, how long to completion)
 - clear complaint procedures and access (e.g. on scale 1-5)
 - control and accountability (access to independent, second opinion or third party case review) (e.g. on scale 1-5)
- Use of electronic information:
 - % awareness of electronic information by different socio-economic groups
 - % use by different socio-economic groups
 - % satisfaction by different socio-economic groups (e.g. on scale 1-5)

**Hot spot 1 Objectives and measurement matrix:
Transparency provoking change**

Table 16

	Measurement levels	Externalities
General objectives (impacts)	<ul style="list-style-type: none"> • Democracy • Equality (through more information symmetry) • Empowerment of citizens & other non public sector actors through new power balances 	
Specific objectives (outcomes)	<ul style="list-style-type: none"> • Greater transparency • More openness • Clearer responsibility • Greater accountability • Agency acting with due regard for rule of law, ensuring neutrality & integrity • Less arbitrary, more standard & rational decisions • Better quality & more complete & authentic information • More information symmetry (& access to and use of information) • Re-structuring of government & agencies • More choice by/for citizens & businesses (change in client patterns) • Better political decision-making & more involvement of other actors • Better policy alignment & more joined-up government • Increased competition between agencies & thus better performance • Transformation of government culture & ways of working 	<ul style="list-style-type: none"> • Reduced democracy if the already loudest voices get louder • More information asymmetry if only strengthens the already included & active • Are standard solutions always best (one size does not fit all) -- could lead to less flexibility • Is civil servant discretion a good or bad thing? • Reduced confidentiality & privacy • Is it legitimate to keep some information hidden (e.g. detailed work of civil servants) • More information transparency could lead to more state control • More criminality (criminals are also empowered) • Focus on easily measured performance targets for transparency & less on factors not easily measured & quality • Risk of greater complexity with more information rather than greater simplicity • Threat that public sector information could become commoditised, become a commercial asset to be bought & sold
Operational objectives (outputs)	<ul style="list-style-type: none"> • Decision schemes • Guidelines • Better information completeness, accuracy, speed, availability (anytime, anywhere) • Lower information costs and transaction costs • Less mis-conduct, abuse, corruption, bribery & manipulation • Better monitoring & control of workflow & financial processes • Performance measurement • Reporting standards & indexes • Codes & charters: benefits, rights & responsibilities • Use of information: passive receipt or active download • Information interaction, one-way & two-way: pro-active identification & searching for information by users, or re-active response to uses requests by government • Transaction, including secure data 	
Activities (process)	<ul style="list-style-type: none"> • Re-organisation, re-processing & re-skilling • Information dissemination (availability & accessibility) • Information anti-fragmentation initiatives • Information creation & renewal (text, pictures, sound, video): <ul style="list-style-type: none"> – decision-making processes through information on policies, laws, rules and regulations, draft bills and regulations as consultation, court decisions, budgets, financial information, structural units of agencies; job descriptions of officials, their addresses, qualifications and salary rates; information with regard to health, safety and environment; budgets and draft budgets; draft acts, regulations and plans including an explanatory memorandum, rights & responsibilities (e.g. role of citizen), and other public activities – governmental performance – public sector information, e.g. on society, citizens, civil organisations, businesses 	
Inputs	<ul style="list-style-type: none"> • ICT: <ul style="list-style-type: none"> – PDAs and mobile phones – web technology, workflow and knowledge management system – intelligent agents and semantic web – broadband, WiFi and WiMAX • Finance and budgets • Human (people and skills) and organisational resources (leadership, management, organisational knowledge) • Legislation (rule set), e.g. Freedom of Information Acts, Information Watchdog & Ombudsman • Public agency cultures (mindsets and ways of working) 	

4.3.2 *Changing the accountability paradigm*

The components of the measurement levels for the “Changing the accountability paradigm” hot spot are shown in the matrix below. This hot spot demonstrates that the concept of accountability needs to be broken up into its different types: administrative, political, cross-agency, and cross actor (i.e. PPPs and PCPs -- Public-Civil-Partnerships). Each of these could be measured independently or a composite ‘accountability index’ could be constructed through a suitable weighted combination per case, system or jurisdiction:

- Administrative accountability: % using ICT where:
 - wrongdoing (illegal or corrupt behaviour, misconduct, abuse, corruption, bribery and manipulation) is logged and corrected
 - mismanagement or maladministration is logged and adjusted/corrected
 - statutory provisions are shown to be met and enforced
 - a fair distribution and allocation of public budget and expenditure is demonstrated (e.g. on scale 1-5)
 - increases in efficiency (e.g. staff productivity), effectiveness (e.g. better decision-making through precise allocation of accountability) or responsiveness (e.g. turn around time of cases/queries(complaints by users) of government are demonstrated
 - acting on jurisdictional authority and competence is demonstrated (e.g. on scale 1-5)
 - giving and acting on clear and legal commands within the administrative hierarchy is demonstrated (e.g. on scale 1-5)
 - codes, charters (or clear and accessible information) include administrative accountability (e.g. who sets accountability tasks: goals, divisions of responsibility, monitoring performance, mechanisms for giving account, etc.)
- Political accountability: % using ICT where:
 - regular elections are held
 - elected representatives have contact with, and/or are contacted by, electors between election
 - electors can (and/or do) access relevant information in order to hold politicians to account (e.g. whether they meet their commitments)
 - codes, charters (or clear and accessible information) include political accountability (e.g. who has which rights, and responsibilities and who has a legitimate stake in any case and thus the right to be heard)
- Cross-agency accountability: % using ICT where:
 - codes, charters (or clear and accessible information) specify who is accountable for what when responsibility is shared between different levels or agencies within the public sector
 - direct and responsive access to given to the level or agency responsible
- Cross actor accountability: % using ICT where:
 - codes, charters (or clear and accessible information) specify who is accountable for what when responsibility is shared between the public sector and/or the private and civil sectors
 - direct and responsive access to given to the organisation responsible.

The other specific objectives shown in the hot spot matrix (responsibility, transparency, due regard for the rule of law and the use of standard procedures for decision-making), can also be important complements to accountability but do not necessarily support it. For example, it is possible to build a highly accountable system that is not transparent or does not follow standard procedures. Thus, these should be measured separately from accountability, especially as this would also facilitate correlating them with accountability

to better understand in which situations and how they support it, and in which situations they have no influence on it. Measurement here would therefore directly assist in analysing the accountability paradigm.

**Hot spot 2 Objectives and measurement matrix:
Changing the accountability paradigm**

Table 17

	Impacts	Externalities
General objectives (impacts)	<ul style="list-style-type: none"> • Legitimacy of power (execution of power in accordance with established legal forms & requirements) • Empowerment of citizens & other non public sector actors through new power balances 	<ul style="list-style-type: none"> • Traditional jurisdictions & areas of responsibility & accountability can be upset without necessarily establishing new clarity • Accountability deficit, i.e. difficult to know who is responsible for what (including quality & authenticity if things go wrong) • In many agencies, formal ways of working, & thus being accountable, are subservient to informal, traditional ways of working and ingrained norms of reciprocity & trust. • Are standard solutions always best (one size does not fit all) -- could lead to less flexibility • Is civil servant discretion a good or bad thing? • Focus on easily measured performance targets for accountability & less on factors not easily measured & quality
Specific objectives (outcomes)	<ul style="list-style-type: none"> • Greater administrative accountability of civil servants individually and as an institution • Greater political accountability of politicians & democratically elected representatives • Clearer accountability in new forms of networked, decentralised, collaborative, inter-agency & cross-jurisdictional cooperation • Clearer accountability of non-public sector stakeholders (private & civil sectors) in partnerships & outsourcing arrangements • Clearer responsibility • Greater transparency & openness • Agency acting with due regard for rule of law, ensuring neutrality & integrity • Less arbitrary, more standard & rational decisions 	
Operational objectives (outputs)	<ul style="list-style-type: none"> • Administrative accountability <ul style="list-style-type: none"> – monitoring wrongdoing – correcting mismanagement or maladministration – enforcing statutory provisions – fair distribution & allocation of public budget & expenditure – pursuing the efficiency, effectiveness & responsiveness of government – acting on jurisdictional authority & competence – accountability within the administrative hierarchy (including giving & acting on clear & legal commands) • Political accountability: <ul style="list-style-type: none"> – regular elections – electors' access to information & thereby holding politicians to account • Participatory accountability framework (i.e. of rights, risks & responsibilities) for identifying who has a legitimate stake in any project & thus right to be heard • Clear & unambiguous practice • Clear model of setting accountability tasks: goals, divisions of responsibility, monitoring performance, mechanisms for giving account, etc. • Quantification of the accountability process • Meeting of commitments • Less misconduct, abuse, corruption, bribery & manipulation • Better monitoring & control of workflow & financial processes • Performance measurement • Reporting standards & indexes • Codes & charters: benefits, rights & responsibilities 	
Activities (process)	<ul style="list-style-type: none"> • Re-organisation, re-processing & re-skilling • Digitisation of procedures & decision making • Service Level Agreements & setting of performance indicators • Development of accountability & assurance tools & mechanisms for compliance regimes to verify that a commitment is met 	
Inputs	<ul style="list-style-type: none"> • ICT: <ul style="list-style-type: none"> – web technology and social software & creative soft- and hardware – workflow, knowledge management systems and intelligent agents – workflow and knowledge management systems • Finance and budgets • Human (people and skills) and organisational resources (leadership, management, organisational knowledge) • Legislation (rule set) • Public agency cultures (mindsets and ways of working) 	

4.3.3 *New forms of policing and law enforcement*

The components of the measurement levels for the “new forms of policing and law enforcement” hot spot are shown in the matrix below. The hot spot demonstrates that the improved law enforcement and policing objective is linked to a number of other specific objectives, which for measurement purposes therefore suggests the construction of a ‘law enforcement and policing’ index. This could consist of a suitable weighted combination per case, system or jurisdiction of the following:

- Surveillance, monitoring and crime fighting capacity: % using ICT with:
 - accurate information (e.g. % inaccuracies, errors)
 - cheaper information (e.g. effort, cost in provision and/or access)
 - speed of access to information (number of clicks)
 - information timeliness (rate of update)
 - intelligent information, such as linking different sets of basic information (e.g. criminal database) to provide analysis and/or prognosis (e.g. on scale 1-5)
 - automated systems (e.g. providing automatic updates, analyses, prognoses)
 - tracking and tracing of people and objects
 - frontline staff in the field connected to back office and/or colleagues on-demand and/or 24/7
 - access to (and/or use of) relevant information from other public sector agencies
 - access to (and/or use of) relevant information from other the private sector and/or civil sector and/or citizens
 - enablement of direct real time intervention in cases perceived to conflict with prevailing rule of law, so that illegal incidents or situations can be either avoided altogether or tackled in real time to prevent escalation
 - direct and controlled access to unsafe or difficult areas
- Criminal justice system: % using ICT with:
 - clear decision structures for reporting and action
 - clear rules and procedures
 - enablement of direct cooperation between all relevant stakeholders
 - speedier, cheaper, more effective work processes and work flow

Hot spot 3 Objectives and measurement matrix: New forms of policing and law enforcement

Table 18

	Impacts	Externalities
General objectives (impacts)	<ul style="list-style-type: none"> • Rule of law ensuring basic rights of freedom, safety & protection from random abuse • Empowerment of citizens & other non public sector actors through new power balances 	<ul style="list-style-type: none"> • Threat to privacy & to individual rights • Greater state control • End of supremacy of government in defining & maintaining norms • Problem of legitimacy & authenticity when non public sector actors are involved (e.g. counter surveillance by private sector or citizens, the privatisation of security, etc.) • Problems with acceptability of evidence, quality norms, reasonable negligence of norms (e.g. fraudulent or mischievous reporting) • Information overload
Specific objectives (outcomes)	<ul style="list-style-type: none"> • Improved law enforcement & better policing • Improved surveillance & monitoring capacity • Improved direct intervention in cases perceived to conflict with prevailing rule of law • Improved crime fighting • Improved criminal justice system • Improved defence & security • Greater transparency • Greater accountability 	
Operational objectives (outputs)	<ul style="list-style-type: none"> • Frontline staff fully connected, improving self-reliance capacity & their changed work processes & work flow • New stakeholders & decentralisation of (police) tasks to both individual citizens & others • Fully automated surveillance & monitoring systems • Direct & controlled access to unsafe or difficult areas • Decision structures for reporting and action • Clearer rules and procedures 	
Activities (process)	<ul style="list-style-type: none"> • Re-organisation, re-processing & re-skilling • Use of camera surveillance • Public assistance to the police • Tracking & tracing people & objects • Collection, analysis & dissemination of suitable data • Real time & in the field investigation & analysis • Training through simulations and scenario developments 	
Inputs	<ul style="list-style-type: none"> • ICT: <ul style="list-style-type: none"> – PDAs, mobile (camera) phones and digital cameras – WiMax, WiFi, and broadband – social software and creative hard- and software, and web technology – RFID, biometrics, sensors and GRID technology – robots – serious games • Finance and budgets • Human (people and skills) and organisational resources (leadership, management, organisational knowledge) • Legislation (rule set) • Public agency cultures (mindsets and ways of working) 	

4.3.4 Changing the privacy paradigm

The components of the measurement levels for the “changing the privacy paradigm” hot spot are shown in the matrix below. This hot spot shows that it is probably useful to break down the concept of privacy into two types: individual and group. Even though these overlap to some extent, given that groups are composed of individuals and that the same ultimate impacts are sought, the relationships and mechanisms involved can be different. For example, group members are likely to wish to pool their privacy with each other but enforce it vis-à-vis others. Individual and group privacy can thus be measured independently.

- Individual privacy: % of cases/systems/jurisdictions (using ICT) with:
 - specific individual privacy and data protection facilities
 - access to all personal user information held by the agency with possibility to change or comment and ability to follow-up
 - tracking and tracing: real time access to case status (where in procedure, who responsible, what pending)
 - codes, charters (or clear and accessible information) specify individual privacy and data protection rights and responsibilities

- facilities enabling avoidance and anonymity when accessing, communicating and searching for information
 - facilities promoting freedom of access and expression which only require where necessary identification (who is this person?) and authentication (what is this person authorised to access or do?) without linking to other information
 - facilities promoting safety and security which only require where necessary identification (who is this person?) and authentication (what is this person authorised to access or do?) without linking to other information
 - privacy audits showing the privacy protection afforded to data holders, i.e. a systematic inspection and review of an agency/system/jurisdiction which has obligations under privacy regulations to ascertain whether records of personal information are being maintained in accordance with the regulations.
- Group privacy: % of cases/systems/jurisdictions (using ICT) with:
 - facilities which enable the public sector to tag persons who cannot look after themselves (e.g. under-aged children, babies in hospital maternity wards, ill or demented patients) and/or criminals in order to protect the privacy of others,
 - facilities which enable linking of persons with objects (e.g. patients with medicines, car owners with their parked cars),
 - location-based services in which information is collected on the specific location where a person is in order to offer the best range of services to that person,
 - facilities which enable individuals to reveal aspects of their life to others of their choosing when they choose to do so,
 - facilities which enable groups to protect and/or control their group privacy and data protection needs.

The other specific objectives listed in the hot spot matrix (freedom of expression, improved public safety, as well as better criminal investigation and security, and reduced crime), can also be important complements to privacy but do not necessarily support it. In fact they could work against privacy. This reflects the fact that, of all seven hot spots, the privacy paradigm is perhaps the most likely to be thought of negatively as positively. The concept of privacy sits at the balancing point between ‘collective’ and ‘individual’ values (as articulated in Task 1 of this study) , so that attempts to develop policies related to privacy arguably have a greater challenge in reconciling these two dimensions than is the case in the other hot spots.

**Hot spot 4 Objectives and measurement matrix:
Changing the privacy paradigm**

Table 19

	Impacts	Externalities: pre-conditions, barriers & risks
General objectives (impacts)	<ul style="list-style-type: none"> • Human rights • Empowerment of citizens & other non public sector actors through new power balances 	<ul style="list-style-type: none"> • Technologies are both a potential protector and offender of privacy, e.g. increased transparency can lead to loss of privacy • Public officials may be enforced to adopt purely a process role, looking only at proper procedures rather than being expert arbiters, interpreters and advisers. Layman’s justice may become part of the legal system. • The power balance may tip in favour of government, given increased opportunities to monitor and survey the whereabouts of individuals and to profile people as belonging to specific groups or networks on the basis of shared characteristics.
Specific objectives (outcomes)	<ul style="list-style-type: none"> • Individual level: improved individual privacy and data protection • Group level: greater privacy for groups who are able to profile their specific privacy needs on the basis of shared characteristics & thereby promote their privacy interests • Promotion of freedom of expression • Better criminal investigation & prevention • Improved public safety • Reduced crime • Improved security 	
Operational objectives (outputs)	<ul style="list-style-type: none"> • Individual level: potential to both increase and decrease intrusions on privacy and affect intimacy in the personal sphere • Group level: potential to both increase and decrease intrusions on group privacy and affect protection of their data • More sophisticated data search and profiling techniques • Improvements in data analysis relating to individuals and groups • Increase in the amount of gathered personal and group data • Direct coupling of the physical space with the virtual space • Increase in ‘avoidance technologies’ and technologies to remain anonymous in electronic communication and searching • People can use ICT tools to reveal aspects of their intimate life to others • Potential to violate the confidentiality and security of communication (e.g. personal information can be revealed beyond control of the person to which the information ‘belongs’) • Improved identification (who is this person?) and authentication (what is this person authorised to access or do?) • Improved tagging of persons (e.g. babies in hospital maternity wards, persons who cannot look after themselves, criminals, etc.) • Improved linking of persons with objects (e.g. patients with medicines) • Improved location-based services in which information is collected on the specific location where a person is in order to offer the best range of services to that person 	
Activities (process)	<ul style="list-style-type: none"> • Re-organisation, re-processing & re-skilling • Gathering of very detailed personal data, anywhere, anytime, any person, any object • Construction of profiles that may be used to identify specific groups of people • Tracking and tracing of people (‘surveying’ technologies, including data mining and pattern recognition techniques, either in real time or in virtual space on the basis of aggregated data • Specific persons can be followed on the basis of the biometric track they leave behind, and financial expenses can be followed through pursuing credit card numbers 	
Inputs	<ul style="list-style-type: none"> • ICT: <ul style="list-style-type: none"> – social software and creation software and hardware – RFID and biometrics – broadband, WiFi and WiMAX • Finance and budgets • Human (people and skills) and organisational resources (leadership, management, organisational knowledge) • Legislation (rule set) • Public agency cultures (mindsets and ways of working) 	

4.3.5 *New countervailing powers*

The components of the measurement levels for the “opening up democratic involvement to new countervailing powers” hot spot are shown in the matrix below. This hot spot shows that it is probably useful to break down the concept of democratic involvement into two types: between government and citizens, and between citizens. (Note, the use of the word ‘citizen’ here should also be seen to include other non-public sector actors). Even though these two overlap to some extent, the aims, relationships and mechanisms involved can be very different. For example, between government and citizens it focuses on established forms of democracy and involvement, as well as on how these can be improved, whereas between citizens themselves it focuses potentially on cutting out government and forming new

countervailing powers which either ignore or threaten government. For each of these two types, an index could be developed consisting of suitably weighted sub-components per case, system or jurisdiction.

Between government and citizens:

- Citizen contact with government (using ICT):
 - % voting / polling / petitioning
 - % citizens contacting civil servants
 - % citizens contacting elected representatives
 - % citizen contacting third parties about government (e.g. ombudsman, independent arbiter or referee)
 - % of different type of contacts (e.g. to receive information / service, to make query / complaint, to report information, to discuss information)
 - % citizens and/or government satisfied (e.g. on scale 1-5)
- Citizen participation in government (using ICT):
 - % participating in decision-making / policy information activities
 - % participating in decision-making / policy forming activities
 - % participating in decision-making / policy finalisation activities
 - % involved in formal political parties which compete for power in the established system
- Change in government (using ICT):
 - % changed/new government procedures due to citizen involvement
 - % changed/new government organisational structures due to citizen involvement
 - % changed/new government decisions due to citizen involvement
 - % changed/new government policies due to citizen involvement
 - % changed/new government democratic/participatory organisations or procedures
- Citizen relationship with government (supported by ICT):
 - % saying they trust government
 - % saying government is transparent
 - % saying government is accountable
 - % saying their elected representative is accountable
 - % saying government is performing well
 - % saying they understand the trade-offs governments must make when making decisions / policies.

Between citizens themselves:

- Citizen involvement in non-government groups (using ICT):
 - % involved in formal interest / advocacy groups with a policy or developmental (rather than recreational) purpose (international, national, sub-national)
 - % involved in informal interest / advocacy groups with a policy or developmental (rather than recreational) purpose (international, national, sub-national)
 - % who have participated in preparing policy or developmental plans
 - % who have participated in implementing policy or developmental actions
 - % who have participated in information sharing, learning, skills development, knowledge development for a policy or developmental purpose
 - % who have participated in organising / coalition building for a policy or developmental purpose
 - % who have passively participated in single issue interest groups for a policy or developmental purpose

– % who have actively participated in single issue interest groups for a policy or developmental purpose.

**Hot spot 5 Objectives and measurement matrix:
New countervailing powers**

Table 20

	Impacts	Externalities
General objectives (impacts)	<ul style="list-style-type: none"> • Democracy (reducing the 'democratic deficit') • Pluralism, based on variety, diversity and tolerance • Empowerment of citizens & other non public sector actors through new power balances • Inclusion of new social groups & geographical locations 	
Specific objectives (outcomes)	<p>Between government and citizens:</p> <ul style="list-style-type: none"> • Improving relationships between governments and the governed • Increased participation, collaboration & engagement • Increased trust, transparency and accountability in government & the political process • New opportunities for democratic involvement and organisation • Enhanced democratic processes like consultation and interactive decision-making • New opportunities for making and implementing policies & decisions <p>Between citizens:</p> <ul style="list-style-type: none"> • Personalisation of communication and information sharing • New opportunities for communication, deliberation & political discourse • New opportunities for individuals and groups to create new knowledge • Improved organisational and coalition building ability • Mobilise individuals and groups around one or more specific interests or issues • Ability to combine and exploit the interests and expertise of huge numbers of people on a global basis 	<ul style="list-style-type: none"> • Decreasing coherence, stability & importance of established interest group politics • Fragmentation of the present system of value- & interest-based politics & shift towards single-issue group politics • Increasing importance of ad-hoc, unrepresentative groups, which are already privileged • Difficult for the establishment to recognise and incorporate ad hoc groups • Threat of instant 'street' politics & domination by unrepresentative groups • Pluralism may lead to fragmentation & become unstable • Too much participation? • Undermining of citizens' sense of accountability • Danger of trivialisation, populism, lack of responsibility, & dominance by the loudest. • Could increase organisational ability of agitators, criminals & terrorists
Operational objectives (outputs)	<ul style="list-style-type: none"> • New formal & informal channels for exerting power • Increase participation rates in elections • eVoting, ePolling, ePetitioning, etc. • Computer-mediated communication and online communities • One-to-one communication takes place through new social networks & software • Inputs to formal & existing government agendas & generation of new informal citizen and community agendas • Stronger involvement of (political) representatives 	
Activities (process)	<ul style="list-style-type: none"> • Re-organisation, re-processing & re-skilling • Mobilising & organising individuals & groups • Instant actions responding to real time situations 	
Inputs	<ul style="list-style-type: none"> • ICT: <ul style="list-style-type: none"> – social software and social network tools – PDAs and mobile devices – electronic gaming, language processing and semantic technologies • Finance and budgets • Human (people and skills) and organisational resources (leadership, management, organisational knowledge) • Legislation (rule set) • Public agency cultures (mindsets and ways of working) 	

4.3.6 Networked government and new stakeholders

The components of the measurement levels for the “networked government and new stakeholders” hot spot are shown in the matrix below. This hot spot shows that it is probably useful to break down the concept of networked government and new stakeholders into two types: the forms of networking between stakeholders itself, and the new types of markets and services which result. For each of these two types, an index could be developed consisting of suitably weighted sub-components.

Networking between stakeholders:

- New (formal) relationships between stakeholders (using ICT): % of jurisdictions:
 - within public sector
 - between public and private sector
 - between public and civil sector
 - within non-public sector to fulfil public sector functions
- Number of non-public sector stakeholders per jurisdiction (using ICT)
- % of jurisdictions involved in ICT-enabled:
 - data/information sharing between stakeholders
 - process sharing between stakeholders
 - service sharing between stakeholders
- Improvements (scale 1-5) due to new stakeholder relationships / involvement of new stakeholders (using ICT): % of jurisdictions:
 - improved back office efficiencies (e.g. staff productivity)
 - improved back office effectiveness (e.g. better decision-making through precise allocation of accountability)
 - improved back office responsiveness (e.g. turn around time of cases/queries(complaints by users))
 - improved access to relevant knowledge
 - improved decision / policy making
 - improved understanding of the needs and demands of specific users
 - improved understanding of the overall needs and demands of society
 - improved decision-making and competence balance between different agencies / stakeholders
 - improved services exploiting ‘societal intelligence’ and new forms of public sector information (PSI), i.e. drawn new stakeholders in all sectors

New markets and services:

- New markets opened / services delivered (using ICT): % of jurisdictions:
 - within public sector
 - between public and private sector
 - between public and civil sector
 - within non-public sector to fulfil public sector functions
 - using private or civil sector intermediaries
 - using social intermediaries (family or friends) for social use
- New markets opened / services delivered (using ICT): % of jurisdictions:
 - by public sector involving users or user groups as co-creators of services
 - by public-private sector involving users or user groups as co-creators of services
 - by public-civil sector involving users or user groups as co-creators of services
- % (or number) of jurisdictions offering choice of (using ICT):
 - service
 - provider
 - channel

Hot spot 6 Objectives and measurement matrix: Networked government and new stakeholders

Table 21

	Impacts	Externalities
General objectives (impacts)	<ul style="list-style-type: none"> • Empowerment of citizens & other non public sector actors through new power balances • Pluralism • Inclusion of all social groups & geographical locations 	
Specific objectives (outcomes)	<p>Networking between stakeholders</p> <ul style="list-style-type: none"> • Networking and decentralisation within the public sector and with other stakeholders • Back-office and inter-organisational reorganisation resulting from stakeholder networking • Benefits for policymakers through increasing access to useful societal knowledge • Digitisation applied to the more routine data heavy processes, freeing up human resources for activities at which humans are innately better equipped than machines • Improving role of intermediary ‘gate-keeper’ organisations <p>New markets and services</p> <ul style="list-style-type: none"> • New markets through new stakeholder involvement (PPPs & PCPs) • New markets through democratisation of both supply & demand/distribution chains & approaching the ‘perfect market’, thereby blurring the distinction between the roles of supplier and user • Bottom-up and user-driven development with users as co-creators • Enabling citizens to self-organise to design and deliver services, whilst the public sector acts as regulator or funding body • Enabling the combination & exploitation of the interests and expertise of huge numbers of people • Enabling individualisation of public sector services • Providing new types and choices of channels & services • Building & exploiting ‘societal intelligence’ and new forms of public sector information (PSI) 	<ul style="list-style-type: none"> • Challenge of balancing centralisation with decentralisation • Highly variable standards in public services between jurisdictions • Resistance to blurring of designer, producer & user roles • Deprofessionalisation & loss of standards & quality control • Challenge of changing jurisdictions within public sector & with private & civil sectors • Complex legal, jurisdictional & organisational issues • Loss of democratic (public) control • Future mandate & competence of public sector
Operational objectives (outputs)	<ul style="list-style-type: none"> • Optimisation and interoperability of all resources between all stakeholders • Shared services and applications, including middle offices, shared service centres, localised front-end services built on shared back end architectures, through modular (building block) approach where investments and resources can be pooled and shared along the service value-chain • Combining ICT with the now common availability and use of formerly professional software and hardware (such as digital video-cameras, photo-cameras, laptops, but also professional devices like sensors, recording equipment and software to edit content, videos, photos and music) • De-centralised, local, semi-independent digital service production workshops 	
Activities (process)	<ul style="list-style-type: none"> • Re-organisation, re-processing & re-skilling • Connect and distribute systems and services between stakeholders, including users • Collaboration with the private and civil sectors, including at community level: partnering, outsourcing, commodisation, including bringing resources and expertise to the public sector which it does not itself always have 	
Inputs	<ul style="list-style-type: none"> • ICT: <ul style="list-style-type: none"> – WiFi, WiMax, broadband and web technologies – GRID, knowledge management and workflow technologies – social software, social network tools and technologies for decentralised service creation • Finance and budgets • Human (people and skills) and organisational resources (leadership, management, organisational knowledge) • Legislation (rule set) • Public agency cultures (mindsets and ways of working) 	

4.3.7 Intelligent and responsive government

The components of the measurement levels for the “intelligent and responsive government” hot spot are shown in the matrix below. This hot spot shows that it could be useful to break down the concept of intelligent and responsive government into two types; firstly, seen from the service provider-side, and, secondly, seen from the user-side. For each of these two types, an index could be developed consisting of suitably weighted sub-components per case/system/jurisdiction.

Provider-side:

- Improved quality and quantity of information ('societal intelligence', CRM and new forms of public sector information -- PSI), drawn from across the public sector and other parts of society, for policy makers and service providers (% using ICT):
 - enabling better decision-making
 - enabling better policy-making
 - enabling better design of services
 - enabling better delivery of services
 - enabling better user group segmentation
 - enabling better targeting of service
- New services delivered (% using ICT):
 - which are pro-active
 - which are self-service
 - which can be personalised by the user
- New channel balances which maximise quality of service use through exploiting strengths of different channels (% using ICT):
 - between ICT channels
 - between ICT and non-ICT channels
 - using private or civil sector intermediaries
 - using social intermediaries (family or friends) for social use

User-side (note some of the new/better services on the provider-side have a user-side counterpart, but are not repeated here):

- New / better services used (% using ICT):
 - which support specific disadvantaged and/or specific individuals or user groups
 - which support improvements to individual and group privacy and data protection, given greater user control over specific data streams and data uses
- New / better services used (% using ICT) with:
 - accurate information (e.g. % inaccuracies, errors)
 - cheaper information (e.g. effort, cost of access)
 - speed of access to information (number of clicks)
 - information timeliness (rate of update)
 - intelligent information use by user such as linking different sets of basic information (e.g. housing database) to provide analysis and/or prognosis (e.g. on scale 1-5)
 - automated systems (e.g. providing automatic updates, analyses, prognoses)
 - tracking and tracing of cases
 - access to (and/or use of) relevant information from other public sector agencies
 - access to (and/or use of) relevant information from other the private sector and/or civil sector and/or citizens.

**Hot spot 7 Objectives and measurement matrix:
Intelligent and responsive government**

Table 22

	Impacts	Externalities
General objectives (impacts)	<ul style="list-style-type: none"> • Empowerment of citizens & other non public sector actors through new power balances • Pluralism • Social welfare of all users • Inclusion of all social groups & geographical locations 	<ul style="list-style-type: none"> • Big brother threat, • Greater potential for abuse by government, criminals and others • More to single 'e' channel • Reverse engineering of eInclusion • Problem of legacy systems
Specific objectives (outcomes)	<p>Provider-side</p> <ul style="list-style-type: none"> • Build and exploit 'societal intelligence' and new forms of public sector information (PSI) • Increase the intelligence & responsiveness of government through new product and service innovations • Enabling flexible access by users to government services through different channels • More involvement of private & civil sectors, as well as of users, in service design, production & delivery • Provide benefits for policymakers through increasing access to useful societal knowledge <p>User-side</p> <ul style="list-style-type: none"> • New types of choice of channels & services • Supporting disadvantaged and/or specific individuals or user groups through highly tailored, targeted and specifically designed assistance and services • Social use of eGovernment services through social intermediaries • Pro-active & self-services for users • Personalised (e.g. ICT-empowered frontline staff) and personalisable (including with eAgents) services • Improved individual & group privacy and data protection 	
Operational objectives (outputs)	<ul style="list-style-type: none"> • Greater capacity of governments to collect, store, process and apply large amounts of information in intelligent & appropriate ways • Creation and design of public sector information (PSI) content through value-adding knowledge, with either a public and/or a commercial benefit, also from constant inputs of user intelligence, partially derived from user behaviour data • Enabling governments to convert information to intelligent knowledge and services, and to deliver better targeted and responsive services which are precisely tailored to meet the needs of specific individuals or groups • Enabling information to be collected and transmitted about an individual's location, activities, behaviour, health and even moods and intentions, including their physical or chemical condition. This could be used both to trigger and determine the type of service and support they require (and indeed whether or not they require it), and also to monitor and adapt to their reaction to and use of such services. • Accurate identification of who users are, and authentication of their rights to access certain services or do certain things, in a wide variety of situations in order to monitor, respond to, and provide tailored services for specific individuals • Ambient intelligent space, and seamless knowledge flow throughout the network, with intelligence everywhere and not just at the nodes • Better reliability, resilience and pervasiveness of networks 	
Activities (process)	<ul style="list-style-type: none"> • Re-organisation, re-processing & re-skilling • More useful information produced through knowledge-based, intelligent and innovation systems and diffused in all kinds of societal networks, as well as across the public sector itself • Setting up and exploiting different channels as different infrastructures, platforms and interfaces, i.e. the delivery media used in government service delivery to users 	
Inputs	<ul style="list-style-type: none"> • ICT: <ul style="list-style-type: none"> – wearables, sensors, intelligent agents, robots, RFID, biometrics, GRID, and new tools for data storage and retrieval – knowledge management systems, semantic web, web technologies, plus PDAs and other mobile devices • Finance and budgets • Human (people and skills) and organisational resources (leadership, management, organisational knowledge) • Legislation (rule set) • Public agency cultures (mindsets and ways of working) 	

5 Research challenges

This section of the report deals with the research challenges that emerge in the *hot spots of eGovernment development* defined in chapter 3. By research challenges we understand scientific *blind spots*; research themes or questions that will be relevant for future models of government and that are relatively new and underexposed or under-researched. Because the subjects of the previous chapters are rather divergent (varying from inventories of tasks and technologies to scenarios and impact measurement tools) and the interrelations between the different research steps that we have taken in this project are manifold and versatile, we have chosen to identify research challenges for each hot spot. We have re-examined the results of our research steps so far (as described in the different sub reports) and selected scientific questions, themes or problems that:

- (a) are highly uncertain (remain unanswered),
- (b) may have a high impact on government or society, and
- (c) of which there appears to be a limited body of knowledge.

Point (c) was inferred by comparison with themes featuring in EU research agendas.

5.1 Research themes

Table 22 presents the list of identified research challenges organised in terms of the hot spots. They are the result of a careful review and classification of hypotheses and conclusions articulated in the subsequent task reports, evaluated against existing EU research agendas.

Table 23: Hot spot related research themes

Hot spot observations	EU research agenda	Research themes
<p>TRANSPARENCY ICTs may be used to increase transparency and to enforce information symmetry between citizens and government. This may empower (groups of) citizens to counterbalance government. However:</p> <ul style="list-style-type: none"> – There are significant differences in the level of government transparency in EU countries. – Although most EU Member States have adopted transparency and freedom of information acts, the actual transparency is limited. Particularly in New Member States government transparency is lacking. – Most of the transparency objectives of EU Member States are focused on service delivery and do not capture other governmental tasks (e.g. policy making, decision making) – Studies indicate that governmental institutions may be reluctant to or selective in giving up their gate-keeping positions – the increased possibilities to commercialise public sector information could endanger the fundamental democratic right of citizens to have access to public sector information free of charge or at marginal cost price 	<p>EU LEVEL <i>Vision 2010 findings</i> Transparency as such is not identified as a research challenge. Topics that are (more or less) related:</p> <ul style="list-style-type: none"> – User needs (priority number 1 of 17) – Socio-economic inclusion (priority number 7 of 17) – Multi-channel (priority number 13) – Evaluation and benchmarking (priority number 14) <p>COUNTRY LEVEL <i>eGovRTD findings</i> Transparency as such is not identified by EU Member Countries as a research topic. Topics that (to some extent) are related to transparency:</p> <ul style="list-style-type: none"> – Understanding user needs, user-centric service delivery (mentioned by 10 Member States) – eInclusion (mentioned by 10 MS) – Multiple channel access (mentioned by 6 MS) – Search (semantic web) and guiding (intelligent agents) methods (4 MS) – Usability (mentioned by 2 MS) 	<p>The emphasis of EU and Member States' research agendas and programmes is on the transparency of <i>service delivery</i> and on the <i>accessibility, usability</i> and <i>user-friendliness</i> of information. When comparing these identified research challenges with future issues addressed in our research (see conclusions), a knowledge gap appears with regard to the transparency of other governmental tasks than service delivery (e.g. policy making, regulation, politics and performance) and the quality of information (accurateness, completeness, etc.) The following research questions are not adequately addressed in existing research agendas:</p> <ol style="list-style-type: none"> 1. What are good indicators of transparency in government processes (policy making, regulation, service delivery, e-democracy)? 2. Based on these indicators what is the variance and evolution in transparency across EU countries? 3. What is the impact of information empowered, networked civil society on the transparency of government tasks? 4. How can the arms race between ambient government (privacy threat) and networked citizens (transparency threat) be monitored?

Hot spot observations	EU research agenda	Research themes
<p>ACCOUNTABILITY</p> <ul style="list-style-type: none"> – The deployment of new ICTs (such as web technologies and electronic devices) drives a trend towards networked and distributed models of government. This development will raise new questions on existing accountability constructions in EU Member states. – One of the key indicators of failing administrative accountability is the level of abuse and corruption within the public administration. – ICTs may provide governments with effective tools to fight corruption – ICTs increase the quantification and managerial approach of the accountability process. An important question is if and how the quality of highly qualitative actions can be quantified 	<p>EU LEVEL <i>eGovRTD findings</i></p> <p>Accountability is not identified as a research topic in EC related initiatives. However, the following topics that (to some extent) are related to accountability are mentioned:</p> <ul style="list-style-type: none"> – Change in the public sector (mentioned in 2 initiatives). However, the emphasis is on the trend towards networked government and not so much the effects on accountability. – Cross-sectoral public services (mentioned in 2 initiatives). Again, the focus is on service integration and not so much on accountability issues. <p><i>IPTS eGovernment Vision 2010 findings</i></p> <p>Accountability as such is not identified as a research challenge. Topics that are (more or less) related:</p> <ul style="list-style-type: none"> – Networked government (priority number 5 of 17) – Public sector change (priority number 8) – Cross-sectoral public services (priority number 12) <p>COUNTRY LEVEL <i>eGovRTD findings</i></p> <p>Accountability as such is not identified by EU Member Countries as a research topic. Topics that (to some extent) are related to accountability</p> <ul style="list-style-type: none"> – Cooperation between private and public sector (mentioned by 11 Member States) – Government modernising/organisational modelling (mentioned by 6 MS) 	<p>When comparing existent research agendas with the future issues addressed in our research, there is an important knowledge gap concerning future models of accountability. The research agendas of the EU and the Member States are one-sidedly focused on new organisational models of government (e.g. new processes, actors and task divisions) and do not capture the effects of the new organisational structures on accountability mechanisms. Furthermore, our research shows that countries do not fully use and benefit from the opportunities provided by ICTs to conquer fraud and corruption. These opportunities particularly may be seized by new EU Member States in which the (perceived) corruption is relatively high. More specifically, the following research questions are not (sufficiently) addressed in existing research agendas:</p> <ol style="list-style-type: none"> 5. What new forms of accountability (e.g. being responsible, giving account, holding accountable) fit the new models of networked government 6. Which ICTs can be used by governments to combat fraud and corruption and under what conditions? 7. What progress do states make in using ICTs in order to fight fraud (not an element of existing benchmarks). 8. How can the performance of more qualitative tasks of government be measured?

Hot spot observations	Research agenda	Research themes
<p>LAW ENFORCEMENT AND SECURITY</p> <p>Most ICTs increase the surveillance capabilities of governments and change the set of actors involved in law enforcement tasks.</p> <ul style="list-style-type: none"> - Private organisations (such security firms) and citizens are increasingly involved in law enforcement tasks - Boundaries between stakeholders are becoming blurry (where does the task/responsibility of government begins and ends?) - Law enforcement is increasingly pervasive (cameras, photos, etc.) - Law enforcement can be carried out more effectively (by using technologies such as robots, RFISs, etc) - ICTs increase the possibilities to gather data but also to manipulate data (and thus evidence in court ruling) 	<p>EU LEVEL</p> <p><i>eGovRTD findings</i></p> <p><i>Security</i> is explicitly mentioned as a research priority in 9 EC related initiatives (among which FP5, FP6 and MODINIS) and thus is high on the EU research agenda. However, security in these agendas is not interpreted as the security <i>task</i> of governments, but as the security of infrastructures, secure platforms, cryptographic techniques and secure identification and authentication. Yet, the issues concerning multi-stakeholder law enforcement and security and possibilities to increase efficiency that derive from our research are addressed by the following identified research topics:</p> <ul style="list-style-type: none"> - Value chains. Could be interpreted as police, public prosecutor and court. (mentioned in 3 initiatives) - Mobility. Could be operationalised as the mobility of government practitioners that have a law enforcement or security task. (mentioned in 2 initiatives) <p><i>IPTS eGovernment Vision 2010 findings</i></p> <p><i>Security</i> is identified as a research priority number 4 and therefore high on the EU research agenda. However, also in this research the focus is on the security of ICTs and less on security tasks of government. Also this report identifies research topics that cover issues raised in our research:</p> <ul style="list-style-type: none"> - Value chain (priority number 3 of 17) - Networked government (priority number 5) - Public sector change (priority number 9) - eGovernment at EU level (priority number 15) 	<p>Overall the emphasis of EU and Member States' agendas is on the security of ICTs; security of infrastructures, secure platforms, cryptographic techniques and secure identification and authentication. However, most of the research topics that derive from our research are covered by other (e.g. networked government, value chains) research topics of current research agendas on EU and country level.</p> <p>Some (minor) additional topics:</p> <p>9. How do new technologies affect the process of gathering proof and legal argumentation?</p> <p>New stakeholders entering the justice sector and boundaries between actors becoming blurry put serious questions to the divisions of tasks and responsibility and the ensuring of power balances within this sector. -> see accountability</p>

Hot spot observations	Research agenda	Research challenges
<p>Privacy ICTs are likely to have two main effects on privacy. On the one hand government will be more able to monitor and survey individual citizens, which increases possibilities of privacy infringements. On the other hand ICTs may empower citizens to combine forces and to defend their privacy interests. It is however most likely that the power balance may tip in favour of government as they structurally will have more information about citizens at their disposal. Governments could also use new technologies in order to ensure privacy.</p>	<p>Privacy is not identified as a research challenge or topic in the EC related initiatives.</p> <p>Topics that are identified and that are related to privacy include <i>trust</i> and <i>security</i></p>	<p>Information about citizens is becoming increasingly available to governments. It has the potential to fundamentally affect the power balance between citizen and governments.</p> <p>How the deployment of ICTs by government and information models (interoperable architectures) will affect this power balance is not clear. This knowledge gap is not well addressed in EU research agendas.</p> <p>10. What are good indicators to monitor the potential threat to privacy as a result of networked and intelligent government?</p> <p>11. Based on these indicators what is the combined impact on privacy of new legislation regulating government powers over information in the digital realm?</p>

Hot spot observations	Research agenda	Research themes
<p>New countervailing powers Society trends and ICT trends strengthen the bottom-up, informal democratic involvement and heralds fundamental shifts in the power balance between society and governments. The new power balance will change institutional and formal arrangements in terms of democratic participation. If not properly applied, ICTs may cause a growing gap between the involved and the not involved (making the loudest louder).</p>	<p>FP 6 aims at developing advanced concepts, tools and solutions for the use ICT in legislation, deliberation and political processes at local, regional, national and EU levels. <i>eGovRTD findings</i></p> <p>The following inclusion topics also relate to the new countervailing powers</p> <ul style="list-style-type: none"> – Inclusive European Information society (mentioned as research priority in 7 initiatives) – Socio-economic inclusion (mentioned in 5 initiatives) – Access for all to government services (mentioned in 4 initiatives) 	<p>EU research agendas foresee little exploration of countervailing powers in the Information society. Governments need to take more informal, bottom-up forms of engagement and participation seriously (both the positive and negative side-effects such as “street-politics” or “trivialisation” of this development) and develop approaches to take this ‘other way of doing politics’ into account.</p> <p>12. What are the ways in which government can facilitate eParticipation and eDemocracy?</p> <p>13. How does increasing eParticipation affect inclusion policies?</p> <p>14. What digital competencies are critical in eParticipation?</p>

Hot spot observations	Research agenda	Research challenges
<p>Networked and Intelligent government</p> <p>The horizontal, decentralized and location/time independent character of technologies will increasingly enhance new ways of operating through decentralised, distributed and trans-organisational cooperation. ICT trends and societal trends (individualisation, multi ethnic diversity, volatility and fragmentation of interests) challenge the governments to become more responsive towards citizens and stakeholders. The responsiveness will increase because of the ability of governments to exploit ‘societal intelligence’ which combines an internal focus on exploiting public sector information with a more external focus on linking with stakeholders.</p>	<p>The notion of shared services and inter-organisational co-operation between governmental agencies is widely anticipated, but currently still in its infancy. Adoption of research in government administration is insufficient. Research should address the mix of social, organizational and ICT problems that hinder the adoption of innovative solutions.</p>	<p>Technologies enable governments to improve their overall responsiveness. However, the maturity of the technology is divers. Examples of deployment of intelligent spaces in the public sector are relatively scarce. The societal impact has yet to be explored.</p> <p>15. How can networked government harness e-participation in policy making? What will the interface with civil society look like and how will it evolve?</p> <p>16. What are the ways in which government can manage the overload of information as a result of ‘ambient government’?</p> <p>17. Should business be allowed to become a steward of public information (Google example)?</p>

The research themes that appear new do not have a technological focus. Technology dominated research challenges are largely covered by the EU research agendas such as the 6th and 7th framework programmes.¹²³

5.2 Key research challenges

The relevance of the research themes in the four scenarios was assessed by ranking each on a scale of three: *not so relevant*, *relevant* and *highly relevant*. Table 23 shows the results for each research challenge in each scenario.

¹²³ See Task Report 6 – Research challenges and recommendations, Annex-II

Table 24: Relevance of research challenges in the four scenarios

Research challenges	Scenario 1 Our Europe	Scenario 2 We the market	Scenario 3 My the community	Scenario 4 My myself and I	score
1. What are good indicators of transparency in government processes (policy making, regulation, service delivery, e-democracy)?	Vvv	vv	v	vv	4
2. Based on these indicators what is the variance and evolution in transparency across EU countries?	vv	vv	v	vv	4
3. What is the impact of information empowered, networked civil society on the transparency of government tasks?	vv	v	vvv	v	3
4. How can the arms race between ambient government (privacy threat) and networked citizens (transparency threat) be monitored?	vvv	vv	v	v	3
5. What new forms of accountability (e.g. being responsible, giving account, holding accountable) fit the new models of networked government	vv	v	v	vvv	3
6. Which ICTs can be used by governments to combat fraud and corruption and under what conditions?	vv	vv	v	vvv	4
7. What progress do states make in using ICTs in order to fight fraud (not an element of existing benchmarks).	v	vv	v	vvv	3
8. How can the performance of more qualitative tasks of government be measured?	vv	v	v	vv	2
9. How do new technologies affect the process of gathering proof and legal argumentation?	vv	v	v	vvv	3
10. What are good indicators to monitor the potential threat to privacy as a result of networked and intelligent government?	vvv	vv	v	vvv	5

11. Based on these indicators what is the combined impact on privacy of new legislation regulating government powers over information in the digital realm?	vvv	vv	v	vv	4
12. What are the ways in which government can facilitate eParticipation and eDemocracy?	vv	vv	vvv	v	3
13. How does increasing eParticipation affect inclusion policies?	vv	v	vvv	v	3
14. What digital competencies are critical in eParticipation?	vv	v	vvv	v	3
15. How can networked government harness e-participation in policy making? What will the interface with civil society look like and how will it evolve?	vv	v	vvv	vv	4
16. What are the ways in which government can manage the overload of information as a result of 'ambient government'?	vvv	v	v	vvv	4
17. Should business be allowed to become a steward of public information (Google example)?	vv	vvv	v	v	3

v = not so relevant, vv= relevant, vvv = highly relevant, [3] = total score (excludes 'not so relevant')

Table 23 shows that in fact all research challenges are relevant in at least one of the scenarios. Between scenarios there is great variation in the relevance of specific research challenges. Overall the scenarios 'We the Market' and 'My community' have fewer relevant research challenges due to a more limited role of government. The scenario exercise does not warrant removing any of the 17 formulated research challenges.

Next the research themes were validated in a workshop with 25 eGovernment experts in Brussels on 19 December 2006 (see appendix 4). Based on a simple scoring and ranking exercise,¹²⁴ the following 5 themes were selected by the experts as most relevant and important:

1. How can the performance of more qualitative tasks of government be measured? (score: 3,2,2,2,2,3,1,3,1 = 19 points)
2. What new forms of accountability (e.g. being responsible, giving account, holding accountable) fit the new models of networked government? (score :2,2,2,1,1,2,2,2,2,3 =19 points)
3. What are good indicators to monitor the potential threat to privacy as a result of networked and intelligent government? (score: 3,3,3,1 =10 points)

¹²⁴ Each expert (1) chose 3 research themes they considered most relevant and (2) scored these on a scale of three: 3 points for the most important theme, 2 points for number 2 and 1 point for the lowest scoring theme.

4. What are the ways in which government can facilitate eParticipation and eDemocracy? (score: 1,2,3,3,3 =12 points)
5. What are the ways in which government can manage the overload of information as a result of 'ambient government'? (score: 3,1,1,3,1,3,2,3 =17 points)

The remaining themes were chosen by 3 or less experts. Two themes (15, 17) related strongly with these five key themes. The remaining themes received 4 points or less.

The following sections will elaborate on these five key themes to formulate detailed research challenges.

5.3 Extreme Hot spots

The seven hot spots show significant synergies, dependencies and overlap. To account for these effects and to focus the discussion of research challenges and policy recommendations, the hot spots can be condensed into three relatively independent 'extreme'¹²⁵ hot spots:

- (1) Extreme transparency,
- (2) Fading boundaries and
- (3) Enhanced Intelligence.

On the one hand **Extreme transparency** of government operations and functions invites close scrutiny of government **accountability** by citizens, business and civil groups. On the other hand, **transparency** of citizen activities raises serious issues of **privacy**. In both cases there are many new opportunities for due or undue **policing and law enforcement**.

Fading boundaries between government and its main counterparts in society are a signpost of the new ways in which government functions are being shaped. Coalitions of state and non-state actors (**countervailing powers**) play an increasing role in the implementation of government tasks.

Enhanced intelligence embodies the hot spots of an **intelligent** and **networked** government that proactively *engages* new knowledge in innovative citizen-centric services but also *guards* the many new sources of information gathered through granular interactive networks that now reach into every corner of society.

¹²⁵ Extreme because the transformational effects are more pronounced as a result of synergies between the original hot spots.

Table 25: Characteristics of extreme hot spots

Extreme Hot spots	Description	Hot spots covered
Extreme Transparency	In 2020 it will be extremely difficult for government to hide from citizens, business and civil organisations; and for citizens to hide from government. Highly networked individuals and action groups can quickly expose government operations. Conversely, government can exploit the transparency of citizens in an increasingly connected world to radically alter the balance in policing and law enforcement.	Transparency Accountability Policing and Law enforcement Privacy
Fading boundaries	The intertwining of C2G, G2B and G2G networks and the resulting mutual dependence are giving rise to new, more inclusive forms of ‘citizen government’ and community driven business (web 2.0). However, these developments are blurring roles and responsibilities raising questions of accountability.	Countervailing powers Accountability
Enhanced intelligence	Interactive and shared forms of government coupled with proliferating sensor networks present eGovernment with an unprecedented level of detail on socio- economic and environmental data to pro-actively develop new citizen-centric services. However, responsible stewardship of sensitive information is required as the ‘market’ value of the data increases.	Networked government Intelligent Government Privacy

The validation workshop suggested expanding the scope of *enhanced intelligence* to include the challenge for government to develop new, high value services based on new and expanding sources of information.

In the next section the extreme hot spots will be elaborated and illustrated with examples. Next, concrete research challenges will be formulated for each relevant combination of *extreme hot spot* and *key research theme*.

5.3.1 Extreme transparency

Box 1 – Extreme transparency or: The glass house



It is the year 2020 every EU citizen can monitor the performance of governments real-time through their mobile devices. They have instant access to government information on organizational level (e.g. allocation of funding, budgetary spending), on unit level (e.g. number of crime cases solved, amount of people helped to find a job) and on the individual level of government practitioners (patient satisfaction per doctor, number of students that pass an exam per teacher, number of successful and unsuccessful cases per prosecutor). Citizens not only have access to performance data, but can also constantly observe the activities of government practitioners and politicians by virtually attending a lecture, medical operation, court ruling, government debate or meeting. Government has become a *glass house* and citizens are more than ever empowered to scrutinize government performance, to organize protest against government and to participate in government.

However, there are also several dark sides to the transparency development. The interference of citizens in government practice is predominantly driven by private and non-societal interests, which causes ad-hoc policy changes, preferential treatments to the loudest of society and provokes political and bureaucratic short-termism. Groups of citizens rapidly mobilize around specific subjects, while using several media as platforms to stand up for their interests - a tendency that stimulates politicians and government practitioners to act upon incidents and hampers the taking of action based upon strategy or vision. An even darker side of the transparency trend is the continuous threat of the *infringement of privacy* of (groups of) individuals. All EU citizens have unique identity numbers which enables the digital exchange of personal information of citizens between government agencies, on local, national but also EU level. This, and the fact that the registering of citizens' data by government agencies has increased dramatically over the past years (e.g. enhanced camera surveillance, growing number of digital traces, micro-monitoring), makes that the individual is more vulnerable in his/her relation to government; the possibility of government practitioners to misuse their power has grown. Moreover, there are increasingly examples of private entities and individuals who make inappropriate use of personal information of citizens; for example in order to exclude certain groups of citizens from a health insurance, to refuse certain students or to refuse particular persons for a job.

Governments could develop the following two services in order to deal with future challenges as described above:

(1) *The Privacy Watchdog*

The establishing of a powerful commission on European level that ensures privacy of citizens by developing proposals for European directives, stimulating the development of technologies that strengthen privacy (for example, semantic technologies that can interpret information requests so that government practitioners do not have to access to all data but only relevant data), the gathering and handling of complaints and the fining of organizations that violate privacy laws.

Extreme transparency issues feature in all four scenarios. In the scenario *Our Europe* there will be a delicate balance between transparency of citizens and transparency of governments. In *We, the Market* and *Me, Myself and I* this balance is distorted in favour of government (and business in the case of *We the Market*). In *My community* the balance has swung in favour of civil society.

In the scenario *Me, myself and I*, government has lost the incentive to ensure accountability. In full control of new ambient and intelligent networks it has forced citizens and business into compliance. Fraud in government circles is rife. The judiciary serves government with show-trials where electronic evidence is conjured-up against dissident citizens and independent corporations. These issues also always lure in the *Our Europe* scenario.

The research challenges for the new models of eGovernment have to deal with finding a balance between two types of transparency: government accountability and citizen privacy. If the balance is maintained, a higher level of trust between government and citizens will ensue.

Key Research Challenges

Three research themes relate to the hot spot *extreme transparency*:

1. How can the performance of more qualitative tasks of government be measured?

Efficiency gains in service delivery through the effective deployment of ICTs can free up government budgets and staff time. This can translate into small government (*My communities*) or it can mean that budget and time is allocated to support more qualitative tasks (*Our Europe*). Research is needed into

- Formulating and monitoring qualitative goals in the execution of key eGovernment tasks at European level with more focus on ‘*how*’ things are done in addition to ‘*what*’ is being done.
- New ICTs offer opportunities for incorporating the views of target audiences into the (re-)design of eGovernment programmes in sectors such as healthcare, education and e-business. New methods need to be designed, tested and validated for each domain.
- User involvement in the design and evaluation of service delivery is still in its infancy. The impact on (1) the quality and effectiveness of programmes and (2) the role of legacy service providers needs to be monitored in order to prepare for necessary guidance and regulation.
- Design of new ‘quality of life’ e-Services and e-Initiatives that promote and monitor performance of government programmes on values such as empowerment, democracy, inclusion, personal integrity and safety, dignity, etc.
- Offline models seem inappropriate for regulating ‘quality of life’ in virtual space. In the absence of valid models cyberspace has evolved as a more self-regulated medium. What is the effect on core, constitutional values (human rights, privacy, etc) of moving to a more virtual world with different laws (code), architecture (IP networks and mobile devices) and communities (self-regulating)? The different manifestations of cyberspace (*MySpace*, *YouTube*, *Second Life*, etc) need to be monitored for their impact on basic societal values.
- Research is needed on making rule-based case decisions fully electronic and transparent, and on the role of ICT in discretionary case decision-making and how the discretionary process can be made transparent without compromising individual privacy. Fully automated case decisions should of course have an appeals process, but the resources released could be re-deployed to discretionary case decision-making to enable more personal case-by-case consideration supported by ICT.

2. What new forms of accountability (e.g. being responsible, giving account, holding accountable) fit the new models of networked government?

Future government networks will be increasingly intertwined with each other (joint-up government) and with civil society and private sector networks. The transparency that these new networks enable (*Our*

Europe) and that a more empowered civil society will demand (My community) can radically alter the dynamics of accountability. Research is needed into

- The impact of ICT-based joined-up government initiatives on accountability. For example the linking of civil and criminal justice systems (e.g. legislators, police, lawyers, courts and prisons/probationary systems), including tracing and tracking facilities, catering for the needs of the different stakeholders, in order to maximise efficiency on the one hand and the effective dispensation of justice on the other.
- ICT- supported systems for controlling and exposing corruption, mis-management, wrongdoing, etc., which needs to be linked to legislative and rule systems (including charters and codes), as well as advice for responsible individuals ('whistle blowers') on how to protect their integrity and rights, but which also itself guards against malicious and frivolous use.
- Monitoring the evolution, emergence of new accountability models (in terms of roles and responsibilities). With rapidly evolving network technologies, eParticipation and joint-up government still in their infancy it is critical to collect intelligence on where accountability is heading (Our Europe or My communities?). This information will guide policy making and inform new regulation. Indicators need to trace shifts in responsibility from government to citizen for example if/when empowerment drives governments to evade responsibility. Who is responsible in complex joint-government initiatives?
- ICT tracing and tracking systems for the public sector when transparency and accountability are important principles, including real time access to case status (where in procedure, who is responsible, what is pending, how long to fulfilment, etc.).

3. What are good indicators to monitor the potential threat to privacy as a result of networked and intelligent government?

Ubiquitous sensor networks, RFID, genetic fingerprints (bio-ICTs), wearable ICTs, pervasive gaming, and further down, nanotechnology and robotics are but a few of the technologies with the potential to unleash large amounts of detailed spatial information at the level of individual citizens (and civil servants and business employees). Regulation is likely to be required once these ambient technologies reach maturity and become widely deployed. Now is the time to develop the monitoring frameworks that assess their effect on the privacy of individuals and community groups to inform future policy guidance and regulation. In this respect the following research challenges are considered relevant:

- What technology approaches can serve both privacy and security concerns? Research is needed into new data security models for devices and data storage systems.
- Citizens should be the owners of personalised information. Information kept by government and business on individuals should be easily traceable by citizens (single point of access to the information profile kept on them).
- Research is needed into how ICTs can protect and promote group privacy through the principle of 'freedom of association' in a democratic society, given that most research to date has been on individual privacy.
- All government regulations with personal data collection and storage requirements could stipulate what information will be collected, where it will be stored, how long it will be stored and what agencies will have access to them. All data collection requirements could have a set time span, after which the data will be discarded. A set time (e.g. 2015) could mark a millennium moment when all 'orphan intelligence' on individuals will be discarded from government systems.
- What is the individual and combined impact on privacy of new European and national legislation governing the use of new ICTs in policing and law enforcement? Examples are new (mobile) data storage regulations at European level, eavesdropping acts in the Netherlands, patriot act in the USA, etc.
- Do new technologies expose privacy beyond what was intended in the laws of the pre-ICT era? What indicators can be used to track this.

5.3.2 *Fading boundaries*

Box 2: *Fading boundaries or: Citizen government*



It is 2020. Citizens have an impressive array of interactive channels at their disposal to actively participate in policy processes and other government functions. Interactive IP television, mobile referenda, online citizen platforms and mmorpg's are but a few places where citizens (and business) mingle with government. Government has come to rely more and more on citizen participation in the effective execution of prominent government tasks. Over time government systems have learned to listen to the voices of society. In turn civil society and business have gradually become intertwined with government. This process started at local level but is now gradually escalating to national and even EU level. EU policy makers are learning to value the interaction and feedback from across the region. Recently the commission unveiled a new virtual EU space where EU businesses can vote and give feedback on the overhaul of the pan-European vat registration modality and the upcoming e2U-services.

In this new world the roles of citizens, business and government are shifting and boundaries between state and society, between government departments and even between citizen collectives and business (Web 3.0) become increasingly blurred. These developments have not been without consequences. In the landmark Poitiers case (2016) a local municipality was acquitted of its responsibility for the spiraling rental costs in a new housing estate because a citizen panel moderated negotiations with contractors. With new roles and new lines of responsibility accountability of new participation initiatives needed to be reviewed. Acting on new policies to regulate accountability of citizen government initiatives at EU level, many national governments have implemented new legislation to overcome these hurdles.

On the positive side, a joined-up citizen government initiative in Helsinki had a different take on things when they launched a new senior citizen infomediary programme. Senior Citizen Infomediaries (SCI)

As a result of aging and migration, senior citizens now make up a large proportion of the rural population in Finland. To address the issue of inclusion in government services a network of active and healthy senior citizens is acting as information intermediaries to facilitate access to government services for the elderly, the disabled and children in care. These groups are known to lack the facilities to access online government services. Through the SCI they are brought onboard. SCI's receive regular online ICT and Human interface IP video training through a government eLearning module. The small government remunerations form a welcome addition on their eCitizen pension. But what they enjoy most is the social recognition in their newfound role.

The extreme hot spot fading boundaries is particularly relevant in the scenario *My community*. Citizens - empowered with new social network technologies and with access to a range of personal, mobile media tools – have the upper hand. Government is lagging behind on the fast cycles of social, technological and business innovation that drive developments in the knowledge economy. Unfortunately not all citizens are keeping up with developments. The elderly feel increasingly marginalized and lack of appropriate skills to succeed in this fast moving society is marginalising low income groups. Is this a key role for government?

Key Research Challenges

The following key research theme is covered by the hot spot *fading boundaries*:

4. What are the ways in which government can facilitate eParticipation and eDemocracy?

By actively promoting and facilitating eParticipation government can harness the positive energy released when citizen engagement is mobilised through the new social networks. Instead of being sidelined government can be reinvented and reinvigorated by intensifying the interaction with civil society. This requires that government learns new ways of going about its business. The following research challenges present themselves:

- How can new *social software* technologies be adapted and adopted to become part of eGovernment? What are the most promising technologies and approaches (eFora, issues for a, hearfromthem, etc)?
- How will government deal with the rapid cycles of WEB 2.0 software innovation while maintaining accountability?
- What are the new digital competencies and eLearning paths for civil servants to succeed in the era of eParticipation?
- What are simple but robust and highly secure systems for eVoting, ePolling and ePetitioning? Are there best practice examples (e.g. UK e-petitioning, Australia)?
- How can users and community groups be empowered to develop and/or adapt their own eGovernment services through the use, for example, of social computing, software and networks? Should all government data and information services be made accessible and extensible through simple XML hooks and REST API's.?
- As individualization progresses, what new access technologies and approaches can be used to ensure universal access and protect weaker groups in society? What are the new business models/ financing mechanisms for this? What are the ways to encourage 'universal service' in a 'My Community' world?
- How can new web 2.0 and social software technologies support both formal and informal eParticipation? Participatory measurement tools

5.3.3 *Enhanced Intelligence*

Box 3 – Enhanced Intelligence or: Information overload?



Joined-up, interactive networks intricately woven into the fabric of every day life will present future eGovernment with unprecedented amounts of information on the inner workings of society. Even when anonymised by enforcing sophisticated data exchange regulation and standards at EU level, governments in 2020 could avail of detailed real-time information on individual citizens, corporations and organisations. This information will include highly sensitive, personal and business data, including for example genetic profiles and business performance data. The secure, coordinated management of sensitive information will become a major challenge. Currently, governments are not geared up for this new stewardship role that will be required of them. This underlines two conflicting challenges: (1) The secure management of sensitive, personal data and (2) the effective and appropriate exploitation of detailed information to better understand and serve the needs of society.

The following two services illustrate how eGovernment could deal with these challenges.

(1) Stewardship of sensitive data

In 2020 it has become increasingly complicated for government to ensure the integrity and authenticity of the vast amount of data it collects and stores. Enacting new EU regulation on data ownership it now maintains a single secure digital space for each citizen to access, review and update all the aggregated data linked to their biometric profile. Any personal information not linked to a citizen profile is automatically discarded from government records. beyond basic identification data, citizens can enable and disable at any time the use of specific categories of information for different purposes on a voluntary basis. Citizens can also enable sharing anonymised personal information for commercial purposes. Participation in such information sharing campaigns may generate revenue from businesses that are looking to collate this information to tailor new services. Such revenues automatically accrue in their eCitizens accounts.

(2) Data-mining, artificial intelligence, and semantic eGovernment

By 2020 government oversees massive streams of data flowing through citizen-government, government-business, government-government and government-R&D and monitoring networks. To ensure more effective exploitation of in particular the massive amounts of new real time data from proliferating sensor networks, it has deployed intelligent agent and semantic web technology to aggregate data from multiple sources and channels and to share it across government departments. In the first pilot intelligent agents have been developed to respond to key aggregate anonymous indicators on co2 emissions in business, traffic violations and sea level /dike surveillance. The next step will be to tie the agents into shared decision-making and enforcement processes using new breakthroughs in semantic eGovernment.

In all scenarios where government still has a significant role, the intelligent management of information collected by an increasingly networked and participatory government is a key challenge. A fundamentally new approach to knowledge based government needs to be explored that strikes a balance between the crucial role of ‘steward of sensitive information’ and the appropriate exploitation of new intelligence to enhance citizen centred government services. The information collected by ambient government is of great value to business. Already in 2006 large scale public sector health surveys are financed by selling access to the data to large pharmaceutical companies.

Key Research Challenges

The following research theme relates to the hot spot *enhanced intelligence*:

5. What are the ways in which government can manage the overload of information as a result of ‘ambient government’?

Large amounts of detailed information can be a blessing in the proactive development of new citizen-centric services when it is used to anticipate the needs of citizens and business. However, without adequate policies, strategies and tools to manage increased flows of information through ambient government there is a risk of compromising the privacy and safety of its intended beneficiaries. Poor information management can also expose sensitive government operations. The following research is needed:

- The use of ambient and semantic intelligence and identification/authentication to provide personalised and pro-active eGovernment services.
- The role of intermediaries (public, private and civil sectors as well as social intermediaries) in providing services to users.
- Research on channel usage and patterns, and how these may change over time, on the different capacities of different media, and how are they changing in a dynamic situation. Research is needed, for example, on how electronic channels provide users with greater independence, self control and self-directed service design, personalisation and use.
- The use of electronic agents to provide personalised and pro-active eGovernment services. Technologies enhancing citizen-centric delivery (personalisation) Pro-active [e]services (e.g. child benefit, tax forms)
- How to integrate citizen feedback on service delivery (interface usability, user satisfaction, user preferences, user feedback) into the design of eGovernment services.
- Interdisciplinary research on human/computer and cognitive psychologist together with technology to enhance usability of services.
- Europe: Different governmental systems, interoperability (technologies and semantics) Ontologies (e.g. project Brite, R4eGov)

5.4 Concluding remarks

While government is investigating new technologies in the pursuit of efficiency and effectiveness in e-service delivery as evidenced by current European Research agendas, our hot spots and scenarios reveal a potential impact on eGovernment that threatens to change the traditional roles of government. These impacts are of three kinds. Firstly, the relentless drive towards always on, pervasive and ubiquitous collection of personal and spatial data will result in excessive exposure of citizens and government. Extreme transparency can bring increased vulnerability and loss of freedom in acting out our roles as citizens, businesses and government. This process may provoke an ICT fuelled arms race between *ambient government* and *citizen empowerment*. Winner takes all. The research challenge will be to develop approaches to monitor and benchmark the evolution of transparency, accountability and privacy for developments that go against the grain of constitutional and human values. Secondly, in far reaching scenarios of e-democracy the complex intertwining of social networks predict the blurring of roles of government, civil society and business. Here the fundamental research challenge will be to monitor the shift in responsibilities under new e-participation and e-democracy scenarios. Finally, the exponential

growth in intelligent data and systems will leave modern government with the burden of stewardship of massive amounts of sensitive data. The research challenge is a dual one: who will be the custodian of sensitive data and what will be the mechanisms to ensure personal data protection and integrity? These fundamental impacts on eGovernment roles and responsibilities will guide the formulation of policy recommendations in the next chapter.

6 Conclusions and policy recommendations

6.1 Introduction

In this chapter we finalise our analysis by bringing together the main arguments of our study and by translating those into key policy recommendations. These recommendations take into account the inputs of experts and policy makers who took part in a validation workshop in December 2006 (see Appendix 4). The next section starts with an overview of our main arguments and conclusions, which is followed by a section containing the policy recommendations.

6.2 Synthesis

The European eGovernment vision for 2010, as developed by IPTS, which we took as starting point for the present study, points at the role of eGovernment as an *enabler for better government*, an intrinsic political objective encompassing a series of democratic, economic, social, environmental and governance related objectives. In this vision, these objectives were articulated around two major pillars: pursuing ‘cost-effectiveness and efficiency’ on the one hand, and the creation of ‘public value’ on the other hand. Our study aimed to look further forward (2020) and has approached these two pillars as ‘means’ and ‘ends’, with the interrelationship that this implies. The diagram below demonstrates that we consider public value as the goal, and efficiency and effectiveness as means to realise this higher end. In the study we further developed this basic thought and tried to come to a more sophisticated articulation of means and ends, as well as the relationship between them. As far as the ‘means’ are concerned, we are thus not merely interested in public sector modernisation for its own sake, but primarily in *public sector modernisation which maximises public value*.

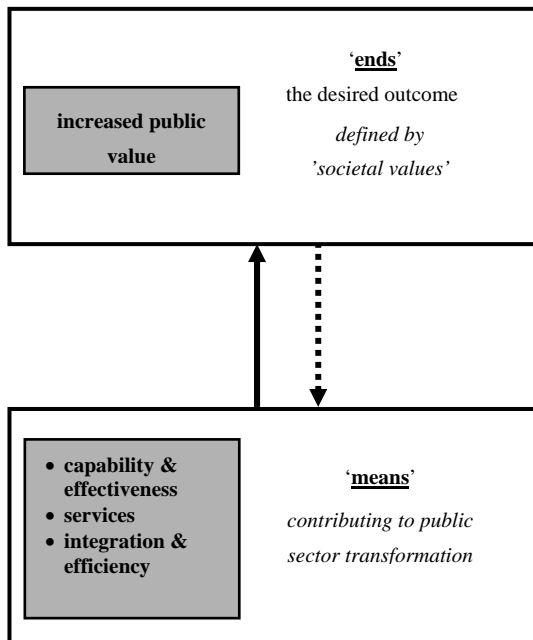


Figure 8: (e)Government ends and means

When thinking about future public sector tasks and activities, and the role eGovernment can play in this, we have first argued that (e)government must be envisaged as a system designed to produce the goal (or

‘ends’) of ‘public value’ through the ‘means’ of ‘public sector transformation’.¹²⁶ We have distinguished here between *liberal values* (originating in the 18th century); *democratic values* (19th century); *social values* (20th century) and finally *empowerment values* (21st century). The latter particularly represent the *future* 21st century model of public values and government roles, which is of particular interest for the present forward-looking study. In our view, ‘empowerment’ represents the stage of transformation, which is now – at the start of the 21st century – just beginning to show. In this study we have argued, therefore, that a *shift towards empowerment* will represent the most important transformation of governmental values and roles in the coming decades.

In technological terms, the study also attempted to look beyond the current deployment of ICTs and has particularly focused on ‘disruptive’, or with a more positive connotation, ‘promising’ technologies: technologies which we assume will contribute to the *transformation* of (future) governmental tasks and activities and which will be deployed on a large scale. Promising technologies may lead to a significant change in the existing establishment, open the gate for new players, lead to new institutional arrangements, change the value chain and relationship between actors and bring in new solutions to the complex problems that current governments are facing. Based on a thorough analysis of a wide range of technological trends, we have argued in this study that the key technologies with such a transformative impact are *mobile devices* (such as PDAs, wearable computers, MP3-players, mobile phones), *intelligent agents* (and robotics), *sensor and language processing and semantic technologies*, *serious games*, *RFID and biometrics*, *ICT infrastructures* (WiFi, WiMAX, Broadband), *web technologies* (social software) and *GRID*.

When confronting our analysis of value-based governmental roles and tasks with the identified promising technologies we have come up with seven so-called ‘hot spots’ of governmental transformation, which will become prominent in the near future: combinations of mature technologies with governmental roles which we expect to lead to governmental transformation within the majority of EU member states within the timeframe of the coming 15 years. These hot spots are:

- transparency provoking change
- changing the accountability paradigm
- new forms of policing and law enforcement
- changing the privacy paradigm
- new countervailing powers
- networked government
- intelligent government

The hot spots were then combined with four EU 2020 scenarios for eGovernment. These scenarios focus on the wider context in which governmental transformations take place, taking into account social, cultural, economic, and institutional trends besides the technological trends. The scenarios can be used as an input for debating the differing possible policy directions for the EU towards 2020. Taking a head start in this debate, we have argued that the Our Europe scenario, albeit quite utopian (which is acceptable for a scenario exercise), could emerge as the default vision. As the hot spots seem to propel this scenario forward, we expect quite dramatic advances in eGovernment if this scenario were to come true in the coming 15 years. If it is considered to be a desirable future for European government, the scenario may inspire us to take a closer look at the possible impacts of this vision of the future.

The hot spots have also been applied to a tool for *measuring the benefits and impacts* of eGovernment in the future, which is presented in one of the chapters. And finally, we have used the hot spots and the scenarios to identify *research challenges* and to evaluate and prioritise these research challenges, for which we have used the input of 25 experts who participated in a validating workshop at the end of the project in December 2006. Because the seven hot spots show significant synergies, dependencies, and overlap, and in

¹²⁶ The European eGovernment Ministerial Conference, “Transforming public services”, 24-25 November 2005, Manchester, England, under the UK Presidency.

order to focus the discussion on research and policy challenges, in this chapter the hot spots have been further condensed into three relatively independent ‘extreme’ hot spots for ICT-driven governmental transformation. For each ‘extreme’ hot spot the key research challenges were formulated and analysed in terms of their relevance for each scenario.

(1) Extreme transparency

of government operations and functions, on the one hand, prompts close scrutiny of government accountability to citizens, business and civil groups. On the other hand, transparency of citizens’ activities raises serious privacy issues. In both cases there are many new opportunities for due and undue police surveillance and other law enforcement strategies. The key research themes (broken down into more detailed challenges in the chapter) are:

- How can the performance of more qualitative tasks of government be measured?
- What new forms of accountability (e.g. being responsible, giving account, holding accountable) fit the new models of networked government?
- What are good indicators to monitor the potential threat to privacy as a result of networked and intelligent government?

(2) Fading boundaries

between government and its main counterparts in society are a signpost of the new ways in which government functions are being shaped. Coalitions of state and non-state actors (countervailing powers) play an increasing role in the implementation of government tasks. In research terms the following key challenge comes to the fore:

- What are the ways in which government can facilitate eParticipation and eDemocracy

(3) Enhanced intelligence

embodies the hot spots of an *intelligent* and *networked* government that exploits but also guards the many new sources of information gathered through granular interactive networks that now reach into every corner of society. This leads to the following key research theme:

- What are the ways in which government can manage the overload of information as a result of ‘ambient government’?

In the next section we move to the final step in the research process and focus on the impact and relevance of these extreme hot spots for policy makers. We shall translate our conclusions into more concrete and specific policy recommendations.

6.3 Policy recommendations

6.3.1 General policy challenges

As a starting point for this section we would first like to stress that our exploration of future ICT-driven models of eGovernment has pointed to the necessity of *fundamental transformations of governmental roles and actions and the institutional context in which these are embedded*. The underlying trend that we foresee to have the most significant impact in the coming decades is the *shift towards empowerment*, which we see as the leading thread running through each of the hot spots, as we have argued in the concluding section of chapter 2. Following this line of argumentation, the main challenge which governments will have to face is to create public value in terms of empowerment, and to organise their roles, functions and actions accordingly. This will, in many cases, involve fundamental transformations and also quite challenging dilemmas and potential pitfalls. To name some of them: A shift towards empowerment will force governments to become truly citizen and user-driven. Governments will have to operate in more open and networked constellations with other stakeholders. They will need to find the balance between being extremely transparent and accountable, on the one hand, and operate in a flexible, not overtly bureaucratic way on the other hand. They will need to act as intelligent, all-knowing government and deliver services

that are highly sophisticated, personalised and pro-active, and yet not interfere too much in citizens' personal lives. And they will have to struggle to define and secure the 'general' interest in an increasingly pluralistic and fragmented society.

Secondly, we would like to stress that there is not one way of coping with these challenges. If we accept the assumption that government models are fundamentally about creating *public value* – future policy directions can only be based on *value-based choices* and thus on a *normative, political vision on the future of eGovernment*. In this study we have explored some of these potential futures in the scenarios, which to a certain extent reflect different political choices concerning the future: these can be used as input for further discussion which may result in such a vision.

In this section we shall first list some overall policy challenges, which arise from the assumed move towards eGovernment models based on empowerment values. These challenges are inevitably rather broad. Moreover, some of the more general challenges described here are not new, but already more or less addressed in all kinds of local, national and European (research) policy agendas. Nevertheless, they are still highly relevant, as they are far from being met yet. In the next section (6.3.2) we shall focus on more specific policy challenges and actions that result from the hot spot analysis. These recommendations are focusing on actions and strategies that need to be developed *now* in order to be prepared for the long-term challenges depicted in the analysis of ICT-driven eGovernment models, which is directed towards 2020.

Political challenges

- Policy strategies and actions need to be based on an explicit value-based *vision* on future eGovernment, which specifically takes into account the realisation of empowerment values.
- Future eGovernment models need to go beyond mere public service and public sector modernisation, and need to be based on a willingness to fundamentally change governmental operations, institutional arrangements and culture. In this sense, the development of *incremental transition paths* is necessary, possibly based on different migration scenarios. This involves a need to look beyond short-term political agendas and implementation issues.
- The trend towards an increasingly networked eGovernment, will involve *cooperation and coordination at all levels of government and with new stakeholders and new intermediaries* at (and across) the local, regional, national and European level. This stresses the need for administrative and regulatory trans-European harmonisation to ensure 'interoperability' both at the organisational and the technological level.
- This harmonisation is also important to address the potential risks of an ambient, all-knowing government, particularly to *ensure data protection (security and privacy) rights* of citizens and businesses.
- These kind of long-term and integrative transitional approaches require univocal *political commitment and strong leadership* with an impact on every level of government.

Technological challenges

- Ensure technological *interoperability and standardisation*.
- Governmental transformation requires back office reorganization and one-stop shop approaches, which, in turn, require substantial *process and workflow redesign* that needs to be translated into new *information architectures*. An additional challenge is that these new architectures need to be *flexible and open* in order to be sufficiently user-centred and dynamic.
- This also involves a stronger investment in technologies that enable *smart ways of cooperating and sharing or producing knowledge* ('collective intelligence', open source and open content, collaborative computing tools etc), among relevant stakeholders in this more networked environment.
- Ensure that networks and services are *accessible to all*, both on the level of *infrastructures*, as on the level of *services* and the necessary (user-friendly) *interfaces* (usability).

- Stimulate the use of technologies which are designed to cope with potential *information overload* (e.g. use smart search engines, tagging technologies etcetera that are developed in social networks and in the context of user-generated content)
- Reduce the *dependency on ICT-infrastructures* and related services or build in necessary safeguards (this requires an approach to cope with ‘critical information infrastructures’).

Socio-economic challenges

- The most important challenge will be to create the conditions for a *truly citizen and user-centred* public service provision, which addresses empowerment values. This involves:
 - A highly developed awareness of citizens’ and businesses’ *needs* (‘ambient government’): ambient government involves deep, personalised and pro- active knowledge about diverse user needs and the ability to translate these into highly diverse services, interfaces and access channels. It also point to the need to constantly monitor user needs, user experiences and user satisfaction;
 - Building *trust* through being transparent, responsive and accountable (‘transparent government’); but trust also depends heavily on the ability to ensure security and privacy of personal data.
 - Diminishing the *regulatory barriers* for both citizens and businesses to be independent, self-organising and self-regulating (‘light government’).
 - Ensuring that public services are equally *accessible* to all European citizens and business (‘inclusive government’).
 - The latter also involves increasing the *awareness* of the potential benefits of eGovernment services. Currently, the level of deployment of eGovernment services is low, and there is strong evidence that lack of awareness of eGovernment services is the main barrier to take-up. Carefully targeted promotion and awareness campaigns should promote the overall benefits, calm the fears, and give general information about what is involved technically, where to find and how to use services. One aspect should be wider use of charters / codes of conduct / SLAs, etc.
- Another important challenge will be to create the *conditions for collaboration, coordination and knowledge sharing*, necessary for ‘networked government’. Future government will increasingly be built on public-private partnerships and will involve new intermediaries in the public service delivery chain and in democratic processes. As a result, new governance structures and shared forms of accountability and transparency need to be designed. Furthermore smart and efficient ways of sharing and producing knowledge between these different stakeholders will be increasingly important.

6.3.2 *Hot spot related policy challenges*

As we have argued in this study, there are seven hot spots where future ICT-driven transformations of governmental roles will become particularly manifest and salient. We also argued that the leading thread running through all these hot spots is a shift towards empowerment. At the same time, these hot spots make it clear that the impact of these transformations is often quite ambiguous and provokes paradoxical challenges:

- The hot spot ‘*transparency provoking change*’ has described how citizens and other stakeholders are increasingly better-informed and more aware of governmental activities, which makes them better equipped (empowered) to address governments directly about their specific needs. On the other hand, for government, in order to develop truly user-centred services, a high degree of transparency of citizens and businesses is required as well, which can be problematic in terms of privacy rights.
- In the hot spot ‘*changing the accountability paradigm*’ we have seen how more networked forms of governance enable citizens and other stakeholders to exert influence on the process of accountability of governmental actors. However, at the same time, these new governance structures require them to assume responsibility for shared activities and be equally accountable. This requires more horizontal and networked forms of accountability.

- In the hot spot '*new forms of policing and law enforcement*' it was pointed out that both private and civic players are more and more enabled to take over policing and law enforcement roles, leading to co-production of roles or – in a more radical scenario – to marginalisation of the role of government. However, ICTs also enable government to strengthen its role as law enforcer and thus ambient government may substantially increase and sophisticate its surveillance capacity.
- The hot spot '*changing the privacy paradigm*' has shown that technologies can be seen as both a potential protector *and* offender of privacy. In the same vein, the role of government is ambiguous: both intrusive in collecting more personal data, and protective in offering protective measures. In terms of empowerment, citizens and businesses have increased possibilities to keep control over (and manipulate?) personal data themselves.
- In the hot spot '*new countervailing powers*' we have seen how new ICT-enabled forms of democratic participation may contribute to the enhancement of countervailing strategies; these new forms of engagement are highly dynamic, volatile, are extremely pluralistic and fragmented and challenge the traditional models of representative democracy.
- The hot spot '*networked government*' underlines that ICT has empowered external stakeholders to increasingly share authority, bypass traditional hierarchies and vertical institutes, co-operate within government and with external stakeholders. As a result, traditional roles for government will change as well, and the role of government can become more process-oriented (facilitating complex interactions and decision-making procedures between stakeholders).
- The hot spot '*intelligent and responsive government*' shows how technological tools enable a shift towards a more responsive government, heading for service leadership, user-oriented approach and context-awareness. On the other hand, the 'ambient government' underlying this trend also implies government to be all-knowing and possibly strongly in control. The impact of this may vary from 'big brother' to 'soft sister' scenarios.

This description makes clear that the seven hot spots – especially if we focus on these ambiguities and paradoxical challenges – show significant correlations, synergies, and dependencies. In the foregoing chapter we therefore condensed them into three 'extreme' hot spots, which underline these interconnections:

- (1) Extreme transparency
- (2) Fading boundaries
- (3) Enhanced intelligence

Building on the key research themes which were defined in the foregoing chapter, in this section we use the extreme hot spots as a starting point to define some of the key *policy challenges and policy priorities*, taking into account some of the opportunities, risks and pitfalls which were described in the different scenarios. As our analysis has been covering the whole field of governmental roles and functions, and the underlying 'public values', these recommendations should be seen as a *policy framework* for future eGovernment. Each of the recommendations deserves a more detailed discussion and a translation into more concrete actions, preferably framed in terms of migration paths towards 2020. This is, however, outside of the scope of this project.

(1) Extreme transparency

Extreme transparency issues have been covered in diverse ways in all the scenarios. What becomes clear here is that ICT-driven developments force governments to seek continuously the delicate and paradoxical balance between transparency of government itself – which also involves a high degree of accountability) and transparency of citizens and other stakeholders. Citizens' transparency is needed if they want to be provided with high quality user-centred, pro-active public services: but this involves giving up some of the rights to the protection of personal data and privacy. New models of accountability are necessary as new stakeholders and intermediaries come up, and more or less take over traditional governmental roles, for instance in the field of policing and law enforcement. The reshuffling of responsibilities requires also new accountability mechanisms.

In each scenario the balance is tipping to another side. For instance, in a future where government is controlling new ambient and intelligent networks, to the consent of citizens who are not interested in taking public responsibility (Me, Myself, I), accountability and transparency of government are less relevant, whereas in the Our Europe scenario, trust in the central government is strongly rooted in transparency and accountability. This shows that is not enough to formulate policy recommendations which are directed towards ensuring high degrees of transparency and accountability of governmental operations and actions: these are only realistic if the potential adverse impact of transparency and accountability on other governmental roles is taken into account (e.g. the impeding of operational simplicity and flexibility). In terms of gaining citizens' trust and realising social cohesion and stability, finding this balance may thus be considered as policy priority no.1.

Policy recommendations for 'extreme transparency'

- Transparency of governmental actions should be embedded in the design of ICT systems.
 - Currently, citizens often do not have insight into how government decisions are made or how public services can be of use to them. This lack of transparency prevents them from actively participating in government, from raising questions and from fully benefiting from public services. Furthermore, a lack of transparency conceals favouritism or corruption. The shift towards empowerment implies that citizens and other stakeholders will be increasingly well informed and critical about governmental operations. Transparency through publishing rules and regulations, and through online and real-time monitoring and tracking of procedures (such as licensing and permit approval) increases the level of accountability. Rule-based case decisions must be made fully electronic and transparent, without compromising individual privacy.
 - This will involve new, open information architectures with built-in privacy protection.
 - Focus on transparency, particularly with regard to information and procedures important to people in their everyday lives, and emphasis on local language content.
 - Relevance: all levels of government, but particularly the local and national level, where citizens will mostly apply for specific services.
- Simplify regulations and procedures.
 - Extreme transparency of governmental operations is only realistic if the regulations and procedures are as simple as possible. Furthermore, contradictory and redundant regulations and procedures need to be redesigned. Transparency of governmental operations thus cannot be realised without substantial process reform, streamlining and consolidating processes.
 - Relevance: all levels of government, but particularly the local and national level, where citizens will mostly apply for specific services.
- Avoid redundant private data collection.
 - Tie data collection to specific policy outcomes instead of accumulating obligations to collect and store data. This serves both simplicity and transparency purposes and privacy protection purposes.
 - All government regulations with personal data collection and storage requirements should stipulate what information will be collected, where it will be stored, for how long it will be stored and which agencies will have access to it. All data collection requirements could have a set time span, after which the data will be discarded. A set time (e.g. 2015) could mark a millennium moment when all 'orphan intelligence' on individuals will be discarded from government systems.
 - Ultimately, citizens should be the owners of personalised information and should decide on what information may be used or not by government and business. What is being done

with it should be easily traceable by citizens (single point of access to the information profile kept on them).

- Relevance: all levels of government.
- New charters and codes should be developed on distributed electronic public sector transparency, accountability and privacy, where and how it applies and for whom.
 - This involves all non-public sector actors who are involved in public sector functions, and should include the rights and responsibilities of all stakeholders.
 - To realise a common understanding of the basics of transparency, accountability and privacy and the way they interconnect, more research is needed:
 - EU-wide benchlearning and benchmarking programmes to monitor and evaluate the impact of evolving transparency on the roles of government, citizens and other stakeholders across Europe.
 - Develop and promote the use of objectively verifiable indicators to assess levels of accountability across the EU. Include research into new horizontal accountability models and associated stakeholder configurations in EU research agendas.
 - Relevance: all levels of government, but particularly the EU (leadership, role model)
- Promote and develop ICT-supported systems building on the collective intelligence of different stakeholders to stimulate and enhance networked models of policing and law enforcement.
 - Charters and codes should be developed on electronic access to networked civil and criminal justice systems, the rights and responsibilities of each actor, the quality and timeliness of information, and appeals and other complaints and help services.
 - Charters and codes should also be developed in relation to surveillance and monitoring systems, and the rights and responsibilities of both citizens and the authorities in relation to these.
 - This should include all non-public sector actors who are involved in justice functions.
 - Relevance: all levels of government, but particularly local (concerning safety in the neighbourhood) and trans-national (concerning organised crime and terrorism).

(2) Fading boundaries

This extreme hot spot points to the ICT-driven enhancement of all kinds of civic engagement, which leads to new countervailing powers, and a redefining (and possibly marginalisation) of the role of government and politics in democratic processes. The main challenge here is to reinvent government by intensifying the interaction with civil society and using the self-organising and self-regulating potential of these new collectives. Looking at how this may work in the different scenarios, we see that fading boundaries are particularly visible in the *My community* scenario. Citizens and their new intermediaries – empowered through the next generation social network technologies and with access to a host of personal, mobile media tools – have taken things into their own hands. A risk sketched in this scenario is that not all citizens are keeping up with these developments, Another risk is that collective interest are more and more fragmented into highly diversified interests of small and inward-looking communities. As we have argued in this study, the shift towards empowerment is the most significant trend for 2020, which will have a profound impact on virtually all governmental roles and actions. Therefore, we may state that the success of future eGovernment will, to a large part, depend on engaged citizens. Efforts to incorporate these forms of engagement into the heart of governmental operations will be critical.

Policy recommendations for ‘fading boundaries’

- Engage citizens in the design of eGovernment applications in order to make them more citizen-centred.
 - Governments need to improve their interfaces to eParticipation initiatives to ensure they harness the expertise and intelligence of civil society and business thereby promoting more rapid cycles of policy making and government innovation. Government skills and attitudes need to adjust to more open innovation processes. Thus: (re)design eGovernment

applications by exploiting the engagement opportunities of successful non-governmental models and practices:

- Build up knowledge of successful citizen initiatives (best practices) using Web 2.0 applications and use this knowledge to (re)design eGovernment applications.
- Use the open innovation cycles of Web 2.0 to (re)design eGovernment applications
- Develop the e-skills of civil servants in order to increase their awareness of these new forms of citizen engagement.
- Use the potential of web 2.0 and social software to support both formal and informal eParticipation and eDemocracy initiatives, particularly to include those who are more or less excluded.
- Relevance: depending on the focus and reach of citizens' engagement this is relevant for all levels of government; new forms of citizen engagement tend to cross borders but may be also strongly oriented towards regional, local or even local neighbourhood objectives ('glocalisation').
- Develop charters and codes on public electronic access and input to the public sector decision- and policy-making process, feedback on that input including the results and reasons for use/non-use, and the expected behaviour and skills of civil servants and elected representatives in this context. This should include the rights and responsibilities of all stakeholders.
 - Create legal conditions/obligations for requiring public notice and comment in legislative and regulatory processes
 - Make clear how citizen engagement will have an impact on processes of service design, decision-making etcetera. Show citizens that their engagement matters.
 - Relevance: all levels of government.

(3) Enhanced intelligence

In all scenarios that we have described in which the government still has a significant role, the intelligent and prudent management of information collected by an increasingly networked government is a key challenge. One of the key challenges here is to cope with possible information overload and to translate the possibilities of sheer endless information and continuous communication into real *knowledge* and real *intelligence*. Intelligent and networked government go hand in hand, as providing high quality citizen-centred services requires an approach in which government is just a node in a network of actors who cooperate and collectively collect, provide and exploit necessary information for these services. This has also been labelled "seamless government": in the future the boundaries between traditionally separated organisations and their jurisdictions tend to be increasingly permeable, only remaining when this is functionally required (e.g. for protecting the basic rights of citizens).

Policy recommendations for 'enhanced intelligence'

- Encourage cooperation and data sharing and cooperation between governmental departments and between government and other stakeholders (including citizens themselves).
 - Use common standards to shorten development time and ensure compatibility.
 - Adopt a common infrastructure.
 - Streamline and simplify record keeping processes to simplify processing of information.
 - Develop and standardise meta-data, critical for successful cooperation across institutions and networks.
 - Stimulate multi-sectoral partnerships and redesign laws and policies that impede public/private cooperation
 - Relevance: all levels of government
- While encouraging cooperation between governmental departments/with other stakeholders, including the private sector and the civil society in collecting, storing and exploiting data, at the

same time develop policies on how these actors are allowed to use personally identifiable information. Policies need to be formulated in which the roles and responsibilities of government, civil society and business in the handling of potentially sensitive information are clearly articulated and in which shared standards for quality are articulated.

- Charters and codes of conduct should be developed covering the rights of citizens and businesses
 - to have to input their data only once into the private sector at whatever level or location,
 - to be able to view the data held by the whole public sector on one web-page (except where legally sanctioned and the applicable laws should be transparent),
 - the right to correct and/or object to such data,
 - and the right to be informed of changes made as a result of their objection or of the reasons for not changing the data.
- Charters, codes and guidelines should be developed on minimum quality standards of all (basic) public sector eGovernment services regardless of who, and where in the system, produces them.
 - guidelines for the design of services in terms of *usability* (ease and simplicity of use), *experience* (time and effort savings, e.g. through up-to-date and accurate information) and *fulfilment* (service realisation, i.e. users actually achieving what they set out to achieve).
 - guidelines for the design of *personalised* (and “personalisable”) eGovernment services which need to be carefully targeted and delivered in a multi-channel environment.
- Relevance: all levels of government, but particularly the EU.
- Government needs to be at the vanguard of semantic web and intelligent agent technologies to manage the flows of information that are coming their way.
 - these technologies need to be based on architectures with built-in privacy protection
 - and need to be based on a secure and shared systems of identity management.
 - Relevance: all levels of government.

Appendix 1: Overview of maturity and deployment of technologies

Technologies

Trends

<i>Technology</i>	1. PDA	2. Wearable computers	3. MP3 players	4. Mobile phone	5. Robots
Technological maturity	Fully developed	Design/development stage	Fully developed	Fully developed	Design/development stage
Usage	High	Low	High	High	Low, automotive/entertainment
Usage barriers	Few, user interface	Various barriers, battery	No major barriers	No major barriers	Diverse technical issues
Deployment curve	Continues deployment	Shallow	Continues deployment	Continues deployment	Significant growth Asia
Market growth	Stable growth	Small growth	Stable growth	Stable growth	Gradual growth long term
Application range	Broad	Broad	Broad	Broad	Broad
Overall:	Mature	Immature	Mature	Mature	Maturing
<i>Technology</i>	6. Intelligent agents	7. Sensor technology	8. Language processing	9. Serious games	10. RFID
Technological maturity	Design/development stage	Fully developed	Development/pilot stage	Fully developed	Fully developed
Usage	Low, mainly web agents	Average	Low	High	Limited, retail/defence
Usage barriers	Diverse technical issues	Low	Technical issues	Low	Few, price and security
Deployment curve	Small growth	Steady growth	Small growth	Exponential growth	Expected expon 2004-2010
Market growth	Gradual growth long term	?	Gradual growth	Large	Large
Application range	Broad	Broad	Translation purposes	Broad	Broad
Overall:	Immature	Mature	Maturing	Mature	Mature
<i>Technology</i>	11. Biometrics	12. WiFi	13. WiMax	14. Broadband	15. Web technology
Technological maturity	Design/development stage	Fully developed	Development stage	Fully developed	Fully developed
Usage	Low, identification	High, hot-spots and housh	Low, some pilots	High, 2005 40 m. lines EU	High
Usage barriers	Diverse technical issues	Low	Few, price	Low	Low
Deployment curve	Shallow	Expected expon 2004-2007	Gradual growth expected	Steady growth, 70% 2005	Exponential growth
Market growth	Small growth	Continuing rise	Gradual growth	Large, 41% EU hh 2008	Large
Application range	Identification purposes	Broad	Broad	Broad	Broad
Overall:	Maturing	Mature	Maturing	Mature	Mature
<i>Technology</i>	16. Social software	17. GRID	18. Semantic technologies		
Technological maturity	Fully developed	Developing/pilot/few app	Developing/pilot/few app		
Usage	High, mill. of users/country	Low, 5% enterprises	Low, 1% market penetration		
Usage barriers	Low	Standardisation	Technical and organisational issues to be solved		
Deployment curve	Exponential	Steady increase expected	Gradual increase expected		
Market growth	Large, 60%Internet traffic peer to peer	Gradual growth	Gradual growth		
Application range	Broad	Large processing	Broad		
Overall:	Mature	Maturing	Maturing		

Appendix 2: Sources used for the scenario exercise (trend analysis)

- Aicholzer, G., *Scenarios of eGovernment in 2010 and implications for strategy design*, in: Electronic Journal of e-Government Volume 2 Issue 1 (1-10), 2005
- Bertrand, G., Michalski, A. and Pench, L.R. *European futures: five possible scenarios for 2010*, Cheltenham: Elgar, 2000.
- Bezolt, *the Future of Patient-Centered Care: Scenarios, Visions and Audacious Goals*, *Journal of alternative and complementary medicine: research on paradigm, practice and policy*, vol. 11 (2005), page s-77
- Centre on Information, Communication and Management Technologies, *e-Government foresight Bulgaria*, April 2003.
- Criekemans, D., Bertrand, G. and J.Q. Rood, *Scenarios Europe 2010-2020: possible futures for the Union*, Antwerp, department of Political and Social Sciences, University of Antwerp, 2000.
- Dischinger, M. and J. Jackson, *Which future urban scenarios can we construct?*, in: *Environmental management and health*, vol. 17 (2006), page 409-420
- DG Information Society, *Intelcity Roadmap; scenarios for the city of the future*, March 2003
- eEurope Advisory Group of leaders of national eGovernment initiatives, *Working Paper on eGovernment Beyond 2005 - An overview of policy issues*, August 2004.
- eGovRTD2020, *Roadmapping eGovernment RTD 2020, Visions and Research Measures towards European Citizenship and Innovative Government*, Deliverable D 2.2: Workshop results, 2006
- FISTERA, *Exploring Emerging Applications Report of the FISTERA Trends, Drivers & Challenges Workshop*, 16th - 17th June 2004, Seville, Spain
- Gartner, *Government in 2020: Taking the Long View*, Andrea Di Maio, Gregg Kreizman, Tichard G. Harris, Bill Rust, Rishi Sood, December 2005
- Glassey, O., *A One-stop Government prototype based on use cases and scenarios*, Lecture notes in Computer Science, 2002, page 116-123.
- Green, L., Popper, R. and I. Miles, *From Sevilla to Success: IST Success Scenario and Policy Priorities*, PREST, University of Manchester, United Kingdom
- IPTS, *Outline of the FISTERA Results 2001–2005, IST at the service of a changing Europe by 2020: Learning from world views*, June 2005.
- IPTS, *Key factors driving the future information society in the European Research Area*, Synthesis Report on the FISTERA Thematic Network Study, September 2004
- IPTS, *eGovernment in the EU in the next decade: The vision and key challenges, based on the workshop held in Seville*, 4-5 March 2004: “eGovernment in the EU in 2010: Key policy and research challenges”, August 2004.
- IPTS, *eHealth in 2010: Realising a Knowledge-based Approach to Healthcare in the EU*, Challenges for the Ambient Care System, April 2004.
- Lesourne, J., *Scenarios de la politique mondiale*, *Commentaire: revue trimestrielle*, vol 28 (2005), page 919-924
- Ministry of Internal Affairs Australia, *Governing and Politics in 2025*, Research Paper for Business Council of Australia, Scenario Planning Project, ‘Aspire Australia 2025’, 2005
- Moulsey, H., *Session 2.1 – Services to improve the Quality of Life – Transforming Local Government Services Through an eGovernment Modernisation Agenda*, *Journal of the communications network*, vol. 4 (2005), page 70-75.
- OECD, Centre for Educational Research and Innovation, *Schooling for Tomorrow, Think scenarios, rethink education*, 2006.
- Office of Public Management, *Beyond Profit – Future scenarios towards 2010*, February 2005.

- Ovum, TNO, University of Aarhus and Dublin City University, BEACON- The BEACON Broadband Future Planning Guide, Deliverable D3.1, 2006
- Compañó, R. and C. Pascu, *Lessons from Foresight on Information Society Technologies*, in: Visions on the Future of Information Society, Publishing House of the Romanian Academy, September 2005.
- Ringland, G., *Scenarios in Public Policy*, Chichester, United Kingdom: Wiley and Sons, 2002
- Zuurmond, A.; Peters R. and J. van Lelie, Scenario session Report eGovernment beyond 2005, Research assigned by the Ministry of Interior and Kingdom relations, The Netherlands, December 2004.

Appendix 3: Longlist of experts for the scenario exercise

Firstname	Surname	(continued)	
Georg	Aichholzer	Miriam	Lips
David	Banisar	Ann	Macintosh
Frank	Bannister	Bogdan	Manolea
Victor	Bekkers	Joan	Marsal
Norbert	Benamou	Ian	Miles
Lasse	Berntzen	Sjoera	Nas
Franz	Betz	Bridie	Nathanson
Michael	Blakemore	Jim	Norton
Mark	Bovens	Arvo	Ott
Agnes	Bradier	Matt	Poelmans
Anne Marie	Brouder	Arnout	Ponsioen
Norman	Butlin	Alan	Porter
Gabriella	Cattaneo	Hilde	Roothart
Karel	Charvat	Frank	Ruff
Stephen	Coleman	Tomas	Sabol
Catherine	Daurele	Hans	Schuttenbeld
Loris	Di Pietrantonio	Jamal	Shahin
Anders	Egelund	Luc	Soete
Siep	Eilander	Mechthild	Stower
Jean Michel	Eymeri	Paul	Timmers
Patrizia	Fariselli	Roland	Traunmuller
Enrico	Ferro	Michael	Tschichholz
Krzystof	Glomb	Leo	van Audenhove van
Ingrid	Götzl	Hein	Duivenboden
Josephine	Green	Robert	van Oirsch
Ayesha	Hassan	Tony	Venables
Hans	Hellendoorn	Dave	Waltho
Gareth	Hughes	Patrick	Wauters
Tarmo	Kalvet	Maria	Wimmer
Michael	Keenan	Dariusz	Wozniak
Stefano	Kluzer	Sally	Wyatt
Trond	Knudsen	Irina	Zalisova
John	Kootstra	Guido	Baayens
Herbert	Kubicek	Gerrit-Jan	van 't Eind
Christine	Leitner		

Appendix 4: References to Chapter 3

List of eGovernment scenario studies

- Aicholzer, G., *Scenarios of eGovernment in 2010 and implications for strategy design*, in: Electronic Journal of e-Government Volume 2 Issue 1 (1-10), 2005
- Bertrand, G., Michalski, A. and L.R Pench, *European futures: five possible scenarios for 2010*, Cheltenham: Elgar, 2000.
- Bezolt, *the Future of Patient-Centered Care: Scenarios, Visions and Audacious Goals*, *Journal of alternative and complementary medicine: research on paradigm, practice and policy*, vol. 11 (2005), page s-77
- Centre on Information, Communication and Management Technologies, *e-Government foresight Bulgaria*, April 2003.
- Criekemans, D., Bertrand, G. and J.Q. Rood, *Scenarios Europe 2010-2020: possible futures for the Union*, Antwerp, department of Political and Social Sciences, University of Antwerp, 2000.
- DG Information Society, *Intelcity Roadmap: scenarios for the city of the future*, March 2003
- eGovRTD2020, Roadmapping eGovernment RTD 2020, *Visions and Research Measures towards European Citizenship and Innovative Government*, Deliverable D 2.2: Workshop results, 2006
- Gartner, *Government in 2020: Taking the Long View*, Andrea Di Maio, Gregg Kreizman, Tichard G. Harris, Bill Rust, Rishi Sood, December 2005
- Glassey, O., *A One-stop Government prototype based on use cases and scenarios*, Lecture notes in Computer Science, 2002, page 116-123.
- Green, L., Popper, R. and I. Miles, *From Sevilla to Success: IST Success Scenario and Policy Priorities*, PREST, University of Manchester, United Kingdom
- IPTS, *Key factors driving the future information society in the European Research Area*, Synthesis Report on the FISTERA Thematic Network Study, September 2004
- IPTS, *eGovernment in the EU in the next decade: The vision and key challenges, based on the workshop held in Seville*, 4-5 March 2004: “eGovernment in the EU in 2010: Key policy and research challenges”, August 2004.
- Lesourne, J., *Scenarios de la politique mondiale*, Commentaire: revue trimestrielle, vol 28 (2005), page 919-924
- OECD, Centre for Educational Research and Innovation, *Schooling for Tomorrow, Think scenarios, rethink education*, 2006.
- Office of Public Management, *Beyond Profit – Future scenarios towards 2010*, February 2005.
- Ramon COMPAÑÓ, Corina PASCU, *Lessons from Foresight on Information Society Technologies*, in: *Visions on the Future of Information Society*, Publishing House of the Romanian Academy, September 2005.
- Ringland, G., *Scenarios in Public Policy*, Chichester, United Kingdom: Wiley and Sons, 2002

Appendix 5: References to Chapter 4

- CapGemini (2006) Online Availability of Public Services: How is Europe Progressing? European Commission: Brussels, June 2006.
- Clayton, T. (2002) 'Towards a Measurement Framework for International e-Commerce Benchmarking', URL: http://www.statistics.gov.uk/about/Methodology_by_theme/benchmarking/default.asp.
- eGEP (eGovernment Economics Project): <http://www.rso.it/eGEP>.
- European Commission (2003) 'The role of eGovernment for Europe's future' Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, Brussels, 26.9.2003, COM(2003) 567 Final.
- European Commission (2005a), Using logic models: developing a methodological framework for high-quality assessment of IST-RTS effects at the Strategic Objectives Level, Summary Report.
- European Commission (2005b), Impact assessment guidelines, SEC(2005)XXX, 8 June 2005.
- European Commission (2006) i2010 eGovernment Action Plan: Accelerating eGovernment in Europe for the Benefit of All, Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, COM(2006) 173 final, Brussels, 25 April 2006
- Eurostat (2005) e-Government 2004: internet based interaction with European businesses and citizens, Catalogue number: KS-NP-05-035-EN-N: http://epp.eurostat.cec.eu.int/cache/TY_OFFPUB/KS-NP-05-035/EN/KS-NP-05-035-EN.PDF
- Foley, P. (2005) The real benefits, beneficiaries and value of eGovernment, Public Money and Management, January 2005, CIPFA
- Foley, P (2006) Benefits realisation and eGovernment, paper presented to the OECD, 3 February 2006.
- Gareis, K., Osimo, D. (2004), "Benchmarking regional performance in the Information Society: turning it into practice", paper presented to the workshop "Measuring the Information Society: what, how, for whom and what?", in the context of the Fifth Annual Conference of the Association of Internet Researchers, 18 September 2004. Brighton, UK:
- http://old.developmentgateway.org/download/251042/Benchmarking_Regional_Performance_in_the_Information_Society_Gareis_&_Osimo.doc
- Heeks, R. (2006) Understanding and measuring eGovernment: international benchmarking studies, Paper prepared for UNDESA workshop, "E-Participation and E-Government: Understanding the Present and Creating the Future", Budapest, Hungary, 27-28 July 2006.
- IAB, Intergovernmental Advisory Board (2003) High payoff in electronic government, Federation of Government Information Processing Councils, Washington DC, May 2003: <http://www.gsa.gov/intergov>.
- Koski, H. and Sierimo, C. (2003) 'Entry and Exit in the ICT Sector – New Markets, New Industrial Dynamics?' Discussion papers, No. 847, Helsinki: The Research Institute of the Finnish Economy.
- McDonald, R., Teather, G. (2000) Measurement of S&T performance in the government of Canada: from outputs to outcomes, Journal of Technology Transfer, 25, pp. 223-236, Kluwer Academic Publishers.
- Millard, J (2006a) eGovernment for an inclusive society: flexi-channelling and social intermediaries, International EGOV Conference 2006, DEXA, Krakow (Poland), 4-8 September, 2006.
- Millard, J (2006b) Benchmarking, presentation and paper for the IANIS+ Intensive Course, Torino, Italy, 2-6 October 2006.
- Millard, J. and Shahin, J. et al (2006) "Towards the eGovernment vision for EU in 2010: research policy challenges", for the Institute of Prospective Technological Studies, Seville, Spain, European Commission, DG JRC, April 2006.

- OECD (2003) 'Compendium of Patent Statistics', Paris: OECD.
- OECD (2005), eGovernment for Better Government, Organisation for Economic Co-operation and Development, Paris, 2005.
- OECD (2006), eGovernment as a tool for transformation, Organisation for Economic Co-operation and Development, Paris, 26-27 October, 2006.
- World Peace Foundation (2003) Good governance rankings: the art of measurement, Cambridge, Massachusetts, USA.

Appendix 6: List of participants validation workshop

Luciano	Morganti	Crosscommunication
Nicole	Donkers	Dutch Ministry of the Interior
Edwin	Horlings	Regioplan
Karel	De Vriendt	European Commission, DG Enter
Jamal	Shahin	University of Amsterdam/VU Brussels
TrondArne	Undheim	European Commission, DG INFSO
Melanie	Bicking	University of Koblenz
Mechthild	Stöwer	Fraunhofer eGovernment Centre.
Cristiano	Codagnone	Gov3 / Milan State University
Philip	Von Haeling	Accenture
Leda	Guidi	Municipality of Bologna
EvertJan	Mulder	HEC Consultants of ICT and Government
Peter	Brown	Pensive EU consultancy
Leonardo	Piccinetti	E4Business Consultants
Karsten	Gareis	empirica
Agnes	Bradier	European Commission, DGINFSO
Bas	Kotterink	TNO
Valerie	Frissen	TNO
Noor	Huijboom	TNO
Jeremy	Millard	DTI
David	Osimo	IPTS
Dieter	Zinnbauer	IPTS
Annaflavia	Bianchi	IPTS

European Commission

EUR 22897 EN – Joint Research Centre – Institute for Prospective Technological Studies

Title: The future of eGovernment: an exploration of ICT-driven models of eGovernment for the EU in 2020

Authors: Valerie Frissen, Jeremy Millard, Noor Huijboom, Jonas Svava Iversen, Linda Kool, Bas Kotterink, Marc van Lieshout, Mildo van Staden, and Patrick van der Duin

Editors: David Osimo, Dieter Zinnbauer, and Annaflavia Bianchi

Luxembourg: Office for Official Publications of the European Communities

2007

EUR – Scientific and Technical Research series – ISSN 1018-5593

ISBN 978-92-79-06697-9

Abstract

This report aims to describe how ICT can enable and shape future models of eGovernment. It summarizes the results of a research project, carried out by TNO and DTI on behalf of IPTS, based on desk research, expert interviews and a scenario-building exercise. It first identifies seven "hotspots" where ICT has a key impact on specific government tasks. It then analyzes these impacts under different possible future scenarios, in order to assess their robustness and the different implications for future models of eGovernment. It finally proposes a new measurement framework suitable for these future models, and outlines the key research challenges and policy options that emerge from this analysis.

The mission of the JRC is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies. As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Union. Close to the policy-making process, it serves the common interest of the Member States, while being independent of special interests, whether private or national.

