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Towards the eGovernment Vision for the EU in 2010: Research Policy Challenges

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EUROPEAN COMMISSION
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Towards the eGovernment Vision for the EU in 2010: Research Policy Challenges

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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 as well as a scientific/technological dimension.

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PREFACE

Modern and efficient public administration is a key factor for competitive economies. Information and communication technologies, accompanied by organisational change, are recognised as driving factors of government modernization. In many countries, this modernization policy is led by eGovernment.[1] Rather than a goal in itself, eGovernment is therefore seen in Europe as a tool for better and more effective government. With particular regard to the Lisbon goals of growth and jobs creation, eGovernment can contribute to making Europe an attractive place for investment and work, through simpler, transparent, more efficient and service-oriented public administration. At the same time, governments must be able to cope with new emerging challenges, such as climate change, ageing, security, and citizens' rising expectations and more diverse needs.

Because of the relevance of eGovernment within the Lisbon strategy, the European Commission has long been active in this policy area. It has articulated its activities along three main directions: research, policy, and exchange of good practice.[2]

In particular, eGovernment research aims to address government challenges that need dedicated research effort and innovative Information Society Technology solutions, when research in other IST application fields would not meet the specific needs, and/or when the nature, size and quality of the challenges cannot be met only by deploying existing technologies.

In this context, the definition of eGovernment research priorities needs to take into account the possible ways in which governments will operate at the time when the research results will be produced, used and deployed. Also, it has to clarify to what degree the specific research effort could contribute not only to eGovernment policy objectives, but to the creation of public value and to the achievement of wider strategic goals, such as the Lisbon priorities for the European Union.

With these goals in mind, and in support of eGovernment policy development, IPTS[3] launched a set of research activities. These aimed to build a common vision of future eGovernment, define the related research areas, understand the specific challenges to be addressed, and provide a degree of prioritization of the research challenges based on technological developments, future eGovernment needs and potential impact on wider strategic goals.

Firstly, IPTS organized a dedicated workshop in Sevilla in March 2004 on “eGovernment in EU in 2010: Key policy and Research Challenges”, which was attended by eGovernment experts from the European countries, including the New Member States, and international organisations. The report on the outcomes of the

[1] For example, surveys show that "in Europe eGovernment currently seems to be by far the most influential topic of public administration modernization" (Demmke et al, 2006, Decentralisation and Accountability as Focus of Public Administration Modernisation.. Report published by the Austrian Federal Chancellery for the European Public Administration Network, May 2006).

[2] These policies are now articulated mainly in the 7th framework programme for RTD; the Competitivess and Innovation Programme, the i2010 eGovernment Action Plan (COM(2006) 173), and the good practice framework. See http://europa.eu.int/information_society/activities/egovernment_research/index_en.htm

[3] IPTS (the Institute for Prospective Technological Studies), based in Seville, Spain is one of 7 research institutes that make up the Joint Research Centre of the European Commission.

workshop,[4] spelled out a vision of future eGovernment as user-centric, knowledge-based, distributed and networked, but also pointed to a number of challenges which have to be met in order for this vision to become reality. Experts indicated several implementation challenges, such as political leadership, budgetary constraints, the legacy of organizational structures and culture. Furthermore, experts identified twelve key areas where eGovernment-specific research challenges are to be found.

Secondly, following on from the workshop, the Danish Technological Institute and the European Institute of Public Administration carried out a study in 2005/2006, the results of which are presented in this report. The study set out to validate, prioritize and analyze these eGovernment research challenges for the enlarged European Union, through an extensive survey, in-depth interviews of eGovernment stakeholders, and research activities. It also aimed to examine how eGovernment research across Europe (both at national level and in EU programmes) could support major, especially EU, policy goals up until 2010, in line with the Lisbon objectives. Additionally, the study projected an eGovernment vision for 2020 and considered its implications for eGovernment research policy in support of the European Research Area (ERA).

The results of the study confirm the key research areas which were outlined in the workshop, but also provide a more precise and shared definition of these research areas and related challenges. It shows that eGovernment research is spread across all of these areas, and that its priorities are evolving over time. Currently, research focusses on issues such as "data and knowledge management", and "integration and interoperability". However in the future, eGovernment research is widely expected to move from these "inward-oriented" areas towards a wider perspective: "user needs" clearly appears as the main area for future research. eGovernment evaluation will move from the current attention on "performance and benchmarking", towards examining the wider "impact of eGovernment on public value". This has significant implications for both research and implementation policy. Overall, 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.

The interim results of the study were presented and discussed at various conferences and workshops, such as DEXA 2005, the EC eGovernment subgroup meetings and the eGovernment stakeholder consultations organized by DG INFSO. The study was mentioned in the impact assessment of the eGovernment Action Plan (COM 2006/173 of 25.04.2006). It was also shared with the US "Center for Technology in Government", which is currently carrying out a similar study to establish the current status of international eGovernment research for the National Science Foundation.

Furthermore, these results currently constitute an important input to the development of a common framework for European, national and regional eGovernment research programmes, in the context of the eGovernet project (www.egovernet.org, 2006-2007) which supports the construction of the ERA in eGovernment research.

Future related IPTS research activities will focus on scenarios of ICT-driven and ICT-enabled government in 2020, and on an in-depth analysis of the emerging role of users as co-producers of public services.

[4] C. Centeno, R. Van Bavel, and J-C. Burgelman (2004): 'eGovernment in the EU in the next decade: the vision and key challenges', DG JRC-IPTS Technical Report, August 2004. Available online at: http://fiste.jrc.es/download/eur21376en.pdf.

Project Team

The study was carried out by a research team composed of:

- Jeremy Millard and Richard Warren of the Danish Technological Institute, Copenhagen, Denmark.
- Christine Leitner and Jamal Shahin of the European Institute of Public Administration, Maastricht, the Netherlands.

Furthermore, the study benefited from active input from Louise Thomasen, (DTI), Antoinette Moussalli (Euromax Solutions Europe ltd.) and Michal Baranowski, Antonio Alabau, Giuseppe Zilioli (EIPA).

Throughout the development of the study, the ICT Unit eGovernment team at IPTS interacted with the authors and provided guidance and input, in order to ensure robust results, which are relevant to EU policy formulation. In particular, the IPTS team reviewed and extensively commented on interim and final versions of this report, and it organized two validation workshops, attended by about 30 European experts.

Acknowledgements

IPTS and the research team would like to thank DG INFSO for their active participation in the workshops and reports, and their feedback.

We would also like to thank all those who contributed their advice and time, either by answering the questionnaires, or through consultation and discussion. A full list of those who contributed is included in Annex 3 to the report.

The Annexes to the report have been published in a separate volume, which is available on the IPTS website.

Web address

For further information on this and other IPTS activities on eGovernment, please visit http://fiste.jrc.es/pages/egovernment.htm

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Executive Summary

The IPTS study

This study for the Institute of Prospective Technological Studies (IPTS) has been carried out within the policy framework and objectives of meeting the European vision of a knowledge-based government which creates public value and improves cost efficiency by 2010 in line with the Lisbon process.

Its main objectives include the validation and further development of a series of European eGovernment research areas identified at an IPTS workshop in 2004, the policy relevance of each research theme, and their recent and future recommended status seen in a global context. Recent and future recommended eGovernment research has been mapped against some of the main Lisbon 2010 policy goals, the major research challenges have been identified, a 'strengths and weaknesses' analysis carried out, and a series of research policy recommendations have been made. Finally, focus has been shifted onto an extended 2020 time horizon in order to contribute to current discussions about eGovernment research, policy and practice in the medium to long term.

The overriding purposes of the present study are to:

- examine how eGovernment research across Europe (both at national level and in EU programmes) can support major, especially EU, policy goals
- validate which are the specific eGovernment research challenges and opportunities for the enlarged Europe Union and related potential policy opinions in support of the 7th Research Framework Programme, to achieve the eGovernment vision for 2010, within the political framework of the Lisbon objectives and the construction of the European Research Area.

Methodology

The study was divided into two phases. The purpose of the first phase was to identify, analyse, and prioritise the various eGovernment research areas from an EU policy perspective. Thus, first the extant knowledge of the field was examined and assessed, which assisted in identifying major research opportunities and challenges in the most relevant research areas. Then, a pilot study design employing an array of methodological elements and instruments was developed and tested for its utility.

Based on those insights, a final multi-method research design was developed and used, through which both quantitative and qualitative data were collected and analysed. The main instruments included wide-ranging desk research, content analysis of recent research published as conference proceedings and on the Internet as well as of EC-supported research projects, questionnaires to 200 stakeholders involved in eGovernment research, a series of interviews, and active participation in a large number of workshops and conferences.

In the second phase, the results and insights developed in the first phase were validated, the policy implications were evaluated, and the relative strengths, weaknesses, opportunities and risks of European eGovernment research were assessed. This was

used as a basis for a series of recommendations concerning research focus and policy, as well as on the organisation and funding of research in Europe. It also provided a foundation for looking further into the 2020 future.

The validated research themes

The identification of major European eGovernment research themes took place through a bottom-up as well as a conceptually-driven process, in which actual research recently taking place was evaluated and validated using the study instruments described above. This resulted in seventeen research themes, which for conceptual and analytical purposes were clustered into three groups to reflect the major fields of research identified during the study:

Group 1: Twelve research themes which examine the direct production and implementation of changes brought about by eGovernment:

- eGovernment inward-facing, including back-office, themes
- eGovernment service and content design, production and delivery themes, the interface between the back- and front-office
- eGovernment outward-facing, including front-office, themes
- cross-cutting themes, such as trust and security, open source and measurement.

Group 2: Four eGovernment themes examining the impact and measurement of group 1 activities on the benefits or otherwise experienced by the public sector and/or eGovernment users (citizens and businesses)

Group 3: One research theme that examines the implication of group 2 impacts for wider public value and high level policy goals.

Recent and future recommended eGovernment research: an overview

Using the empirical sources employed during the study, a research map of Europe in a global context was developed. This showed that, recently, an overwhelming amount of research has been carried out in the area of the back-office and on the interface between the back- and front-office, especially focusing on technology aspects (rather than organisational or economic issues), including data and knowledge management, as well as on the technical aspects of interoperability, service design and production, and trust and security. A relatively large amount of research on eDemocracy has also been carried out. Overall, there is a clear recent focus on technology use and exploitation in eGovernment research. At the European level a significant move towards policy-related research has been initiated, and corresponding cooperation between policy-makers and the research community has been set up and is being further reinforced. This also intends to raise, specifically, the interest of the eGovernment policy-community in eGovernment research issues and also, generally, the interest in the potential of innovative eGovernment for public policy making. Such approaches could also be initiated at the national level.

At the European level the link between policy and research is expressed in key documents such as the Manchester Ministerial Declaration,[5] the 'Signposts Towards eGovernment 2010' document,[6] and the Cobra recommendations (European Commission, 2004f). The opportunity now is to further strengthen this and to also look forward, beyond the 2010 timeframe, in order to make the linkage between policy and research a sustainable European strength.

Recent eGovernment research tends to be of a similar nature across the globe, often with only small regional deviations, although the OECD regions tend to be much further advanced in terms of coverage and deployment. The differences can often be explained by the nature of the political institutions and cultural systems within each region.

However, the picture changes quite dramatically when stakeholders' recommended future research is examined. Although non-Europeans tend to recommend more of the same, i.e. not highly different from what they are doing now, Europeans have almost turned the rank-order list of research upside down. Although many of the most important recent research themes are also expected to be areas of focus in the future, there are a large number of highly significant divergences. Data and knowledge management, and integration and interoperability, slip significantly down the ranking, and are replaced by user needs, value chains for developing services and content, and networked multi-level services. The outward facing, user focused research themes are also much more prominent than in recent research. Both user needs and socio-economic inclusion move significantly up the rankings, whilst eDemocracy further improves its already important position.

All this implies an important shift away from back-office inward-facing research more towards the wider organisational aspects of service design and delivery, as well as a strong shift of emphasis towards the front-office and service use. Even more significant, however, is the quite dramatic shift of emphasis of recommended research towards an examination of the impacts of eGovernment on the benefits experienced by the public sector and/or eGovernment users. Similarly, the implication of these impacts for wider public value and high level policy goals is also stressed much more.

Finally, the study shows quite clearly that EC-sponsored research activities, compared to the other research examined in this study, emphasise very similar eGovernment themes. However, EC-sponsored research activities are significantly closer to deployment and thus more likely to have a direct impact on EU policy, and also involve a higher number of stakeholders (i.e. are more multi-stakeholder), including a larger proportion of public sector and ICT industry stakeholders, and cover a larger number of research themes (i.e. are more multi-disciplinary).

In fact, EC-sponsored research seems to play a very specific and important role in European research generally, and successfully complements the overall European research effort, providing a well balanced eGovernment research portfolio from the perspective of stakeholder mix and research type. Indeed from the evidence in this

[5] Agreed at the European eGovernment Ministerial Conference, 24-25 November 2005, under the UK Presidency.
[6] Also published at the European eGovernment Ministerial Conference, 24-25 November 2005, under the UK Presidency.

study, the EC is clearly showing the way for other European researchers in linking eGovernment research to deployment and to major policy goals, as well as providing a framework within which such deployment and policy linking can better take place.

Linking research to policy

There are at least two specific patterns that emerge when considering stakeholder assessment of the importance of eGovernment research for policy goals. The first prioritises social and inclusion policies, to some extent citizenship, and EU level policies over the others, and reflects the views of academics, the public sector and users. The second prioritises economic and cross public sector policies (i.e. linking and integrating eGovernment with what is taking place in health, education, etc.), and reflects the views of consultants, industry and non-Europeans. Non-Europeans, in particular stress cross public sector policies much more than European stakeholders. ICT industry stakeholders also weight EU level policies highly. The data provided by the study also indicate that EC-sponsored research tends, as would be expected, to be more relevant for the EU level policies like enlargement, European research policy, etc.

The current basis for policy-related research is promising. In order to further reinforce this and build on the potential and interest that is clearly present, a methodology is suggested based on the 'intervention logic', already employed in EC impact assessment exercises, which facilitates understanding of the link between eGovernment research and general policies and policy visions. These intervention logics connect three levels of objectives, each coinciding exactly with the three major groups of research themes described above, i.e.:

Level 1: The eGovernment operational objectives level, as the building blocks and detailed operations of eGovernment, which directly produce and implement change

Level 2: The eGovernment specific objectives level, which are the eGovernment impacts (benefits or otherwise) experienced by the public sector and/or eGovernment users (citizens and businesses)

Level 3: The general objectives level, which examines the implications of Level 2 impacts for wider public value and high level policy goals.

Five detailed analyses of these three levels and their intervention logics have been developed by the study in support of major EU policy goals for the 2010 time frame, based on existing sources and consultations. These are economic policies, social and regional policies, quality of life and welfare policies, citizenship policies, and EU enlargement and research policies.

For each of these policy goals detailed recommendations are made about the eGovernment research required to support them. In addition, the methodology also enables consideration of so-called externalities, i.e. factors beyond the control of researchers and those responsible for eGovernment research which may reduce the impacts of research results on policy achievement. It is recommended that these externalities be directly incorporated into the research policy process, so that their importance, their risk of acting as barriers, and the level of control policy makers may or may not have over them, can be clearly articulated and taken into account.

Strengths and weaknesses of European eGovernment research

Using as a yardstick the global state-of-the art research agenda developed by the study, a number of first and second order European strengths were identified. First order strengths comprise the following three research themes:

- eDemocracy and eParticipation
- Change in the public sector
- eGovernment at the EU level

The following second order strengths were also recognised:

- Data and knowledge management
- Socio-economic inclusion
- Open source
- Trust and security
- Measurement

However, the evidence also shows that deployment of the results of these research strengths in Europe is highly variable, and is particularly low in relation to change in the public sector, so the question arises in terms of policy relevance, whether or not Europe is getting value for money in exploiting the results of all these research strengths.

Europe also demonstrates a series of research weaknesses, determined by low coverage of the global state-of-the art research agenda:

- Integration and interoperability
- Value chains for designing, producing and delivering eGovernment services, particularly in relation to public-private partnerships as well as partnerships with the civil sector
- Networked government
- Multi-channel
- User needs
- Cross-sectoral public services
- Innovative governance
- Public value creation

Many of these strengths and weaknesses translate into opportunities for European eGovernment research, although the changing external environment within which this research finds itself also plays an important role. There are also a number of potential risks or ‘missed opportunities’ which arise if Europe’s strengths are not exploited or its weaknesses are allowing to persist. The most important of these opportunities and potential risks are addressed in the research policy recommendations in the next section.

eGovernment research policy recommendations

Content of research

eGovernment research policy recommendations arise directly out of the need for Europe to build on its strengths, learn from its weaknesses, and take hold of opportunities emerging in the context of broader policy goals. Focusing on Europe's strengths and linking research direct to policy goals, are ways of looking forward to the future. There is clearly a lot of positive work being carried out in terms of eGovernment research in Europe, but this must be continuously developed. There are also some weaknesses in the research capacity seen across Europe as a whole, which are, in some cases, reflected around the world, and in others Europe lags behind.

In summary, the following main research policy recommendations stand out:

1. It is important to strengthen even more research into the higher level policy and political implications of eGovernment implementation, thereby supporting the creation of public value. The study has shown that EC-sponsored research, as compared to the rest of European research, is already quite advanced in this regard, so this approach should be strengthened and the EC's role in European research as a whole further focused on providing leadership and a framework to make this happen more widely.
2. In relation to recommendation 1, when designing and implementing major EU societal level policies which support public value (like economic growth, inclusion, citizenship, etc.) the specific eGovernment research needed to support this should be analysed and described in detail. This report provides examples of how this can be done for five major policy areas, as indicated above.
3. In the context of linking eGovernment research more directly to policy impacts, there should also be greater focus on the deployment of eGovernment research results. Again, the EC has over the last few years been leading efforts to better link eGovernment research to EU level policies (many of which are now also national policies) by encouraging the deployment of research results, so this role should be strengthened even more.
4. Despite the European strength of change in the public sector in terms of coverage of the global research agenda, research in this theme is still mainly focused at national and regional levels and not sufficiently close to deployment. Indeed, in the autumn of 2005 the EC issued a call for research to partially address this weakness, so these efforts should be strengthened in future.
5. The weakness of recent research into the interface between front and back office (content and service design, production and delivery), especially in terms of deploying research results, should be addressed more forcibly.
6. Also, more focused research is needed into front office and service use aspects, both to build even further on the existing European strengths of eDemocracy/eParticipation and socio-economic inclusion, but also to tackle the general European weakness in user needs issues. EC-sponsored research is already tackling user needs quite well, but across Europe as a whole this theme needs much more attention.

7. Cross sectoral services, i.e. spanning and integrating the public sector as a whole, need more focus. Historically, the EC has not been able to lead or encourage research in this area because of lack of mandate at EU level and a history of compartmentalisation. The opportunity now is to look at other countries (especially in North America and Asia), build common infrastructures and economies of scale, learn between sectors, better understand the user perspective, and avoid the sub-optimisation of resource use and of impacts.
8. Finally, notwithstanding the disagreement which often characterises the debate about the precise role of basic technology research in eGovernment, there is a need for a strong technology research task in eGovernment. In general, there should be two main strands of such a task:
   i) Look at future possible government functions and then determine which technologies and technology research is needed to bring them about.
   ii) Look at wider technology developments and research activities, especially those which take place in the private sector, and investigate which aspects could be exploited by eGovernment.

Organisation and coordination of research

The following recommendations concerning the organisation, coordination and operation of eGovernment research relate largely to European Commission (EC) actions and initiatives. However, they also indicate how these should relate to other eGovernment research at national and regional levels, and as undertaken by industry, academia and the public sector within Europe. Building on the successful role and leadership already shown by the EC (as indicated above), this study proposes nine interlocking strategies to meet the broad needs of European eGovernment research over the next five to ten years:

1. Seeding innovation – Although much recent eGovernment research remains too bottom-up, uncoordinated and haphazard, there is a clear need and role for a healthy undergrowth of bottom-up, decentralised research, responding to signals from the public and civil sectors across Europe, as well as to market signals and the needs of the European ICT industry.
2. Supporting policy priorities – This study and other evidence point overwhelmingly to the need to concentrate much of the future eGovernment research effort supported by the EC onto a specifically policy-driven and strategic approach reflecting EU and, where they overlap, also MS and industrial priorities and policies. As this study has shown, the EC has already taken important steps in this direction, so now the task is to strengthen this approach even more. The main vehicle for EC research in pursuing such a strategic approach should be to determine (on the basis of major EU policies and by agreement across the EC and with MS), a limited number of key strategic eGovernment areas, each supported by appropriate clusters of research activity. Each of the latter should include individual projects that undertake particular and complementary research, and which, crucially, are linked together by an intervention logic which addresses the different objectives levels.
3. Creating synergies – The need to link more directly and decisively to national policies, as well as to EU policies, and create better and greater synergies with them, is now high on the EC's agenda. In future, it will not be necessary and perhaps not

desirable to have exactly the same approaches or services across all MS. The scale of enlargement also necessitates this. Instead, focusing on groups of countries or sectors where appropriate should be encouraged, especially in relation to cross-border services, thereby achieving a lot more differentiation and healthy diversity.

4. Strengthening global cooperation and synergies – It is also imperative to create tighter, more formal and more effective synergies between European and non-European eGovernment research. A clear need exists for the 'formal' identification of common areas of interest with our major partners/ competitors, and then provide funding for European researchers to participate around these on a reciprocal basis.
5. Enhancing quality and relevance – In order to enhance even more the quality and relevance of eGovernment research across Europe, a more pro-active approach to identifying needs, interests and resources could be taken. This could include the identification of key actors, stakeholders, institutions, networks, users, sponsors, etc., at EU, national and regional levels proactively by the EC or Member States as well as through a brokerage service. There could also be a multi-stage process for eliciting, nurturing and selecting suitable proposals.
6. Placing eGovernment research more firmly within the virtuous circle of research, policy and practice – The European Commission is already quite advanced in doing this itself, but it needs to be more firmly coordinated across all forms of eGovernment research at all levels in Europe. Proactive efforts to create interaction between practitioners and researchers should be given the utmost priority in eGovernment research. These should encompass the concept of research clusters (as above), and a European research infrastructure including a European eGovernment research portal for access to all types of all eGovernment research at all levels, and a brokerage service (as below). This will help free up the resources of individual organisations at the local and regional levels, where R&D is not normally part of the remit, but where, in the place of resources to search for research funding and partners, money could be spent on implementation. An important element of this recommendation is for much more decisive support to be given to SMEs, especially as they are the key to local competitiveness, jobs and growth.
7. Creating an infrastructure for European eGovernment research – In order to provide a coherent, flexible, yet effective infrastructure for European eGovernment research, greater cooperation is needed not just with and between MS but also within the EC and across different programmes. Firstly, a cross EC eGovernment strategic review should be undertaken feeding into the development of the eGovernment Action Plan due to be agreed in April 2006. Indeed, during the autumn of 2005, the EC has already embarked on such a review. Second, is to set up a (virtual) European Centre for eGovernment,[7] but independent from the Commission, although supported financially by it.
8. Related to the previous recommendation is the need for much better communication of research and research results. For example, a European eGovernment research portal should be set up as a one-stop-shop providing a regular overview of the field without users needing to get hold of actual research which may require a fee.

[7] This has some similarities to the proposals made by the Austrian representative to the eEurope Advisory Group, for a Virtual eGovernment Centre ("Bloomsday Recommendations", 2nd eEurope eGovernment subgroup meeting, Dublin 16 June 2004).

9. Finding the right balance for EC eGovernment research funding – Given the recommendations above (and the more detailed analysis provided in this report), a recommendation can be made concerning the organisation of eGovernment research policy as to the most suitable spread of resources for different types of instruments:
   - 30% seeding innovation (functioning as of now, but with even more innovative leeway and support)
   - 50% supporting major EU policy goals, e.g. through priority research clusters.
   - 20% creating synergies, e.g. through strategic support functions, including ideas factory, clearing house, brokering service and good practice framework.

   Whatever distribution of resources is adopted in practice, however, it is also important to retain flexibility in order to both respond to new research needs as these materialise and to maximise coherence and synergy with other programmes, whether at European, MS or regional levels.

Longer term eGovernment research priorities

Finally, some thoughts are provided about the development of longer term eGovernment priorities in Europe, and the role of research in this. Nine visions are developed, principally as suggestions as to how the public sector could dispose of both its structure and role within a 2020 timeframe.

The nine visions present different goals for public administrations, and the part played by ICT in this. Within the different visions, the public sector can take varying institutional structures, which constrain or bound its activity in dealing with society, i.e. networked, distributed or centralised. It can also take either a proactive, highly involved and omnipresent role in society, or a more reactive and withdrawn role. The attempt here is not to construct a series of scenarios, but rather to elicit a set of possible suggestions which can be used to stimulate discussion on future possibilities for research policy for (e)government in the medium to long term. Briefly, the nine visions are:

Networked (e)government:

1. A dynamic public sector – is a highly effective and highly (pro)active networked organisation, in which the government knows what a user requires before the user knows about it or asks for it.
2. A personal public sector – in which the citizen is dealt with individually and proactively, with completely personalised services and a ‘one-to-one’ relationship with their own government representative.
3. An inclusive public sector – is one in which all stakeholders (whether citizens, businesses, NGOs, regions, etc.) are fully included. This is defined as being fully served by appropriate services no matter who they are, what their condition and circumstances are, or where they are, as well as fully participating in the processes of government and governance to the extent that legislation allows and the individual wishes.
4. A democratic public sector – is concerned with user involvement in, and contribution to, both the decisions and workings of communities as well as of society as a whole, and focuses here on user empowerment through eGovernment.

5. An open public sector – provides the perfect model of transparency, where citizens can trace every single interaction with public administrations right down to the name of the individual who is dealing with their query or case in real time. In this vision there is focus on such openness rather than on proactivity, so that government becomes totally transparent.
6. A user-driven public sector – means not just designing government and services for users and taking their needs fully into account (i.e. user-centric), but drawing users themselves fully into the processes whereby government and services are determined, designed and created.

Distributed (e)government:

7. A diverse public sector – is one in which citizens interact with different levels of public administration in a distributed manner, and where the public administration is not highly joined-up. Therefore, duplication can occur, but this is one of the prices to be paid for security of information and distributed power.
8. A private public sector – is one geared to the private interests of individuals, groups or economic entities. In the latter case it tends to be more or less outsourced to private corporations, thereby leaving politicians with little recourse to affecting political decisions through anything other than market forces. The interaction between the public and private sector in terms of value chains becomes a highly important subject. Issues of legitimacy and accountability will arise, not only for public administrations but also for politicians. However, efficiency in terms of costs, responding to user demand (maybe at the expense of user need) is maximised.

Centralised (e)government:

9. A single public sector – is a centralised body, either at the national or European level, where transparency and inclusiveness are not the main objectives. This could lead to a very efficient organisation, but one that is not legitimate according to our current understandings of accountability, openness and transparency. Democracy could be the loser in the battle for efficiency.

Finally, it is necessary to realise that the up-coming generation will naturally contribute to the evolution, perhaps revolution, of eGovernment, almost certainly beyond our current understanding. Many youth today have grown up with computers and the Internet, so their attitudes to the use of what the older generation terms 'new technology', as well as to eServices generally, already appear to be completely different. In order to tap into this potentially rich vein of 2020 visions, this report recommends that serious and sustained dialogue should be undertaken with the new generation, already now. They are highly likely to be living in a world where www (whole wide world) at the speed of light is as natural as turning on a light switch is for us. In the same way that, today, we take electricity, water and other commodities for granted, so will they take the *www@c* as a standard and ubiquitous utility available to all in 2020.

Abbreviations used in main report

BPR	Business Process Reengineering
CEO	Chief Executive Officer
CSO	Civil Society Organisations
DG	Directorate General (of the European Commission)
DRM	Digital Rights Management
EC	European Commission
ERA	European Research Area
ERP	Enterprise Resource Planning
EU	European Union
FP	Framework Programme (of the European Commission RTD)
G2B	Government to Business
G2C	Government to Citizen
G2G	Government to Government
GDP	Gross Domestic Product
GIS	Geographic Information System
GRID	Global Information Grid (multi-networked network)
ICT	Information Communications Technology
IDABC	Interoperable Delivery of European eGovernment Services to public Administrations, Businesses, and Citizens
IST	Information Society Technology
LISBON	Lisbon Agenda, Process, Strategy, Action plan agreed in May 2000
MEURO	Million Euro
MIS	Management Information System
MS	Member State (of the European Union)
NCP	National Contact Points (for EU RTD programmes in member states)
NGO	Non Governmental Organisation
OECD	Organisation for Economic Co-operation and Development
OMC	Open Method of Co-ordination
OSS	Open Source Systems/Software
PC	Personal Computer
PIAP	Public Internet Access Point
PPP	Public/Private Partnership
R&D	Research and Development
ROI	Return On Investment
RT	Research Theme
RTD	Research and Technology Development
SLA	Service Level Agreement (citizen charter)
SME	Small and Medium-sized Enterprise
SWOT	Strengths, Weaknesses, Opportunities and Threats analysis
TESTA	Trans European Services for Telematics between Administrations
TEU	Treaty Establishing the European Union
www@c	Whole-wide-world at the speed of light

1 Introduction

1.1 The IPTS study

This study for the Institute of Prospective Technological Studies (IPTS) has been be carried out during 2005 within the policy framework and objectives of meeting the European vision of a knowledge-based government which creates public value and improves cost efficiency. It focuses on the outcomes of the eGovernment Workshop held in Seville in March 2004,[8] which identified the most important eGovernment issues and led to the identification of key research challenges, specific to eGovernment, both technological and socio-economic, to achieve the vision for eGovernment in 2010.

Specifically, the study has the following detailed goals:[9]

- To validate the policy relevance of each of the research areas developed as a result of the March 2004 workshop, and to assess their priority.
- For each of these research areas, to understand the current status and the expected developments. (Note, because of the fast changing nature of eGovernment research, especially at the European level, 'current' research has been operationalised as 'recent' research. See section 2.2 below).
- For each of these research areas, to understand the relative positioning of European research (EU25) vis à vis other relevant geo-economic areas of the world.
- For each of these research areas, to identify the major research challenges and opportunities ahead.
- To identify potential research policy options and priority assessment, in support of the definition of the 7th Framework Programme.

It must be emphasised that this study is not about conducting research into any specific research area, but is about carrying out an analysis of and classifying research that has already been done, so as to identify which are the specific eGovernment research challenges and opportunities for the enlarged European Union. Neither is this study directly concerned with whether or not eGovernment research constitutes a discrete and coherent scientific research field or discipline, nor will the study directly assess the quality or rigour of recent eGovernment research from an academic or scientific perspective. The purpose is thus not to conduct research *on* these areas, but *about* these areas. Additionally, this research *about* eGovernment research is not being undertaken purely to map recent and future research for its own sake. The approach adopted is clearly designed to relate eGovernment research to relevant European Union policies and to future potential research policy options. This will be done in order to achieve the eGovernment vision for 2010, within the political framework of the Lisbon objectives and the construction of the European Research Area.

It therefore needs to be made clear that, although this study has attempted to survey all types of eGovernment research undertaken by all relevant stakeholders (in Europe as well as a sample outside Europe), the analysis and recommendations made are purely in

[8] European Commission, 2004s.
[9] From the study's Technical Specifications.

relation to research which can support, indirectly or directly, the major EU policies up to 2010. Despite this specific focus, however we feel that these analyses and recommendations can also be seen in a wider context, i.e. for national and regional governments, for industry and for the users of eGovernment who may have other objectives or goals in mind. Further, section 8 of the report looks beyond 2010 to a notional 2020, and offers some initial thoughts on eGovernment visions and possible policy consequences in the longer term.

It should also be noted that it is not within the remit of this of this survey to examine the academic or scientific quality of the research being carried out. This would be a huge and different undertaking. However, the content and scope of research, and whether it is focusing sufficiently on the research challenges resulting from the major policy goals, and thus whether or not European research is at the leading edge globally in this regard, is examined.

1.2 The purpose of this Final Report

This Final Report provides an overview of all the tasks carried out, the results, and the recommendations drawing on these. A separate document is provided containing detailed annexes with fuller details of work done and methods, sources and evidence used. Reference to the annexes will be made where appropriate.

This section of the report provides the context and introduction to the study, and a brief review of the eGovernment vision 2010 which provided the platform and starting point for the study.

Section 2 presents a brief overview of the methodology employed, including the validation and adjustment of the research areas derived from the March 2004 workshop.

Section 3 presents the eGovernment research map, examining both recent and future recommended research, and placing Europe in a global context.

Section 4 outlines the conceptual approach adopted to link eGovernment and eGovernment research to the major EU policy goals.

Section 5 reviews the results of feedback on the relevance of eGovernment research for EU policies, provides a set of detailed examples of the conceptual approach described in section 4 in relation to five major EU policy goals for 2010, and makes eGovernment research recommendations based on these.

Section 6 consists of a strengths and weaknesses analysis of European eGovernment research in relation to EU policy goals and in relation to the research taking place in other parts of the world. It concludes with a summary of main recommendations and research challenges.

Section 7 examines the organisation, coordination and operation of European eGovernment research, and suggests a series of recommendations arising from this.

Section 8 looks beyond 2010 to a notional 2020, and offers some initial thoughts on eGovernment visions and possible research policy consequences in the longer term.

Section 9 summaries the main conclusions and recommendations made in the rest of the report.

1.3 The eGovernment vision 2010

The European eGovernment vision developed as a result of the March 2004 IPTS workshop is summarised as follows:[10] "This vision points at the role of eGovernment as an enabler for better government, an intrinsic political objective encompassing a series of democratic, economic, social, environment and governance objectives. These objectives can be articulated around two major axes: pursuing cost-effectiveness and efficiency, and the creation of public value. It also raises the importance for eGovernment to address the emerging needs of the individual user in its dual role as a citizen and as a customer against addressing its explicit demands. eGovernment should also address businesses' needs as users, both for cost reduction and increased competitiveness."

"Finally the vision pointed at the increasing importance of knowledge management in the provision of public value to the public administrations themselves, to the citizens and to the businesses. The creation and management of knowledge on users' needs (being these the citizens or the businesses) on citizens' involvement in policy making, on regulations, on administrative procedures, etc., are becoming key for the provision of public value within a network of public, private and civil actors where the latter are playing an increasing role in the delivery of public services. Examples of actors with increasing intermediary and mediator roles are: the citizen itself, the Unions, the Civil Society Organizations (CSOs), Non Governmental Organizations (NGOs), private sector organizations (service providers), and public service providers (education, health, police, etc.)." The diagram below illustrates the network of actors playing a role in the creation and delivery of knowledge-based public value, as well as their inter-relationships.

The present study found that, in general terms, this vision does reflect the high level goals of many of the eGovernment research stakeholders consulted and of many research activities taking place. However, some important additions and caveats need to be made.

This study has shown that a key feature of the future vision is increasing focus on the final user (outward) facing aspects of eGovernment in the context of increasing public value. Three main dimensions need to be addressed in ensuring citizens and businesses are put more fully in the centre. First, greater attention needs to be placed on the quality and scope of eGovernment services (whether information, communication and transaction services) and their delivery. New delivery modes need to be developed in cooperation with all the stakeholders involved, for example:

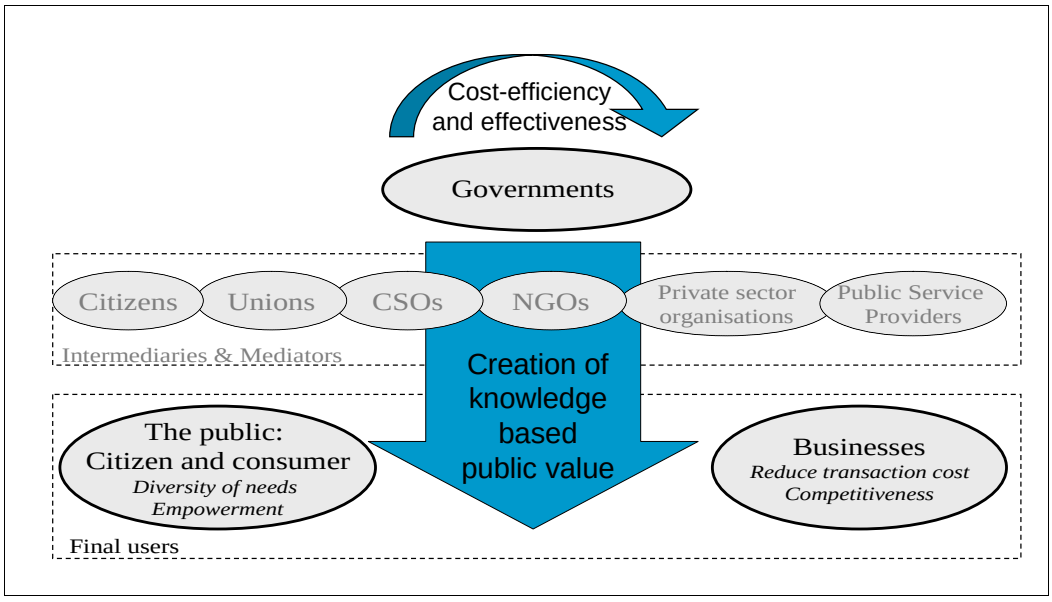
- pro-active, self-service, intermediation, personalisation

[10] European Commission, 2004s.

- multiple delivery channels and modes (one-stop shops, PIAPs, face-to-face, telephone, mobile, digital TV, as well as web-based services)
- the visibility, utility, access, quality and fulfilment of eServices as experienced by users.

Second, in Europe's increasingly mosaic society, the types and behaviour of users, their demands and needs, need to be better understood. This includes greater concern for ensuring users have both adequate skills and adequate access, and that digital divide and exclusion issues are firmly tackled. Finally, increasing focus should be placed on using ICT to develop good governance, including the framework of laws and institutions needed for justice, liberty and security, as well as taking account of the changing power relations in European society and how eGovernment can support moves to greater democracy and participation. eGovernment is also transforming the parameters of political organisation and activity, including decision making, accountability, openness, trust and dependability. It contributes directly to re-thinking democracy and the rights and responsibilities of citizens in a knowledge-based society.

eGovernment actors[11]



It is also important to make several caveats to the model developed in March 2004. The two major axes of the eGovernment vision (cost efficiency and effectiveness and the creation of public value) capture the main issues and essence of eGovernment looking forward over the next five years. They should, however, not be seen as two independent and equal pillars, but rather as 'means' and 'ends', with the interrelationship that this implies.

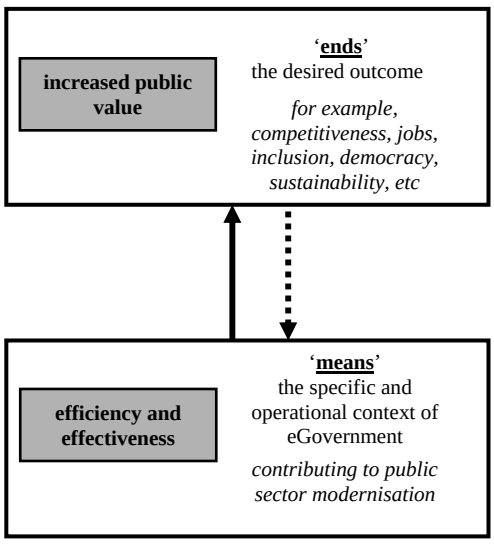
[11] From the draft version of European Commission, 2004s.

The diagram below is designed to imply, not only that public value and efficiency/effectiveness are not equal and independent, but also that public value is the 'superior' ends of the operational means. Public value is thus the ultimate goal, and efficiency and effectiveness are 'only' means to this higher end.

Both means and ends, as well as the relationship between them, need to be better articulated within the context of the question: "what are government and governance for and how can ICT support this?" In very brief terms, the answer to this can only be "to deliver public value". The latter is a slippery concept, but its significance means that it itself needs research attention as well as being of importance to policy makers and practitioners. As far as the 'means' are concerned, we are thus not interested in public sector modernisation for its own sake, nor indeed in just any type of public sector modernisation, but we are interested in public sector modernisation which maximises public value.

As the desirable 'ends', we are therefore interested in public value for its own sake, so it must be more clearly articulated and linked to the outcomes of eGovernment. For example, it should include the economy (growth, employment, innovation), society (including citizenship and inclusion), democracy, quality of life and wellbeing, an improving environment and sustainability, spatial cohesion and territorial development, as well as providing frameworks for decision-making, participation, liberty, justice and security. In other words, public value is given meaning and is articulated through policy making and implementation. In the context of the present study, therefore, public value is best represented by the major high level EU policy priorities such as the Lisbon and Gothenburg strategies.

eGovernment ends and means



Another important dimension of opinion captured in this study emphasises that eGovernment is (just) part of government. ICT is a (very powerful) tool or enabler, but

also goes further than most tools and has the potential to transform government, both what it is and does as well as how we think about it. However, it cannot ultimately be understood or researched if entirely divorced from mainstream government and public sector developments and research. A pertinent quote in this context is from the ex-eEnvoy in the UK, Alan Mather (2003): "eGovernment isn't any different from government. It just might make it better, sooner."

Other clear messages include the need for research to move from a mainly technology to a socio-economic, organisational and management focus, which largely sees eGovernment as a technology application area rather than one undertaking basic technological research in its own right. This also includes a focus on policy and governance relevance. Research must also look forward and help prepare desirable frameworks of support for future citizens and future government, as well as future regions, Member States and the EU.[12]

[12] For example from the eGovernment Research Cluster Workshop, held in Brussels, 1-2 March 2003: European Commission, 2005af.

2 Study methodology

This study consisted of a two-phase research investigation intended to develop recommendations for European research policy choices in pursuit of the vision for eGovernment up to 2010 and beyond. In this section a comprehensive explanation is given of the methodology used during the study. For some specific issues, more details are available in the Annexes, to which reference is made as appropriate.

2.1 Overview of methodology

Phase 1 of the study was mainly concerned with refining and testing the methods to be used, with data and information collection, and with initial analysis in order to provide a detailed overview of eGovernment research in Europe mapped in a global context. As part of this, an important activity of Phase 1 was to examine the 11 research areas proposed by the March 2004 workshop, to validate whether they are indeed the critical research challenges, and to suggest which other ones can be identified and which adjustments should be recommended.

Phase 2 built directly on Phase 1 by, first, validating the work of Phase 1 through a new round of questionnaires, interviews and consultations, as well as presentations at workshops and conferences. Second by developing detailed links between eGovernment research and EU policies represented by the Lisbon and Gothenburg Strategies, the eEurope Action Plans (2002, 2005), and the recently proposed successor of eEurope, i2010. Third, by conducting a strengths and weaknesses analysis, and making detailed research policy recommendations, and finally by examining the organisational issues of European eGovernment research.

2.2 Phase 1: Taxonomy and research policy mapping

The main objectives of Phase 1 were to address four tasks, the achievement of which took place to a large extent iteratively and in parallel. Task 1 (classification) took the original taxonomy of research areas derived from the March 2004 workshop and validated whether or not these are indeed the critical research challenges, which other ones could be identified and which adjustments should be recommended. This validation was also conducted by Tasks 2 and 3, which examined respectively the policy relevance of research and the recent and future status of research. Task 4 summarised the results of Tasks 1, 2 and 3.

Task 1) Classification
Taxonomy of research areas and challenges to provide a platform and framework for the rest of the study, described using scientific academic and industry research terminology, and articulated in the form of research challenges:

- political and strategic
- structural, legal and organisational, including institutional, regulatory, management, cultural, etc.
- economic
- social, including users

- technological

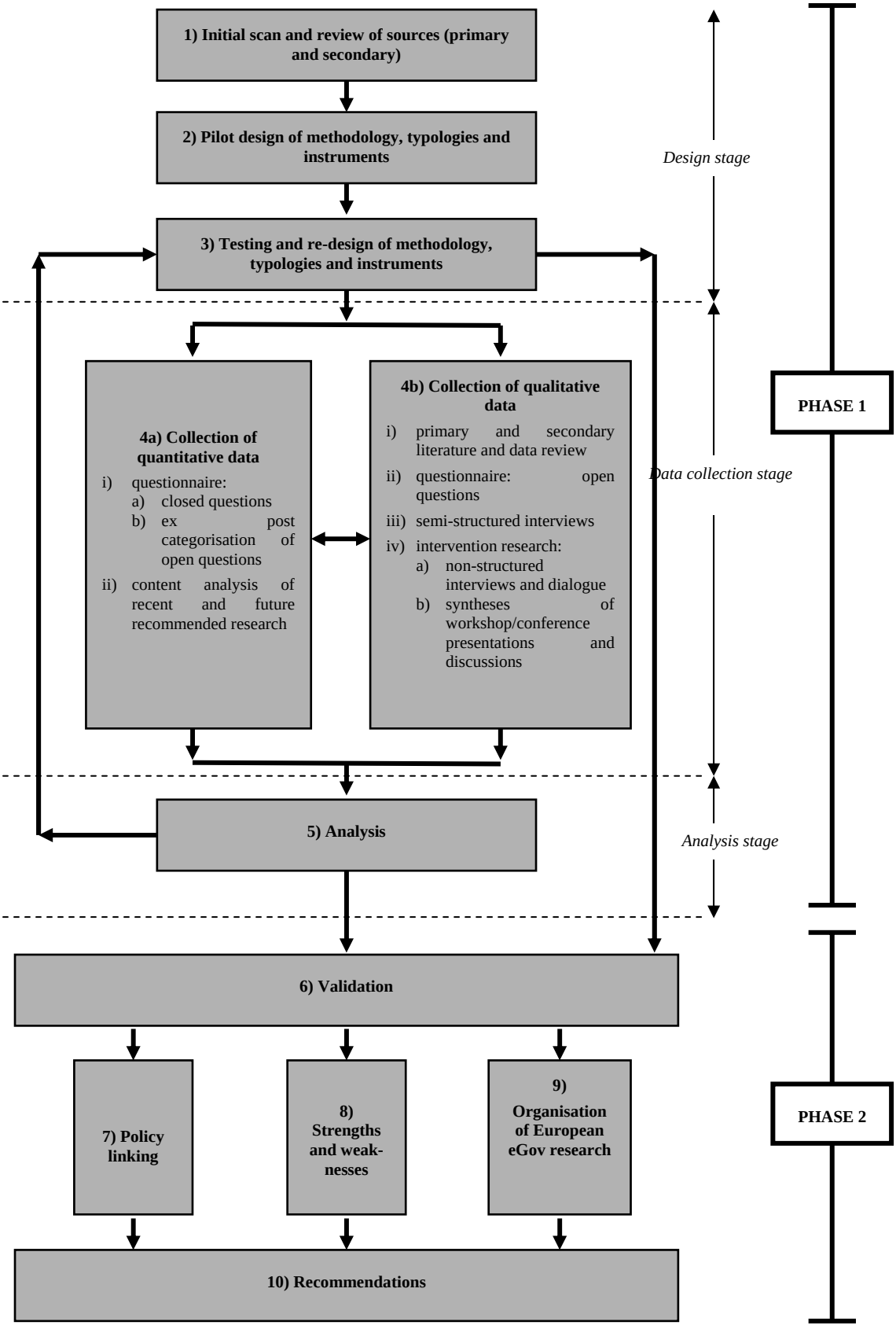
Task 2) Assessment of relevance to EU policy
EU policy areas mapped against each research area, in order to understand and validate the policy relevance of each area and to ascertain its priority and any potential gaps.

Task 3) Recent status and expected developments
Description and assessment of the recent status and the expected developments by each research area. Note, the original Task 3 description was "Current status of research", but because of the fast changing nature of eGovernment research, especially at the European level, this was operationalised as 'recent' research. In this study, the eGovernment research activities surveyed covered the period 2001/2002 up to early 2005, although some of this research is currently continuing at the end of 2005.

Task 4) Research map
Comparative worldwide assessment of each research area, including major actors, size of effort and significance, in order to provide an overview of Europe's position.

The detailed implementation of both phases took place through a number of steps, as illustrated in the diagram below. In Phase 1, there were five steps. First, an examination and assessment of the extant knowledge of the field, which assisted in identifying major research opportunities and challenges in the most relevant research areas. Then, a pilot study design employing an array of methodological instruments and typologies, included questionnaires, interviews, and content analysis, was developed and tested for its utility. Based on those insights, a multi-method research design was developed and used, through which both quantitative and qualitative data were collected and analysed.

The five steps in Phase 1 are described in more detail in Section 2.2.1.


1) Initial scan and review of sources (primary and secondary)
2) Pilot design of methodology, typologies and instruments
3) Testing and re-design of methodology, typologies and instruments
4a) Collection of quantitative data
i) questionnaire:
a) closed questions
b) ex post categorisation of open questions
ii) content analysis of recent and future recommended research
4b) Collection of qualitative data
i) primary and secondary literature and data review
ii) questionnaire: open questions
iii) semi-structured interviews
iv) intervention research:
a) non-structured interviews and dialogue
b) syntheses of workshop/conference presentations and discussions
5) Analysis
6) Validation
7) Policy linking
8) Strengths and weak-nesses
9) Organisation of European eGov research
10) Recommendations
Design stage
Data collection stage
Analysis stage
PHASE 1
PHASE 2

The five steps in Phase 1 are described in more detail in the following:

2.2.1 Step 1: Initial scan and review of sources

Phase 1 kicked off with an initial but detailed scan of primary and secondary literature, data and other sources relevant to the study. An overview of the main literature sources is given in Annex 1.1.

2.2.2 Step 2: Pilot design: methodology, typologies and instruments

Step 1 provided the basis for Step 2's pilot design of the methodology for Phase 1, as well as the typologies and instruments to be used. Requirements for providing a firm foundation for Phase 2 were the main goal, but within an iterative framework. Thus, the methodology could not be fixed entirely at the outset but needed to be developed and adapted in light of piloting, feedback and validation, notwithstanding the need to retain overall rigour and focus on the ultimate objectives of the study.

2.2.3 Step 3: Testing and re-design: methodology, typologies and instruments

Step 3 consisted of piloting and testing the typologies and instruments prepared in Step 2, resulting in re-designed and more robust tools capable of large scale data collection and analysis. These re-designed instruments and typologies are outlined in section 2.4 below.

2.2.4 Step 4a: Collection of quantitative data

Sources for quantitative data

There were two sources for the quantitative data:

i) **Questionnaires**, used both as a self-completion instrument and for completion during telephone or in-person interviews, providing two types of quantitative data:
   a) Closed questions, numbers 1, 2, 4.7, 6.1 and 8 in the base questionnaire (see Annex 2).
   b) Open questions, numbers 2.12, 3, and 5 in the base questionnaire (see Annex 2). Open questions to be used quantitatively were subjected to inductive clustering, i.e. by grouping very similar statements together in order to build a taxonomy bottom-up, and then counting the occurrences in each category. (See Annex 6 for full details)

ii) **Content analysis of existing published research**, derived from a number of different sources, as listed in Annex 5. This was done by first reading abstracts or summaries, and then validating the results by checking appropriate parts of the material, such as introductions and conclusions, and, where necessary, the whole of the source. Scores and coding were then entered into the database, as shown in Annex 5. Piloting and checks showed that this process was sufficient given that the purpose was not to make judgements about the quality or rigour of individual sources but to determine some basic characteristics of the source.
   The sources selected for the content analysis, together with their justification, were:
   a) DEXA EGOV Conference Proceedings 2004, Zaragosa, Spain, September 2004
   b) DEXA EGOV Conference Proceedings 2005, Copenhagen, Denmark, August 2005

These two sources constitute a large part of the study's content analysis. The rationale for this is underpinned by a current review of the state of the art in eGovernment research (Grönlund, 2005) which *inter alia* reports:

- "There is no doubt that the bulk of eGovernment papers appear in conference proceedings, and, hence, this is a reasonable place to look when trying to get a picture of what the field contains." (p. 4)
- Compared to the other main international eGovernment conferences, DEXA has the most "comprehensive coverage of Europe, including the eastern part. Also comparatively good international coverage, including Asia and Latin America." (p. 9)
- "[In 2003] DEXA gathered researchers from 30 countries, as compared to 9…" and 15 each at the other two international eGovernment conferences investigated (p. 21)
- DEXA has the broadest cross section of stakeholders (p. 17, Table 7: target audience)

c) IDABC eGovernment Observatory and newsletter (http://europa.eu.int/idabc/egovo), 2004-2005. This is the most comprehensive and extensive source of eGovernment news and activities across Europe which also provides a global perspective. Focus was placed on research activities and results. (European Commission, 2005ag)

d) All European Commission supported eGovernment research projects under the Information Society Technology Programme, Fifth Framework Programme (2000-2003)

e) All recent European Commission supported eGovernment research projects under the Information Society Technology Programme, Sixth Framework Programme (2004-2007): (European Commission, 2005a)

f) Other recent European Commissions supported eGovernment research projects, including from eTEN, Modinis, Interreg III B, eContent, Tempus.

It is important to scan recent and current EC-supported eGovernment research given this study's prime purpose of linking to EU-level policies and making recommendations which focus on the European level.

Checks were made into the accuracy of the content analysis coding by two independent coders on about 10% of the papers. Results showed approximately 6% deviation from the original coding, which is within acceptable limits.

Given the limited time and resources available to the study, decisions had to be made about the most useful and representative sources, as given above. Even if most eGovernment research papers appear in conference proceedings, and even if the DEXA conference series is the most representative, a focus on DEXA has the important limitation that is excludes other important conference, as well as journals and other sources, such as public sector, ICT industry and user sources.

Full details about the methods and sources employed in the content analysis are given in Annex 5.

Measuring recent and future recommended research activities

Both the questionnaires and the content analysis were used to measure the extent and type of recent eGovernment research, as well as future recommended eGovernment research. This was done by combining the two sources in order to present an overall index consisting of a weighted average of the two, thus ensuring that the relative weights of both are fully represented. Both sources here measure the same phenomenon, i.e. recent actual research activity. The questionnaires do this by asking respondents to describe and give details of current research, as well as of future recommended research. The content analysis does this by desk research examination of different sources of projects, papers, etc, as described above. Despite the different sources employed, they each paint a very similar picture, which indicates that some faith can be had in the overall validity of the results as a snapshot of the period 2001/02 to mid 2005. The Pearson rank order correlation coefficients between the four sets of data (i.e. questionnaire and content analysis data for European, EC-sponsored, non-European and global overview) are between 0.76 and 0.88. Duplication between sources (i.e. where the same research activity appeared in more than one source) was about 6% of activities, but such additional occurrences were removed so that each activity was included once only.

Research effort for a given research theme is measured by the number of activities covering that theme, and weighting the activity by the number of stakeholders working on it. In the absence of data on the financial resources of each research activity (which would often be difficult to obtain and is anyway beyond the scope of the present study), the number of stakeholders is thus used as a useful surrogate for the 'size' or weight of each research activity covering a given research theme. So, for example, a research activity involving three different stakeholders is weighted three times more than a research activity involving only one stakeholder. An alternative measure of research effort would be not to weight research activities or projects which focus on a given research theme, i.e. to disregard the number of stakeholders involved in each activity. This is considered a cruder method which does not take any account of the 'size' of each research activity. However, if this measure is used the resulting ranked order of research themes is almost identical to that derived from the weighted measure used. The Pearson rank order correlation coefficients between the four sets of data (i.e. comparing the two measures based on number of weighted and un-weighted research activities for European, EC-sponsored, non-European and global overview) are between 0.81 and 0.93.

Finally, a given research activity may legitimately provide good coverage of two or more research themes. In such cases the research activity, and its constituent stakeholders, is allocated separately to each research theme, so that it is counted twice or more.

Full details of the collection and analysis of quantitative data are given in Annex 4.

2.2.5 Step 4c: Collection of qualitative data

There were four sources for the qualitative data:

i) **Primary and secondary literature and data review** of eGovernment research, eGovernment and European and other appropriate policies. An overview of the main sources is given in Annex 1. In addition, eGovernment research sources for the content analysis provided a large quantity of additional literature (see Annex 5).

ii) **Questionnaire: open questions**, i.e. questions 3, 4.1 to 4.6, 4.8 to 4.9, 5, 6.2 to 6.3, 7 and 9, as well as parts of questions 2 and 8, in the base questionnaire included as Annex 2. The questionnaire was applied both as a self completion instrument and used during telephone or in-person interviews. Annexes 3.1 and 3.2 list questionnaire respondents.

iii) **Semi-structured interviews**, in the form of in-depth discussion and dialogue, were undertaken with a variety of interlocutors, either by telephone or in-person, about the purpose of the study, for validating the research areas, their policy relevance, relative European strengths and weaknesses, the design and organisation of eGovernment research, etc. Often, the questionnaire was used as a springboard and guide for such an interview, but without constraining the process. Annex 3.3 lists interlocutors.

iv) **Intervention research**, i.e. participation in relevant events during which direct or indirect intervention was made by the consultants to obtain relevant data, information, feedback or validation, in relation to the purpose of the study, for validating the research areas/themes, their policy relevance, relative European strengths and weaknesses, the design and organisation of eGovernment research, etc. This was normally undertaken in two distinct modes:

   a) non-structured, and typically informal, interviews and dialogue

   b) syntheses of workshop/conference presentations and discussions prepared by the consultant and drawing on official reports where the latter were available and relevant (these syntheses are not included in this report or annexes, but can be made available on request).

   Annex 3.4 lists events participated in.

2.2.6 Step 5: Analysis

Given the relatively complex purpose of the study, and that the survey it undertook is relatively novel and thus ill-defined, the overall methodology employed has been multi-method, combining both qualitative and quantitative data and techniques. The fact that the study is also focused on research situations which cover multiple disciplines is another reason for such an approach.

Using the databases and sources described above, the following analyses were undertaken:

i) Validation of existing research areas using both descriptive statistics and qualitative data.

ii) Using inductive clustering (i.e. progressive grouping of respondent comments around core elements identified from existing research areas and areas not adequately represented), for example using questionnaire questions 2.12 and 5 (see Annexes 2 and 6), as well as all other sources, resulted in:

   - a synthesis of (new) research themes incorporating existing research areas

- a mapping of recent and future recommended research using both descriptive statistics and qualitative data.

The results of the validation of existing research areas and the new research themes are presented in section 2.5, below.

iii) Overall research classification, policy assessment, research challenges, recent and expected status, global map, etc., using both descriptive statistics and qualitative data.

iv) Initial validation of points i) to iii).

v) Preparation of the Interim Report.

2.3 Phase 2: Analysis and research policy recommendations

The main objectives of Phase 2 were to address two tasks, which took place to a large extent iteratively and in parallel. Phase 2 undertook a strengths and weaknesses analysis of EU research activity within the global context, which in turn, and building on the results of Phase 1, enabled a detailed articulation of research policy recommendations to be made, including priorities and proposed organisational arrangements.

Task 5) Strengths and weaknesses of EU research
A strengths and weaknesses analysis of European eGovernment research activity in relation to the eGovernment vision and EU policy priorities such as Lisbon, as well as within a worldwide context. Note, the original Task 5 description was "SWOT analysis", but because it was found both theoretically and operationally problematic to sensibly investigate opportunities and, especially, threats in a public sector context given its non-market environment, the focus was placed upon strengths and weaknesses only. However, opportunities are still generally addressed in the study, as are, where relevant, the risks of not implementing certain recommendations, but the is not done as part of a formal SWOT analysis.

Task 6) European research policy recommendations
EU level policy recommendations and priorities, including funding, organisation, tools and mobility, based on the strengths and weaknesses analysis and the framework of the eGovernment vision and EU policy priorities such as Lisbon.

Phase 2, like Phase 1, was in practice broken down into a number of steps, as illustrated in the diagram above, and as described in more detail in the following.

2.3.1 Step 6: Validation

At the beginning of Phase 2, the data collected in Phase 1 and the results thereby obtained underwent a validation process. This was essentially a double-checking process with a limited number of people, designed to ensure that the conclusions of the data analysis were at least re-examined by others. This validation process was not, however, externally validated in a quantitative and theory-testing sense, given the limited time and resources of the study, so the more rigorous 'investigation', 'communicative' and 'action' validity of the findings[13] has not been undertaken.

[13] Kvale, S (1996), "Interviews: an introduction to qualitative research interviewing", Thousand Oaks, California, Sage Publications.

Validation was carried out by interviews with various stakeholders, in which the new set of research themes were outlined and discussed. Three primary outlets were used for this validation:

i) a workshop organised in the framework of the DEXA eGov' 2005 conference in Copenhagen in September 2006
ii) intervention research with practitioners and academics at various workshops and conferences
iii) 77 additional questionnaires revised to validate new research themes, etc.
iv) further telephone and email interviews, including with European Commission officials.

The overall approach to be adopted in Phase 2 was likewise subject to validation and discussion with peers and other experts before its final application.

2.3.2 Step 7: Policy linking

Linking eGovernment research to major European policy goals was undertaken by using an approach based on three levels of objectives, linked via an intervention logic. (This is described in detail in section 4.) The major policy goals at the top objectives level were selected by the contractor in discussion with staff at the IPTS, and were used to demonstrate the utility of the intervention logic approach in determining eGovernment research policy. The use of the intervention logic revealed that different policy areas require different levels of attention to different types of eGovernment research. This attempt to link policy to eGovernment research is crucial in terms of making eGovernment research as useful as possible, i.e. making research 'work' towards achieving major political goals.

2.3.3 Step 8: Strengths and weaknesses

Building upon the Phase 1 data and its validation, together with the policy linking exercise, a strengths and weaknesses analysis was carried out on European eGovernment research.

Strengths and weaknesses were analysed by examining European coverage of the scope, content and research challenges of each research theme (see research theme Annexes 12 to 28), each of which has been developed through:

- desk research (literature review and content analysis),
- questionnaires and interviews,
- intervention research.

The scope, content and research challenges sections in the Annexes are designed to represent a combination of the ‘state-of-the-art’ in eGovernment research issues globally, so they represent an ideal type for comparison purposes. No one global region will necessarily cover all the issues for a given research theme, though some do. Annex 9 provides full details of the approach and a detailed mapping of European strengths and weaknesses against this global state-of-the-art coverage.

Within this framework, a general list of challenges to eGovernment research according to each objectives level and different domains (political, social, organisational, economic, and technological) was enumerated. These can be supplemented by the detailed list of research challenges outlined per research theme in Annexes 12 to 28.

Originally, Step 8 consisted of a formal SWOT analysis, but because it was found both theoretically and operationally problematic to sensibly investigate opportunities and, especially, threats in a public sector context given its non-market environment, the focus was placed upon strengths and weaknesses only. However, opportunities are still generally addressed in the study, as are, where relevant, the risks of not implementing certain recommendations, but this is not done as part of a formal SWOT analysis.

2.3.4 Step 9: Organisation of European eGovernment research

The results of the previous steps in the study, together with feedback from interviews and questionnaires (especially from those questions concerned with the funding and organisation of current and recommended research in the base questionnaire, see Annex 2) provided a basis for a series of recommendations on the organisation, coordination and operation of eGovernment research. These are presented in section 7 of this report.

2.3.5 Step 10: Recommendations

Looking back at the final three steps (policy linking, strengths and weaknesses, and organisational issues), the recommendations and conclusions to this study produce a concrete set of issues, topics, and suggestions for overcoming the challenges for eGovernment research policy to help achieve the EU's eGovernment vision for 2010 and beyond.

2.4 Instruments, typologies and samples

2.4.1 Instruments for data collection and field work

Two main instruments were developed, piloted and subsequently used for data collection and field work:

1. **Base questionnaire** (see Annex 2) designed to collect basic data and information, for use in three main contexts:
   i) for self completion by respondents (the list of respondents is given in Annex 3.1)
   ii) for telephone interviews (the list of interlocutors is given in Annex 3.2)
   iii)for in-person interviews (the list of interlocutors is given in Annex 3.2)
   The questionnaire was designed to collect base data for all tasks in both phases of the study. It was also adapted as necessary to fit the needs of different stakeholder groups and individuals, whilst retaining its overall structure in order to facilitate comparative data collection. In Phase 2, the 11 original research areas were replaced by the 17 new research themes in order to validate the latter.

2. **Content analysis framework**, consisting of a series of categories and codes applied to selected sources of eGovernment research, in order to answer questions concerning research classification, EU policy relevance, and the recent status of eGovernment research (who is doing what research where), which together reflect

the tasks of Phase 1. The basic structure of categories and codes of the content analysis is given in Annex 5, together with a list of sources and their justification.

A summary of the type of evidence in relation to the instruments employed is given in the table below.

Table summarising evidence and instruments

Instruments and sources	Types of evidence	How used
Desk research: literature – primary and secondary literature and data review	Qualitative and quantitative	Phase 1 started by first examining and assessing the extant knowledge of the field, which provided a basis for identifying major research opportunities and challenges in the most relevant research areas, as well as assisting in identifying the need for, and design of, appropriate instruments and evidence sources.
Base questionnaire	Qualitative and quantitative	The questionnaire was designed to collect base data for all tasks in both phases of the study. It was also adapted as necessary to fit the needs of different stakeholder groups and individuals, whilst retaining its overall structure in order to facilitate comparative data collection. In Phase 2, the 11 original research areas were replaced by the 17 new research themes in the questionnaire in order to validate the latter.
Desk research: content analysis framework	Quantitative	The content analysis framework consisted of a series of categories and codes applied to selected sources of eGovernment research, in order to answer questions concerning research classification, EU policy relevance, and the recent status of eGovernment research (who is doing what research where), which together reflect the tasks of Phase 1.
Semi-structured interviews	Qualitative	Semi-structured interviews in the form of in-depth discussion and dialogue were undertaken with a variety of interlocutors, either by telephone or in-person, about the purpose of the study, for validating the research areas, their policy relevance, relative European strengths and weaknesses, the design and organisation of eGovernment research, etc. Often, the questionnaire was used as a springboard and guide, but not a constraint, for such interviews.
Intervention research	Qualitative	Intervention research is the participation in relevant events during which direct or indirect intervention was made by the consultants to obtain relevant data, information, feedback or validation, in relation to the purpose of the study, for validating the research areas/themes, their policy relevance, relative European strengths and weaknesses, the design and organisation of eGovernment research, etc. This was normally undertaken in two distinct modes: i) non-structured, and typically informal, interviews and dialogue ii) syntheses of workshop/conference presentations and discussions prepared by the consultant and drawing on official reports where the latter were available and relevant.

2.4.2 Typologies and samples for data collection and field work

Three main typologies were developed, piloted, adjusted and subsequently used for data collection and field work: research stakeholders, policy areas, and types of research.

Research stakeholders and samples

Stakeholders are defined as parties (whether organisations, informal groups or individuals) which participate in (or sponsor in the case of the European Commission) eGovernment research. For the purposes of basic data collection, the questionnaires, interviews and desk research have utilised the following stakeholder taxonomy:

- Public sector (any level)
- ICT-related industry

- European level institution
- Global institution
- Non-European institution
- Academic, researcher, think-tank or similar
- Consultant or enabler
- Politician, interest group
- Media, commentator
- User or user representative (such as user group NGOs, like for the elderly or disabled, chambers of commerce, etc.)
- Others

This taxonomy provides the basic building blocks, but not all categories have been used during analysis, due to the need to present a relatively small number of directly comparable groups with sample sizes which can be subject to heuristic analysis. The following seven major stakeholder groups were thus employed after initial piloting:

1. Academics
2. Consultants
3. Public sector
4. ICT industry
5. Users, media and others
6. European Commission (this stakeholder category was only used in the European questionnaire and interview sample)
7. Non-European stakeholders

The sampling frame adopted has been based on the above stakeholder typology of seven types. Given that no prior information exists on the likely representation of these stakeholders in eGovernment research across Europe, the sampling frame was developed in order to:

- include a sufficient sample number from each group in order to represent their views and activities.
- follow the dictates of availability and convenience given the study's limited duration and resources.

It must be pointed out that it has not been the intention to collect statistically significant samples, but rather to collate information to be used and analysed qualitatively and heuristically, for example by setting it against the information collected from the desk research and in-depth interviews and consultations.

The samples are presented in the tables below.

Comparing the two European stakeholder samples (questionnaires and content analysis), it is possible to argue that both are relatively representative of actual research taking place in Europe, given their similarity and the fact that they come from two completely independent sources. However, the questionnaire sample (excluding European

Commission respondents) has relatively fewer academics, consultants and ICT industry representatives. This is because the user sample was deliberately set higher than in the content analysis in order to provide a sample size sufficient for analysis purposes, and the fact that it is quite difficult interviewing ICT industry representatives because of possible commercial confidentiality. In contrast, the public sector questionnaire sample is higher than in the content analysis, probably because of their ready availability and willingness to participate in studies of this kind. Given, also that the public sector represents the 'practitioners', who ultimately must implement eGovernment, this possible over-representation is not considered a problem. Similarly, with the over-representation of users who are the ultimate beneficiaries.

As regards the non-European samples, the evidence is less sure, both because this study focused mainly on European activities, and also because the content analysis, although including non-European research, has used mainly European sources. Thus, it seems unlikely that the non-European content analysis is representative of actual non-European research, given its heavy weight of academic stakeholders. This means that all other non-European stakeholders in the content analysis are likely to be under-represented, on the assumption that the non-European questionnaire stakeholders are more representative of the actual situation. The latter seems possible given its comparability with the European questionnaire sample. It would be feasible to weight the content analysis for non-Europeans to reflect the questionnaire sample to compensate for this likely unrepresentativeness. But this has not been done in the present study, given both that no reliable evidence exists of the how actually to draw a real representative sample, and because the primary purpose is not to undertake quantitative analysis but rather to provide an initial indicative and heuristic understanding.

Samples of stakeholders participating in eGovernment research

Questionnaires (Number of individual stakeholders completing a questionnaire. Each stakeholder allocated to one stakeholder type only)

Stakeholder questionnaires		*Number*	*% of total*	*Including European Commission*	
				Number	*% of total*
Europeans	Academics	27	23%	27	21%
	Consultants	22	18%	22	17%
	Public sector	33	28%	33	25%
	ICT industry	19	16%	19	14%
	User and media	19	16%	19	14%
	European Commission	--	--	12	9%
	European total	*120*	*100%*	*132*	*100%*
Stakeholder questionnaires		*Number*	*% of total*		
Non-Europeans	Academics	14	21%		
	Consultants	10	15%		
	Public sector	18	26%		
	ICT industry	17	25%		
	User and media	9	13%		
	Non-European total	*68*	*100%*		

Stakeholder questionnaires		*Number*	*% of total*	*Including European Commission*	
				Number	*% of total*
Overall total	Europeans	120	64%	132	66%
	Non-Europeans	68	36%	68	34%
	Total	*188*	*100%*	*200*	*100%*

The above data can be compared to the distribution of stakeholders found actually participating in eGovernment research activities in the content analysis (see also section 3.3.1), as follows.

Content analysis (Number of individual stakeholders identified in the content analysis. Each stakeholder allocated to one stakeholder type only)

Stakeholder content analysis		*Number*	*% of total*
Europeans	Academics	235	31%
	Consultants	152	20%
	Public sector	158	21%
	ICT industry	180	24%
	User and media	30	4%
	European total	*755*	*100%*
Stakeholder content analysis		*Number*	*% of total*
Non-Europeans	Academics	42	57%
	Consultants	4	5%
	Public sector	14	19%
	ICT industry	10	14%
	User and media	4	5%
	Non-European total	*74*	*100%*
Stakeholder content analysis		*Number*	*% of total*
Overall total	Europeans	755	91%
	Non-Europeans	74	9%
	Total	*829*	*100%*

Policy areas

For the purposes of basic data collection and analysis, the questionnaires, interviews and desk research have utilised a simple taxonomy of policies, organised both as individual policies and in major policy groups. These have been derived largely from the (revised) Lisbon and Gothenburg Strategies, the eEurope Action Plans (2002, 2005), and their recently proposed successor, i2010. One individual policy (consumer protection) was not originally included, but was found to be quite important during pilot testing so was added as shown.

Policy group	Individual policies
A. Economic policies	1. Competitiveness 2. Economic growth 3. Employment and jobs 4. Innovative business and SMEs
B. Social policies	5. Social inclusion (supporting socio-economic changes and diversity) 6. Social, economic and regional cohesion 7. Quality of life, welfare, social security 8. Citizenship 9. Consumer protection
C. Sustainability policies	10. Sustainability and sustainable development 11. Sustainable transport
D. Information society for all policy	12. Information society for all
E. Other public service sector policies	13. Public health 14. Education and training
F. EU-level socio-economic and political policies	15. EU Internal Market (including for cross-border services and mobility) 16. European citizenship 17. EU enlargement
G. EU research, science and technology policies	18. EU scientific and technological excellence 19. EU research policy

Types of research

Analysis was made of the types of recent research carried out. After a survey of eGovernment research reviews (for example, academic reviews such as Grönlund 2005, and Norris 2005 under review), as well as an examination of the types of eGovernment research undertaken by the European Commission (European Commission, 2005a), and the research examined during content analysis, various typologies were piloted and the following categorisation finally adopted and applied:

- Generic and theoretical research

  These two different types of research are combined into one category given that they are both normally considered mainly long-term research, perhaps vision-driven or normative, to implement a vision or policy in relation to what we want to achieve over a longer time horizon. This could include, for example, public value, such as better services through eGovernment, better decision making, quality of life, economic growth, market share, etc.

- Applied research

  This is normally considered medium-term research, perhaps strategy-driven, to solve a strategic objective or meet a strategic need, for example, for identity management, interoperability, providing services for disadvantaged groups, etc.

- Development research

  This is normally considered short-term research, development-driven, to solve a practical problem or practical need, for example, bringing together different components into a specific application, developing and deploying specific hardware, software, middleware, improving interface usability, researching the need for and type of training programmes for civil servants, etc.

- Review research

  This includes, for example, comparing and contrasting different eGovernment themes and issues, conducting reviews, synopses and surveys, including analysing good practices, analysing trends and issues, etc.

This four-fold taxonomy was found to be a robust and operational typology in the context of the present study. This is because it is able to relate eGovernment research to EU-level policies, so that, for example, applied and development research can be seen as part of the R&D process towards deployment and exploitation.

2.5 Validation and updating of research areas

2.5.1 Validation of original research areas

As indicated above, the original research areas were validated as laid out in the Technical Specifications for the study and reproduced in the table below.

The nomenclature of the 11 research areas was adapted during the pilot testing step of Phase 1 in order to take account of initial feedback from respondents and interviewees. The new labels are shown in the last column of the table.

The original research areas derived from the March 2004 Workshop[14]

Area classification	Research Area		Research Area name used in questionnaires, etc.
Technological Research Areas	Technology, Tools and Applications	1. Access technologies to ensure eGovernment for all 2. Specific technologies for knowledge management and creation 3. New models for harmonisation 4. Open source tools for eGovernment applications development 5. Quality monitoring tools 6. New models for eGovernment service delivery	1. Access for all to government services 2. Knowledge management for data handling and creation 3. Harmonisation and interoperability across and between levels and types of government 4. Open source application software, tools, modules and standards 5. Quality management and monitoring tools and methods 6. New eGovernment delivery models and their business and/or community justification
Socio-Economic Research Areas	Economic	7. The role of intermediaries in eGovernment service delivery	7. The specific role of intermediaries in eGovernment service delivery
	Sociological / Social Psychology	8. Understanding individual user's needs 9. Tools and methods for ensuring trust and security 10. Resistance to change in the public sector	8. Understanding individual user needs 9. Trust and security in eGovernment 10. Change in the public sector
EU related Research Areas	EU level	11. eGovernment at EU level	11. eGovernment at EU level

Full validation of the original research areas then took place during the first half of Phase 1, using the following instruments:

- Questionnaire and interview feedback from individual stakeholders.
- Desk research and content analysis.
- Input from conferences and workshops concerning what research is taking place and is planned or recommended.
- An analysis of how the research areas relate to each other, whether they are internally consistent and demonstrate a high degree of scientific and research rationale.

2.5.2 Derivation and validation of new research themes

As a result of this validation, 17 research themes (RTs) were then developed. These made small adaptations to the original research areas but also added additional themes which were found to be either missing or insufficiently focused in the 11 research areas. During the rest of Phase 1, as well as in Phase 2, these new 17 research themes were themselves validated using the same instruments as above.

As shown in Annex 7, there is a high degree of overlap between the 11 original research areas and the 17 new research themes, but also some very important adjustments and additions. The two tables below show:

[14] From the Technical Specifications of this study, IPTS, 2004…

1. The mapping of new research themes to original research areas – including definitions of each research theme (Annexes 12 to 28 provide full definitions and details of all research themes).
2. The mapping of original research areas to new research themes.

TABLE MAPPING RESEARCH THEMES TO ORIGINAL RESEARCH AREAS

Level (see section 4)	**Research Theme (RT)**	**Brief description of Research Theme (RT)**	**Relation to original Research Areas**
eGovernment operational objectives: inward-facing (the back-office)	1) Data and knowledge management	This RT concerns the basic (business) processes for capturing, sharing and managing data, and converting these to useful and exploitable information, content and knowledge. It thus covers the mechanics of data handling including formats, syntax, semantics and ontologies, and provides the 'raw material' for RT 2 in which data need to be integrated or exchanged with other entities. It also covers the knowledge management of these data and their use within the back-offices of government agencies. (Knowledge management for designing, delivering and using content and services in covered in RTs below)	2) Specific technologies for knowledge management and creation
	2) Integration and interoperability	Building on the 'raw material' provided by RT 1, this research theme focuses on integrating and interoperating these across and between organisational units, whether inside or outside government. In terms of integration this theme thus covers institutional, organisational, cultural and human resource issues where these directly impact interoperability, thus linking to the change in the public sector theme. In terms of interoperability, the theme covers technical, semantic and organisation levels, as well as standards, in order to achieve seamless and joined-up activities which are device or platform independent and able to replace or cope with legacy technologies, architectures and systems.	3) New models for harmonisation
	3) Change in the public sector	In contrast to RTs 1 and 2, this RT covers the overall institutional, organisational, administrative, managerial and cultural changes, mainly in the back-office, necessary for eGovernment and government modernisation generally. It is essentially concerned with change management, leadership, decision-making and human resources within the public sector. It also covers, both at the organisational and individual civil servant level, learning, roles, jobs, skills, competencies and resistance to and/or opportunities for change, and how to balance the need for change with the need for some stability both for the public sector itself as well as for the society it serves.	10) Resistance to change in the public sector
eGovernment operational objectives: content / service design, production and delivery (interface between back- and front-office)	4) Value chains, service design & delivery models	This research theme covers eGovernment delivery models and their business and/or community justification. It is essentially concerned with the partnership, cooperation or coordination between the public sector and the private and/or civic sector, i.e. different actors along the value chain for designing and delivering services to users. It also focuses on the creation and design of public sector information content, such as MIS, GIS and similar, through value-adding knowledge, with either a public and/or a commercial benefit. On the production side it includes PPPs, procurement and outsourcing for design, financing and roll-out. On the distribution side it includes the roles of intermediaries, mediators and mentors, whether these be banks, post offices, garages, shops, civic organisations and community or family individuals. Delivery models are not only economic, but also organisational, legal and political.	6) New models for eGovernment service delivery PLUS 7) The role of intermediaries in eGovernment service delivery
	5) Networked, multi-level eGovernment & service delivery	In contrast to the previous research theme which covers partnerships with the private and civic sectors, this research theme focuses on networking, coordination and cooperation between and within the different jurisdictions of the public sector itself for the purposes of service supply and delivery, and particularly between different levels of government: national, regional and local, as well as cross-border services. It also covers coordination between different public sector entities at the same level for the purposes of service supply and delivery, such as local authorities within a region. Features here include middle offices, shared services and service centres, localised front-end services built on shared back end architectures, etc.	NEW
	6) Multi-channel service design & delivery	This research theme examines how government services are designed and delivered within the context of a modernising public sector adopting ICT. By service design is meant the functionalities and formats adopted, whether using ICT directly or indirectly. By channel is meant different infrastructures, platforms and interfaces, i.e. the delivery media used in government service delivery to users. Regardless of the type of user or user group, this research theme covers the fact that 'e' is just one channel for delivering public services and is unlikely to completely replace other channels but rather will complement and support them. The 'e' channel can thus become the backbone or infrastructure for all channels regardless of which channel is actually experienced by the user, thereby improving both the internal and external quality and scope of any service. Other channels include face-to-face, post, telephone, as well as the whole array of 'e' channels: internet, PC, mobile, digital TV, cable, broadband, GRID, ambient technology, etc.	Parts of 1) Access technologies to ensure eGovernment for all
eGovernment operational objectives: eGovernment outward facing, service demand and use (the front-	7) Understanding user needs	This research theme is concerned with the direct needs or demands of users, whether as individuals or as specific groups. It covers different user relationships with government, user skills, expectations and activities in relation to public services, including understanding different user types, characteristics and situations which will contribute to determining which channel mix the user wishes to use, and how he or she wishes to use them. This includes the context of use, service initiation and control, the delivery environment, service visibility/findability, utility/usefulness, access/availability, and service quality and fulfilment in relation to the specific user/user group.	8) Understanding individual users' needs
	8) eGovernment for socio-economic	Whereas RT 7 is concerned with any and all users and their needs for and use of services, this research theme is specifically focused only on those individuals or groups of users who are disadvantaged in some way, and who are thus (potentially) beyond the so-called 'digital divide'. Such users could include the disabled, the elderly, the poor, inhabitants of inaccessible locations, minority groups, etc. In other words, all users who require deliberate and special consideration or help in order to ensure that they can	Parts of 1) Access technologies to ensure

Level (see section 4)	**Research Theme (RT)**	**Brief description of Research Theme (RT)**	**Relation to original Research Areas**
office)	inclusion	access and exploit services, which 'mainstream' users otherwise enjoy. Included here is therefore design-for-all, inclusion, combating exclusion and the digital divide, and so-called universal service and access. These groups are disadvantaged in that government has to think about specific ways to support them given that the normal offerings provided by the public sector, or by the market, may not, or may be slow to, offer support.	eGovernment for all
	9) eDemocracy & eParticipation	This RT covers the areas of eDemocracy, eParticipation, eEngagement, eConsultation, eInvolvement, eVoting and eReferenda, as well as community, social and informal networking. It is concerned with the power relations between citizens and government, how to make government more transparent, open, responsive, free from corruption and unnecessary bureaucracy, freedom of information, dialogue, discourse and democratic decision-making. It can also encompass new forms and structures of democracy and democratic representation, including empowerment and the balance of powers, rights and responsibilities.	NEW, though also part of 2) Specific technologies for knowledge management and creation
eGovernment operational objectives:: eGovernment cross-cutting themes	10) Open source tools & applications	This RT is concerned with open source application software, tools, modules and standards, particularly as a technology building block in many aspects of G2G, G2C and G2B, where it can support data and application integration and interoperability. It also covers human, business and organisation aspects, such as ensuring transparency and openness, cutting technology costs, simplifying technology, building trust and confidence, training of software designers, etc. It is still held back by the problems of creating appropriate business models and licensing and intellectual property issues, though new ways are being found to circumvent or solve these. Open source also supports collaboration, shared exploitation and dissemination within and between governments and countries.	4) Open source tools for eGovernment applications development
	11) Ensuring trust & security	Trust and security covers the tools, methods, technologies and policies of information assurance, and also needs to balance the dual needs of privacy and identification. It is concerned with building and maintained trust and confidence between all stakeholders in all directions, for example in relation to network and data security, data protection, identity management, authentification, privacy, surveillance, and digital rights management (DRM).	9) Tools and methods for ensuring trust and security
	12) Quality & performance management & monitoring	This RT covers the management and monitoring of quality and performance of specific government-centred and user-oriented activities and interests. This includes measuring service qualities, user satisfaction and preferences, internal government operations, processes and performance, and technical and data reliability and quality (errors, failures), and the evaluation and testing of these.	5) Quality monitoring tools
eGovernment specific objectives	13) Cross-sectoral ePublic services	This RT is concerned with the cross-sectoral aspects of all electronic public services. It explicitly covers the relationships between sectors, including health, education, transport, social care and security, police and legal, environmental, housing, utilities, consumer protection, business support, cultural and community support, etc., with eGovernment which is often narrowly treated largely as just eAdministration. The RT thus considers and exploits the cross-sectoral aspects and synergies in the public sector seen as a whole instead of segmented as above.	NEW
	14) Innovative governance	This RT is about innovating the overall frameworks of government and governance, including political leadership. It focuses on change and innovation across the whole public sector (cf. to RT 3 which is concerned mainly with specific back-office change). It thus also covers organisational learning, good practice, planning, foresight, roadmaps, decision- and (evidence-based) policy making, as well as governance structures and the role of the state, law, legal and regulatory aspects, and relations with the market and civil society.	NEW
	15) eGovernment at EU level	This RT covers all aspects of pan-EU eGovernment, thereby potentially drawing on all other RTs but from the specific EU-level needs and perspective. It is anchored in the EU treaties, constitution, subsidiarity principles, programmes and policies, including European and cross-border eGovernment services which can support the Internal Market and competitiveness, European citizenship, European social and economic cohesion, the Lisbon and Gothenburg Strategies, the ERA, enlargement, and scientific and technological excellence. In particular, this research theme draws on EU-wide integration and interoperability, trust and security, and open source.	11) eGovernment at EU level
	16) Evaluating and benchmarking eGovernment	In contrast to RT 12 which is concerned mainly with operational level quality and performance, and particularly non-monetary measurement, this RT focuses more on the overall outcomes of eGovernment, particularly of monetary costs and benefits, the business case, business benefits, economics and financing, does eGovernment pay, burden reduction measures, ROI, added-value, as well as overall evaluation frameworks and methodologies. It is also concerned with eGovernment benchmarking, e.g. the roll-out and take-up of services.	NEW
General EU policy objectives	17) Public value creation	This RT focuses at a high level on public value outcomes and impact assessment. It examines definitions of the public good and public value and how eGovernment can contribute to these, including the main EU and national policy goals of competitiveness, economic growth, employment and jobs, social inclusion, regional development,	NEW

Level (see section 4)	**Research Theme (RT)**	**Brief description of Research Theme (RT)**	**Relation to original Research Areas**
		welfare and the quality of life, environmental sustainability, etc. It helps to provide an overall model of eGovernment's ultimate justification, as its medium and long-term impacts mediated through other socio-economic, political and technological factors and trends.	

For full descriptions of the scope, content and research challenges of each research theme see Annexes 12 to 28. These also contain fully developed research challenges, as well as of their EU level policy relevance, and their recent worldwide status and expected future developments.

TABLE MAPPING ORIGINAL RESEARCH AREAS to RESEARCH THEMES

Original research area	**Recommendation**	**New research theme(s)**
1) Access technologies to ensure eGovernment for all	Too large and mix of issues -- split into two: multi-channel and socio-economic inclusion	Part: 6) Multi-channel service design and delivery Part: 8) eGovernment for socio-economic inclusion
2) Specific technologies for knowledge management and creation	Too large and mix of issues – rename (as data and knowledge management) and split off eDemocracy	1) Data and knowledge management
3) Harmonisation and interoperability	Largely retain, but adjust and rename as integration and interoperability	2) Integration and interoperability
4) Open source tools for eGovernment applications development	Retain as is	10) Open source tools and applications
5) Quality monitoring tools	Retain as is	12) Quality and performance management and monitoring
6) New models for eGovernment service delivery	Combine with intermediaries and rename	4) Value chains, service design and delivery models
7) The role of intermediaries in eGovernment service delivery	Combine with new models and rename	4) Value chains, service design and delivery models
8) Understanding individual users' needs	Retain as is	7) Understanding user needs
9) Tools and methods for ensuring trust and security	Retain as is	11) Ensuring trust and security
10) Resistance to change in the public sector	Retain but rename as change in the public sector	3) Change in the public sector
11) eGovernment at EU level	Retain as is	15) eGovernment at EU level

3 eGovernment research map

This section presents the main results of the research mapping exercise. It provides a comparative analysis of recent research and recommended future research in both European and non-European regions for each research theme, including stakeholder involvement and types of research undertaken. It also provides an overview of Europe's relative global position.

3.1 Recent worldwide status and expected developments

3.1.1 Recent status

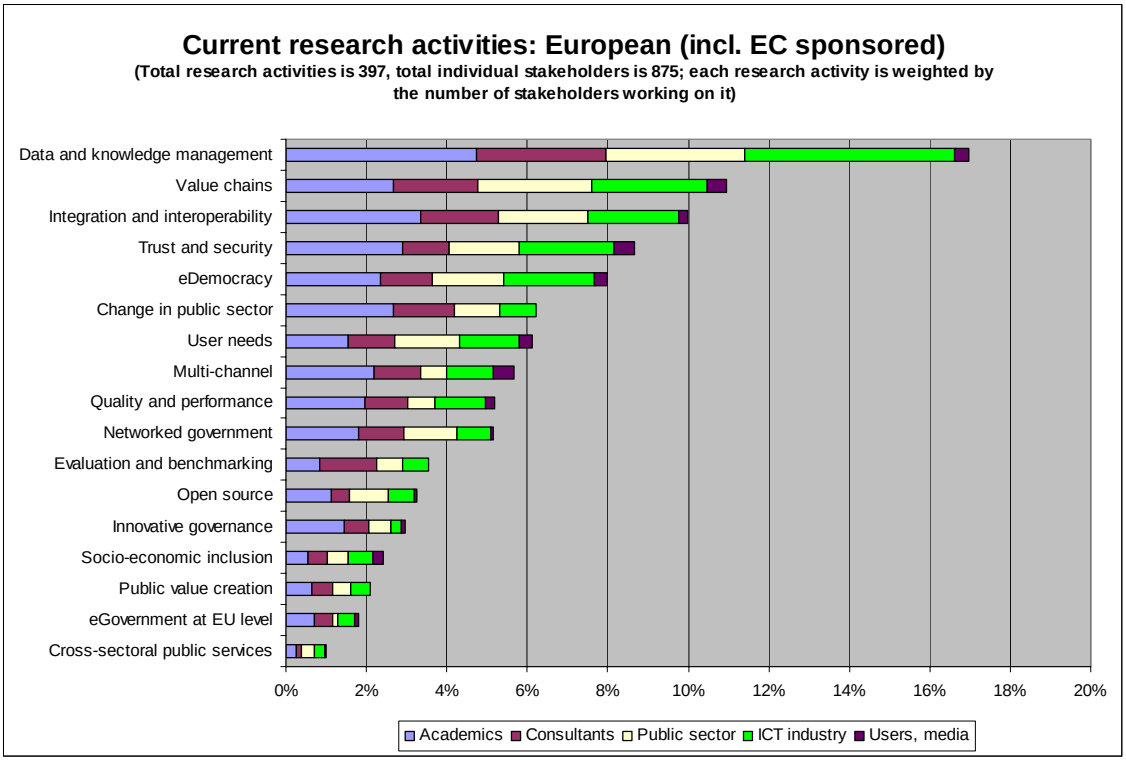
The recent eGovernment research status across all research themes is shown in the following four charts, for European research, for EC-supported research, for non-European research, and a global overview.

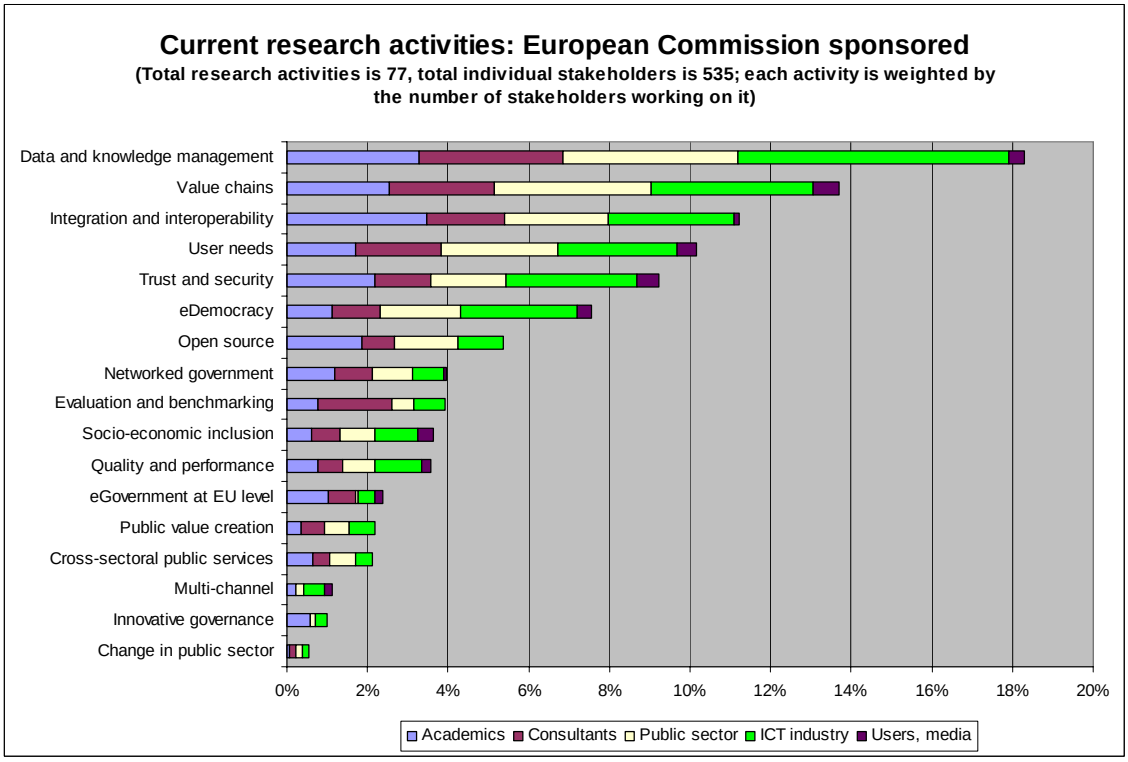
These charts show the relative ranking of research effort across the 17 research themes. Research effort is measured by the number of research activities covering each research theme, where each research activity is weighted by the number of stakeholders working on it. So percentage research effort is the number of weighted research activities for a given research theme compared to the total number of weighted research activities.[15]

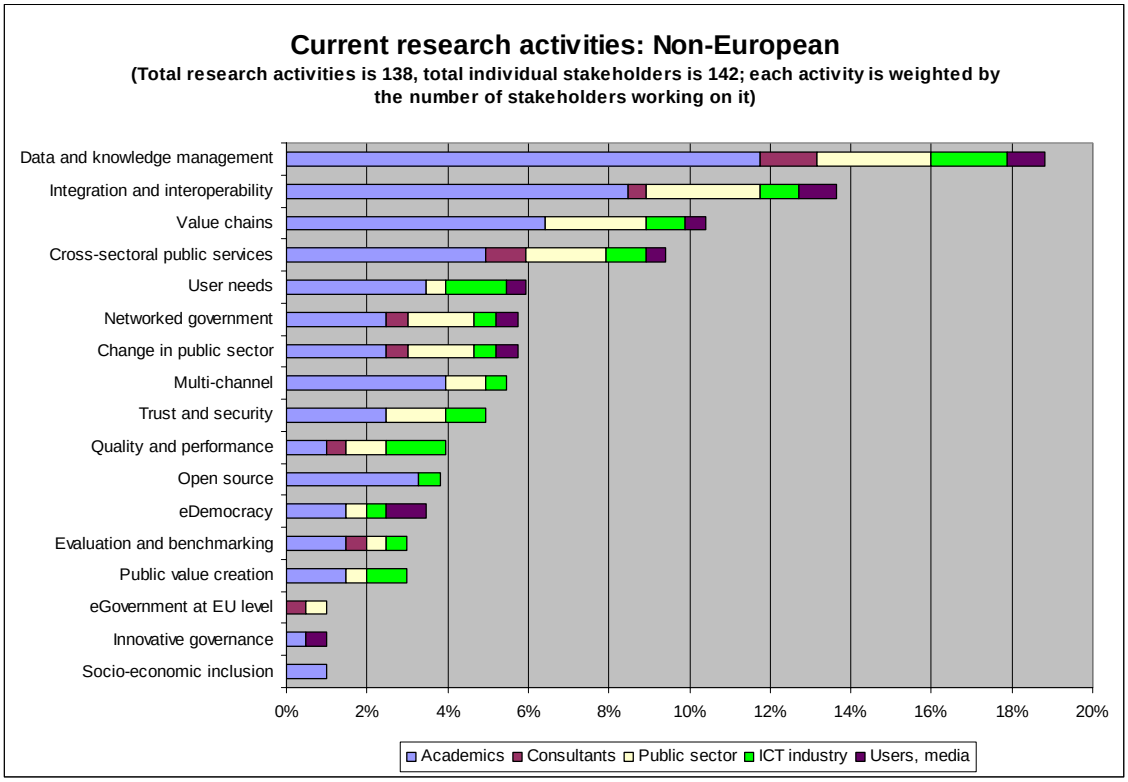
This approach also enables the bars in the charts to be broken down into different segments which show the percentages of the different types of stakeholders involved in each research theme. This provides some insight into which type of stakeholders are doing which research.

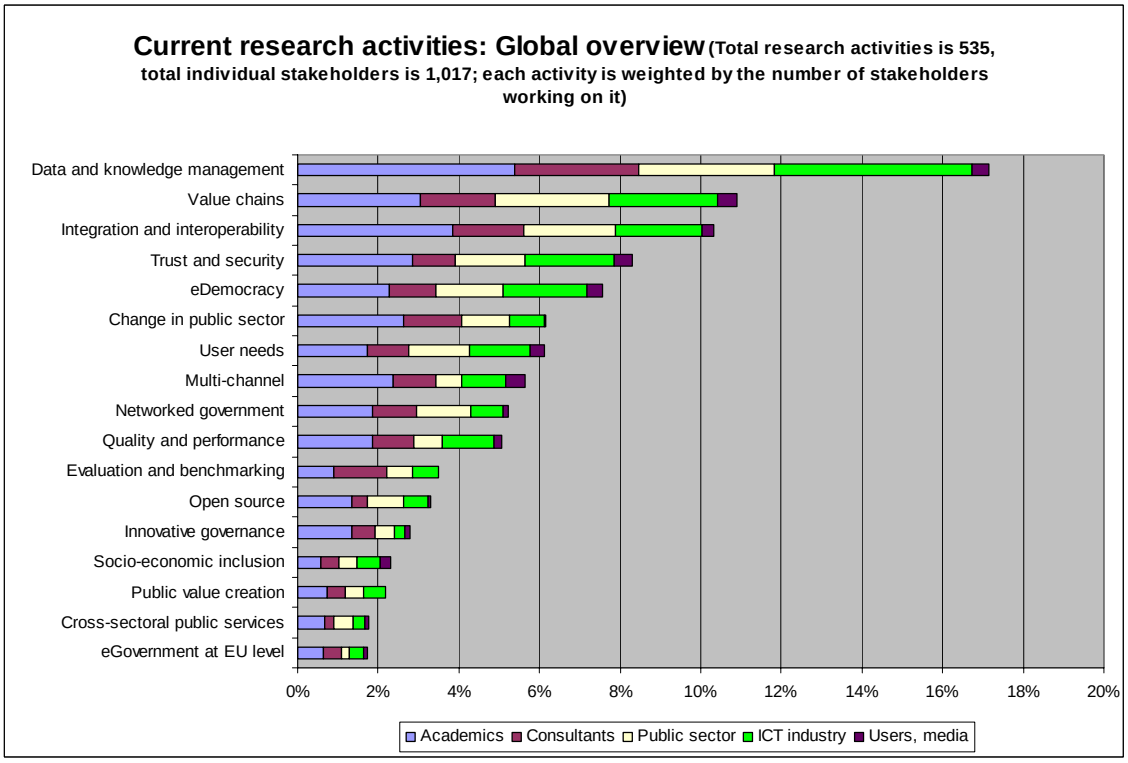
The four charts combine the data from the questionnaires and the content analysis as weighted averages, both of which, despite being fully independent sources, paint a very similar picture. This again indicates that the overall results are relatively valid. Thus, the charts represent the total data set relating to recent research activities.

[15] See Annex 2.5 for a more detailed explanation.


Current research activities: European (incl. EC sponsored)
(Total research activities is 397, total individual stakeholders is 875; each research activity is weighted by the number of stakeholders working on it)
Data and knowledge management
Value chains
Integration and interoperability
Trust and security
eDemocracy
Change in public sector
User needs
Multi-channel
Quality and performance
Networked government
Evaluation and benchmarking
Open source
Innovative governance
Socio-economic inclusion
Public value creation
eGovernment at EU level
Cross-sectoral public services
0%
2%
4%
6%
8%
10%
12%
14%
16%
18%
20%
Academics
Consultants
Public sector
ICT industry
Users, media


Current research activities: European Commission sponsored
(Total research activities is 77, total individual stakeholders is 535; each activity is weighted by the number of stakeholders working on it)
Data and knowledge management
Value chains
Integration and interoperability
User needs
Trust and security
eDemocracy
Open source
Networked government
Evaluation and benchmarking
Socio-economic inclusion
Quality and performance
eGovernment at EU level
Public value creation
Cross-sectoral public services
Multi-channel
Innovative governance
Change in public sector
0%
2%
4%
6%
8%
10%
12%
14%
16%
18%
20%
Academics
Consultants
Public sector
ICT industry
Users, media


Current research activities: Non-European
(Total research activities is 138, total individual stakeholders is 142; each activity is weighted by the number of stakeholders working on it)
Data and knowledge management
Integration and interoperability
Value chains
Cross-sectoral public services
User needs
Networked government
Change in public sector
Multi-channel
Trust and security
Quality and performance
Open source
eDemocracy
Evaluation and benchmarking
Public value creation
eGovernment at EU level
Innovative governance
Socio-economic inclusion
0%
2%
4%
6%
8%
10%
12%
14%
16%
18%
20%
Academics
Consultants
Public sector
ICT industry
Users, media


Current research activities: Global overview (Total research activities is 535, total individual stakeholders is 1,017; each activity is weighted by the number of stakeholders working on it)
Data and knowledge management
Value chains
Integration and interoperability
Trust and security
eDemocracy
Change in public sector
User needs
Multi-channel
Networked government
Quality and performance
Evaluation and benchmarking
Open source
Innovative governance
Socio-economic inclusion
Public value creation
Cross-sectoral public services
eGovernment at EU level
0%
2%
4%
6%
8%
10%
12%
14%
16%
18%
20%
Academics
Consultants
Public sector
ICT industry
Users, media

Closer inspection of these data, show a distinct focus of recent eGovernment research on themes heavily oriented to direct technology use and exploitation, as well as on organisational and coordination issues. As Grönlund states in his recent review of eGovernment research "…but the main focus for the time being is informatization and reorganisation." (Grönlund, 2005, p. 16).

The data presented above are also in general agreement with two other recent overviews of eGovernment research. In the 115 eGovernment research papers reviewed by Grönlund (2005), the split between mainly socially-focused and mainly technology-focused disciplines was about 63% to 37%. This can be compared to a corresponding split found in this survey's mapping of recent eGovernment research:

- Research themes 3-9 and 12-17: mainly (though not exclusively) socially-focused: about 60%.
- Research Themes 1, 2, 10 and 11: mainly (though not exclusively) technically-focused: about 40%.

In addition, Norris (2005, under review) examined 53 reviewed eGovernment research articles and found that 61% of the lead authors were from the social sciences or business compared to 36% from IT or communications, with the remaining 3% from the US federal government.

There are potentially a large number of detailed observations to be made when comparing the charts, both about the relative importance of the different research themes and the involvement of different types stakeholders in each research theme. The first chart summarises all the European research, including that sponsored by the EC, and shows that themes like public value creation, innovative governance and cross-sectoral public services have very low relative focus. Similarly, eGovernment at EU level is ranked second from bottom, although its importance, as would be expected, jumps significantly to sixth from bottom when only EC-sponsored is considered.

In terms of stakeholder involvement, it can be seen, for example, that ICT industry is more heavily involved in the direct technology use and exploitation themes, whilst users are more likely to be involved in the design and delivery of service themes like value chains and multi-channel, as well as in trust and security. The public sector, on the other hand, is relatively more involved in the value chain, networked government, eDemocracy and user needs research themes.

There is strong similarity between the general European research and the research sponsored by the EC, except that open source is much more important in EC-sponsored research and change in the public sector much less so. This can perhaps be explained by the specific EC policy to support open source, as well as the fact that the EU and EC do not have direct competence in public sector change issues and that most of this type of research tends to take place at national and regional levels.

Non-European recent research is again quite similar to European research with a few important differences. There is much less focus out of Europe on eDemocracy and socio-economic inclusion, but much more on cross-sectoral aspects. Indeed, cross-sectoral research, i.e. examining issues that cut across the whole public sector and not

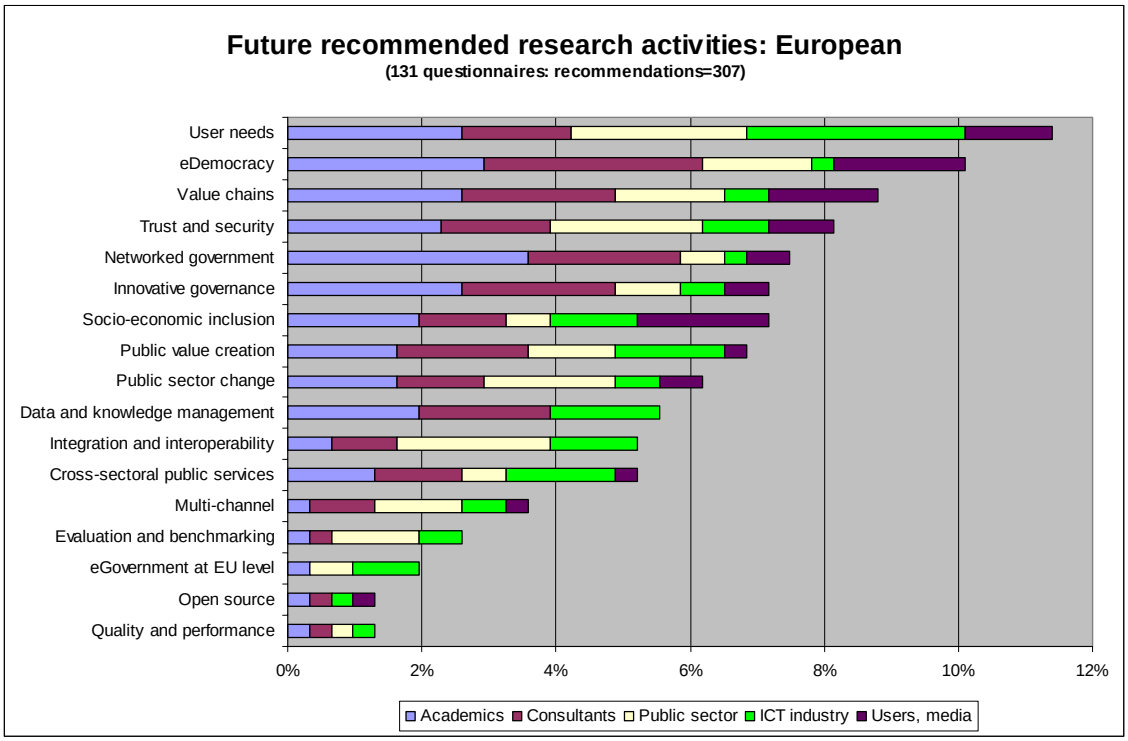
just the administration, unlike in much European research, is much more prominent. This means, for example, that non-European research is more likely to examine the links and integration between different sectors like transport, environment, health, education, etc., as well as with the administration.

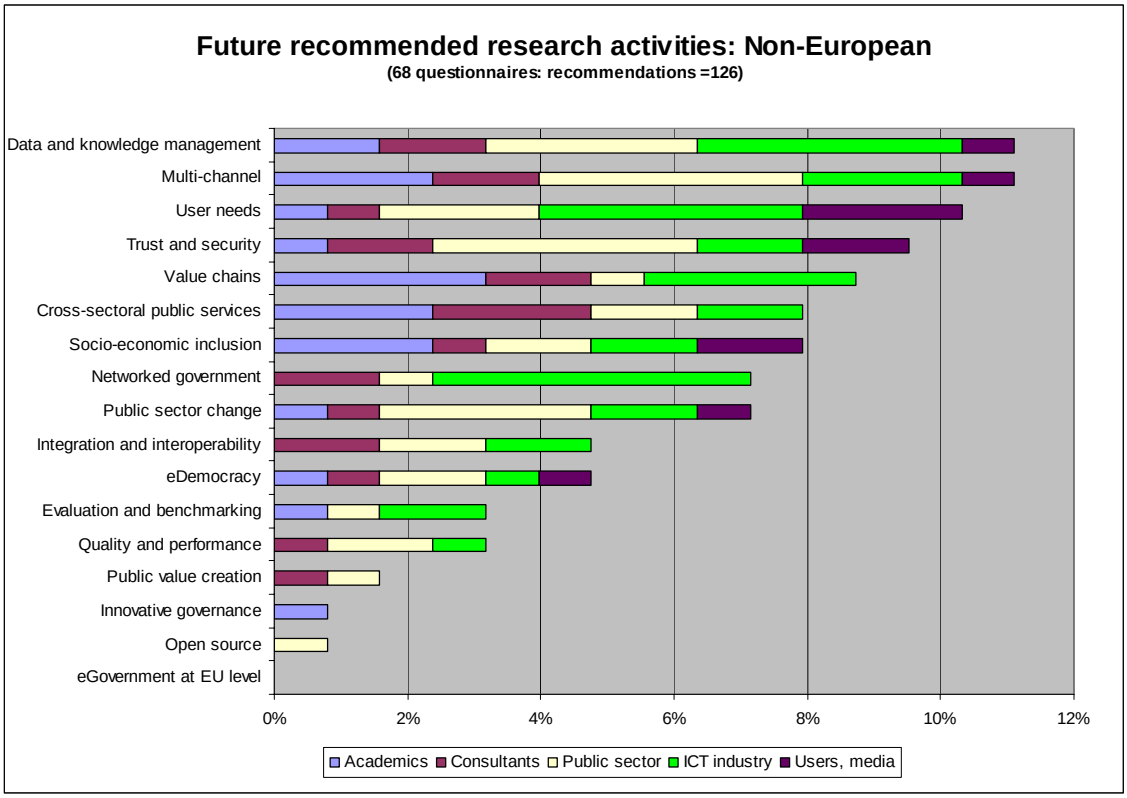
The data also show that EC-sponsored research activities tend to cover, with a couple of exceptions, a very similar portfolio of research themes as does Europe as a whole, but, in contrast, involve a higher number of stakeholders than other research. In addition, research carried out during the course of this study revealed that EC-sponsored research activities tend to cover more research themes than other research, which makes them perhaps more interdisciplinary.

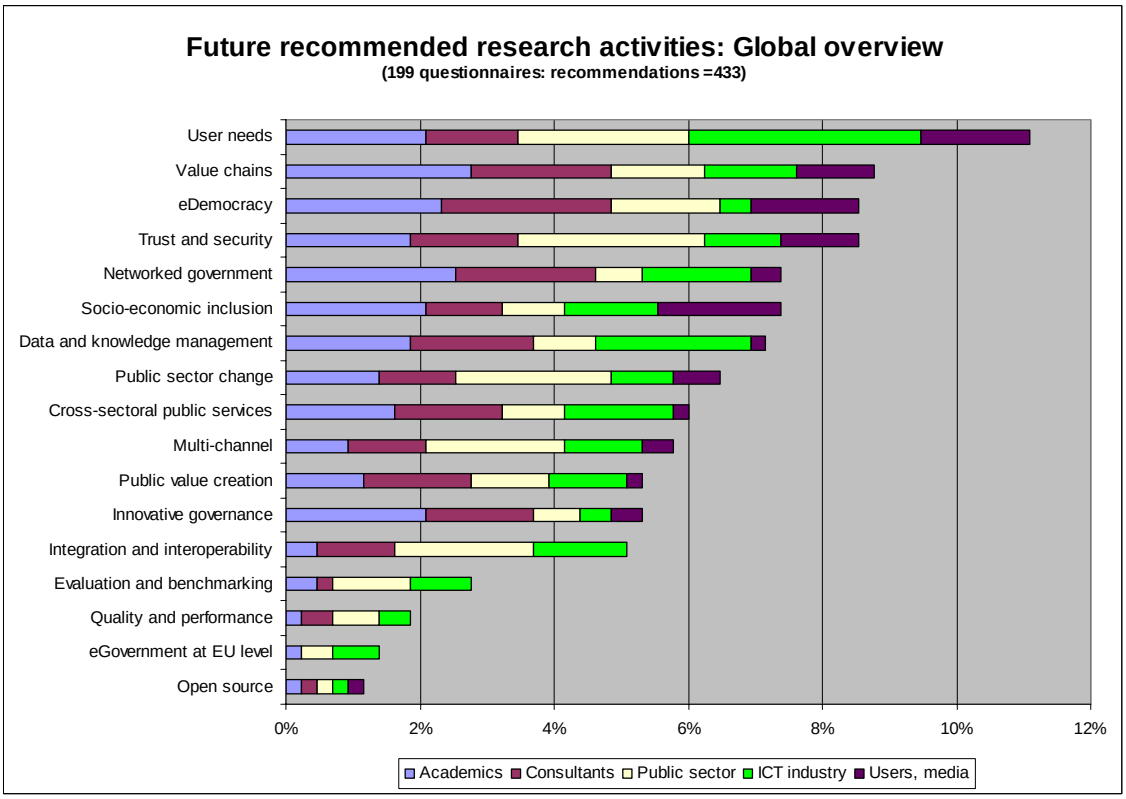
3.1.2 Recommended future research

The recommended future eGovernment research themes are presented in the following three charts, one for European, one for non-European research, and one global. The sample here is only from the questionnaires, as little systematic evidence about future research expectations can be acquired directly from desk research.

Each chart gives the number of stakeholders interviewed and the number of recommendations they made in total. In fact, the stakeholders described the research activities they recommend be undertaken in the future, and each of these could be categorised by one or more research themes. The number of recommendations in the following charts is thus the total number of research themes resulting from the research activity descriptions made by the stakeholders interviewed.




Future recommended research activities: Non-European
(68 questionnaires: recommendations =126)
Data and knowledge management
Multi-channel
User needs
Trust and security
Value chains
Cross-sectoral public services
Socio-economic inclusion
Networked government
Public sector change
Integration and interoperability
eDemocracy
Evaluation and benchmarking
Quality and performance
Public value creation
Innovative governance
Open source
eGovernment at EU level
0%
2%
4%
6%
8%
10%
12%
Academics
Consultants
Public sector
ICT industry
Users, media


Future recommended research activities: Global overview
(199 questionnaires: recommendations =433)
User needs
Value chains
eDemocracy
Trust and security
Networked government
Socio-economic inclusion
Data and knowledge management
Public sector change
Cross-sectoral public services
Multi-channel
Public value creation
Innovative governance
Integration and interoperability
Evaluation and benchmarking
Quality and performance
eGovernment at EU level
Open source
0%
2%
4%
6%
8%
10%
12%
Academics
Consultants
Public sector
ICT industry
Users, media

The overall picture of recommended future research is quite different from recent research activities. Although many of the most important recent research themes are also expected to be areas of focus in the future, there are a number of highly significant divergences. Data and knowledge management, and integration and interoperability, slip significantly down the ranking, and are replaced by user needs, value chains, eDemocracy, and networked multi-level services. The fact that three out of the four of these latter research themes are new constructs, is significant and underlines one of the reasons why they were created. The outward facing, user focused research themes are also much more prominent than with recent research. Both user needs and socio-economic inclusion move significantly up the rankings, whilst eDemocracy further improves its already important position.

All this implies an important shift away from back-office inward facing research more towards the wider organisational aspects of service design and delivery, involving both the private and civil sectors, but also much better coordination between authorities and agencies as part of networked government. There is also a strong shift of emphasis towards the front-office and service use. These new priorities are highly dependent, of course, upon good research and application in the back-office research areas, but it is now predicted (or perhaps hoped and expected) that sufficient has been achieved here so that priority should in future be increasingly given to research for service design, delivery, deployment and use.

Perhaps not surprisingly, the priority given to open source and quality measurement moves even further down the list of priorities compared with existing research. For many, these themes may be difficult to understand and somewhat ‘invisible’.

Of greater interest, perhaps, is the significant jump of public value creation and innovative governance to almost halfway up the ranking, from their previously low and somewhat anonymous positions. This undoubtedly reflects two contrasting but mutually supporting trends. First, the increasing pressures to ‘show’ the economic, social and European benefits of the large investments already made in eGovernment in Europe. Second, the softer more academic and social science interest which is awakening in tracing the impacts of real world infrastructure, organisational and human resource investments on society at large and on the public good. Indeed, there is currently a strong academic debate about governance and public value, which has also been taken up by industry and the public sector, and which, in Europe at least, is probably partially (though not completely) linked to European enlargement, the Constitutional debate and issues related to perceived crises in our democracies, the so-called ‘democratic deficit’, as well as to a re-examination of the relationships between citizens and government. There is also a strong current of opinion that the Sixth Framework research Programme for Information Society Technologies, presently supported by the European Commission, has significantly underplayed and under-valued the importance of socio-economic research. A proposed strengthening of all these issues can be seen in the charts above.

There are also some interesting shifts in stakeholder views between recent and future expected research. For example, it may be significant that research interest in trust and security, user needs, integration and interoperability, multi-channel and public sector

change is now dominated to a much greater extent than before by the public sector. Similarly, industry seems to be taking a relatively greater interest in data and knowledge research than before, as well as in user needs.

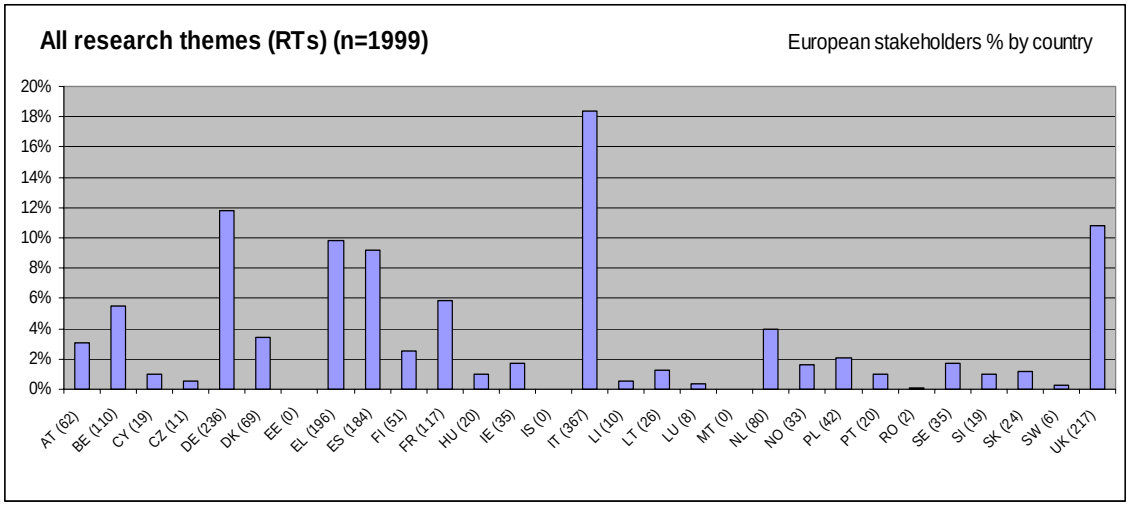
Whereas the above comments focus mainly on the European views of future research, there appear to be very important differences between European and non-European recommendations. Outside of Europe, general advice about future research is very much 'business as usual', i.e. it is very similar to recent research activities. The only interesting exceptions to this are an important rise in ranking from bottom in recent research to seventh in future recommended research for socio-economic inclusion. Two other research themes fall somewhat in ranking to compensate: integration and interoperability, and open source. Once again, however, we need to remember that it is likely that the non-European sample is biased, and that it will anyway encompass a very large and diverse set of opinions from around the global. Nevertheless the comparison with Europe is potentially useful.

The above analyses have not included separate investigations of recent and future research for each stakeholder group in this study, although a strong indication of this can be inferred from differentiation along the bars in sections 3.3.1 and 3.3.2, which is the reason these details are included. However, the data are available to undertake such detailed stakeholder profiling if required. Separate stakeholder views on the importance of eGovernment research for different policy areas are illustrated later in the report (Section 5.1.1).

3.2 Research themes

In this section, some of the main study results relating to individual research themes are briefly reviewed. For each research theme, first an overview and assessment of the main findings and challenges is summarised. In each case a much fuller account is provided in the relevant annex (Annexes 12 to 28). Second, a chart is provided showing, for each European country, the relative research effort the country devotes to the research theme in question, compared to its total eGovernment research effort. These charts provide a country overview independent of the size of the country and its total eGovernment research effort, and can in each case be compared with the average European position.

To provide a context for these research theme charts, however, the summary chart below shows the absolute research effort by country across all research themes. This shows, not unexpectedly, that the larger countries have the greatest research effort. The main point to note is that Italy is the leading country in terms of research activities, particularly in relation to papers and projects as analysed in the content analysis. (See also Annex 4. Note, unlike in the charts in Annex 4, the charts here count a given stakeholder more than once if they are engaged in more than one research activity or research theme.) Countries which are also more prominent than expected are Belgium, Greece and the UK, the former probably because many European stakeholder organisations are located in Brussels. Germany and France are perhaps under-represented in relation to their size.



The individual research theme charts in the sub-sections below showing country focus need careful interpretation because in many cases the sample size related to the research theme and/or the country is too small for sensible interpretation. Thus, the only comments made are in relation to sample, which is judged to be acceptable.

3.2.1 Data and knowledge management

Overview and assessment

Current research developments

Data and Knowledge Management research in the sphere of eGovernment has concentrated on the development of technical systems to ensure that information is treated efficiently and effectively in public administrations. It has, therefore, been the cornerstone of most of the research carried out to date and is very nature as a subject. This is shown by the equal dispersion between all research types (generic, applied, development, and review). For future development, the review area will be far more important, as this is where much of the 'testing' of systems will take place - one of the challenges for future research would be to instigate development into reviewing the implications and effects of data and knowledge management exercises within the EU at all geographic levels. Use of bench-learning exercises in this regard would be highly useful: in terms of data and knowledge management there is no need for each separate public administration to 'reinvent the wheel', especially given the proven benefits of cooperation in this area. One of the biggest examples of Europe-wide data and knowledge management exercises is the European Interoperability Framework, which provides a loose framework for ensuring that data can be transferred not only across public administrations within one country but also within the EU's borders. This example, as well as the political desire to ensure ease of (secure) transfer of information across the EU's internal borders, serves to show the political weight behind issues of data and knowledge management in the European context, both for the efficient and effective delivery of services and also for political development including cohesion and improving citizenship policies.

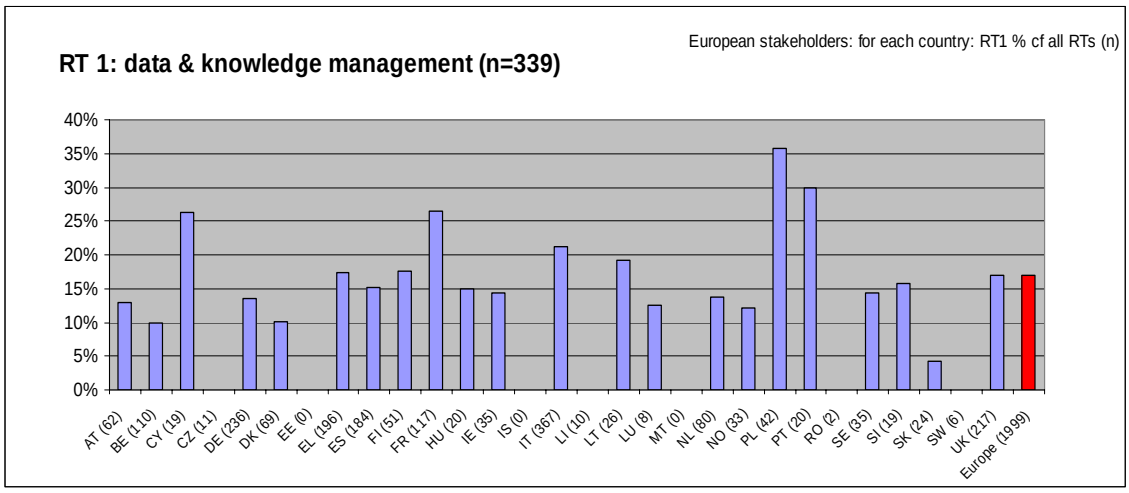
Assessment of research challenges

This study has shown that according to various sources, this research theme has achieved a high level of maturity, and so a future set of general research challenges for eGovernment research policy will not have to concern itself with many issues that have already been dealt with in the research environment. More research can be done in review activities, to ensure that public administrations keep up with technological change and are achieving a high level of pervasion across the entire EU. The major challenges still existing in this research theme are perceived mainly by consultant and academic actors, who see research either as a commercial field or as an area for development purely for the sake of research, rather than implementation: again, this reinforces the fact that this research theme is highly mature in the EU. However, this does not mean that there are not research topics (and their corroborating challenges) that should be addressed. These include ensuring that data management 'keeps up' with other advances in other research themes, particularly in that of integration and interoperability, where there could be possible domino effects of new developments in terms of research carried out in that theme.

Prioritising challenges

Challenges for research in this area range from, in highly technical situations: looking at more efficient and developed natural language processing tools, more effective search engine technologies, better semantic modeling technologies; to, in more social and institutional situations: the actual use of data by public servants, the processes behind storing, retrieving, and manipulating data and knowledge within an institution and, by extension, across the EU, where linguistic and cultural barriers also arise. One of the most important priorities for research is to therefore understand, as in most research themes, how to achieve the most widespread (and therefore most effective) eGovernment systems across the EU. Management of data and knowledge is central to this aim. Research needs to be carried out to understand how public administrations should work alone and together with tools to manage data and knowledge.

Country analysis



Countries focusing more than average on data and knowledge management, a heavily technology focused area, are Poland and Portugal, followed by France, Cyprus, Italy and Latvia. These are all countries not leading in eGovernment sophistication or roll-out according to most benchmarking surveys.

3.2.2 Integration and interoperability

Overview and assessment

Current research developments

Integration and interoperability research has concentrated on the interaction within and between two different issues: organisations and technologies. Building on the 'raw material' provided by the data, information, content and knowledge research theme, this research theme focuses on integrating and interoperating these across and between organisational units within government. A higher proportion of this research, compared to other research themes, is carried out in the applied area, showing that much of the research is being carried out on working systems and samples. Much less is done in the review area; given that this is a crucial area for future development – if monopolies and concentrations of software and hardware are to be avoided – then one of the challenges for future research would be to instigate development into reviewing the implications and effects of integration and interoperability exercises within the EU at all levels. The measurement of integration and interoperability activities would provide a useful way to understand whether these were being effective or not. Europe lacks behind North America and Australasia in this domain, where more research has been done on the mechanics of eGovernment. One of the biggest examples of Europe-wide integration and interoperability exercises is the s-TESTA network, which allows secure and interoperable electronic communication between public administrations across the EU. This example, as part of the IDABC initiative, serves to show how integration and interoperability have become key issues in the European context, both for the efficient and effective delivery of services and also for political development including cohesion and improving citizenship policies. By having the status of key issues in a European context, these political challenges certainly require further research in applied, generic, and review areas.

Assessment of research challenges

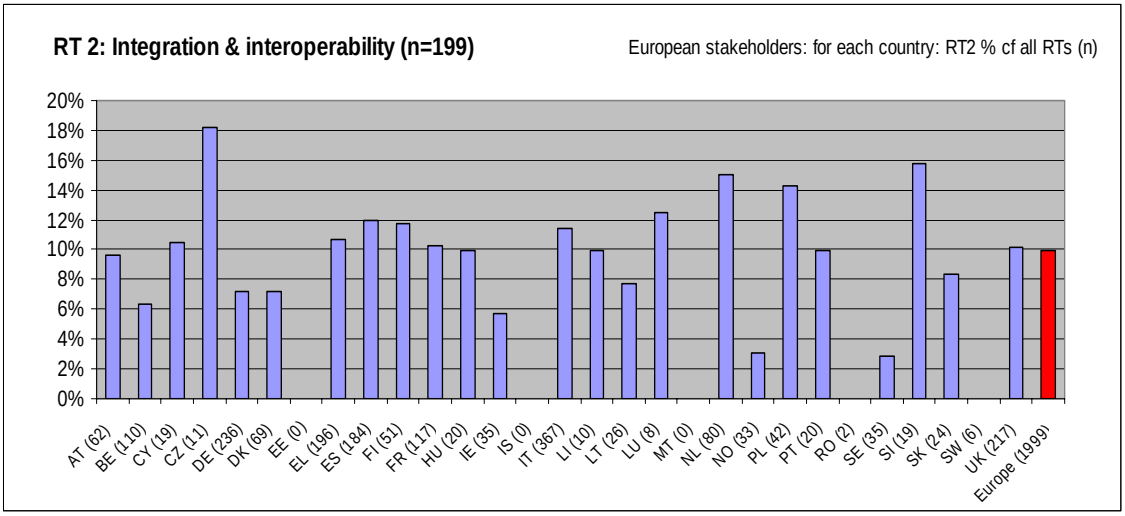
This study has shown that according to various sources, this research theme has achieved a certain level of maturity, and so a future set of general research challenges for eGovernment research policy will not have to concern itself with many issues that have already been dealt with in the research environment. Research that has been thus far carried out in this thematic area can be capitalised upon in deployment activities, and can also lead to new issues and challenges for other themes. The major challenges still existing in this research theme emerge mainly from an institutional environment and a security perspective: the workings of public administrations and the way they share data and knowledge, and the way data is transferred between different departments and institutions must be examined as well as the requisite security challenges that accompany transferral of data pertaining to individual citizens.

Prioritising challenges

In order for eGovernment applications to work across networks, systems must be interoperable and must have the possibility to be integrated. One of the major challenges is to adapt legacy systems to be interoperable, or to create new systems that are based on world-wide and/ or European standards. As well as being a technological challenge, this is also a political one as many activities have already been carried out at different levels within Europe (at the national and the local as well as the European), and now there is a need to understand how to integrate these efforts, and to allocate resources accordingly. One of the most important priorities for research is to therefore understand how to achieve the most widespread (and therefore most effective) eGovernment systems across the EU. To this aim, research needs to be carried out to understand how public administrations should work together to ensure that systems and applications are completely interoperable (and should therefore respect and work towards developing the European Interoperability Framework guidelines). With regard to citizens, work should be carried out to ensure that they are treated equally, regardless of socio-economic background or other differentiation. Research can work towards enhancing the relationships between citizens and public administrations due to the increased perception of ease of use of eGovernment services. This is related to the so-called 'one-stop-shop' idea that has been around for some time in eGovernment research circles. Work on multiple channels has done a lot to highlight the unsuitability of a single access point for all government services. Much work to date has been done on integration and interoperability from a technical perspective, concentrating on the interface between citizens and varying public services: whilst this needs to be maintained, there is also a need to develop work in the institutional issue area.

Country analysis

This theme is also heavily focused on technology but also addresses the organisational and related interoperability issues. The most important countries appear to be the Czech Republic, Slovenia, Poland and the Netherlands. Again, these are not the most advanced countries, with the possible exception of the Netherlands, but are ones which are emerging strongly and which seem to be relatively well focused on using technology systems across and between agencies.



3.2.3 Change in the public sector

Overview and assessment

Current research developments

Change in the public sector research has concentrated on the needs of the public sector itself in adjusting to changes brought on by introduction of ICTs into their working processes. Building on the 'raw material' provided by the data, information, content and knowledge research theme, and the notions developed in research carried out in the integration and interoperability field, this research theme focuses mainly on institutional and organisational changes in the 'back office'. Almost all of the research carried out until now has either focused on review activities, or on generic research, revealing that this is an area which is lacking in applied or development research work. In itself, this is not unusual, as the public sector has no real interest in carrying out research on its own organisational change issues, and applied and development research work would need the cooperation of the public sector itself. This lack of research effort should be seen as a crucial area for future development – one of the challenges for future research would be to instigate development and application of research activities. This way, theoretical and review work would benefit from the results of the research carried out.

There are no leading examples of European Commission-sponsored research in this area, with less than one percent of EU-funded research in eGovernment taking place in this area. Despite this fact, Europe is considered to be a leading area for research in this theme. This can be explained by showing that this area is more important at the national level, as opposed to the European level. Research into change in the public sector, whilst having a major European input, has been thus far focused on national environments. The challenges of Europe-wide research into this area are mainly political, and are due to the differences in public administrations and their requirements for change.

Assessment of research challenges

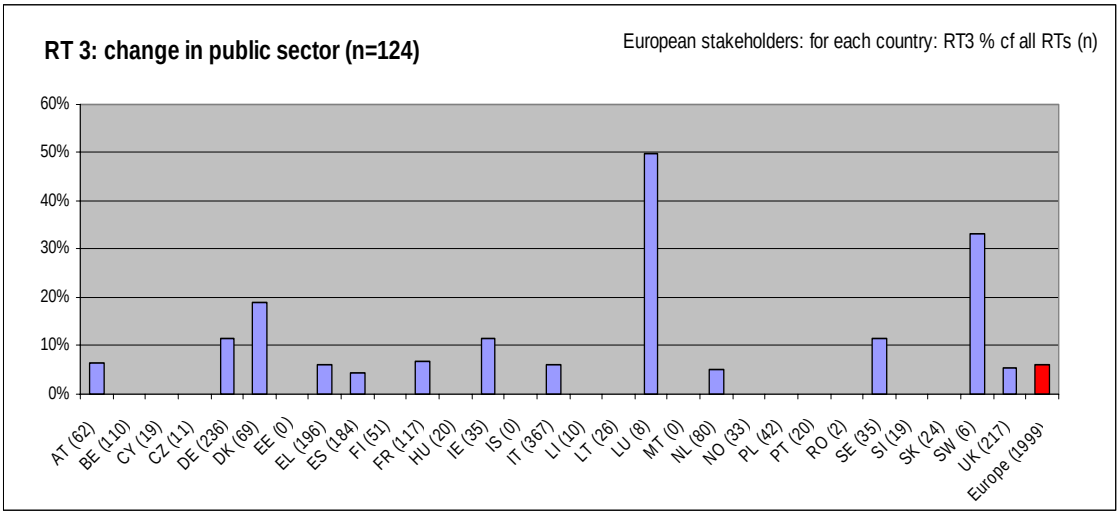
The study has shown that most of the research carried out in this Research Theme is of a review or theoretical nature. This is perhaps surprising given that the reviews show that a lot of public sector change is taking place in Europe, but it seems that not much research is examining how eGovernment change can be applied to, or developed for, specific needs or situations. Maybe this is because the change which agencies undergo, for example as part of a wider modernisation process, is seen as being too specific to themselves in line with the 'not invented here' syndrome.

In order for eGovernment to work, change needs to take place in public administrations. This theme considers how this will be done operationally, and as such needs to involve directly the public sector when carrying out research. This research is necessary to ensure that eGovernment is as efficient and effective as possible, and is capable of achieving the operational objectives outlined in policy. The lack of interaction between researchers and public administrations is one of the major barriers to research in this theme. Another is the lack of perceived interest by industry in future activity in this research theme, which is understandable due to the differences between public and private sectors.

Prioritising challenges

This study has shown that there are high-level political challenges to carrying out research in this area on a European scale. Until now, most of the research carried out in this theme has been in the theoretical and review areas. Any future set of general research challenges for eGovernment research policy will have to concern itself with issues of development and application: many of these have not already been dealt with in the research environment. Research can also be extended to the European level, not only by looking at the mechanisms, systems, and processes of interaction between the European Commission and other European institutions and the national, regional, and local governments. Therefore, major challenges still existing in this research theme at the EU level mainly concern the institutional environment and relations and interactions between the different levels and domains of public administrations. This can be considered both horizontally and vertically (i.e. concerning 'territory' (how the administrative function is exercised across space) and 'sectors', or how the administrative function is exercised across the traditional divisions apparent in public administration). Exploiting current technologies in different institutional settings, examining where benefits might be shared across the public sector as a whole would be one of the most pressing challenges to be addressed in technological terms, as well as those political, social, and institutional ones mentioned above.

Country analysis



Unlike RTs 1 and 2, this back-office research theme focuses mainly on the overall institutional, organisational, administrative, managerial and cultural changes necessary for eGovernment and government modernisation generally. The pattern of prominent countries is also quite different from RTs 1 and 2. The two most prominent are Luxembourg and Switzerland, though the samples for these two countries are very small. However, during the Luxembourg EU Presidency, in the first half of 2005, the country did focus research effort onto the organisational changes, skills and leadership required by eGovernment. The other prominent countries, are Denmark, Sweden, Ireland, Germany and Austria, all of which are leading in the eGovernment field, with

the exception of Germany, although the latter has challenging inter-institutional issues to address because of its federal structure.

3.2.4 Value chains

Overview and assessment

Current research developments

Value chains, service design, and delivery models examine the way eGovernment services are designed and delivered, by looking at the relationships between service designers and service deliverers. It also focuses on the creation and design of public sector information content, such as MIS, GIS and similar tools, through value-adding knowledge, with either a public and/or a commercial benefit. The majority of the research carried out has been in the areas of review and theoretical work (55%), which is roughly in line with the averages over all research themes. However, when considering the European data alone, more than the average amount of research is done in the applied area, revealing that work in Europe is moving towards making use of prior 'pre-competitive' research. This area is of crucial importance to a networked government, which relies on 'outsourcing' and other means of getting services to as many citizens as possible, through the most efficient means possible. As more actors become involved in public service delivery, the manner in which relationships are defined and exercised are of utmost importance. At the European level, the research environment has been designed to ensure that as many actors as possible are involved, including industry and public administrations, which is a necessary attribute of this research theme.

Assessment of research challenges

As in the challenges noted for the previous research themes, there is a lack of research into technical aspects of information control. In this research theme, the need for this becomes even more evident, due to the fact that public administrations are supposed to interact with other actors in delivering services. This is a major political challenge, as the use of data concerning individuals is a contentious subject. Technologically, the challenges for this research theme are related to Digital Rights Management, Customer Relationship Management systems, and other technologies which allow transfer of information without jeopardising the loss of such data.

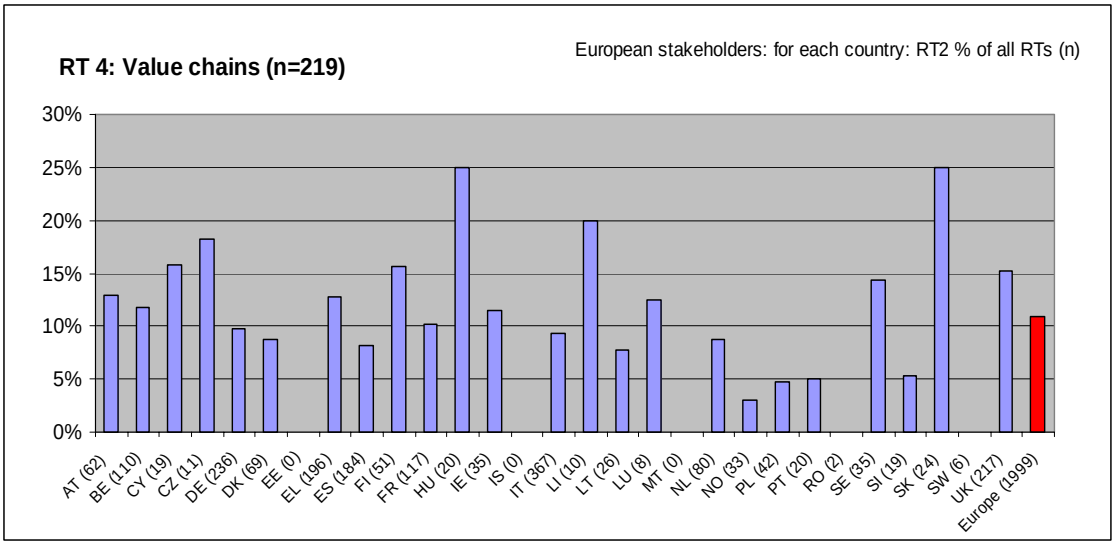
The barriers that exist in this research theme lean towards the need to further develop technological responses to the changes that are taking place institutionally. These also need to be understood from a socio-economic perspective, meaning that we need to understand how the new technologies will be applied once they have been developed.

Prioritising challenges

Challenges should be prioritised according to the objectives approach outlined in this study. As value chains are an operational objective, in terms of research, work should be carried out to further develop activities on a European scale. Although more than ten percent of current European research activity is in this domain, there is a need to strengthen the research carried out, this needs to be a priority area in future research. This is particularly important in the area of finding new ways to deliver eGovernment services.

The consequences of research work in other research themes, particularly those mentioned above, will lead to a greater potential for the use of value chains in the public sector. Therefore, the challenges for this area will be even more flexible and dynamic than in those research themes mentioned previously.

Country analysis



This research theme covers eGovernment service design, production and delivery models, also involving the private and civil sectors. Leading countries are Hungary, Slovakia, Lithuania, the Czech Republic and Cyprus, i.e. all New Member States. Finland, Sweden and the UK are also above the European average. It seems that this important research theme, with is recommended to continue to receive heavy focus in future (see section 3.1.2) is currently being led by fast emerging new EU countries, possibly because the establishment of public-private-partnerships is more readily promoted here.

3.2.5 Networked government

Overview and assessment

Current research developments

European research in the area of networked, multi-level eGovernment is lagging behind other parts of the world, mainly due to the political issues of distribution of power and authority in the EU. At the national and local levels, however, momentum towards 'joining-up' government is slowly reducing the inertia that is evident in some of the oldest public administrations in the world. Networked eGovernment is about linking the different levels and domains of the public sector together, encouraging simplicity and ease-of-use for the citizen in its dealings with government. Research that has been thus far carried out has looked at issues of process management, one-stop shops, and linking local governments together in networks, as opposed to hierarchical operations which are necessarily far more inefficient and resource-consuming. Most of the European research carried out in this research theme, according to the survey data, is carried out in the applied domain (36%). Despite the political challenges that underlie much of the

research in this area, particularly at the EU level, research work appears to be attempting to deal with these by developing projects to overcome these. Furthermore, sharing the costs of designing and delivering services through networked multi-level eGovernment can support the objectives of efficient and effective eGovernment, which would explain how and why there is an albeit minor focus on research into this topic.

Assessment of research challenges

Networked multilevel eGovernment is a relative newcomer to the research scene that can help contribute towards various political, economic, and social goals for (e)Government policies. It also contributes towards issues of regional cohesion, where public administrations can pool resources together for more effective and efficient eGovernment.

However, there are several issues that limit the development of these objectives in terms of a European research agenda. These include the political and regulatory barriers mentioned above, which include the full and unambiguous implementation of the Single European Market to ensure legislative clarity and simplicity, which can only facilitate the development of cross-border, networked and multilevel eGovernment services. Therefore, the challenges for this research theme are highly dependent upon work carried out in previously mentioned themes, particularly interoperability and integration. The following prioritisation therefore relies heavily upon the development and standardisation of activities in prior research themes.

Prioritising challenges

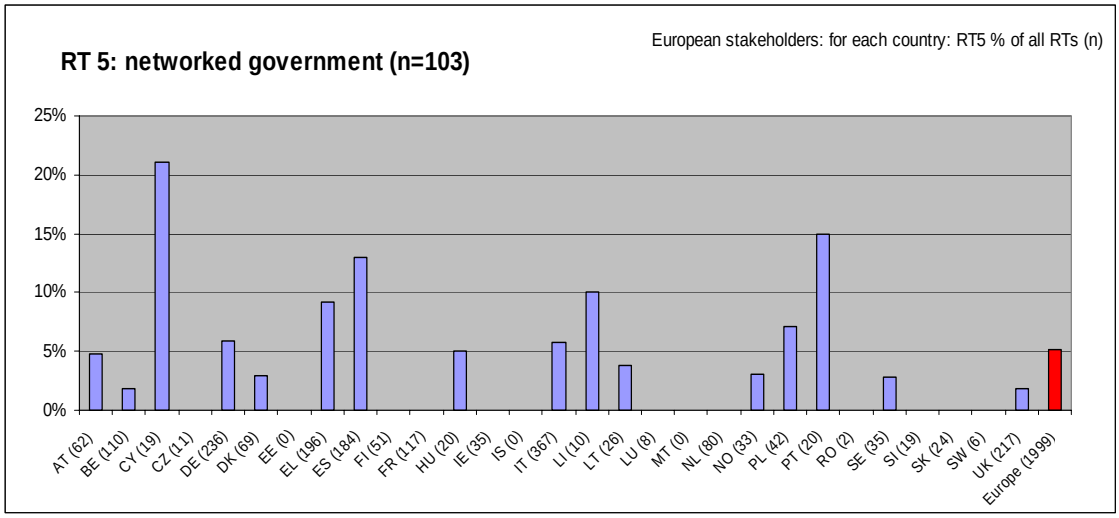
Given that this research theme focuses more on the interface between back and front offices, the main challenge for research in networked multi-level eGovernment and services is to ensure that the public sector is capable of interacting as a single body in terms of service delivery. In doing so, this research theme focuses on the role of public administrations in encouraging these developments, by carrying out research into how they can work together. One of the major challenges is thus getting the public sector involved in this research, to ensure that the research developed is appropriate and pertinent to the needs of the public sector. A comprehension of the role of PPPs is crucial in this activity, and research needs to be done on these new types of frameworks for the public sector.

Once the initial requirements for working together have been laid out, there is a need to understand how to effectively reproduce data and information for use in multiple environments (different regions as well as at different levels); this requires an understanding of knowledge management tools that should have been developed in a previous research theme. Use of these tools will be paramount in this research theme, and an understanding of how to overcome potential blocks and gaps in data management will be necessary; including a greater understanding of data semantics.

Country analysis

In contrast to RT 4 which covers partnerships with the private and civil sectors, this research theme focuses on networking, coordination and cooperation between and within the different jurisdictions of the public sector itself for the purposes of service supply and delivery. Leading countries are Cyprus, Portugal, Spain, Lithuania, Greece

and Poland, i.e. Mediterranean countries and some small New Member States. Mediterranean countries do tend to give a strong role for non-governmental civic institutions, and a relatively high Importance of city regions, which perhaps accounts for this interest.



3.2.6 Multi-channel

Overview and assessment

Current research developments

The use of different channels for dissemination of information is a clear necessity for eGovernment services. The distinction between ICT use in public and private domains is specifically noted in this area, where the public sector has a mandate to look after the public at large, rather than catering to a specific customer base. In this research theme, infrastructures, platforms and interfaces need to be accessible to their users in different formats, including the different variety of 'e' interfaces, such as digital TV, PC, mobile, *et cetera*. The multi-channel service research theme is also about linking a public administration's back-office(s) to easy to use interfaces for citizens, therefore, as for value chains and networked government, this research theme focuses upon the relationship between the use (delivery) and the design of services.

Current research has focused on delivering services to all citizens through these different interfaces, but has concentrated on improving portal design, rather than looking at alternative 'e' infrastructures, which are the 'back end' of the multi-channel research agenda. Most of the European research has been carried out in the review area (40%), and far less public sectors are involved in the research surveyed, despite some high-profile examples being developed, particularly in the UK with the use of GSM technology. This research theme has thus far not been a highly-funded research theme in European Commission funded research, and is not likely to be so in the future.

Assessment of research challenges

This study has shown that according to various sources, this research theme has achieved a certain level of maturity, and so a future set of general research challenges

for eGovernment research policy will not have to concern itself with many issues that have already been dealt with in the research environment. This is likely to be less due to the fact that research has been highly effective, but more due to the fact that the general research environment into new 'channels' is in a state of flux; more research is thus needed on the technological environment, which is not only a task for eGovernment research, but a task for IST research in general.

Research that has been thus far carried out in this thematic area can be capitalised upon in deployment activities, and can also lead to new issues and challenges for other themes, particularly noting the research theme on socio-economic inclusion. Despite the fact that there have been some advances in this research theme, therefore, the major challenges still existing in this research theme emerge mainly from an unclear technological environment, which leads to limiting the amount of socio-economic research that can be done.

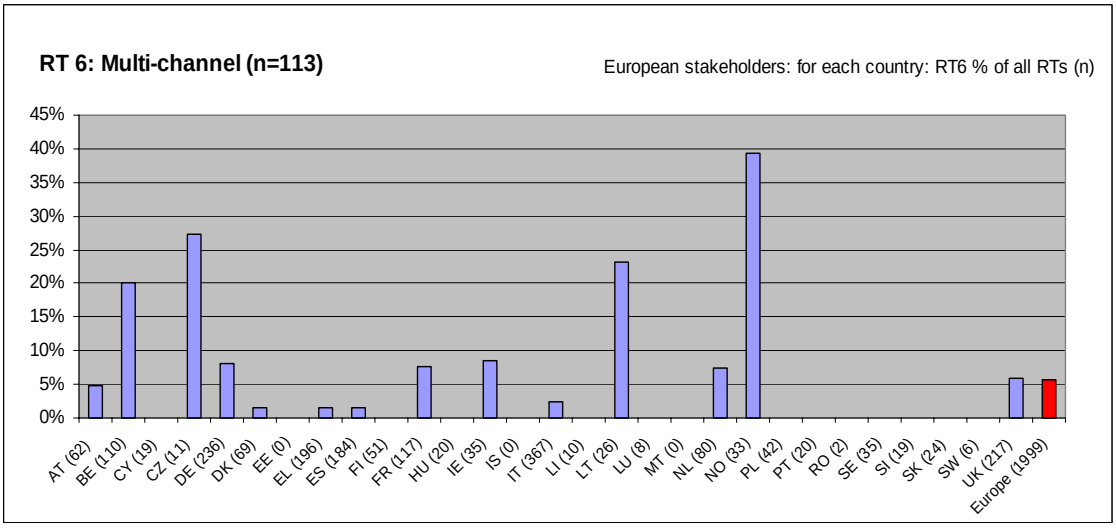
Prioritising challenges

The main priority for this research theme is to encourage and make use of new research done in general ICT research on new interfaces, and the application of that research in eGovernment services and interfaces. The problematic issue here is that technological selection may take place, and research done into channels that are no longer used in everyday life, which would make the research useless.

On the backward-facing aspect of this research theme, more work can be done on focusing upon the role of the electronic channel as a 'backbone' or infrastructure for all the forward-looking channels. Research is also needed on focusing on providing choice to citizens, which will encourage participation from as wide a 'market' as possible.

Research is needed into the mixed strengths and weaknesses of each type of technology channel, focusing on how these change perceptions of public administrations, and the tasks that are expected of them.

Country analysis



Research into multi-channels is attracting the heaviest focus in Norway, the Czech Republic, Latvia, and Belgium. Germany, Ireland, France and the Netherlands are also above average. Few of these are leading eGovernment countries (with the possible exception of Ireland and Norway), but are certainly countries strongly pushing their eGovernment agendas forward.

3.2.7 User needs

Overview and assessment

Current research developments

Understanding user needs is the first research theme thus far to focus entirely on the outward-facing aspect of eGovernment. This theme looks at the needs of users, whether as groups (communities), or individuals, and tries to understand how to deal with the variety of different and sometimes even competing and conflicting desires of attention from citizens. Research in this area has thus far examined the usability of eGovernment services, trying to establish how user demand can be increased and users' needs can be fulfilled. A large proportion of the European research carried out has been in the development area, which shows that despite this research area not being in the most prolific five research themes, there is a great deal of focus being placed on actually bringing generic and theoretical research to fruition. This also shows that the theme has reached a relative maturity. Furthermore, benchmarking and reviews of this theme were identified as being approximately 1/3 of the research activity identified in the survey carried out for this study. The public sector plays an active role in this research theme, which is positive for the research environment, and shows that research results might be more effectively made use of in practical situations.

Assessment of research challenges

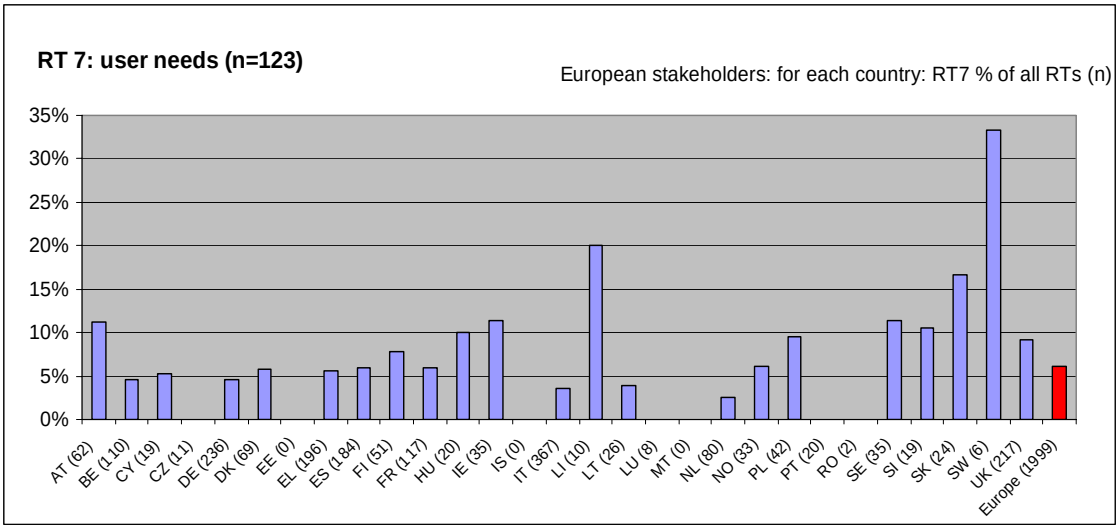
Research carried out thus far has been limited by the ability to truly understand the needs of the 'user', which is - in the public sector - a term so broad as to almost defy meaning. However, research into user needs has thus far been considered a theme worthy of research, and this will continue into the future, with 11% of stakeholders interviewed in the study's survey highlighting this research theme as a top priority for future research. The challenges that lie ahead are manifold, and cover many different domains; they include the political challenges of creating 'user-driven services', which will be far more likely to appeal to citizens than user-centric services. The challenges of increasing take up and confidence in eGovernment services are related to this, and rely on information dissemination from the public sector. In order to ensure that eGovernment services still remain efficient and effective (both for the citizen as an individual, a member of a community, or as an employee or employer, and the public administration), there is the need to develop common models and frameworks that will enhance ease of use and simplicity of systems.

Prioritising challenges

Research to be carried out in this theme can be linked with those which come before it, particularly those relating to the interface between citizen and public administration. User needs, in terms of eGovernment, are dependent upon the technology used to interact with the public sector, and this can be of crucial importance when determining what the requirements are for research in this theme.

One of the most important priorities for research is to therefore understand how to link the needs of individuals and groups to the possibilities afforded by new technologies, such as NLP and different channels of interaction. Also, research needs to examine the potentials of user participation in designing and evaluating public (ICT-driven) services.

Country analysis



Research into user needs is a comparative European weakness, but is also recommended as the most important future area for research. Countries focusing most heavily on this area at present are Switzerland (but with a very small sample), Lithuania and Slovakia, followed by Austria, Sweden and Ireland, and then Slovenia, Hungary and the UK.

3.2.8 Socio-economic inclusion

Overview and assessment

Current research developments

Whereas the previous research theme focuses on all users, this theme focuses upon individuals or groups who are considered 'disadvantaged' in some way (physically, socio-economically, linguistically, *et cetera*), and who are probably in more need than the average citizen of public services that offer and provide support. These groups and individuals tend to be on the other side of the digital divide, and are thus treated differently in terms of research. Current research in this area has focused upon reducing barriers to accessing ICTs, including usability both in terms of software and hardware, identifying research into the development of community access points, *et cetera*. Although this research area does not have a high profile in terms of research activities currently taking place, there is a large focus on the topic area, particularly from the EU's institutions, where social inclusion is an high profile, and an highly politicised issue.

Assessment of research challenges

Thus far, research that has been carried out has been highly practically oriented, which reveals that some of the generic and theoretical research carried out in domains outside of eGovernment may be being used in the public sector. This is also shown by the

slightly above-average participation of ICT industry as a stakeholder in this sector (28% in place of the average of 24% across all themes).

Barriers to research in this area comprise mainly of the socio-economic issues that affect inequality as a whole, and particularly those affecting the so-called 'digital divide'. These are mainly of cost, accessibility of, and access to, technology.

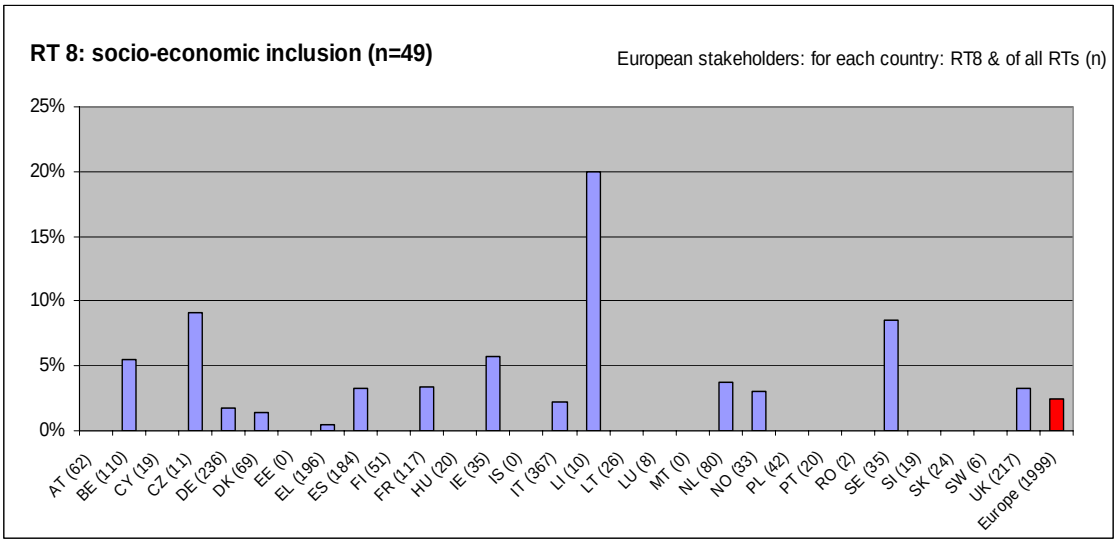
Prioritising challenges

Research challenges in this area are thus identified by a need to focus on new 'assistive technologies', and the use of new interfaces for eGovernment services. Research also needs to be done on the reduction of the so-called digital divide in the context of the socio-economic divide which also embraces aspects of inequality of society outside of the IST domain. This requires looking, in terms of ICT usage, at business models for providing low-cost access to eGovernment services, as well as looking at the possibilities of multi-channel activities in this area.

As the 'e' channel becomes more commonplace, research should be done into ensuring that new divides do not emerge within society, which will ensure that inclusion is one of the priorities in all activities relating to public services.

Furthermore, research carried out should be fully in line with international efforts to include all of society into work, including those of organisations such as the WorldWideWeb consortium, who have developed the W3C Accessibility Initiative.

Country analysis



A focus on the user needs of disadvantaged users is being made by Lithuania, Sweden, the Czech Republic, Ireland and Belgium. There is partial overlap here, as would be expected, with RT 7, although also some big differences. Note, also, that the overall sample size is not large, so it is difficult to draw real conclusions.

3.2.9 eDemocracy

Overview and assessment

Current research developments

As a research theme, eDemocracy and eParticipation considers the tools and applications available to encourage citizen involvement in public life. These include tools to encourage engagement through consultation and voting, as well as the more general issues of providing accurate and relevant information to citizens and groups. Not only is this research area about encouraging the public sector to deal more openly with civil society, but it is also about providing opportunities for civil society to interact within itself. Research carried out thus far has focused on several main topics, including information provision, consultation, and participation. Notable work has been carried out in the UK, under the banner of the Office of the Deputy Prime Minister through the National eDemocracy project. This collection of smaller initiatives has provided a basis for further developments in research, whilst showing some of the limitations that hamper efforts to further develop these areas. This study has shown that the majority of work currently done in this research area has been of a review and a developmental nature. European researchers are also clearly in the lead in terms of global research on eDemocracy and eParticipation, despite very notable efforts from North America and Australasia.

Assessment of research challenges

Challenges for research in this area are multiple, and also refer to other research themes, particularly Ensuring Trust and Security. This research theme challenges many assumptions predominant in the public sector about the roles of civil servants and politicians, and as such does not only consider technological research issues, but is far broader in its issues. However, there are technological issues which are specific to this theme, including the infrastructures for large scale discussions, the possibilities for interaction between different groups (including the public sector as well as civil society), and the need to enhance mechanisms for open and transparent decision-making through use of ICTs.

Some of the main barriers to research in this area are legal and regulatory challenges that are not inline with technological developments. Despite this, many countries in Europe and beyond are now implementing trials of electronic voting schemes, some even using mobile telephones to encourage participation.

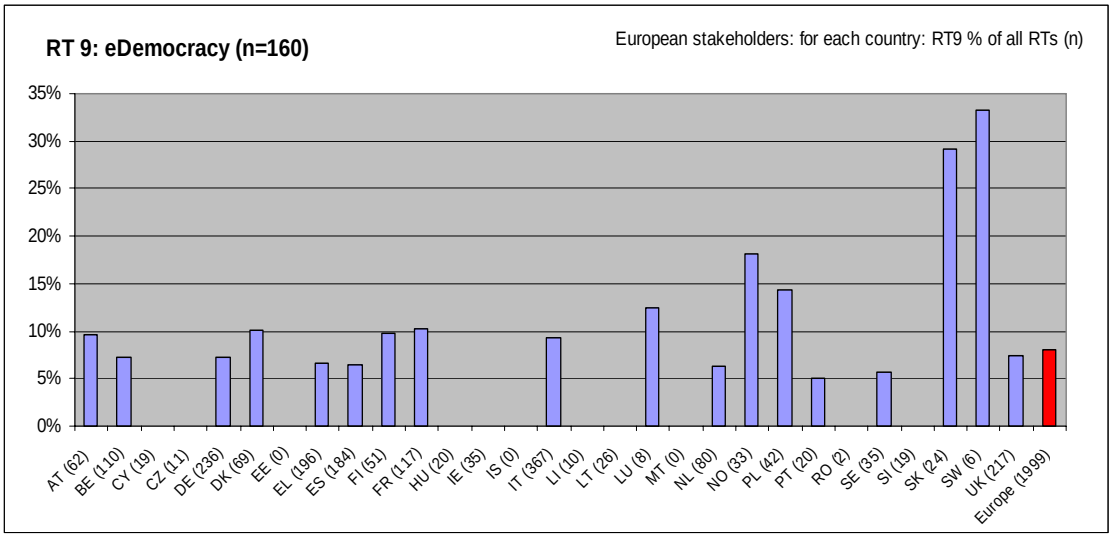
By far the most important barrier to eDemocracy and eParticipation research is the institutional one. Political institutions are, on the whole, far from ready to accept new modes and methods of governance, particularly ones which change something as fundamental as the means of representation, or the ways of decision-making.

Prioritising challenges

This theme is increasing in importance, and emphasis needs to be placed on this, due to the fact that a lot of the legitimation of eGovernment services can only be fulfilled if the public sector embraces the ‘e’ channel wholeheartedly. eDemocracy and eParticipation require a continued effort in the areas of identity management and privacy from a technical perspective: whilst this needs to be maintained, there is also a need to develop

work in the regulatory areas of this theme, which are different across the EU, leading to challenges for a unified or even coordinated approach to research across Europe.

Country analysis



eDemocracy is a comparative European strength, both in terms of coverage of the state-of-the-art research agenda and in amount of effort. Leading countries are Switzerland (which is quite heavily using eVoting in their referendum system, though with a strong caveat for a small sample size), Norway, Finland, Denmark, as well as Poland, France, Austria and Luxembourg. Interestingly, these are all older Member States (with the exception of Poland, the largest NMS), and heavily focused on Scandinavia which has a very strong democratic tradition.

3.2.10 Open source

Overview and assessment

Current research developments

Current research in the Open Source Tools and Applications theme are focused upon the role of open source as a technology building block in many aspects of the digitisation of public administrations. This includes human, business, and organisational aspects of the digitisation process, and the role that open source software and open standards play in that development. Current research focuses on the manner in which open source software is developed and implemented, as well as the products that result from these interactions between developers. Research is being carried out at the European level to analyse the development of Free/Libre Open Source Software (FLOSSPOLS project) and the organisational and human factors surrounding this relatively new phenomenon. In terms of eGovernment research, OSS as an implementation is crucially important to understand, as public administrations look for alternatives to existing business models and 'off the shelf' software to fulfill their needs. Open standards often form the basis of out technological

Assessment of research challenges

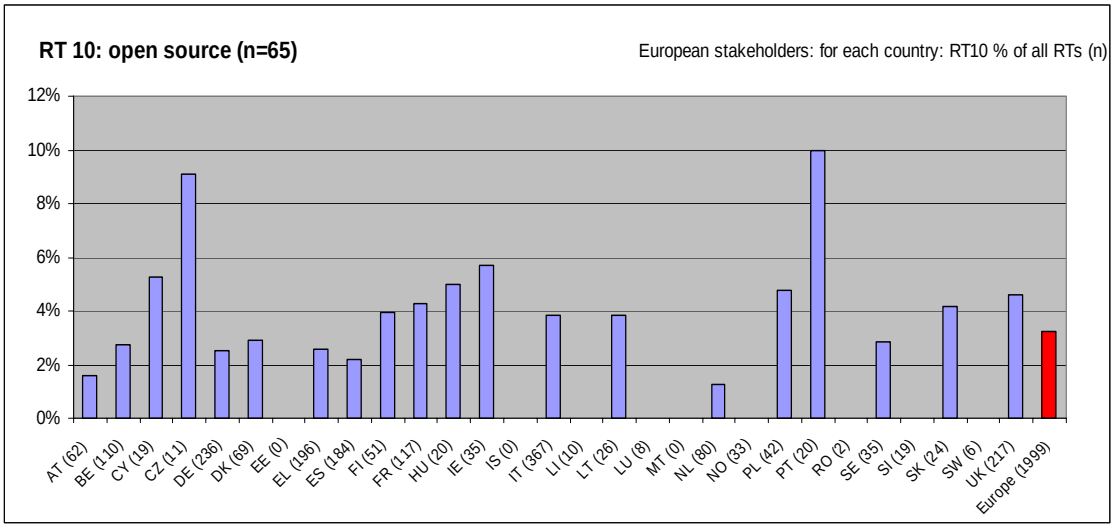
This research theme is a second-order strength in Europe, but many challenges to actual research in this theme are worthy of note. They fundamentally lie in the needs of researchers and developers in this area, particularly in establishing frameworks in which professional activity can be carried out in the OSS domain. This includes a greater understanding of the legal status of intellectual property rights and licences, which are necessary for promoting transparency, trust, and confidence in OSS eGovernment systems. The development of such systems also requires that the capacity of the public administrations to deal with software and hardware issues is extended. Security of OSS in eGovernment systems, is another major challenge for future research.

Prioritising challenges

Open source software and open standards provide an opportunity for the EU, as systems are, by their open nature, flexible and open to modification to specific needs of a local, national, or European context. OSS systems also lend themselves towards group development, carried out over networks, which can also be done at the European level. Despite this fact, future research in the area is not given much priority by stakeholders in the area. One of the most important priorities for research is to therefore understand how to achieve the most widespread (and therefore most effective) use of OSS and open standards in eGovernment systems across the EU. To this aim, research needs to be carried out to understand in what areas Open Source Software can be used, and what is the trade-off between using proprietary systems and systems that can be shared. How public administrations should work together to ensure that systems and applications are completely interoperable through use of OSS and open standards is of crucial importance. This research theme needs to be clarified through a greater understanding of the nature and use of OSS and open standards, in order for it to be an effective theme into which resources should be placed. Certainly, as an underlying area of research, which can be used in a cross-cutting fashion, this area provides many opportunities to enable European innovation in the public sector to thrive. Unlocking that potential, by providing for legislative support in terms of IPR, will ensure that OSS is continued to be seen as an area for future research.

Country analysis

The countries with the heaviest focus on open source research are Portugal, Poland, the Czech Republic, Cyprus, Hungary, Slovakia, and the UK. This area is thus an important one for many NMS, and shows a similar pattern of country focus as do RT 1 and RT 2, as may be expected given the common technology content.



3.2.11 Trust and security

Overview and assessment

Current research developments

Trust and Security, as the previous research theme, is a cross-cutting topic which works towards developing research that will contribute to all the previously-mentioned research themes. This, trust and security in this instance refers to the tools, methods, technologies, and policies of information assurance. Specifically, for example, this deals with the paradox of identification and privacy. This is a very important research theme in comparison with other topics, due to the importance of creating a secure infrastructure for eGovernment operations, which was made a European political priority with the eEurope 2005 initiative for a faster and safer Internet. The current FP6 GUIDE Project examines the role of ID management in EU countries, looking at Administrations' relations with other Administrations, Businesses, and Citizens. This project attempts to build an open architecture for secure eGovernment transactions and other services across Europe. Other examples of research include the now-finalised RAPID project, which outlined future research topics in the area of Identity Management. A large amount of work is done in Europe in the area of development, with less than the average being carried out in the applied area. The stakeholder breakdown is dispersed, which is a sign that the theme has the attention of many different groups involved in the eGovernment process chain.

Assessment of research challenges

This study has shown that according to various sources, this research theme is a major priority for European research and policy, particularly as it is considered a necessary aspect of many of the operational objectives of eGovernment research: without secure and protected means of communication and information dissemination, eGovernment will be limited in its use. Therefore, this research theme is crucial to stimulating work in other areas. The area is not just a technical one, however, as trust is a social issue as well, and herein lie many of the future challenges for the research theme, as described below. The barriers to this research are therefore not simply technological, regarding adoption of specific standards, tools, and applications across Europe, for example, but

also are very much based on the social concepts that lie behind the application of research in this area particularly from the citizen's perspective: who will trust the software to do what it says it will, and nothing else?

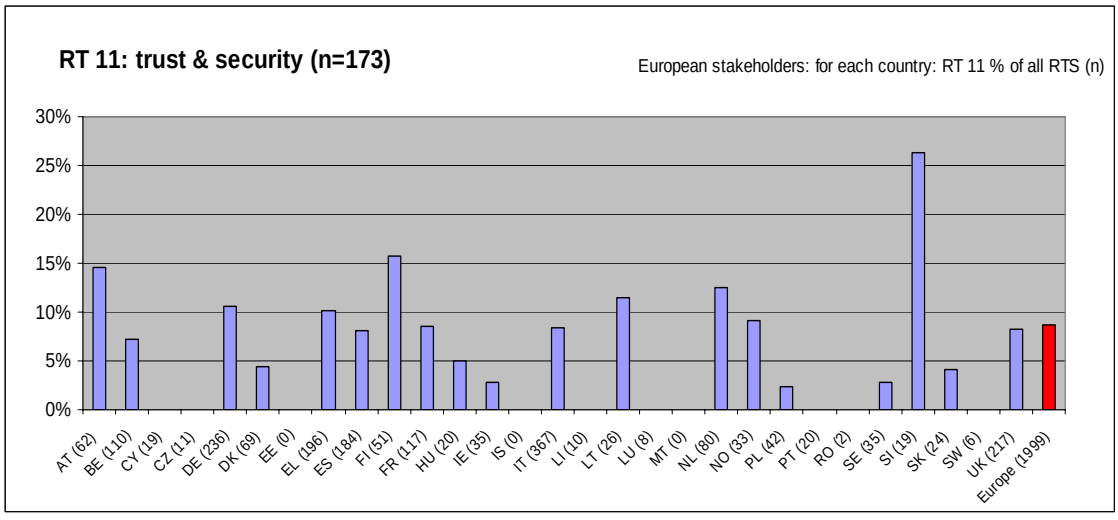
Given that technological solutions are very quickly outdated, and that new possibilities emerge very quickly in this area, one of the major technological barriers to research in this area can be considered the swiftness of change, with developers constantly trying to keep up with the pace of newer and better solutions to the problems of security.

Prioritising challenges

Challenges to research in this theme are equally distributed between social, economic, political, and technological, and a few of them will be outlined here.

Firstly, the technological challenges of developing and implementing a secure infrastructure that is compatible on a Europe-wide basis is challenging, given the interoperability and flexibility requirements necessary in the European context. Identification procedures differ from a legislative and regulatory perspective across the EU. Research needs to be done into the ownership of data: how can a public administration make their interaction easier with individual citizens if the ownership of personal data lies with the individual in question? Should government play a more imposing role in terms of controlling and securing data of individuals, which leads to privacy concerns?

Country analysis



Slovenia seems to be the leading country in comparative terms for research into trust and security issues, although the sample size is not large. It is followed by Finland, Austria, the Netherlands, Latvia, Germany and Greece, which are generally quite advanced eGovernment countries with the exceptions of the latter three.

3.2.12 Quality and performance

Overview and assessment

Current research developments

This research theme deals with the measurement of operational activities in eGovernment, which are those developed through research undertaken in previously-mentioned research themes. It looks at issues such as the measuring of service quality, and internal government processes. This area provides for some policymakers and researchers the ultimate test as to whether eGovernment pays off or not, through looking at the micro-level quality and performance of eGovernment applications.

Current research has looked at how to improve the added value citizens feel they receive through eGovernment applications, as well as how public servants work with the applications. This has, so far, included topics such as improving speed for processing transactions, as well as the ease of use. A lot of interesting and wide ranging research has recently been taking place. The focus is on reviews (many of which are looking at how various government agencies have improved or not their service delivery either by applying quality tools or by gaining consumer feedback), surveys of the usability of existing services (which analysed feedback from users who had been sent a questionnaire or were interviewed), and the promotion of tools that had been developed to measure some aspect of quality/usability (mainly front- rather than back-office usability). Other research activities include the examination of risk analysis tools developed for eGovernment use, reviews of services that have been improved through the application of a quality system/redesign process, for example a tax website that dramatically improved the receipt of payments. Some research is looking at the use of commercial CRM applications for improving quality of service, feasibility studies (e.g. the cost/benefit of applying a quality system), the need for new performance indicators, and the need for workshops on quality in eGovernment services.

Assessment of research challenges

Most of the research done in this area is of the review type (around 50% for both European and global research). An above average amount has been accounted for in the survey by generic or theoretical type research. EU-funding only funded three of the 32 research projects included in the survey, which goes some way to explaining the lack of Applied or Development type research in this area. This area of research is important for a wide variety of EU policy areas, due to the nature of the theme, which looks at how public administrations and public services in general can monitor and manage quality and performance. This is becoming a more politically important theme.

Challenges in this area are related to improving the levels of service provided by the public sector: how this can be achieved, not only in monetary terms, but also in terms of improving levels of quality, which includes issues like responsiveness and time to completion.

Prioritising challenges

When looking at the different types of research challenges for this theme, many issues arise. Research is needed into how best to measure the quality and performance of the

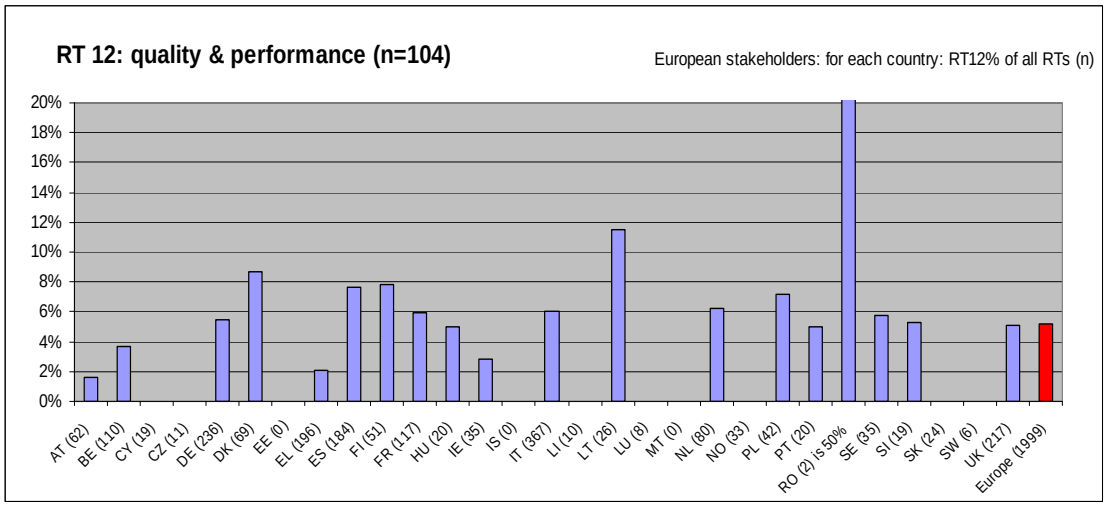
front-office when developing, designing and delivering eGovernment, for example in relation to:

- different user groups and situations
- different delivery channels
- user preferences and usability
- customer satisfaction
- changes in user attitude

The set of challenges described above outline the main issues that need to be addressed in social, technological, and institutional areas. They also outline the political issues that are related to research in this area.

Finally, one of the main challenges of this research theme is to ensure that quality and performance is not treated separately, but integrated into research that takes place in other research themes. Quality and performance are not ideally meant to be treated alone.

Country analysis



Ignoring Romania (because of the tiny sample), the countries focusing most on research into quality and performance are Latvia, Denmark, Finland, Spain and Poland.

3.2.13 Cross-sectoral public services

Overview and assessment

Current research developments

In the first of the research themes that covers eGovernment specific objectives, the cross-sectoral ePublic services looks at how to link up public services across sectors. This is to ensure that citizens and other users get the fullest treatment by the public sector, rather than having to contact different 'silos' to ensure they are given the best attention. It explicitly covers the relationships between sectors, including health, education, transport, social care and security, police and legal, environmental, housing,

utilities, consumer protection, business support, cultural and community support, etc., with eGovernment which is often narrowly treated largely as just eAdministration. The research theme thus considers and exploits the cross-sectoral aspects and synergies in the public sector seen as a whole instead of segmented.

Assessment of research challenges

Current developments in this area are rather advanced in Europe, but much of this is in the review area. The reasonably well mixed range of stakeholders involved within Europe in this theme is partly due to the range of stakeholders involved in the four studies funded by the EU. These included the eGovernment Studies 2005 – MODINIS programme that included a project that looked at cross-border and cross-sector eGovernment services[16] and others funded by the Framework Programmes.

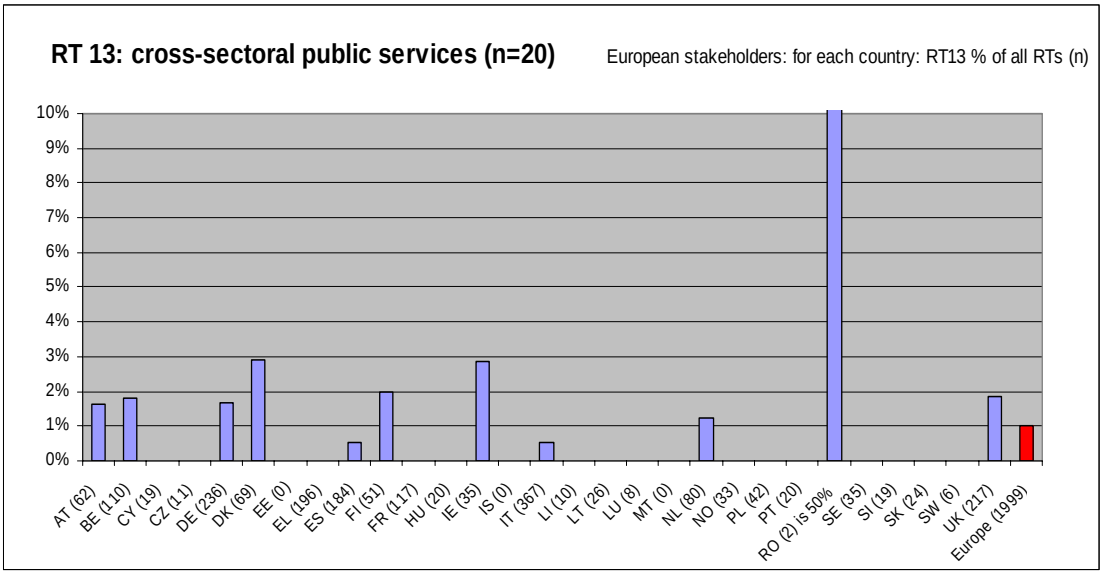
This theme tends to have most impact at national, regional or local level rather than international and it may be that, within Europe, the amount of effort predicted for future research at trans-national level is masking the predictions for basic cross-sectoral public services. However it is an important theme for future back-office development and its apparent low ranking amongst priorities may indicate that the field is already sufficiently well understood, but it is more likely that, as discussed earlier (see user needs), researchers currently feel that other themes are more important to developing and demonstrating the true potential of eGovernment.

Prioritising challenges

Challenges in this research area include issues of semantic interoperability as well as harmonization of processes across departments and, indeed, different public sectors: this is part of the main challenge to move this area of research from one which is primarily concerned with review and theoretical or generic issues into one concerned with application and development. In order for this stage to happen, one of the most important major challenges that can be considered a prerequisite is to actually investigate what the institutional and political structures of such cross-sectoral public services will be. These are clearly not questions that are simply related to the 'e', but questions which need to be addressed from a context that also makes use of the advantages that ICTs can facilitate.

[16] "Advancing identity management within the EU": http://europa.eu.int/information_society/activities/egovernment_research/projects/i2010_studies/index_en.htm)

Country analysis



Again, ignoring Romania (because of the tiny sample), the countries focusing most on research into cross sectoral public services, which is a very weak European area at present but also attracts strong recommendations for much greater future focus, are Denmark, Ireland, Finland, Belgium and Austria, plus Germany, the UK and the Netherlands. These are overwhelmingly small countries, leading in eGovernment, where interest in linking across the whole public sector and strongly pursuing joined-up-government is greatest. In the case of the two larger countries, Germany and the UK, the former has a federal structure (like Austria) and thus has a special interest in linking different jurisdictions and agencies, whilst the latter has experienced a very strong centrally-driven joined-up government programme since 1997. Note, however, that the overall sample size is small, so it is difficult to draw any significant conclusions.

3.2.14 Innovative governance

Overview and assessment

Current research developments

As a specific objective, innovative governance is about progress towards 'better' political institutions and public administrations through new means and methods of governance. The role of eGovernment, and therefore eGovernment research in this area is complementary to redesigning governance mechanisms as a whole. ICT can play a transformative role in this theme, and it is here where research is most active. Currently, this is one of the least important research areas, with no work identified from the survey as underway in the developmental area. Most of the stakeholders in this research theme are from the academic environment. Although this is an immature research theme, there are many signs that this will become far more important in the future, when more general governance issues within Europe will be addressed by researchers in the eGovernment domain.

Assessment of research challenges

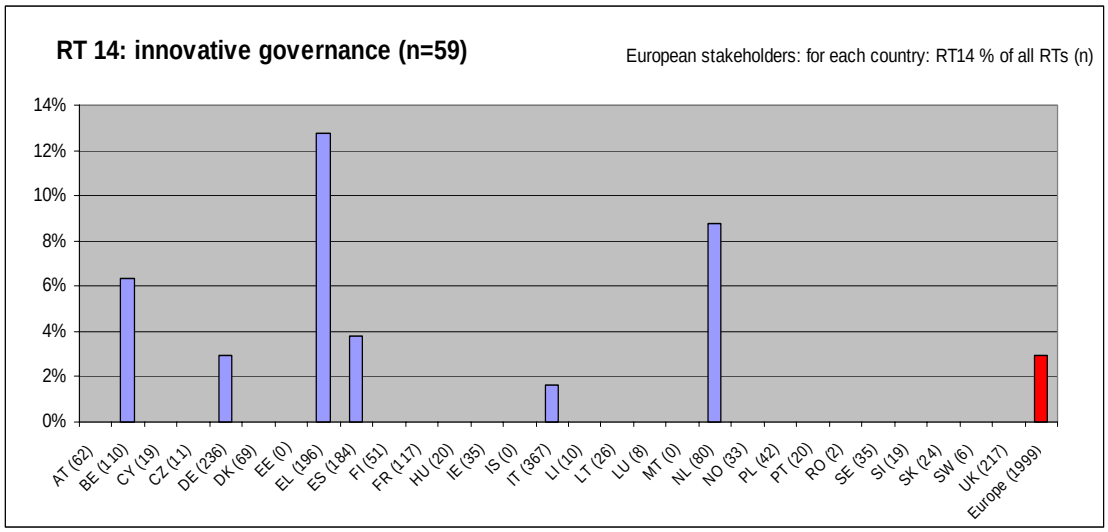
There are clear limits on the amount of research that can be done in this area without political impetus towards the use of new forms of governance, and although some of these are technological, the issues are more cultural, institutional, and political, particularly at the European level. Given the fact that the EU's political institutions are bound by strict limitations to changing their mandates, many of the barriers to research in this area lie in the realm of application and development. This is also possibly due to the fact that the majority of stakeholders in this research theme are academic and consultants (71% in total).

Prioritising challenges

Innovative governance as a research theme takes on issues such as using new intelligent simulation systems to aid in decision-making processes. These are challenges for institutions as well as technology, and research is needed to understand how to enable a public administration's capacity to make use of new technologies in effective and innovative ways.

Learning how to adapt processes to new forms of governance that are emerging is perhaps the major political challenge to take into consideration. This is particularly important at the EU level, where certain political considerations must be taken into account. Notably, the democratic deficit, and the perceived perception by the general public of the inefficient EU, must be dealt with through developing new forms of governance that may include an eGovernment component.

Country analysis



This emerging area of research is relatively weak in Europe at present, but interestingly the most important countries appear to be Greece, the Netherlands, Belgium and Spain. It is difficult to discern what these countries may have in common in this context, but the overall sample size is not very big so the pattern may be quite random.

3.2.15 eGovernment at EU level

Overview and assessment

Current research developments

The eGovernment at the EU level research theme is one of the areas in which least activity is taking place. Research in this area looks, amongst other things, at the remaining barriers to eGovernment implementation at the European level, the benefits of carrying out pan-European activity, and the interoperability of various sub-European systems at the European level. Whereas the earlier research themes consider the technical aspects of such work, this theme examines the impact on the political infrastructure of eGovernment developments at the EU level. Therefore, most of the research to date has considered either developing European frameworks around existing projects (from an applied perspective), or has looked at more structural issues, such as the potentials for best-practice learning in a European context.

Assessment of research challenges

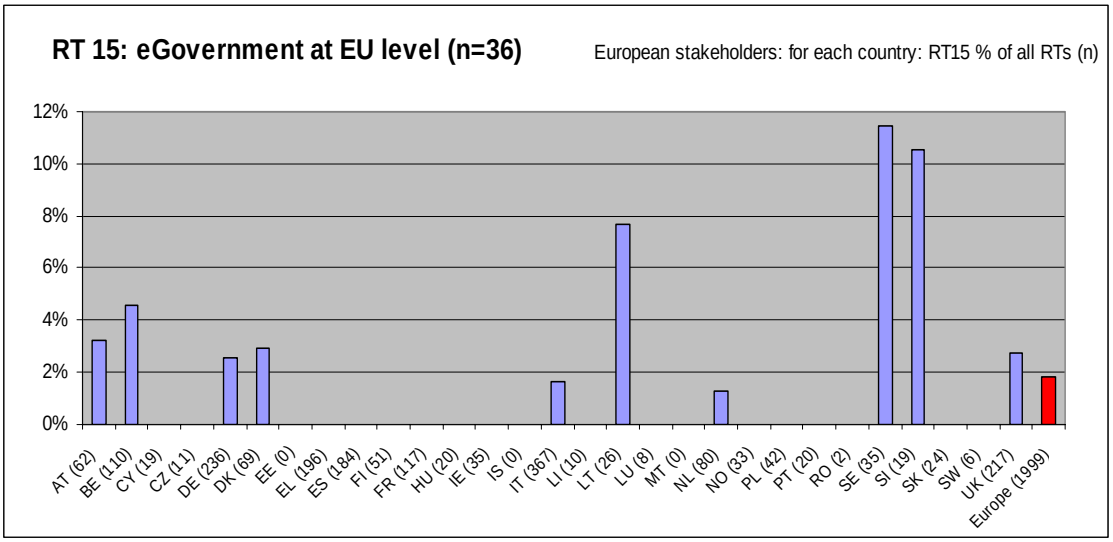
This study has shown that this is one of the areas of research, which commands the least interest globally. Despite this fact, given that much research is being done in other areas that are clearly related to eGovernment at the EU level, this research theme is a secondary task for most research being carried out at the European level. There are some distinct barriers to research in this area, notably that of implementation and regulation. Currently, barriers to this exist in particular in regulatory contexts, where there is a lack of common understanding at the concrete role of the EU. These need to be emphasised in the prioritising of research challenges carried out in the following section.

Prioritising challenges

The priorities for eGovernment at the EU level are predominantly in the field of pan-European implementation and pan-European regulation and legislation. Whereas research is (by and large) taking into consideration aspects of interoperability at the national and local levels, more work needs to be done to ensure that data and information can be transferred at the European levels in a cost-effective manner. Furthermore, due to subsidiarity, there needs to be an identified benefit (or need) to carrying out research at the EU level, which is related to the user-uptake of pan-European services.

In terms of technology, there is a need to ensure that the European Interoperability Framework is enhanced and used by sub-European level public administrations.

Country analysis



This research theme suffers from a low sample size and which makes any inferences highly suspect. However, the countries focusing most on this politically important area of European research seem to be Sweden, Slovenia, Latvia, Belgium, Austria, Denmark, Germany and the UK. It is difficult to draw any conclusions from this diverse group.

3.2.16 Evaluation and benchmarking

Overview and assessment

Current research developments

This research theme looks at the overall effects and outcomes of eGovernment, and attempts to disseminate that information to researchers and policymakers alike. In the area of dissemination, the European Commission has funded several initiatives to support the 'export' of best-practices from across Europe, most recently the eGovernment Good Practice Framework, and prior to that, the BEEP Knowledge Base. The BISER project examined the role of the regions in benchmarking the information society, which provided input into the evaluation of the impact of the eEurope initiative.

Assessment of research challenges

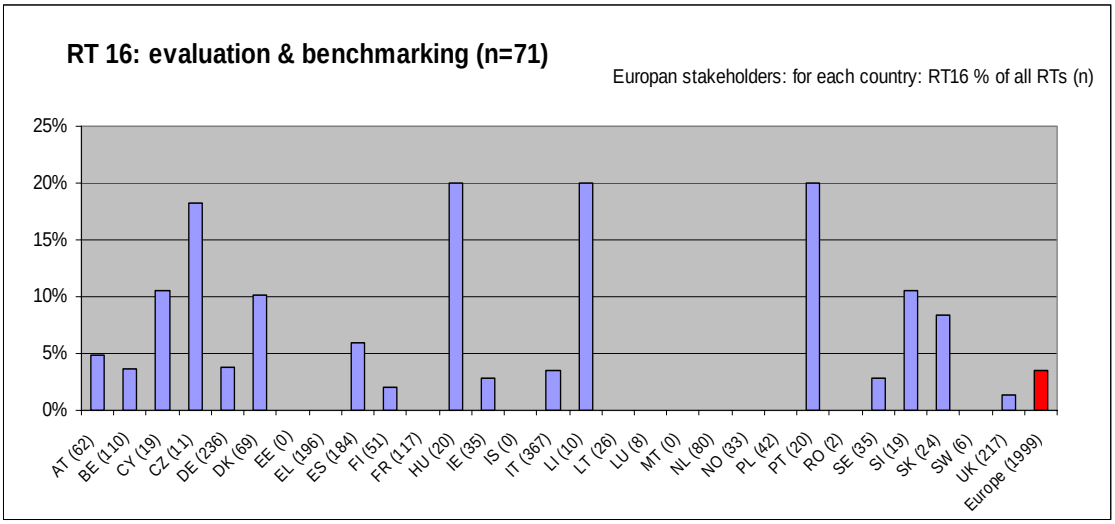
Barriers exist in the methodological domain, where, for example, the impact on individual users is very difficult to measure, and given that the public sector deals with a diverse range of needs from diverse groups of citizens, the 'user' can rarely be treated as a homogenous entity. The focus has, until recently, been on the supply side of eGovernment research, and the demand side, despite the challenges that emerge in such a topic, needs to be addressed. At the European level, research also needs to focus on measuring and understanding the ICT-use process in the public sector, which is a challenge for understanding how to make the best use of ICT.

Prioritising challenges

Research such as that described above has developed a common framework for measurement of eGovernment progress across the European Union. In this, it has been

highly successful. However, given the developments that are continuously taking place in the sphere of eGovernment, and the new specific objectives that are being given to the tasks of eGovernment, these need to be continuously revised. Furthermore, new methodologies for measuring impact are being introduced, and are therefore in need of applied research to actually measure the impacts. Review work in this area is of crucial importance, to analyse and evaluate the results of the data.

Country analysis



The countries which appear to be focusing most on evaluating and benchmarking are Portugal, Lithuania, Hungary, the Czech Republic, Cyprus, Slovenia and Slovakia. Denmark is also above average. These are overwhelmingly NMS, which can perhaps be explained by the interest of these new, but in many cases emerging eGovernment, countries to catch up and measure themselves against Europe's leading countries.

3.2.17 Public value creation

Overview and assessment

Current research developments

At the top of the hierarchy concerning eGovernment research, this research theme deals with issues that are more concerned with the 'added value' of eGovernment. These concern such topics as the promotion of democracy and the development of other specific societal 'ends', such as respect for the law, transparency, etc. In order to encourage a common research area, that takes into consideration the effects and impacts of enlargement on the EU, there is a need to understand exactly what role a common research programme for the whole of the EU can play in the general visions of the European Union. This should include studies on the impact of research into eGovernment on public administrations across the EU, as well as an analysis of how exactly research can contribute to the development of eGovernment.

Assessment of research challenges

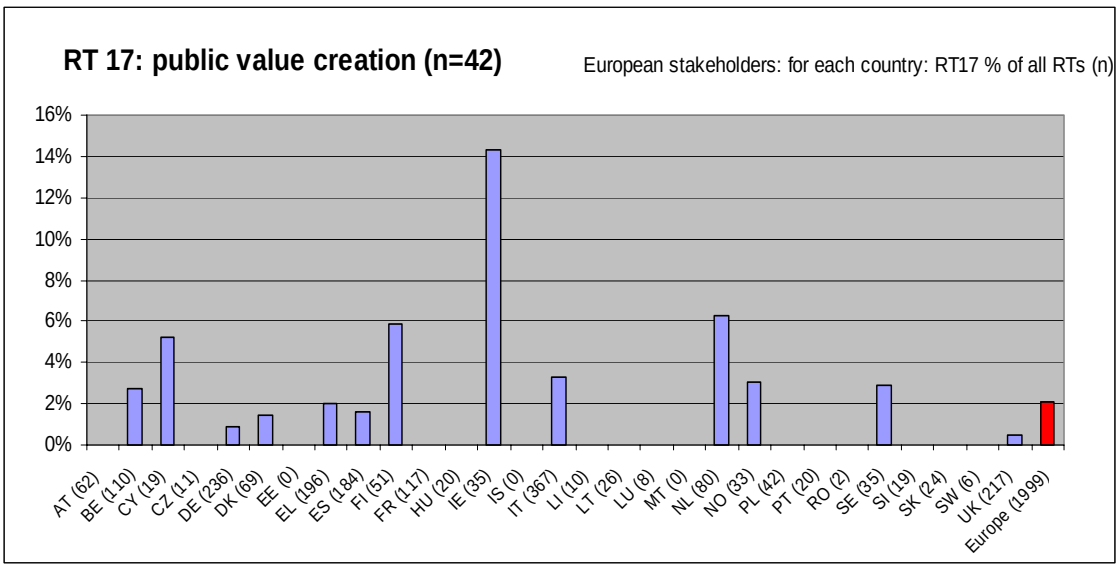
Very little research has been undertaken on the direct importance of eGovernment to the high level social and regional policies of social inclusion or regional cohesion, certainly not attempts which show the differential impact of eGovernment. A major research

effort is required to better understand and exploit both the general and differentiated impacts of government and eGovernment on social and regional objectives in order to improve policy making and maximise development results. Research impact of eGovernment and other ICT developments on the quality of life, welfare of workers and consumers (as well as citizens) needs to be further developed. There is a missing link between the development of services and the study of their uptake and subsequent impact. Due to the early phases of most eGovernment activity, this is to be expected, but by 2010, research should be carried out to work towards a greater understanding of how eGovernment can be used to provide a positive impact on the broader policy goals mentioned in Section 5 of this study.

Prioritising challenges

Although Europe is a leader in the public value creation research theme, it is still very weak in terms of coverage of the state-of-the-art research agenda, and stakeholders have recommended that it be allocated a large increase in relative effort in future. This is due to the fact that, as with the justification for more research at the specific objectives level, there is a need to understand the relationship between eGovernment and more general policy goals much better than we do at present. The ultimate goal of eGovernment should be measured in its contribution towards wider policy goals, and not just in the rollout of services or re-trained staff. However, this cannot take place without carrying out research into exactly what form this contribution can take. Again, DG Information Society's research projects in this area have been considerably weaker than the average European position (as well as the non-European status), but recent initiatives like the Modinis and other programmes should go part way to redressing this imbalance. Overall, however, the critical issue is the need to focus on public value in much more detail in the forthcoming years, especially in terms of how research results can be deployed.

Country analysis



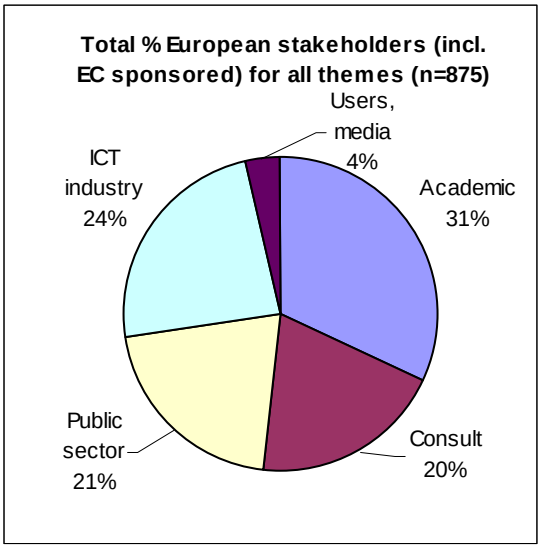
This is a research theme in which Europe is currently very weak, but is likely to be given much greater focus in future. Although the sample size is low, it may be interesting that the most important country by far appears to be Ireland, which is currently one of the leading European eGovernment countries, but has only emerged in the last few years in this position. Other important countries are the Netherlands, Finland, Cyprus, Italy and Sweden. These are mainly small, northern older Member States, with the exceptions of Cyprus and Italy.

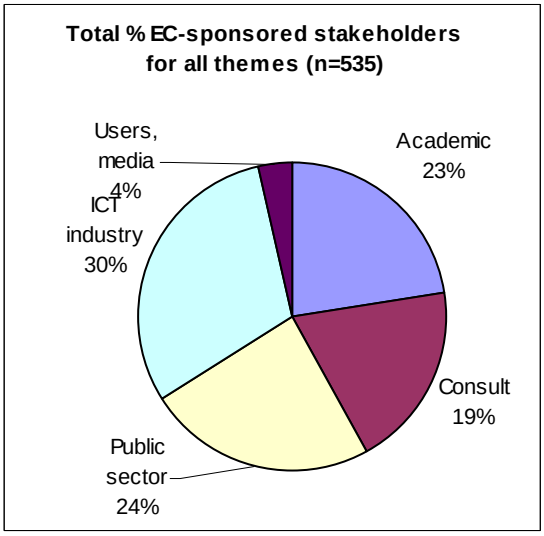
3.3 Stakeholders, types of research and deployment

3.3.1 Stakeholders

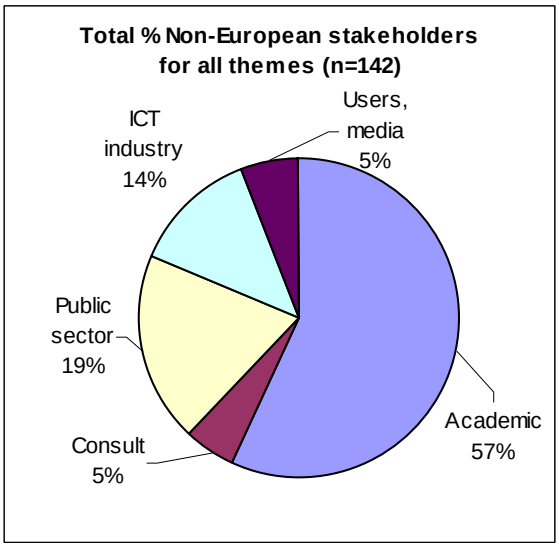
The disposition of stakeholders in the content analysis samples obtained within and outside Europe is presented in the pie charts below.[17] The European data on recent research seem to be relatively balanced, and compares quite well with the questionnaire sample. However, the non-European content analysis sample seems to be biased quite heavily towards academics, at least when compared with the non-European questionnaire sample and both the European samples.

Given that the present survey's main goal is to focus on European research, and then to put this in the context of wider global research but without doing a full global survey, it seems that some confidence can be had regarding the representativeness at least of the European data from the stakeholder perspective, but less so for the non-European data. That said, however, the non-European data does seem to throw up results which are otherwise consistent with the qualitative and intuitive inferences we are drawing about non-European research.





[17] In the pie charts in this sub-section 3.3.1, 'n' refers to the number of individual stakeholders involved in all the recent research activities surveyed both through the questionnaires and the content analysis (see table in Annex 2.5).



Of particular interest is the contrast between the EC-sponsored stakeholders and the whole European sample which includes these stakeholders. It is clear that the EC-sponsored research has fewer academics and consultants, and correspondingly greater participation of public sector and especially industry stakeholders. This distinction would of course be sharper if the EC-sponsored stakeholders were removed from the whole European data.

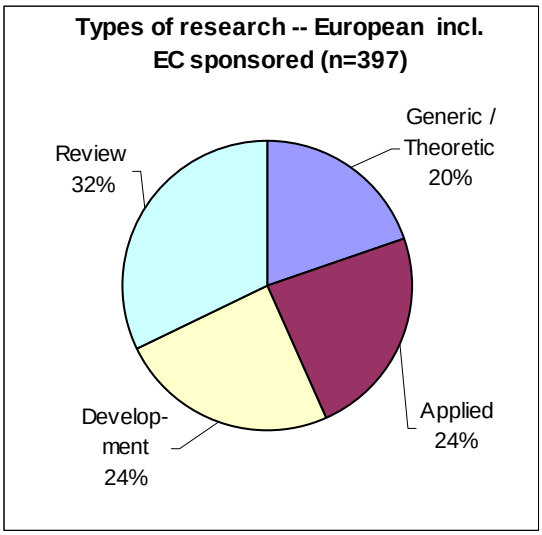
These data clearer imply a more practitioner and industry focus in EC-sponsored eGovernment research compared to other European eGovernment research.

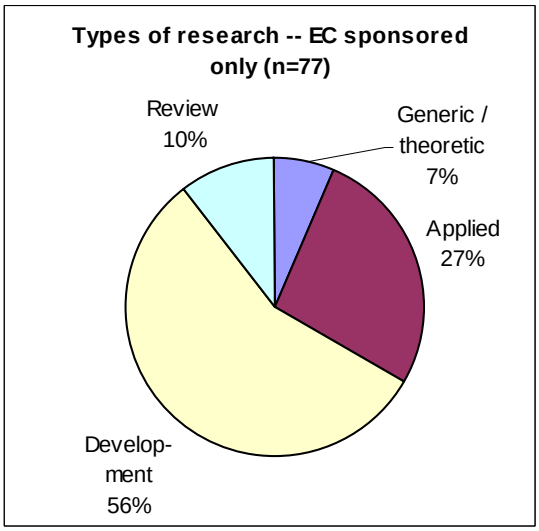
3.3.2 Types of research

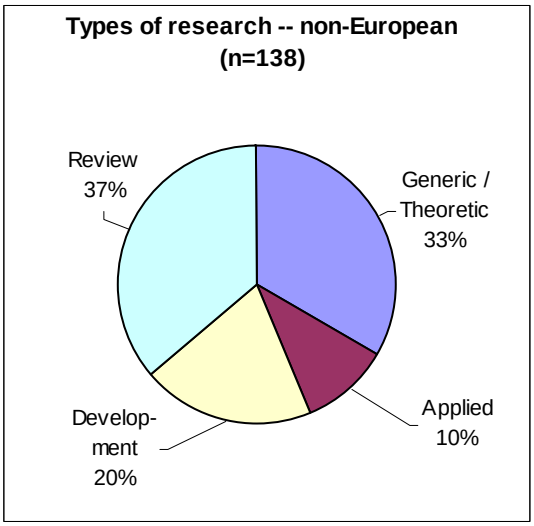
The pie charts below show the overall share of research types for total European, EC-sponsored and non-European recent research.[18]

The disposition of the whole of European research types seems to shows a good balance between the four main categories. However a sharp difference is seen with the EC-sponsored research, which shows an overwhelming focus on applied and especially development research. Some of the consequences of this are discussed below, but it is clear, firstly, from these data that EC-sponsored research is much closer to deployment than European research generally. Secondly, however, the EC-sponsored research together with the other European research presents a very balanced overall portfolio of eGovernment research. This means that the EC-sponsored research plays a very specific role in European research generally, and complements this wider research extremely well.

[18] In the pie charts in this sub-section 3.3.2, 'n' refers to the number of recent research activities surveyed both through the questionnaires and the content analysis (see table in Annex 2.5).







In contrast, the non-European research appears in this sample to have a significantly higher proportion of generic/theoretical and review research, and a lower proportion of applied and developmental research. This may reflect the fact that this non European sample probably has an over representation of academics, as described above. Some stakeholder feedback, however, has suggested that this dominance of non-European, and especially North American, research by academics may in fact reflect the actual situation.[19]

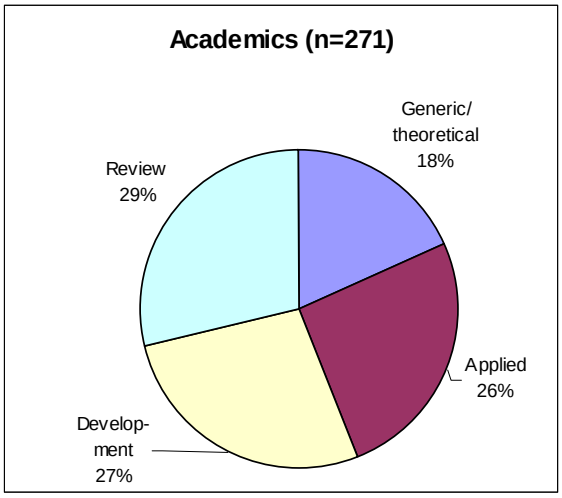
Annexes 12 to 28 show similar data and analysis for each research theme individually.

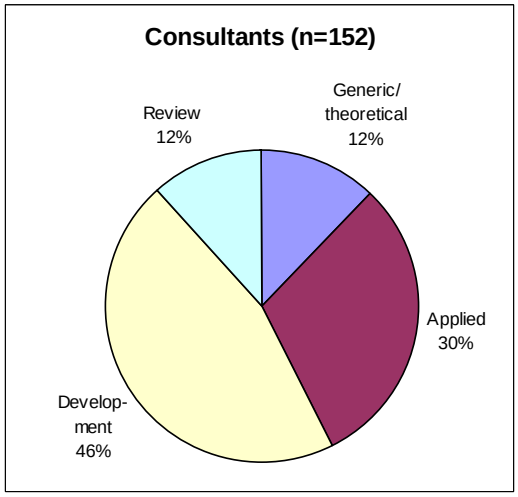
3.3.3 Types of research by stakeholder

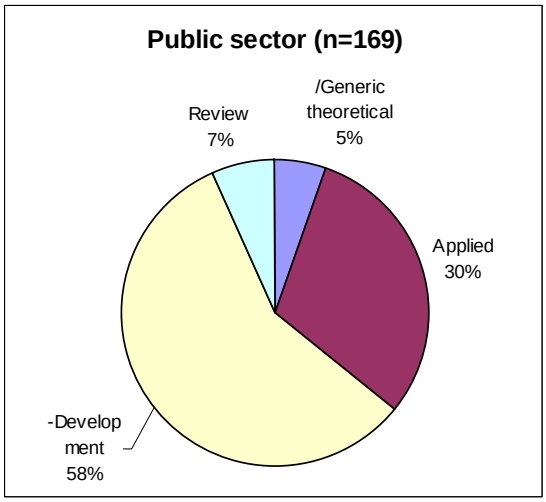
As predicted above, the five pie charts below show that academic stakeholders do indeed dominate generic/theoretical research, although they also have a good balance across all types of research.[20]

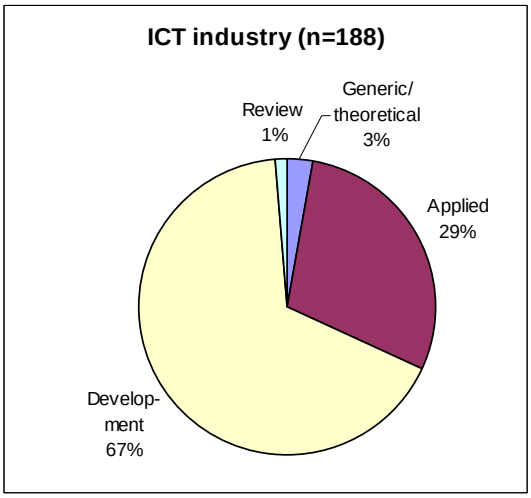
[19] Comments and discussion at the study's Validation Workshop, held in Brussels on 29 November 2005.

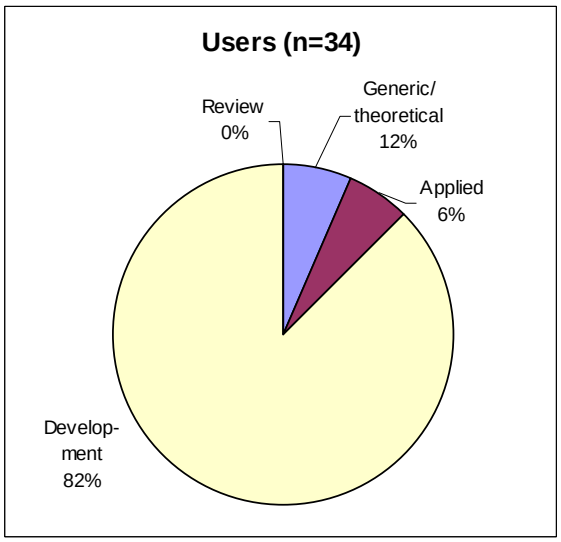
[20] In the pie charts in this sub-section 3.3.3, 'n' refers to the total number of individual stakeholders involved in all the recent research activities surveyed in the content analysis (see table in Section 2.4.1).











Consultants are also engaged in generic/ theoretical and review types of research, but are starting to focus much more on applied and development research. When it comes to, first, the public sector and, second, ICT industry, the dominance of applied and development research continues to increase highly significantly.

As far as users are concerned, although the sample size here is quite small, the focus is overwhelmingly on development research. All these observations are completely in line with expectations, which lends some support to the assertion both that the samples are relatively representative and that the research taxonomy is sound and operational, at least in the context of the present study.

3.3.4 Deployment of eGovernment research

An examination of types of research and types of stakeholders involved in eGovernment research also makes it possible to explore some aspects of the progression of research towards implementation and deployment. In fact, one of the reasons for developing the research type taxonomy in the way it has been was to enable this. It is clear that application and especially development research are closer to the real life deployment of research results than are generic/theoretical or review type research. Similarly, the closer research results get to deployment the more likely it is that public sector, ICT industry and uses themselves will be involved.

Annex 10 describes in detail how a tentative measure of the deployment of research activities can be conceptualised and measured.

The main conclusions for European research are that the first two inward facing (back office) eGovernment operational objective themes (1 and 2) appear to be well advanced down the path to deployment. The third of these inward facing themes, Change in the Public Sector, however, has progressed down this path much less. The first two are heavily dominated by technology research, whereas Change in the Public Sector is more concerned with organisational and human resources, which is more difficult to implement in practice. However, there is already ample supply of 'change management' consultants in the private sector so it is probably only a matter of adapting this knowledge to the specific public sector needs before we see more applications in this area. Unfortunately (at a promotional level) the results of these objectives are not clearly apparent to the general citizen (and therefore, probably, his/her elected representative). This low profile may limit resources for further research, but changing attitudes in the public sector is crucial to successful development.

The Change in the Public Sector research theme demonstrates an interesting case. It is a very important European strength in terms of coverage and perception amongst eGovernment researchers, it has a fairly high level of research activity at about 6% of total research, but the vast majority of this takes place at national and regional level and by academics, rather than at EU level as supported by the European Commission or by industry or the public sector, and it has not progressed far towards deployment. This means that in Europe significant research is being undertaken into most or all of the main issues, but this research has not progressed very far towards deployment or exploitation. The strong impression made during the study is that the lack of progress towards deployment in this research theme, despite excellent coverage and effort, is mainly due to political and bureaucratic resistance and the long time scales needed to effect real change..

The three service design/delivery (interface between back/front office) themes (4 – 6) have a few applications in place, but generally they are still themes some way from deployment. This may be due to the practical difficulties of designing and delivering eGovernment services in collaboration with the private and civil sectors or with other public agencies at different levels, and in getting the high levels of coordination needed for multi-channel rollout to be successful.

The three outward facing (front office) themes are evidently making some progress towards deployment. Unfortunately the Understanding User Needs theme is relatively weak in some important coverage issues (particularly in the area of usefulness and usability, and the needs of public servants as employees). It is not just a matter of identifying these needs, but of implementing the changes required. If eGovernment were a commercial activity following the concept of 'the customer is king', this research theme would be a top priority. Indeed, the European stakeholders interviewed have positioned user needs as their top priority for future research.

The three cross-cutting objectives (themes 10 – 12) appear reasonably advanced towards deployment, this is probably because the tools required are similar to those required by the private sector. The lower score for quality performance management and monitoring is probably due to the limited supply of deployed services for monitoring purposes.

The four eGovernment specific objectives (themes 13 – 16) have very few practical examples (applications). The evaluation and benchmarking tools are probably available as adaptations of commercial tools– but there is still very little eGovernment for them to be applied to.

Finally, the general policy of Public Value Creation (theme 17) appears to be making slow progress, but the limited number of cases suggests that either this is still an area of incipient research (perhaps because public value is only seen by some in purely financial terms, and is therefore a simple accounting process) or because there is not enough experience yet with eGovernment for researchers to work on.

From this analysis, the potential bottlenecks to the actual deployment of eGovernment research results, as a first step in supporting policy goals, appear to be:

- Change in the Public Sector – ensuring that public servants are skilled in, and enthusiastic about, eGovernment by meeting their needs and aspirations.
- A continuing lack of publicly available, working, and well designed eGovernment services (in both numbers and variety).
- Identifying (and promoting) public value creation.
- Obtaining political leadership for innovative governance.
- Overall, and most importantly, the direct link of research results in Europe as a whole with deployment is generally quite low. This perhaps does not matter too much from an academic perspective, but in the context of this study with its focus on the contribution eGovernment research should be having to EU policies, this is potentially a serious shortcoming.
- In order to promote the deployment of research results, the clear conclusion is that the public sector, ICT industry and even users need to be involved more, not instead of, but together with, academics and consultants. Indeed, on the evidence we have from this survey, research activities which have a good balance across all these stakeholders, particularly where the public sector and ICT industry works closely with consultants, are most likely to be contributing strongly to deployment. Note, however, this conclusion is in relation to direct deployment potential only. This study also shows that generic/theoretical and review research are often essential

early pre-cursers to research which is closer to deployment. Again, a balance is needed, depending on policy preferences and short and longer term goals.

Despite the above conclusions, however, it is also clear that an examination of only the EC-sponsored research shows that it is much closer to deployment than European research generally, and has thus a potentially greater impact on EU policies.

Overall, it can be concluded from the analysis presented above that EC-sponsored research activities are generally closer to deployment and thus more likely to have a direct impact on EU policy. Moreover, EC-sponsored research involves a higher number of stakeholders (i.e. is more multi-stakeholder), including a larger proportion of public sector and ICT industry stakeholders, and covers a larger number of research themes (i.e. is more multi-disciplinary) than the other research examined in this study. All this, whilst at the same time, focusing on very similar eGovernment themes compared to all European eGovernment research.

In fact, EC-sponsored research seems to play a very specific role in European research generally, and successfully complements this wider European research, providing, overall, a well balanced eGovernment research portfolio from the perspective of stakeholder mix and research type. Indeed from the evidence above, the EC is clearly showing the way for other European researchers in linking eGovernment research to deployment and thus to major policy goals, as well as providing a framework within which such deployment and policy linking can better take place.

3.4 Research map overview

Quantitative and qualitative analysis of the feedback from the field work and desk research enables quite a detailed mapping of the main geo-economic regions of the world in terms of eGovernment research. A description of each of these regions is given below, including nuances mentioned by different stakeholders where these are relevant, and is followed by a summary chart which provides a comparative assessment of eGovernment research activity in different parts of the world in relation to each of the research themes identified. It must be remembered, however, that these descriptions can hide quite significant variations within the regions concerned, for example between northern Europe on the one hand, and southern and eastern Europe on the other, as well as between different states and provinces in North America, and between the more developed and less developed countries of Asia. The purpose of this exercise is not to provide accurate detailed mapping but to enable a better understanding of where strengths and weaknesses in eGovernment research are likely to lie in order to enable better cooperation on a global basis in future.

The following descriptions are mainly a qualitative exercise which summarises interviews, discussions and observations undertaken at workshops and conferences. See Annex 9.3 for a methodological justification.

3.4.1 Europe's relative position

Both the data and the stakeholder opinions strongly favour the view that Europe is particularly strong in a number of eGovernment research issues compared with other parts of the world:

- social, economic and regional research, for example based on the EU social model.
- social inclusion.
- information society and access for all.
- welfare.
- accessibility for disadvantaged groups and combating the digital divide.
- democracy and particularly participation.
- change in the public sector.

The EU is attempting to use ICT to help deal with some of the large scale institutional issues of creating a measure of coordination between 25 disparate states, with many languages, cultures, etc., which most other world regions are not much concerned with. Thus, it is perhaps inevitable that Europe has more socio-economic and policy related research, as eGovernment and ICT must be put into a much more variegated context. In these terms, Europe appears more innovative and creative, based on greater diversity than, for example, the US, and reflecting more closely the situation in the rest of the world. This also means, of course, that Europe is leading in some aspects of interoperability and ontology research, particularly in relation to supra-national eGovernment services and macro eGovernment strategies

Other issues where Europe may have less relative strength but is still doing quite well include:

- benchmarking and related activities (like data collection).
- ontology development.
- individual services for both citizens and business are often quite well researched and developed in Europe, e.g. customs declarations, public eServices for business, registration of a new company, social contributions for employees, tax, VAT declarations and notification, disabled related services, job search services and social security contributions, and services related to elections.
- quite a lot of effort in Europe has gone into individual citizen and user aspects, e.g. identity management, privacy, personal services, i.e. single public services online, but without sufficient coordination -- despite the widespread move to portals, services are still often presented in a less well integrated manner than elsewhere.
- authentication infrastructures.
- trust and security.

In contrast to Europe focusing more on the social and inclusion issues, it is somewhat lagging compared to elsewhere when it comes to business issues. Industry feedback has, in particular, stressed this weakness which encompasses less developed research into the following issues:

- innovative business and SMEs.
- economic growth policies.

- employment and jobs.
- public-private-partnerships (PPPs) and particularly the funding and technology transfer that can come from the private sector, and the rapid transformation of successful eGovernment applications into commercial or semi-commercial products.
- business models.
- ERP (Enterprise Resource Planning) and BPR (Business Process Re-engineering).
- ICT and the technology component in general (except for ICT consultancy), including most middleware, shared services, etc.
- linking between different domains of the public sector, including technology transfer, common systems, and interoperability, databases, etc. – many other global regions tend to see eGovernment much more as embracing the whole of the public sector, i.e. not just administration but also education, transport, health, policy and judicial services, etc., whereas in Europe there is a tendency to compartmentalise these sectors much more which has some advantages in terms of directly addressing on-the-ground differences resulting from historically different traditions, but does result in potentially serious loss of synergy.
- services related to the policy development and the decision-making process within government and business.
- local scale public management, for example derived from business management.
- medium and large scale public, as well as private partnership, information systems.
- quality management and monitoring tools and methods when derived from business.
- mGovernment (mobile eGovernment) and new broadband technologies.
- G2B services and interoperability.

Industry feedback particularly stresses the feeling that Europe is not doing enough to push partnerships between the public and private sectors and the universities, with the right level of investments. Europe needs to have better criteria to assess the quality and the risk of each R&D project. Several representatives from the public sector also pointed to the low level of acceptance in Europe of technology as a tool to deliver a result, and were of the opinion that Europe was also lagging in usability research and in understanding individual user needs. Apart from concurring with most of the above, several non-Europe respondents thought that Europe was seriously behind in terms of interoperability, benchmarking and evaluation, as well as in local content and knowledge management.

While Europe is a leader in many aspects of OSS research and development area, most of the derived benefits, marketing and certification activities seem to be dominated by US companies to date. Given the size of government ICT contracts across the EU, there is an understandable movement to see OSS as a facilitator to a more rapid roll out of eGovernment services and astute stewardship of limited government resources. Research has an important role in supporting this movement.

European eGovernment research on integration and interoperability is not advanced enough and could learn a lot, particularly from the USA. One academic respondent said: “In Europe we tend to talk only about web services as the key to technical interoperability, whilst in the USA they have an approach based on intelligent

documentation and this is not compatible with what happens in Europe. Europe needs to take part in intelligent document research, otherwise it will be left behind and find itself incompatible with what is taking place elsewhere."

Another European academic stressed what much of the other evidence also shows: "Europe should focus much more on European Information Systems, i.e. more collective, interoperable and large scale. There is a difference between such large scale Information Systems and the individual public services which Europe has focused upon up to now". This could be said to be one consequence of Europe's relative fragmented nature, both between Member States but also often at sub-national and regional level, with many political, legal, cultural and organisational barriers. "The USA does the large scale collective information systems much better. Such Info systems require a lot of investment. Thus knowledge management and changes in the organisation of PAs are essential. This is also difficult because information is often under the control of one group. DRM (Digital Rights Management) is just one part of the problem. It is a micro issue, but the issue of Info Systems is much wider without any DRM implications for public information. If we want real, effective eGovernment we need to get the participation of all actors, and DRM is of course part of this but a long way from being the whole story. In the USA they do this very well, for example, in relation to the forests, energy, statistics, etc.) but there is a huge effort required (including research, and even more so in Europe) to connect up different organisations and sectors and change the way they operate and relate to other organisations. Just getting them involved can be a huge problem. The USA is, of course, favoured by being one state with (more or less) a single language and a strong culture of freedom of information. It has the most important and open info systems in the world and we must learn from this. Please quote me on this!"

3.4.2 North America

The US approach to what they term 'digital government' research focuses more explicitly on a coming together of researchers from the disciplines of computer science, social sciences, government and industry. Attempts to form a real partnership between these different disciplines are consciously made, if not always achieved. This approach is, in fact, generic and relevant for many other 'application areas' than only eGovernment. In eGovernment it results in a more overt attempt to include cross-sectoral approaches, e.g. transportation, health, environment, making the whole approach to research much more about the digital public sector, whilst in Europe there is a tendency to focus on eAdministration, even if this term is now not widely used, or at least to compartmentalise the public sector by default.

The USA tends to be a global leader in a number of critical research issues, such as:

- integration and interoperability,
- data gathering, handling, mining, quality, archiving and preservation,
- knowledge management and creation,
- rule- and decision-making in eGovernance and eParticipation, for example user participation in standard and regulation setting and in legal frameworks,
- large scale, cross sector information systems as well as community information systems,

- alert and crisis management, such as emergency monitoring and response,
- technology transfer for eGovernment,
- user interfaces and user needs analysis,
- services and practices in foreign policy, security and in international relations, some of which are linked to homeland security but can be applied to other areas including eGovernment,
- involvement of private sector industry in eGovernment research,
- enterprise architecture.

Issues where the USA tends to be weaker include:

- eDemocracy, although in some aspects such as rule setting the US is quite strong, and there are examples in different parts of the USA of highly successful public participation in decision-making.
- issues which address the digital divide.
- specific (governance) visions and policies, although public value probably has about the same focus as in the EU.
- linking public administrations between levels.

Traditionally the social sciences aspect of eGovernment research in the USA has not been policy driven but driven more by an exploratory mode, i.e. bottom up by academic enquiry. There also tends to be a greater cross disciplinary vigour and in attempts to 'triangulate' results across the different disciplines. However, there can also be blind spots as when results may be seen to be politically sensitive which can result in them being ignored.

In the USA, the research paradigm is much more business and industry oriented, so that a local or city mayor is seen just as much as a manager as a politician, and particularly a business manager. The USA also does a lot better on collective identity and collectively coordinated mass services, i.e. the development of public services not orientated to the individual citizen but to the collective. Thus, the development of interoperable systems and mass information systems. The USA also does better in the PPP aspects of this.

eGovernment research in the USA seems to be much more related to efficiency and not so much connected to large societal-wide policy issues as in the EU, i.e. the driver in the USA is ICT compared to the EU's driver of the Information Society. The USA is more advanced on the public management (small scale) side especially derived from business management, for example in public sector data re-use, sharing and ownership, where there are better solutions and clearer market relations, so it is clearer which actors are selling, which adding value, etc. This is a very important area, e.g. in GIS.

In the US generally, there is a view of ICT as something more strategic and longer term in economic terms and not just a tool to save costs here and now. In Europe ICT tends to be used as a commodity only, whereas in the US they tend to see ICT as an investment, for example for reducing labour, re-sizing companies and institutions, changing the role of government, maybe also 'downsizing' government, etc. Thus there

is a more business oriented approach to public services and some research is related to the influence of eGovernment and ICT on productivity and growth.

A recent survey into the main contrasts between US and European eGovernment (research) for businesses revealed important differences in emphasis which largely reflect the above accounts.[21] The US clearly has the benefits of only one federal state (cf. to federal frameworks in several European countries in addition to the development of a 'super-structure' at EU level), but also takes a more operational and demand driven approach to eGovernment. Its primary purpose seems to be to increase business competitiveness by providing services and intelligence to business users. There is thus good on-going coordination between the public sector, technology and business, and there tends to be linear process to integration between the three factors.

In contrast, Europe has a multiple states set-up where it is difficult to harmonise and integrate the public administrations. Thus, attempts are made to provide general frameworks and platforms in the context of a supply, rather than demand, driven approach. An important goal is to reform the public administration and increase its efficiency and transparency, as well as to provide e(basic)-services for all. Rather than on-going coordination between the public sector, technology and business as in the US, in Europe there tends to be a sequence starting with the technology which is taken up by the public administration and then used to deliver eServices to business in a spiral process of integration.

In many ways Canada is similar to the USA in terms of eGovernment research, but it also shares some of the more 'European' characteristics, for example with the Nordic countries, in areas such as community and user needs analysis and the many 'citizen first' research and deployment initiatives. Canada is explicitly focusing on citizen-focused government and multi-channel, recognising that users want more choice. Usage in eGovernment services has increased markedly in the last few years but depends on the type of service and is related strongly to trust, i.e. the Internet is good for structured information (i.e. relatively codified knowledge), whilst the telephone and face-to-face are used more for more unstructured and personal information (i.e. relatively tacit knowledge).

In the recent Canadian eGovernment research survey, 3 barriers were identified: privacy, lack of awareness and complexity, leading to the conclusion that simpler and more user friendly multi-channel services are required, such as functional sites (e.g. for the elderly) which give a whole-of-government view. Some research focus in Canada is therefore on the transformation of government departments internally and between departments, so that questions are asked as to whether the right structure of government has been achieved. There is, of course, also a federal government in Canada, but here the different levels seems to be a bigger issue than in the USA in terms of eGovernment, with a research focus on better integration between the levels, which in turn requires a high degree of collaboration, also for staff skills, and how front-line agencies actually work. There is not much experience in Canada with citizen consultation online, just a few pilots, but these are increasingly being researched and explored.

[21] Fariselli et al, 2005.

3.4.3 Asia

Parts of Asia are extremely advanced in eGovernment research and are global leaders. South Korea particularly stands out in terms of eParticipation and eDemocracy, on the one hand, but also areas like knowledge management, database development and business processes for eGovernment, on the other. South Korea is also focusing on R&D for practical applications, for example in multi-channel services, such as call centres, video, multi-lingual and mobile in-car systems.

Other parts of, particularly of South-East, Asia, such as Malaysia, are very strong in innovative eHealth and biotechnology research and applications, and Singapore of course is strong all round in providing citizen and business services, although sometimes this is heavily top-down oriented. Sometimes the research base for these advanced applications is not as well developed as, say, in North America, but in terms of applied research and development Asia is the most rapidly developing part of the world. Singapore tends to be seen, at least by Asians, as very strong in eGovernment in general, and particularly in trust and security, multi-channel, cross sectoral public services and eGovernment service delivery (front-office).[22] However, rivalry and political differences may not always allow the widespread sharing of such experiences.

Parts of Asia are also strong in researching employment and jobs creation through eGovernment, innovative business and SMEs. Asia is the most creative region, especially in loosening up on legislation, for example in Bangladesh, where the micro-credit system was first introduced. It would be impossible to get such creativity and innovation in Europe because of regulation and risk aversion.

India and China are also rising fast in research terms, particularly in relation to back-office and business process automation though not so much in integration and interoperability which remains a huge barrier. India is now strong in research for eGovernment policy and strategy development, as well as in electronic cards for use with local and city eGovernment services and digital divide and rural development issues.

In Asia, and particularly South Korea and Japan, researchers and deployers seem much better at sharing experiences at the individual level. In Scandinavia there also tends to be such a participatory approach in which many agencies do share their research and experiences also at individual worker level. This gives, overall, better group coherence. But this is not the case in much of the rest of Europe. Also in Asia (but not Japan), there is a stronger focus on research for cutting costs and reducing staff, especially if the latter don't perform.

In Japan, the research issues are quite technology driven and weak on the social science side. On the technology side, high speed computing is a main strength, but research is needed though not yet developed in relation to interoperability as each agency is typically highly independent on its own way of thinking and acting. As in Europe and the USA, there is a drive to be more effective and cheaper, but also to explore new

[22] Some conclusions from the "International Conference on Best Practices of eGovernment and eCity: visions, innovations and opportunities" in Malaysia in June 2005 (see Annex 4.3).

forms of government-citizen relations. The government of Japan has recently established a centre of government excellence and is developing plans and strategies (not just for eGovernment), as well as a public policy school and programme.

3.4.4 Australasia

In many ways Australia is akin to Canada, and provides a good example of a mix between US and European approaches. The recent main research challenges include:

- improve and enhance services and provide new services.
- improve business efficiency, cooperation with business, business services and research related to the influence of eGovernment and ICT on productivity and growth.
- meet user expectations.

Australia is also very good with citizen's portals, especially for those with disabilities, including highly innovative and successful portals based on life events which are strong on social inclusion.

As in Canada and the USA, Australia has a federal system, with federal, state and local levels, and eGovernment must work with these inter-jurisdictional issues. The initial research and deployment focus in 2000 was just getting services online, but today's focus has moved to managing the challenges of organisational change, especially forms and structures, moving towards a holistic, joined-up system. Ultimately, service innovation is the focus, and re-shaping the public sector in order to do this, with ROI and a solidly business approach.

In Australia, one focus of research is on individual services, but now it is also on use and satisfaction across most eGovernment services. Overall satisfaction is high, but there are some key messages resulting from this research:

- user attitudes change
- users now want enhanced services
- tracking is important, e.g. electronic receipt

Research in both Australia and New Zealand show that there is significant latent user demand but this is held back by lack of awareness. One research conclusion is that there is a need to follow more systematically private sector trends in accessibility and use, and that some citizens may be prepared to sacrifice some privacy in return for greater convenience and tailoring of services, but there is a need to pace this carefully. Other research issues include the problems in finding services online, and getting them to achieve their goals. The most popular services are licences, income taxes and benefits.

Multi-channel is an important and strong research focus, especially through the recognition that ICT supports all channels, and that users like a mix for different situations. Research has supported this approach and the deployment of an 'ICT backbone'. For example, developing a job search service which can build resumés, deliver messages, map the seasonable work around the country, all using multiple

channels but integrated via the ICT backbone. Users can also logon themselves and reconfigure their data using a globally unique identifier, via which other authorised stakeholders also have access to the data, providing an overall integrated response.

The key research challenge seems now to be juggling the demands of users across different channels as multi-channel research and deployment progress. The move towards multi-channels is significant in relation to working with the private sector, as well as with other government departments and different levels, and with community actors, i.e. new forms of collaboration, information resources, business processes, etc., all of which have skill and other research implications. Thus, research into standardised building blocks and common standards for interoperability are important and are seen as a long-term goal for both research and investment, especially as it is realised that it is not possible to simply drop existing traditional channels.

Thus, although some technology research is important (such as in PKI), research into people and organisational change is being prioritised. In the Australia eGovernment workplan 2005, the customer is being placed at the centre, so the way of organising government must change completely, with the research challenge to effect this holistic change.

In both Australia and New Zealand, budgets tend to be smaller, so governments are far more sceptical and thus focus limited research on value for money and being very innovative.

3.4.5 Latin America

As in Asia, eGovernment research in Latin America is highly variable with some outstanding exemplars amidst more basic deployment initiatives. For example, Brazil has been one of the first countries in the world to successfully research and deploy electronic voting, not via the Internet but in the polling booths themselves, which is, of course, much more relevant in this part of the world with low, though rapidly rising, Internet penetration and use. Brazil is also quite advanced in interoperability research and is also starting to implement the results of this research.

There are also good examples of research and deployment of multi-channel, including PIAPs and other service centres. Both Mexico and Argentina provide examples here.

3.4.6 Elsewhere

Much of the rest of the world shares some of the development priorities of parts of Asia and much of Latin America, so that research is very closely tied to actual and specific socio-economic and political requirements, and to the urgency of starting to provide basic eGovernment services, typically at the information level only in the first instance. For example, in South Africa, recent eGovernment is focused on exploring the concept of (basic) eGovernment for development purposes. Research in the former Soviet states, plus places such as Lebanon, Jordan and other Arab countries, have problems which are quite similar, also to Europe's New Member States prior to accession. Research in such countries tends to focus less on back-office and reorganisation issues and much more on how to deploy basic eGovernment services.

3.5 Overview of strengths and weaknesses by global region

The summary table below provides a comparative assessment of recent eGovernment research activity in terms of 'strengths and weaknesses' in different parts of the world in relation to each of the research themes.

There is a strong degree of conformity between conclusions concerning strengths and weaknesses derived from the three methods employed to analyse them: questionnaire responses, coverage of research scope, content and challenges, and the results of the intervention research summarised above. These conclusions are collated in the following table.

Entries in the table are in relation to strengths and weaknesses defined as recent research coverage of the scope, content and research challenges of each research theme. It does not necessarily reflect recent research effort expended in a given region, nor the progress of research towards deployment. Neither does the table attempt to assess the quality of research nor its impact on eGovernment in practice.

Strengths and weaknesses are examined in more detail in section 6 below.

Overview of eGovernment research theme strengths and weaknesses by global region

Entries in the table are in relation to strengths and weaknesses defined as recent research coverage of the scope, content and research challenges of each research theme, as given in Annexes 12 to 28, and explained in Annex 9. Coding is as follows: **blank**=very weak, ✓=weak, ✓✓ = strong, ✓✓✓ = very strong.

Research Theme	Europe	North America	. Asia	Australasia	Latin America	Elsewhere
1) Data, information, content and knowledge	✓✓	✓✓	✓✓	✓		
2) Integration and interoperability	✓	✓✓✓		✓✓	✓	
3) Change in the public sector	✓✓✓		✓	✓✓		
4) Value chain partnerships & service delivery models	✓	✓✓✓	✓	✓✓		
5) Networked, multi-level eGovernment and service delivery	✓					
6) Multi-channel service design & delivery	✓	✓✓	✓✓✓	✓✓✓	✓✓	✓
7) Understanding user needs	✓	✓✓		✓✓		
8) eGovernment for socio-economic inclusion	✓✓		✓		✓	✓
9) eDemocracy and eParticipation	✓✓✓	✓	✓✓		✓	
10) Open source tools and applications	✓✓	✓✓				
11) Ensuring trust and security	✓✓	✓	✓	✓✓		
12) Quality and performance management & monitoring	✓✓	✓✓		✓✓		
13) Cross-sectoral ePublic services		✓✓	✓✓✓			
14) Innovative governance	✓					
15) eGovernment at EU level	✓✓✓					
16) Evaluating & bench-marking eGovernment	✓✓	✓	✓	✓✓		
17) Public value creation	✓	✓				

4 Linking eGovernment research to EU policy

Section 4 outlines the conceptual approach adopted in Phase 2 to link eGovernment and eGovernment research to the major EU policy goals.

4.1 Conceptual approach

4.1.1 EU research

EU research (including eGovernment research) consists of all phases of RTD (Research and Technology Development) from inception to evaluation. It includes theoretical, applied, development/deployment and review type research. In this sense, EU research is generally considered to consist of research 'projects' which encompass some, many, or all of these types. EU research takes place in an environment which attempts to contribute to the achievement of various goals as determined by policy objectives and visions.

4.1.2 Understanding the link

There is a clear potential, as well as a desire, for eGovernment to facilitate and contribute towards EU high-level visions. Recent understanding of the policy making process has conceptualised it as one which is highly dependent upon continuous monitoring and evaluation. At the European level this is carried out by the European Commission.

As a result of political desire to use the reform of public administrations as a means to build better governance, eGovernment has risen to a high level on political agendas in recent years.[23] Coupled with some of the research that has shown the transformative potential of the application of ICT to public administration, the model presented here aims to demonstrate one way in which the link between eGovernment research and political visions can be understood.

As has been outlined through this study, eGovernment is not just about the implementation of IT and ICT into public administrations, but is far more embracing of the role of government and the public sector in society.

4.1.3 Three levels of objectives and analysis

In attempting to link EU research objectives to EU policy, three levels of objectives have been identified as useful in our analysis. These objectives should be thought of as a hierarchy which clarifies the link (the 'intervention logic') between them. Thus, the production or implementation of an eGovernment good or service helps to achieve a specific eGovernment objective, which in turn contributes to a general or overall policy goal or vision.

These three levels of objectives take place in a continuous cycle of feedback and information, reflecting the embedded nature of monitoring the policymaking process.

[23] Shahin J. (2004)

They are described as a hierarchy, with EU visions placed at the top (see diagram below).[24]

eGovernment operations or **eGovernment operational objectives**. These are the detailed changes or operations constituting eGovernment, such as the production of hardware and software, applications and services, systems and working procedures, the implementation of organisational changes and trained personnel, or indeed any eGovernment internal process change or externally-offered ICT-based service. These operations are the building blocks of eGovernment and take place through the conversion and management of inputs like finance, human resources and technology. They can be undertaken at any scale, whether local, national, regional, international, and, of course, European. Only the operations that support EU visions will be dealt with in this study. In order to implement these operations, research is necessary. The motivation and justification for this (EU) research is derived from the specific and general objectives at the next two levels.

eGovernment policy or **eGovernment specific objectives**. These objectives are specific to (e)Government and act as the bridge or the intermediate stage between the overall political vision setting at the top level and the eGovernment operational building blocks at the bottom. They are basically concerned with the performance of (e)government which results from the operational level, and include such things as savings in time and money, less bureaucracy, more convenience, more efficient and lighter administrative procedures, easier and wider access to services by citizens, more transparency and accountability, etc. A recent European Commission working paper expressed a similar set of specific objectives for eGovernment, including good governance, increased efficiency, increased user satisfaction with services, public services actually used by all, and a reduction in the democratic deficit.[25]

The achievement of these eGovernment specific objectives is an important but not the only way to realise policy visions; achievements in business or civil society, for example, are also often necessary. eGovernment specific objectives are concerned with how and in what way the eGovernment operations are used. For example, does the development of applications and services, the reorganisation of the back-office or the training of staff, actually lead to savings in time and money, less bureaucracy, etc.? These specific objectives may be stakeholder dependent, so that cost savings for the PA could result, depending on how they are used, in poorer rather than better services for citizens. Thus, the eGovernment specific objectives reflect specific eGovernment policies.

EU policy and visions, or **general EU objectives**. These objectives result from policies articulated at the highest level of the EU institutions. They are not specific to (e)government, but are (EU) general policy goals driven by one or more visions, and often articulated as 'public value' impacts to which (e)government specific objectives can contribute. Public value is a slippery concept but can be defined as both contributing to, and providing an enabling framework for, economic growth, jobs,

[24] This is the same approach as used by the European Commission in its policy impact assessment process: European Commission 2005ai.

[25] European Commission 2004h.

competitiveness, and sustainable development, but also encompassing public governance and its many intangible public goods, such as inclusion, democracy, quality of life, citizenship, trust, continuity, stability, and universal human rights. The recent European Commission working paper already referred to expressed a similar set of general EU objectives in the context of eGovernment, including increased productivity in the economy at large, bridging the European innovation gap, accelerating social and economic convergence in an enlarged Europe, perhaps also a contribution to an answer to the challenge of the ageing population.[26]

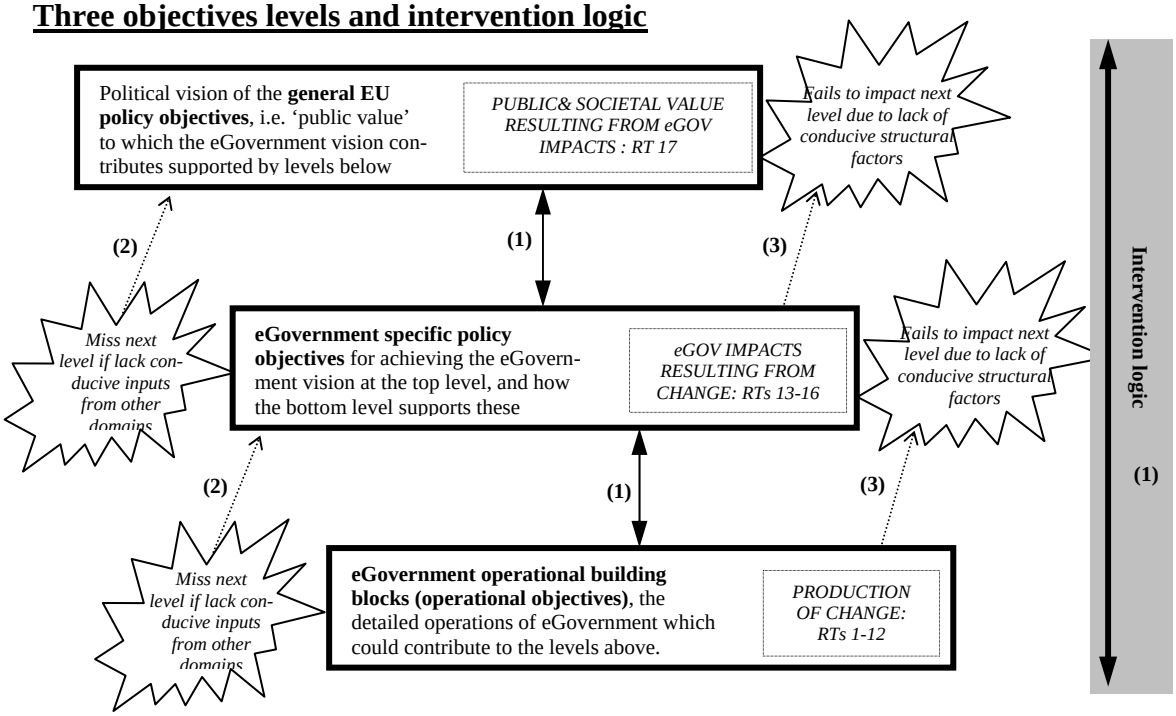
In this study, we focus on the policy or general objectives generated at the European level to increase public value, as formulated by the European Commission in *Communications* and other policy documents, and endorsed by the Council and Parliament. Such policy objectives often stem from the EU visions, and specifically the eGovernment component of these visions. These are generally to be found in the conclusions of the European Council meetings and are articulated and supported by the work of the European Commission, which derives its political direction from these visions. EU visions are supposed to ensure policy coherence within the EU's policymaking framework. As EU visions are informed by political decisions, they are also influenced by existing situations on the ground, which means that a joint bottom-up and top-down dynamic process occurs.

The three objectives levels are shown in the diagram below. As explained above, the first (bottom) level is concerned with the production and implementation of change (both technical and non-technical). The next two levels are concerned with the progressive impacts of the changes at the bottom level. The up-and-down arrows in the diagram indicate that defining objectives can be approached by starting from either the more general or the operational operational end. In practice, the iterative nature of objective-setting means that, regardless of where the start is made, policy makers need to go up and down from level to level until the objectives are aligned, consistent and adequately linked through their intervention logic. Clearly, in a given situation, any number of levels could be articulated. Three seems to be most appropriate in the present context, and indeed is the number typically used and recommended by the European Commission[27]

One of the benefits of this three-level approach is that it separates out what is done (and the measurement of what is done) at the lower level, from the impacts of what is done (and the measurement of these impacts) at the next two levels. At the middle level, the impact of what is done on (e)government is analysed and measured, and at the top level the impact on public value of this (e)government impact is itself analysed and measured.

[26] European Commission 2004h.
[27] European Commission 2005ai.

Three objectives levels and intervention logic



The three objectives levels model used here are also in line with the latest method of impact assessment used by the European Commission.[28] Impact assessment, now a crucial element of European governance, is a required aspect of most policy areas defined and implemented at the European level. As such, the governance of the EU's eGovernment research policy is inherently connected to the process of impact assessment. Therefore, the alignment of the three objectives level approach used here with related activities of the European Commission serves the purposes of this study effectively.

This three level model also usefully complements other on-going research work being undertaken by the EC. The eGEP project is providing a framework for the measurement of especially economic impacts of eGovernment (eGEP, 2005). It is developing three so-called 'value drivers' (efficiency, effectiveness, and openness or governance), which are themselves being linked by a set of equations to public value. eGEP thus operates mainly at the specific eGovernment objectives level and is concerned mainly with micro-level measurement, i.e. of individual projects, cases, initiatives. The three-level model, on the other hand, is more relevant for macro- and programme level impacts, where a large number of individual projects working together could make an impact. The two approaches are thus highly complementary, with eGEP fitting in at the middle and upper level of the three level model. Also, the equations eGEP is developing to link its three value drivers to public value represents the intervention logic of eGEP's approach. Intervention logics can, of course, be any one of, or a mixture of, quantitative, mathematical, qualitative, description, etc. They can range from rather loose narratives at one extreme to precise and quantitative mathematic relationships at the other.

[28] European Commission 2005ai.

4.1.4 Externalities, risks, assumptions and control

The diagram also shows the importance of attempting to align the three levels, as there is a possibility that achievements at one level will not contribute to meeting the objectives of the next level. This is a problem typically overlooked in policy making and in the development of action plans, whether or not they include research inputs. This could be for any of three reasons, numbered (1), (2) and (3) on the diagram:

(1) The intervention logic is faulty, in which case it needs to be re-designed.

(2) A need for the input of other actions and policies (some of which could be conflicting) not in the eGovernment domain and thus beyond the immediate control of the stakeholders concerned with eGovernment. For example, in the domains of business or civil society, and especially where a collection of actions or policies from different domains is necessary to fulfil an overall policy goal. However well the eGovernment objectives at one level contribute to the next level through the intervention logic, the next level objectives may not be (fully) realised unless these non-eGovernment actions and policies are in place and successful.

(3) Structural factors, which are beyond the immediate control of the stakeholders concerned with eGovernment, but which are nevertheless important, and perhaps crucial, for ensuring that the achievements of a given level do not miss the target of the next level. Structural factors can be of two types:

- external such as political, institutional, cultural and economic conditions and the legal framework, including economic sector and state of the market, organisational size, etc., affecting the ability of an organisation or region to benefit from eGovernment.
- internal management and resource factors, such as organisational structure, strategy formulation, management factors, HR factors, etc.

Situation (1) is largely under the control of the eGovernment stakeholders, but situations (2) and (3) are not, and can thus be termed *externalities* which are recognised through the assimilation of a number of assumptions and risks. In assuming that the necessary conducive policies and factors are in place, it is important to ascertain which are important for reaching the next level, and, for those which are important, the risk of them not being conducive. For policies and factors which are both important and high risk, an analysis should be made of whether or not the stakeholders can exert any control to make them conducive. Where the possibility of such control is minimal, consideration needs to be given as to whether or not there is an adequate link between the levels, and thus whether or not the research (or other intervention) should take place.

Although the scope of the present study does not allow detailed consideration of externalities, it is clear that the higher up the levels we go from operational to specific to general objectives, the risk of other uncontrollable policies and factors not being conducive increases significantly.

4.2 eGovernment and eGovernment research

The above conceptual approach can be applied directly to the eGovernment research themes identified in Section 2.5, as shown in the following diagram. Each research theme can be conceptually located in one of the three objectives levels, each of which has its own purpose within the eGovernment intervention logic. In addition, the role of

ICT itself is seen as an input to the operational objectives level, where is becomes embedded in each of the research themes. Other inputs could include finance, and human and organisational resources.

In addition to the explanation given above about the purpose and role of each level, these can be summarised in relation to research themes in the following.

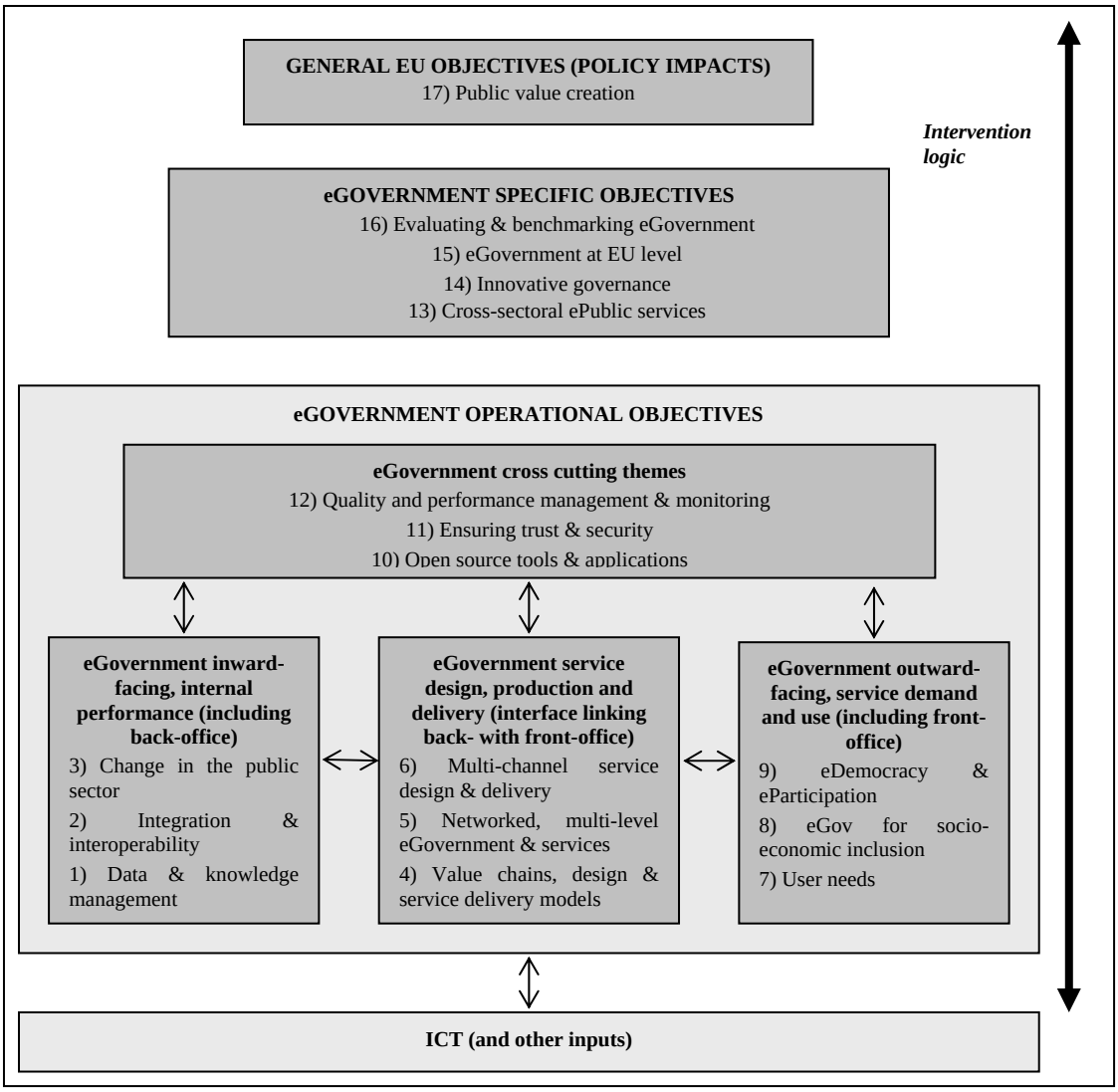
4.2.1 eGovernment operational objectives

At the eGovernment operational objectives level, research takes place into the building blocks of eGovernment production and implementation. The 12 research themes (RTs) included here are also consciously organised to show their intrinsic clustering and inter-relationships, viz.:

- RTs 1-3 are concerned with the inward-facing (including the 'back-office') and internal performance aspects of eGovernment, with a heavy emphasis on direct technology use and exploitation (both concerning how data is manipulated and converted to knowledge and how these are integrated between operational units), as well as on change management and organisational issues within the public sector itself. (The possibility of broadening the definitions of RTs 1 and 2, and why this was not done, was discussed in section 2.5.2).
- RTs 4-6 are concerned with the interface between the inward-faces and the outward-faces of (e)government, i.e. service design and delivery issues, which tend to focus on how technology is used to put together content and services, with a heavy emphasis on organisational and coordination issues.
- RTs 7-9 are concerned with outward-facing (including the 'front-office') and user aspects of eGovernment, with a heavy focus on how technology is exploited by users, whether citizens or business, in consuming eGovernment services and in participating in government itself. The justification for splitting RT 8 from RT 7 is that the latter is concerned with the overall population of users, putting users in the centre and making services as usable and as fulfilling as possible. RT 8, on the other hand, focuses on specific types of user target groups, whether disabled, the elderly, remote SMEs, etc. The recent European Commission report on eInclusion also makes this distinction.[29]

[29] European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206, p. 13: http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html

Proposed holistic conceptual research framework for eGovernment



- RTs 10-11 are cross-cutting themes, which are heavily focused on the exploitation of technology across the whole spectrum spanning the inward-facing, the interface, and the outward-facing aspects of (e)government, plus RT 12 which evaluates overall quality and performance at the eGovernment operational objectives level.

This clustering is not to deny that all RTs are interlinked, but to suggest that the above organisational framework provides significant heuristic benefits. It is based on three types of evidence:

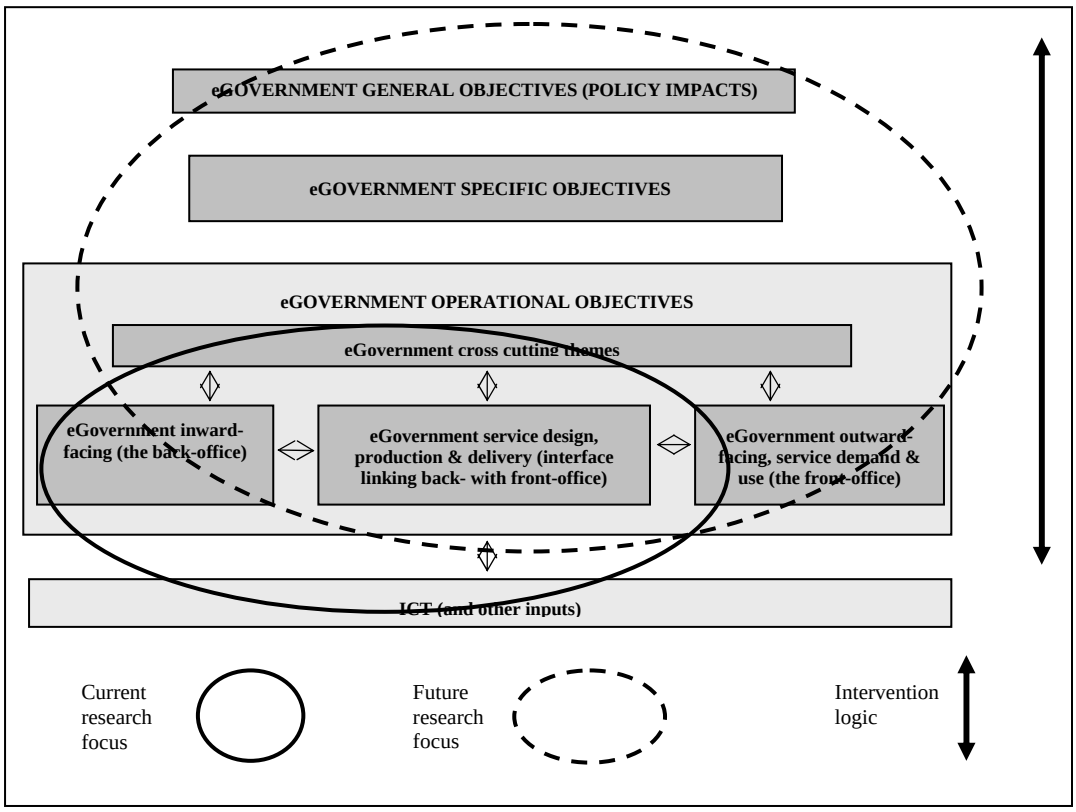
i) Directly from qualitative feedback from the study, for example one academic interlocutor suggested that "we need to think about the back-office, the front-office and the interface between them. Too much emphasis is just now only on back-office aspects…we've done that and a lot anyway can be derived from experiences in industry which has done it for years…which is not the case in other aspects…".

ii) Indirectly from the study's quantitative evidence which shows that much recent eGovernment research is clustered around the bottom-left (RTs 1-3) and bottom centre (RTs 4-6) of the operational objectives level. However, future recommended research, at least in a European context, shows a distinct trend towards the right (both RTs 4-6 and RTs 7-9), as well as upwards to RTs 10-12, and specifically includes more emphasis on RTs 13-17 in the other levels (see the diagram below). The fact that the future recommended research focus covers a very wide spectrum of research themes should not be surprising. The data used for this has been aggregated for all stakeholders each of which have their specific views and preferences, and which research themes are important depends very much on the policy being pursued. Separate recent and future research analyses have not been undertaken for each stakeholder group in this study (although a strong indication of this can be inferred from the bars in sections 3.3.1 and 3.3.2), although data are available to undertake such detailed stakeholder profiling if required. Separate stakeholder views on the importance of eGovernment research for different policy areas are, however, illustrated in section 5.2.1.

iii) Directly on other sources, just a small selection:

- European Commission (2005ah, p. 4) summarises eGovernment research as structured around core challenges: front- and back-office.
- OECD (2005a), apart from examining the overall business case for eGovernment, focuses on four main areas, progressing from inward- to outward-facing issues, viz.: common business processes, eGovernment coordination, multi-channel delivery and user-focused eGovernment.
- eGEP (2005) highlights the 'supply' (back-office) and 'demand' (front-office) aspects of eGovernment in the eGovernment measurement framework (p. 24).
- Millard (2003d, p. 48) analyses the balancing of the 'supply' (back-office) and 'demand' (front-office) aspects of eGovernment, and the need for re-balancing the focus on these.

Comparison of European current and future recommended research focus



4.2.2 eGovernment specific objectives

At the eGovernment specific objectives level, research takes place into the immediate impacts of the application of ICT to government in the level below, including the immediate impact on other public services (RT 13), on new forms of government and governance (RT 14), and at the EU level (RT 15), as well as overall benchmarking and evaluation of the specific objectives level (RT 16).

4.2.3 General EU objectives

At the general EU objectives level, research takes place into the high-level, longer term goals of EU-level policies which articulate the concept of 'public value' (RT 17) within the context of this study. Compare the above conceptual framework diagram with the second diagram in section 1.3 illustrating the eGovernment vision and the significance of public value.

4.2.4 Perceptions of 'public sector'

In examining Europe's relative global position in eGovernment research it is also useful to briefly consider its specific approach to the 'public sector' and the role of the EU in this. There are clear differences, although some of these are anecdotal, in the perception of the 'public sector' in Europe compared to the rest of the world. In some countries, where patriarchal political cultures reign, there is more likely to be a more pervasive public sector which would be heavily involved in a citizen's way of life, and where

different parts of the public sector can be more easily linked through top-down action. In European political cultures, where the public sector has been a part of society for centuries (and where the welfare state was, arguably, created), the public sector has become entrenched in society. As a result of the age of the European public sectors, where new 'services' have been added incrementally, the connection between different parts has not been so evident. Hence, in the United States, whose 'public sector' may be considered younger, the division between different parts of the public sector is not so hard to bridge. Cross-sectoral activity in Europe, therefore, is more difficult to achieve than in other parts of the world.

The rather unique position that DG Information Society and Media holds in the European Commission, with its ability to directly support European research as well as European Union regulation, has provided a series of opportunities for Europe-wide action that can be suggested and monitored, and even implemented at the European level, through recourse to European legislation where this is necessary. DG Information Society and Media has also been able to make great use of the recent Lisbon agenda, to improve competitiveness in the knowledge-based economy, by linking the economy to inclusion and innovation.

In terms of eGovernment, the European Commission over the last few years has been able to support, with Member States acknowledgement and encouragement, the development of Europe-wide ICT-based solutions to the current, and potential future issues facing public administrations in Europe. These have also been considered key aspects in developing a competitive economy in a much broader sense of the term.

4.2.5 The role of technology research in eGovernment

It will also be clear from the above that basic or pure ICT research has not been designated as a specific research theme. ICT is shown in the two diagrams above as a direct input to the operational eGovernment level, and thus becomes embedded into each research theme. Research in eGovernment can in fact be seen as the applications conjunction of the three main disciplinary areas of, i) public sector and government studies, ii) ICT, and iii) the social sciences. None of these disciplines is allocated its own research theme as they are all embedded in all the other research themes.

The vast majority of input received in the study strongly supports this view. Example comments include "there is no basic technology-only research in eGovernment, i.e. eGov only implements existing technology rather than develops from scratch its own technology. Thus, the technology challenges in eGov are in terms of implementation" and "there is no such thing as an IT government project, but rather business processes using IT." However, some respondents and discussants tend to disagree, and some of these have commented on the need for basic technology research, for example in the area of eVoting or maybe research on ontologies.

The recent eGovernment Research Cluster Workshop[30] also fully endorsed such an approach, viz.:

[30] eGovernment Research Cluster Workshop, "eGovernment 2020: Future Research", eGovernment Unit, DG INFSO, 1-2 March 2005, Brussels.

> "On the main, it does not appear that on-going projects will deliver breakthroughs in the strictest sense. However, this should not be seen a negative trait of the project portfolio. eGovernment is mostly about putting existing technology to work, and integrate technologies, data and applications. With the only exception of research on ontologies, which has some element of longer term impact, all the others deal with actual deployment and use of existing or almost available technologies. When discussing about future research in the short and medium term, many of the issues pertained horizontal research, which does not necessarily belong to e-government (although it can be usefully applied there). This includes areas such as the establishment of a secure, reliable and transparent infrastructure (a la grid); advanced adaptable and reliable user interfaces; quality of content and equality of access; and system vulnerability."

> "All these clearly play a key in eGovernment architectures and applications, and in some cases (such as accessibility) the public sector remains the primary application area. However it is not clear to what extent research advances in this field would benefit from taking place exclusively under the auspices of eGovernment research. There are, of course, other research areas where this link is more evident. Examples include specific research about how to facilitate government process transformation and the creation of new services, theoretical models of technology-enabled government, and how to implement deep process change. There was consensus that the issues eGovernment will face over the next several years will remain primarily non-technical, and the question is to what extent ICT research can help overcome any of those. It was felt that more research on socio-economic issues would be beneficial."

The majority view of European Commission's interview respondents was also that eGovernment is an application area which does not require its own basic technology research, as this can be obtained from elsewhere. However, there is some disagreement about this and it was also suggested that eGovernment research could combine with technology research in other domains to adapt and develop technologies appropriate for eGovernment.

Another comment received during interviews made the following point. "Many multinational companies have more employees and larger budgets than some Member States. For these companies effective knowledge management tools are commercially vital and have received substantial research investment. Many of the issues faced by these companies are similar to those faced by government. As a result it will be difficult to justify government funding for basic or developmental research in the technology area, i.e. most of the technologies already exist."

This conclusion also helps explain why the proposed conceptual framework presented above does not pinpoint separate technology, economic and social research domains, which is the approach used for the original research areas. It focuses instead on looking at major coherent multi-disciplinary research themes where different aspects of these domains come together within the specific eGovernment context, and to organise these themes on the basis of the eGovernment virtuous circle. Such an approach is also fully validated by the overall results of this study.

The above discussion does not imply, however, that eGovernment research does not itself feed back into basic technology research. This does, of course, take place since any technology is consumed and reproduced by users (whether government itself, citizens or business), but these feedback loops are not shown in the framework diagram for the sake of simplicity.

This said, it is also clear that eGovernment without technology R&D is meaningless, so there is a clear research function which both monitors relevant technology developments in other domains for their value to government, examines how they can be integrated, and actively investigates the future needs of new, advanced and basic technology by governments. This issue is taken up again in section 6.4 below.

5 2010 policy visions

In this section, first, the feedback responses from the questionnaires and interviews concerning the overall relevance of eGovernment research for the major policy areas are examined. Second, five major 2010 policy areas of the EU[31] are analysed, the potential role of government is unpicked and the contribution that eGovernment can make is examined in some detail. This enables a start to be made on preparing a set of eGovernment intervention logics for each policy area, thereby better understanding precisely how eGovernment and eGovernment research can support policy achievement. The full development of such intervention logics is beyond the scope of the present study, but the start made here should provide a useful basis for further necessary work in this area, and as an input to the wider task of EU policy development and to research policy itself.

For the five policy areas in turn, the specific roles of government and eGovernment are summarised and the eGovernment research requirements described at each of the three objectives levels: general EU objectives, specific eGovernment objectives and operational eGovernment objectives. A summary of eGovernment research recommendations in relation to the policy area is then made.

The examination of each policy area starts with a summary overview diagram showing, on the right hand side, the three objectives levels and the specific research themes which it is suggested need to be prioritised at each level in order to achieve the policy in question. This diagram can be used as a check list of points made in the text. The diagram also provides, on the left hand side, summary data for each research theme showing *inter alia* its recent and future recommended status. These reference data will enable an initial interpretation to be made of how the research should be carried out. In section 6, which follows, these eGovernment research requirements are examined in the context of a strengths and weaknesses analysis of EU research activity in a global context.

5.1 EU policy relevance assessment

In this sub-section, first of all, the feedback responses from the questionnaires and interviews concerning the overall relevance of eGovernment research for the major policy areas are examined. Second, an overview is given of each individual research themes' potential policy relevance, based on both the desk research and the questionnaires and interviews.

5.1.1 Assessment of eGovernment research relevance for policy areas

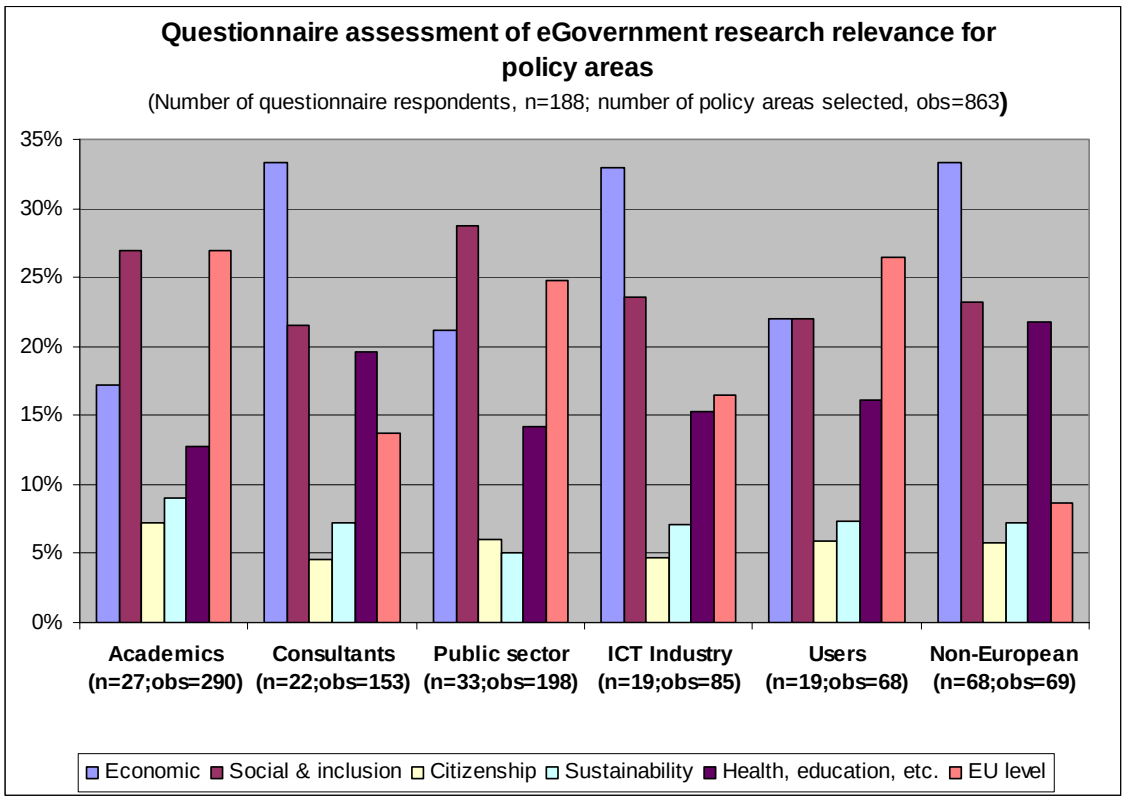
The chart below summarises the questionnaire respondent's assessment of the how important eGovernment research is for different policy areas.

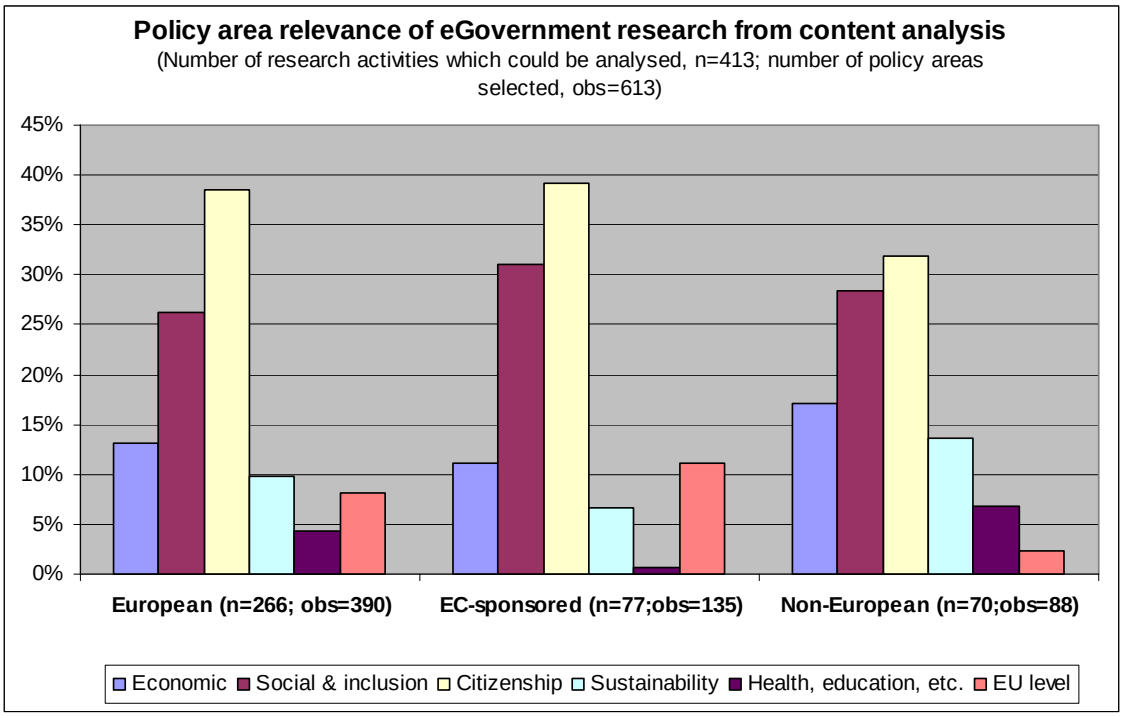
This shows that there are at least two specific patterns. The first prioritises social/inclusion, to some extent citizenship, and EU level policies over the others, and reflects the views of academics, the public sector and users. The second prioritises

[31] Derived in consultation with the Institute for Prospective Technological Studies, June 2005.

economic and other public sector (health, education) policies and reflects the views of consultants, industry and non-Europeans. Non-Europeans, in particular stress other public sector policies much more than European stakeholders. ICT industry stakeholders also weight EU level policies quite highly. The sample sizes also indicate that academics are much more prone to link many more than one policy area to eGovernment research, whilst users and particularly non-Europeans are much more likely to link to a single or a low number of policies.

The second graph below shows how the sources used in the content analysis were allocated to the main policy areas, this time split between all European research, EC-sponsored research only, and non-European research. These data again give support to the conclusions derived above, which means they are probably sound, given that these two sources (questionnaires and content analysis are completely independent. For example, non-Europeans assess economic and other public sector policies (health and education) more highly than European. The data shown here also indicate that EC-supported research tends, as would be expected, to be more relevant for the EU level policies like enlargement, European research policy, etc.





5.1.2 Overview of eGovernment research themes' potential policy relevance

In this sub-section, an overview is given of each individual research theme's potential policy relevance. These assessments are based on the content analysis data, as well as the questionnaires and interviews and desk research generally.

The table below summarises these overall results. It must be emphasised that this is based on the bottom-up data collected and qualitative assessment of the evidence provided and found, largely in Phase 1. In the rest of section 5, this is subject to a more top-down, normative assessment of the actual link between eGovernment research and the different policy areas.

As discussed later in the study however, it is unlikely that any eGovernment research on its own will have a direct or straightforward effect on policy achievements. Also, given the spread of potentially relevant policy areas, it is clear that research themes would have to work together to achieve important policy benefits, rather than achieving much individually.

5.2 Economic growth, competitiveness, jobs and innovation

5.2.1 General EU objectives and research requirements

One of the European Economic Community's initial and primary aims was to establish a Single European Market (SEM) across all members of the Community. This political vision was, to a large extent, realised in 1992 when legislation was brought into force that created the SEM. Arguments for the development of a economic union were primarily targeted towards improving the power of European markets both within Europe and beyond Europe's borders. These had been debated since the creation of the

EEC, and were reiterated at The Hague summit of 1969, when heads of state met together to discuss the priorities for the future of the European Community. These priorities focused on political and economic cooperation, and highlighted the importance of the objective of Economic and Monetary Union.[32] Since the development of Economic and Monetary Union in the EU, the case for or against European harmonisation and interoperability in sectors related to the economy (virtually all sectors) has been hotly debated. Globalisation has led to a paradoxical situation for the European economy, which has to cope with the contradictions of global free trade on the one hand, and supporting local producers and services on the other.

The primary focus on economic growth for the European Union relates to the perception policymakers at national and European levels have of the EU, and its role not only in Europe, but the world beyond. The answers to such questions as whether the EU should be seen simply as a large trading bloc, or as a set of institutions which promotes institutions and policies above and beyond those only relating to the expansion of national market frontiers vary through time, and are dependent upon political will and opinion at the national level.

However, there are some basic principles that are enshrined in the EU's institutional make up: the Consolidated Treaty Establishing a European Union outlines the role of member states in "acting in accordance with the principle of an open market economy with free competition, favouring an efficient allocation of resources",[33] wherein a Customs Union operates which does not enable tariffs to be charged within the EU's borders. This is the fundamental basis of the EU: "The Community shall be based upon a customs union which shall cover all trade in goods and which shall involve the prohibition between Member States of customs duties on imports and exports and of all charges having equivalent effect, and the adoption of a common customs tariff in their relations with third countries."[34]

At the present moment, there is a widespread and common understanding that economic growth, competitiveness, jobs and innovation relates to more than just the idea of markets. The Renewed Lisbon Agenda links competitiveness with knowledge and innovation, reform of state aid policy, better regulation, and dealing with the social consequences of economic restructuring, amongst others.[35]

[32] Armstrong D., Lloyd L., and Redmond J. (1996) *From Versailles to Maastricht*, Macmillan Press, Hampshire, p.163-4.
[33] Article 98 of the Treaty of the European Union.
[34] Article 23 of the Treaty of the European Union.
[35] European Council (2005am), Presidency Conclusions, 22-23 March 2005, Brussels, DOC/05/1.

Overview of eGovernment research themes' potential policy relevance

Qualitative assessment of research themes' relevance for policy areas: **blank** is very low, ✓ low, ✓✓ medium, ✓✓✓ high relevance.

Research Theme	Economic policies	Social policies	Sustainability policies	Other public sector service policies	Information Society for all policy	EU-level socio-economic & political policies	EU research, science & technology policies
1) Data, information, content and knowledge	✓✓			✓	✓✓	✓	✓
2) Integration and interoperability	✓✓	✓		✓	✓✓	✓✓	✓
3) Change in the public sector	✓	✓✓✓	✓	✓✓			
4) Value chain partnerships & service delivery models	✓✓	✓✓	✓✓			✓✓	
5) Networked, multi-level eGovernment and service delivery	✓✓✓	✓✓✓		✓✓		✓✓	
6) Multi-channel service design & delivery		✓✓✓	✓	✓	✓✓		
7) Understanding user needs	✓	✓✓✓			✓		
8) eGovernment for socio-economic inclusion	✓✓	✓✓✓			✓✓✓		
9) eDemocracy and eParticipation		✓✓✓		✓	✓		
10) Open source tools and applications	✓	✓			✓✓✓		✓
11) Ensuring trust and security	✓✓	✓✓	✓✓	✓	✓✓	✓✓	
12) Quality and performance management & monitoring	✓	✓✓	✓	✓	✓	✓✓	✓✓✓
13) Cross-sectoral ePublic services	✓✓	✓✓	✓✓	✓✓✓	✓	✓✓✓	
14) Innovative governance	✓✓✓	✓✓✓	✓✓✓	✓			✓✓✓
15) eGovernment at EU level	✓✓✓	✓✓✓	✓	✓	✓	✓✓✓	✓✓✓
16) Evaluating and benchmarking eGovernment	✓	✓✓	✓✓	✓	✓	✓✓	✓✓✓
17) Public value creation	**Given the nature of this research theme, it potentially has high relevance across all policy areas**						

Competitiveness was also an issue that was very present in the original Lisbon Agenda, which wished to make Europe the world's most competitive knowledge-based economy by 2010. The more recent Competitiveness and Innovation Programme and the Commission's action plan for the Renewed Lisbon Agenda outline the way in which Community support programmes can be brought together to act towards "boosting European productivity, innovation capacity and sustainable growth, whilst simultaneously addressing complementary environmental concerns."[36]

Therefore, economic growth, competitiveness, jobs and innovation are now seen as being part of a holistic approach to policymaking, with the general target of improving the state of the EU, by helping to develop policies and actions that will encourage the EU to become a leader in the world's global economy.

The EU's high level economic policy goals, as sketched above, are all founded on the need to increase competitiveness, growth, jobs and innovation across Europe. In essence, the competitiveness of an economy has two complementary dimensions which may in some cases appear as contradictory:[37]

1. the ability of firms to compete in the global market place, leading to overall economic growth
2. general increases in living standards and employment opportunities across the population.

Meeting global market requirements, where cost is often a key factor,[38] while simultaneously achieving rising real incomes, is a real and pressing challenge. The key to simultaneously achieving both low costs and high wages is productivity, not only labour productivity but also the productivity of other factors such as capital, resources, knowledge, etc., hence multi-factor productivity.[39] Productivity growth is thus the key driver for economic competitiveness, and it has been shown that this is increasingly driven by innovations in and the application of ICT, coupled with organisational and market innovations.[40] Apart from the element of potential trade-off between global market requirements and living standards, they are of course also mutually supportive, given that the growth in international competitiveness will itself tend to lead to a growth in real incomes as more market share and trade are achieved. Productivity growth is also best achieved in a dynamic and growing economy.

eGovernment research requirements for the general EU objectives level:

- Public value creation (RT17) – Very little research has been undertaken on the direct importance of eGovernment to the high level economic policies of

[36] CIP, COM(2005) 121 final, p.2.
[37] European Commission, 2005d, p. 7.
[38] However, as implied, and although cost is a very important component in international competitiveness, other factors are also crucial, including user-driven and R&D/research driven competitiveness and innovation: (Danish Technological Institute (2004), "Policy debate in the EU on outsourcing of ICT and related services – Options for the Future", Report for EU-US seminar on "Offshoring of services in ICT and related services", December 13-14, 2004, in the framework of co-operation between the European Union and the USA in the field of employment and social affairs, 3 December 2004, under the auspices of the European Commission's DG Employment and Social Affairs.
[39] European Commission, 2005d, pp. 7-8.
[40] OECD, (2004) "The economic impact of ICT: measuring evidence and implications", September 2004: http://www1.oecd.org/publications/e-book/9204051E.PDF

competitiveness, growth, jobs, innovation, support to SMEs, etc., certainly not attempts which show the differential impact of eGovernment.[41] A major research effort is required to better understand and exploit both the general and differentiated impacts of government and eGovernment on economic objectives in order to improve policy making and maximise development results.

5.2.2 Specific eGovernment objectives and research requirements

Government can support the European drive for competitiveness, growth, jobs and innovation by providing **effective** inputs to society as a whole, through governance, administration, regulation, specific services, democratic participation, infrastructures, as well as through its actions as an employer, as a spender, investor and purchaser. These eGovernment specific objectives examine how and whether government is performing the appropriate tasks required by society, and particularly the economy in the context of the present set of policy goals. The European Competitiveness Report 2004, identifies three main levers through which 'government' (understood as the public sector) can influence the economic performance of economic actors: taxation, government spending, and regulations.[42] There is increasing consensus[43] that the more 'effectively' government does this, i.e. reducing the compliance costs for economic actors and increasing the quality of government services, the greater positive impact there will be on wider economic competitiveness, growth and jobs.

[41] The existing research drawn upon to develop this section is referenced in Annex 1.18.

[42] "European Competitiveness Report 2004", Commission Staff Working Paper SEC(2004) 1397 of 8.11.2004 http://europa.eu.int/comm/enterprise/enterprise_policy/competitiveness/doc/comprep_2004_en.pdf

[43] European Commission, 2005d, p. 30.

Overview of eGovernment research requirements for economic growth, competitiveness, jobs and innovation policy

X Research themes necessary to achieve the policies in question

Questionnaires: future recommended effort		Recent Europ deploy-ment [44]	Recent Europ strength [45]	*Questionnaires & content analysis: recent effort*			*Research Themes*	*General EU objectives* **Policies for economic growth, competitiveness, jobs and innovation**	*eGovernment specific objectives* **Policies to support government in providing effective inputs to the economy**			*eGovernment operational objectives* **Policies to support government carry out its tasks as efficiently as possible**			
Non-European	Europe			Non-European	*EC*[46]	*Europe* [47]			1. Governance & conditioning policy	2. External performance policy	3. Policy for measuring (e)government effectiveness	4. Internal performance policy	5. Service design & delivery policy	6. Service use policy	7. Policy for measuring (e)government efficiency
2%	7%	1	✓	3%	2%	2%	17. Public value creation	X							
3%	3%	2	✓✓	3%	4%	4%	16. Evaluation & benchmarking				X				
0%	2%	1	✓✓✓	1%	2%	2%	15. eGov at EU level		X	X					
1%	7%	1	✓	1%	1%	3%	14. Innovative governance		X	X					
8%	5%	1	**0**	9%	2%	1%	13. Cross-sectoral services		X	X					
3%	1%	2	✓✓	4%	4%	5%	12. Quality & performance								X
9%	8%	3	✓✓	5%	9%	9%	11. Trust & security					X	X	X	
1%	1%	3	✓✓	4%	5%	3%	10. Open source					X			
5%	10%	3	✓✓✓	3%	8%	8%	9. eDemocracy								
8%	7%	2	✓✓	1%	4%	2%	8. Socio-economic inclusion								
10%	11%	3	✓	6%	10%	6%	7. User Needs							X	
11%	4%	2	✓	5%	1%	6%	6. Multi-channel						X		
7%	8%	2	✓	6%	4%	5%	5. Networked government						X		
9%	9%	3	✓	10%	14%	11%	4. Value chains						X		
7%	6%	2	✓✓✓	6%	1%	6%	3. Change in public sector					X			
5%	5%	3	✓	14%	11%	10%	2. Integration & interoperability					X			
11%	6%	4	✓✓	19%	18%	17%	1. Data & knowledge management					X			
100%	*100%*			*100%*	*100%*	*100%*									

[44] Current European research deployment, scored from 1 to 4 for increasing progress towards deployment of research results (see Annex 10).
[45] Current European strength in relation to coverage of research scope, content and research challenges: **0** is very low, ✓ low, ✓✓ strong, ✓✓✓ very strong (see Annex 9.2).
[46] Research funded by the EC's DG Information Society and Media only, during the 5th and 6th IST Framework Programmes and through the Modinis Programme
[47] All European research, including that funded by the EC's DG Information Society and Media.

Given this potential impact of government on the overall performance of the economy, both globally and locally, the specific roles of eGovernment can be articulated. A synthesis of the results of a number of reports and studies,[48] including the present one, shows that eGovernment has the potential to **support government in providing effective inputs to the economy** by adopting a number of policies as follows (note, in this sub-section, as well as the other sub-sections in section 5, policies are numbered according to their appearance in the table at the beginning of each sub-section):

1) Governance and conditioning[49] policy:
The main aspects of this policy which can be supported by eGovernment are:

- Reduction in the administrative and compliance burden of government regulations[50] placed upon society (especially businesses), through eGovernment-enabled greater efficiency, simplification, information, transparency, etc. The regulation system is necessary, for example to promote economic and social goals, fair competition, consumer protection, environmental quality, minimum wages, workplace standards, etc., but also imposes compliance burdens on the economy which must be weighed against the benefits. These compliance activities include registering, applying for licenses and permits, reporting, and making payments, each of which involves finding the right information, understanding what is needed and actual compliance, and for each of which eServices can provide direct cost savings (travel, postage, fees, etc.) and indirect opportunity cost savings (time savings, etc.).[51]
- Direct benefits to businesses through appropriate and high quality eContent and eServices, such as time saved, money saved, increased convenience, greater transparency and access, higher quality and more satisfactory service fulfilment.
- Supporting R&D, knowledge creation, innovation, technology platforms, eBusiness, SMEs, access to finance for research, entrepreneurship, start-ups, etc., and deployment of ICT through networks, clusters, science parks, data, and technology-transfer.
- Improved societal and economic policy-making, policy coordination and monitoring, including evidence-based policy-making, labour market, labour mobility, complementary qualification and certification systems, education/training/skills and work-place policies, trade and investment policies, regional policies, etc. This can be achieved through better data collection, better

[48] European Commission, 2005d; Millard *et al* (2004); European Commission (2005f); "eGovernment Economics Project (eGEP), Measurement Framework", Interim Version, 27 June 2005: http://www.rso.it/eGEP.

[48] "European Competitiveness Report 2004", Commission Staff Working Paper SEC(2004) 1397 of 8.11.2004 http://europa.eu.int/comm/enterprise/enterprise_policy/competitiveness/doc/comprep_2004_en.pdf, and feedback from this study's questionnaires and consultations.

[49] "Innovating Public Administration and the Lisbon strategy", Background document for the Ministerial Troika on 4 November 2004, uses the term 'conditioning' role:
http://www.eupan.org/cms/repository/document/2004-10-28%20ENG%20App%203%20back%20ground%20paper.doc

[50] A 2004 study found that "incompletely competitive markets in the EU, caused by excessive or ill-adapted regulation, are leading to sub-optimal economic performance: Bayoumi, T., Laxton, D. and Pesenti, P. (2004) "Benefits and Spillovers of Greater Competition in Europe: A Macroeconomic Assessment", Papers No. 803, Board of Governors of the Federal Reserve System, April 2004: http://www.newyorkfed.org/research/staff_reports/sr182.pdf.

[51] Deloitte Research (2003), "Citizen advantage: enhancing economic competitiveness through eGovernment", September 2003:
http://www.deloitte.com/dtt/research/0,1015,sid%253D2230%2526cid%253D26333,00.html

performance measurement, improved decision-making and communication, and better coordination.

- Improved governance of society and the economy, e.g. determining and supporting the role of different societal actors (public, private, civil), setting legal, institutional and investment frameworks, financial markets and risk capital (e.g. for the Internal Market, a Single European Information Space), funding, regulation, law-making, IPR frameworks such as copyright and privacy rights, etc. This can be achieved through better data collection, better performance measurement, improved decision-making and communication, and better coordination.
- Better frameworks for EU level and cross-border initiatives.
- All the above can produce multiplier effects in the economy by enabling businesses to operate with reduced costs and with greater opportunities.

2) External performance policy (government as a large economic actor in its own right)[52]

The main aspects of this policy which can be supported by eGovernment are:

- Government spending and investment, e.g. on infrastructures (including ICT), education, health, etc., can be improved by better coordination, funding, and resource allocation, through improved e-supported systems. Government, when seen as a single entity, is by far Europe's biggest economic sector -- overall government spending across EU15 amounted to 49% of GDP in 2003.[53]
- Government performance as an employer can be improved by better coordination with labour markets, wages setting, training, etc., through improved e-supported systems. In 2003, government employment represented 16.7% of total employment in the EU15.
- Government performance as a purchaser, e.g. through eProcurement.
- Government performance at EU level and cross borders.
- All the above can produce multiplier effects in the economy by the effective investment of public resources.

eGovernment research requirements for the governance and external performance policies:

– eGovernment at EU level (RT 15) – In order to have a continent wide and coordinated impact, for example through the workings and further enhancement of the Internal Market, the new Competitiveness and Innovation Framework Programme, and the proposed Single European Information Space, as well as to enhance cross-border economic policies and impacts, greater research is needed into the role of eGovernment at EU level.

[52] European Commission (2004), "Innovating Public Administration and the Lisbon strategy", Background document for the Ministerial Troika on 4 November 2004: http://www.eupan.org/cms/repository/document/2004-10-28%20ENG%20App%203%20back%20ground%20paper.doc. However, as European Commission, 2005d, p. 19 states: "no clear and straightforward relation can be established between government size and economic performance….Therefore the concept that must be used to relate pubic administration to economic performance and competitiveness is that of public sector efficiency rather than that of public sector size."

[53] European Commission, 2005d, p. 19

- Innovative governance (RT 14) – Research is needed on how eGovernment can contribute to innovating the overall frameworks of government and governance, particularly in relation to economic policies, including political leadership. It focuses on change and innovation across the whole public sector. It should thus cover organisational learning, good practice, planning, foresight, roadmaps, decision- and (evidence-based) policy making, as well as governance structures and the role of the state, law, legal and regulatory aspects, and relations with the market and civil society.
- Cross-sectoral public services (RT 13) – Research is needed which examines the cross-sectoral aspects of all electronic public services and eGovernment. It should explicitly cover the relationships between sectors, including health, education, transport, social care and security, police and legal, environmental, housing, utilities, consumer protection, business support, cultural and community support, etc., with eGovernment, which in Europe is often narrowly treated largely as just eAdministration. This research should consider the cross-sectoral aspects and synergies in the public sector seen as a whole, instead of segmented as is often the case.

3) Policy for measuring (e)government effectiveness – the use of measurement systems and benchmarks for the effectiveness of eGovernment in supporting economic growth, competitiveness, jobs and innovation.[54]

eGovernment research requirements for measuring (e)government effectiveness:

- Evaluation and benchmarking (RT 16) – Research is needed on developing and deploying measures and benchmarks of the overall effects and outcomes of eGovernment at the specific objectives level, and particularly of monetary costs and benefits, the business case, business benefits, economics and financing, does eGovernment pay, burden reduction measures, ROI, added-value, as well as overall evaluation frameworks and methodologies. The focus should be on measuring and understanding the ICT use process in the public sector, i.e. whether ICT is used appropriately or inappropriately to achieve the specific objectives. The latter include, for example, savings in time and money, less bureaucracy, more convenience, more efficient and lighter administrative procedures, easier and wider access to services by businesses, service fulfilment experienced by business, more transparency and accountability, the quality and effectiveness of economic decision-making, more effective and holistic coordination between public sectors and services, etc., and how these are evaluated and benchmarked.

5.2.3 Operational eGovernment objectives and research requirements

Government can support the European drive for competitiveness, growth, jobs and innovation by being as **efficient** as possible in the way it achieves the tasks described at the eGovernment specific objectives level. Part of this is ensuring that the public sector imposes the least costs on society and the economy as a whole in relation to the effective contribution it makes. It is increasingly acknowledged that public sector efficiency and productivity have a significant impact on competitiveness. Efficiency and productivity gains in the public sector indeed contribute to boosting economic

[54] For example, see CGEY (2004b), Foley & Ghani (2005).

competitiveness through their impact on productivity growth in the whole economy. This link between government efficiency and competitiveness is considerably reinforced by globalisation and the increased cross-border mobility of production factors this entails.[55] To boost competitiveness, governments thus need to become more competitive themselves, which means focusing on return on investment (ROI) and acquiring the capacity to make cost efficiencies and cut waste.

The potential for improvements in public sector internal efficiency is large, remains widely unfulfilled, and is not well understood.[56] However, a synthesis of the results of a number of reports and studies,[57] including the present one, shows that eGovernment has the potential to **support government carry out its tasks as efficiently as possible** by adopting a number of policies as follows.

4) Internal performance policy (back-office efficiencies):
The main aspects of this policy which can be supported by eGovernment are:

- Lower service processing costs through automation, interoperability, common standards, etc.
- Lower public procurement costs through eProcurement
- Improved revenue collection (e.g. tax-discovery systems)
- Reduced training and travel expenses through eLearning and eCollaboration.
- Reduced errors, fraud and abuse through automated systems and electronic monitoring.
- Improved internal coordination, funding, organisation and administration in the public sector, evidence–based decision-making, etc., through better data collection, better performance measurement, and improved communication.
- Increasing the productive time of front-line public service professionals by reducing the time spent on routine back-office processes.

eGovernment research requirements for the internal performance policy:

– Trust and security (RT 11) – Research is needed to ensure trust and security within government and between government agencies, particularly the tools, methods, technologies and policies of information assurance. Massive data transfers and exploitation between agencies require sound data protection based on legal, technical and workplace safeguards and standards. In addition to maintaining data security it is essential that the data source itself is able to be identified as genuine. An examination is also required of the role of the civil servant in this theme including such issues as workplace surveillance and the quality of their working conditions.

– Open source (RT 10) – Research is needed to improve the business and efficiency benefits of open source application software, tools, modules and standards, where it can support data and application integration and interoperability. Open source software (OSS) can be a significantly cheaper solution than proprietary systems, as

[55] European Commission, 2005d, p. 22.
[56] European Commission, 2005d, p. 25.
[57] European Commission, 2005d; Millard *et al* (2004); European Commission (2005f); "eGovernment Economics Project (eGEP), Measurement Framework", Interim Version, 27 June 2005: http://www.rso.it/eGEP.
[57] "European Competitiveness Report 2004", Commission Staff Working Paper SEC(2004) 1397 of 8.11.2004 http://europa.eu.int/comm/enterprise/enterprise_policy/competitiveness/doc/comprep_2004_en.pdf, and feedback from this study's questionnaires and consultations.

well as provide greater control and security of the operating systems which become verifiable with complete disclosure of source and binary code to public scrutiny. OSS in eGovernment can also support better G2B and B2B interactions by catalysing the spontaneous and dynamic formation of value chains and value nets. Research is needed into how such an open source infrastructure, used and supported by government, can help (particularly) SMEs get over the threshold beyond which they can tap into the virtuous circle of greater ICT adoption, more B2B interactions, greater market reach, more cash-flow, and so forth. OSS can be a new business model to enable new entrepreneurship across Europe, new suppliers, new demand, etc.

- Change in the public sector (RT 3) – Research is required into the overall institutional, organisational, administrative, managerial and cultural changes, mainly in the back-office, necessary for eGovernment and government modernisation generally. This should focus on change management, leadership, decision-making and human resources within the public sector, as well as covering, both at the organisational and individual civil servant level, learning, roles, jobs, skills, competencies and resistance to and/or opportunities for change. It is also important to better understand how to balance this need for change in order to become more efficient with the need for some stability and continuity, both for the public sector itself as well as for the business sector it serves. This is especially needed by the latter as a framework for longer term planning, investment and risk taking.
- Integration and interoperability (RT 2) – Research is needed which focuses on integrating and interoperating data and information across and between organisational units. In terms of integration this research should focus on institutional, organisational, cultural and human resource issues where these directly impact interoperability. In terms of interoperability, research should cover technical, semantic and organisation levels, as well as standards, in order to achieve seamless and joined-up activities which are device or platform independent and able to replace or cope with legacy technologies, architectures and systems.
- Data and knowledge management (RT 1) – Research is needed on the basic (business) processes for capturing, sharing and managing data. This should cover the mechanics of data handling including formats, syntax, semantics and ontology.

5) Service design and delivery policy (interface efficiencies)
The main aspects of this policy which can be supported by eGovernment are:

- Greater trust and security within government and the value chain.
- Lower service delivery costs and better and more flexible service delivery and choice through user self-service, proactive services, intermediated services, etc.
- Improved customer relations management.
- Improved supply chain management.
- Improved business service content and greater ROI through PPPs and cooperation with the business sector in eService design and delivery.
- Improved and more cost-effective channel management and choice.

- Improved and more cost-effective coordination, burden- and facility-sharing, and common service design and delivery between different government levels, whether local, regional, national, EU.

eGovernment research requirements for the service design and delivery policy:

– Trust and security (RT 11) – Research is needed to ensure trust and security in partnering with the private sector through PPPs and in designing better eGovernment services for business, particularly the tools, methods, technologies and policies of information assurance. Massive data transfers and exploitation between the public and private sectors require sound data protection based on legal, technical and institutional safeguards and standards. This includes network and data security, data protection, identity management, authentification, privacy, surveillance, and digital rights management (DRM).

– Multi-channel service design and delivery (RT 6) – Research is needed into how government services are designed and delivered to business users within the context of a modernising public sector adopting ICT. By service design is meant the functionalities and formats adopted, whether using ICT directly or indirectly. By channel is meant different infrastructures, platforms and interfaces, i.e. the delivery media used in government service delivery to business users. Regardless of the type of business user, for example whether SMEs, large companies, or geographically remote firms, this research should cover the fact that 'e' is just one channel for delivering government services and is unlikely to completely replace other channels, like face-to-face, post or telephone, but rather will complement and support them. The 'e' channel can thus become the backbone or infrastructure for all channels regardless of which channel is actually experienced by the user, thereby improving both the internal and external quality and scope of any service.

– Networked, multi-level and coordinated eGovernment and services (RT 5) – Research is needed on the networking, coordination and cooperation required between and within the different jurisdictions of the public sector itself for the purposes of service supply and delivery to the private sector, and particularly between different levels of government: national, regional and local, as well as cross-border services. It should also cover coordination between different public sector entities at the same level for the purposes of such service supply and delivery, such as local authorities within a region. Features here include middle offices, shared services and service centres, localised front-end services built on shared back end architectures, etc.

– Value chains, service design and delivery models (RT 4) – Research is required into eGovernment delivery models for the private sector and their business case. Special focus should be on partnership, cooperation or coordination between the public sector and the private sector, i.e. different actors along the value chain for designing and delivering services to business users, and ensuring that the appropriate type of content and services are developed. It also focuses on the creation and design of public sector information content with a commercial or business benefit, such as MIS, GIS and similar, through value-adding knowledge. On the production side it includes PPPs, procurement and outsourcing for design, financing and roll-out. On the distribution side it includes the roles of private sector intermediaries, such as

banks, garages, or shops. Such delivery models are not only economic, but also organisational, legal and political.

6) Service use policy (front-office efficiencies)
The main aspects of this policy which can be supported by eGovernment are:

- Improved provision of eContent and eServices, especially those supporting businesses and economic development.
- Increased quality, comprehensiveness and outreach of these eServices.
- Improved access to different (technology) channels, including broadband and PIAPs where necessary.[58]
- Increased take-up and use of eServices by business users based on differential targeting and marketing, for example of tax, customs and procurement systems delivered by on-line services.
- Improved business user satisfaction and confidence in open, transparent and accurate e-supported systems.
- Greater trust, security and safety for business users through e-supported systems.

eGovernment research requirements for the service use policy:

– Trust and security (RT 11) – As above.

– Understanding user needs (RT 7) – Research is required into the direct needs or demands of business users, whether as individual companies, sectors, or within specific localities or regions. This should cover business user relationships with government, user skills, expectations and activities in relation to public services, including understanding different types of business and their characteristics and situations which will contribute to determining which channel mix they need and how they are to be used. This includes the context of use, service initiation and control, the delivery environment, service visibility/findability, utility/usefulness, access/availability, and service quality and fulfilment in relation to the specific business user.

7) Policy for measuring (e)government efficiency – the use of measurement systems and benchmarks for the operational performance and quality of systems, services, and organisations in support of eGovernment specific objectives related to economic growth, competitiveness, etc., especially if these can be converted into monetary terms.

eGovernment research requirements for measuring (e)government efficiency:

– Quality and performance management and monitoring (RT 12) – Research is needed on developing and deploying the operational level measurement of quality and performance. The focus should be on measuring and understanding the ICT conversion process in the public sector, i.e. how ICT expenditure and implementation result in the achievement of operational objectives. This includes measuring service qualities, business user satisfaction and preferences, internal

[58] European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206, p. 27: http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html

government operations, processes and performance, and technical and data reliability and quality (errors, failures), and the evaluation and testing of these. It can also cover hard-, middle- and software systems, processes and services, their availability, quality and performance as experienced by both government and business users, and how they are organised, managed and monitored.

It should be noted that there can be significant trade-offs between eGovernment enabled efficiency (as operational objectives) and eGovernment enabled effectiveness (as specific objectives). For example, cutting costs in the back office by electronic automation of processes and services, such as by reducing staff and thus also reducing the potential for face-to-face contact with users, can make government significantly more efficient. However, this could be at the cost of making it less effective, at least as far as users, who rely on or prefer face-to-face services, are concerned. The impacts on civil service staff also need to be considered. Costs savings can result in lower taxes and/or increased government spending in other areas, both of which potentially can boost the economy. Thus, effectiveness and efficiency can be positively complementary in a virtuous circle in which, for example, cost savings through back-office efficiencies translate into resource re-deployment to higher quality and more comprehensive multi-channel user services. The link between effectiveness and efficiency, and whether or not this results in trade-offs or virtuous circles, is ultimately a political issue but one very much mediated through the design and implementation of appropriate policies.

The term 'efficiency' is used here in the broad sense, i.e. how well (or efficiently) do the operational objectives achieve the specific objectives? Similarly, the term 'effectiveness' is used in the broad sense, i.e. are the specific objectives the right (most effective) ones for contributing to the general EU objectives, in this case high level economic policy goals? The benefit of seeing specific objectives as eGovernment effectiveness and operational objectives as eGovernment efficiencies (at least in the context of the EU's economic policies) is that it demonstrates the 'superiority' of the former over the latter. Thus, efficiencies should not be seen as ends in themselves, but only if they positively support the specific objectives desired, and that these in turn contribute to the general EU policy objectives.[59]

5.2.4 Summary of research recommendations

The economic policy dimension is arguably the most complex, comprehensive, wide-ranging and interrelated of all the major policy areas. It is thus the most difficult to link directly to specific roles and actions of (e)government, so a large number of the eGovernment research themes have some role to play in supporting economic policies. However, by breaking up the policy area into its sub policies, as described above, particular research requirements can be more easily ascribed to each one, as well as showing that there is considerable overlap.

[59] The on-going eGovernment Economics Project (eGEP) has identified three main value drivers for its eGovernment measurement framework: efficiency, effectiveness and openness. The first two can be recognised in the specific and operational objectives levels respectively, whilst the third is more relevant to other policy areas, such as the citizen policy area in section 5.5 below. See "eGovernment Economics Project (eGEP), Measurement Framework", Interim Version, 27 June 2005: http://www.rso.it/eGEP.

The table at the beginning of section 5.2 summarises the research requirements for the economic policy area and the recent and recommended future status of each research theme. This shows that there are a number of gaps between the recent research being carried out in Europe and by the EC and the research required to fully support the EU's 2010 economic policies.

Two main dimensions of research re-focusing are recommended. Firstly, greater effort on research at the specific objective and the general EU objective levels is necessary in order to be better tuned to EU policies (which is the purpose of the present study). This means a more directive, top-down and policy-driven research policy is required which analyses the specific links (both direct and indirect) between eGovernment, government and EU policies, and is able to feed this back into the design and development of such policies, as well as into research policy itself. Until there is a much better understanding of how government and eGovernment can contribute to public value and the main EU policy goals, much research will continue to be risky and arbitrary from this perspective.

Second, the first recommendation is not an argument to significantly downgrade all research at the operational objectives level. On the contrary, such research is absolutely necessary in order to properly support the achievements at the specific objectives level, and in turn the general EU objectives level. What is called for, instead, is a re-adjustment in favour of the upper two levels, and a significant re-focusing at the operational objectives level. Indeed, in the context of the EU economic policy goals examined here, there are four operational level research themes which should remain either just as important as they are at present or receive significantly more research focus for the reasons described above. These are, first and foremost, trust and security, as well as value chain partnerships, networked government and user needs. This is in addition to other required research at this level which should continue, albeit with a lower relative effort than before. Some research is also essential into measurement and benchmarking at all objectives levels, although in relative terms, this can be downgraded to some extent.

5.3 Social inclusion and regional cohesion

5.3.1 General EU objectives and research requirements

Social inclusion has emerged as an issue of great importance in the EU in recent years, notably in the original Lisbon Declaration, which was based on the need to strengthen employment, economic reform, and social cohesion as part of the knowledge-based economy. The Treaty of the European Union, Article 2 stated the need to encourage social cohesion throughout the Union. The EU has received a lot of attention for its attempts to establish social dimensions to its Community-wide policies.[60] and whilst these have mainly focused on employment policies, social inclusion has always been high on the agenda. The European Social Model is attributed with being able to:[61]

[60] Leibfried and Pierson (2000) 'Social Policy', in Wallace and Wallace, Policy Making in the European Union, Oxford UP: Oxford, p. 286

[61] http://europa.eu.int/rapid/pressReleasesAction.do?reference=SPEECH/03/419&format=HTML&aged=0&language=EN&guiLanguage=en, accessed September 10, 2005).

- improve coordination of economic, employment and social policies, ensuring that all EU citizens share in the fruits of growth,
- help drive better conditions for business and for our economies generally, and
- change people's perception of the EU for the better.

Regional cohesion is often treated simultaneously with social inclusion at the European level, with the focus on the role of EU institutions in encouraging interaction within and between regions, which form part of the social fabric of the EU. The consolidated treaty of the European Community makes reference to regional development through developing trans-European Networks (Article 154) and regional funding (Article 159 and 160) amongst others. These networks and funding structures have encouraged regional development in terms of information society technologies since the publication of the Bangemann Report, which encouraged such work to be carried out.[62] Furthermore, the creation of the Committee of the Regions in 1994, an EU institution with an advisory role, highlights the importance of the EU's regional dimension. Enhancing the role of the regions in European policy making is intended to improve the perceived democratic deficit at the European level.

While the penetration of new technologies is mainly driven by market forces, public policies have the task of guaranteeing as broad as possible access to the enabling capacities of ICT. At EU level, the political guidelines laid down by the European Council for the fight against poverty and social exclusion[63] set the objective "to exploit fully the potential of the knowledge based society and of new information and communication technologies, taking particular account of the needs of people with disabilities" in order to prevent the risk of exclusion, while the eEurope 2005 Action Plan: An information society for all aims at "giving everyone the opportunity to participate in the global information society". The development of key competencies in ICT – a crucial factor for digital inclusion – is addressed in the Commission Action Plan to promote Skills and Mobility. While the eLearning programme focuses on ICT's contribution to learning, especially for those who, due to their geographical location, socio-economic situation or special needs, do not have easy access to traditional education and training. With regard to regional cohesion, a Competitiveness and Innovation Programme to operate at regional and local levels, is currently being considered.[64]

All Member States are implementing eInclusion policies,[65] in the framework of their Information Society strategies as well as of their social policies. New Member States highlighted in their Social Inclusion Memoranda their ongoing and/or planned actions for promoting digital inclusion.

[62] Dai, X (2000) ''Policy Push' for European Integration: Implications of the Information Society', in Shahin and Wintle, The Idea of a United Europe, Macmillan: Basingstoke: 129-133).

[63] see objective 2 (a) in Annex I to the "Fight against poverty and social exclusion: common objectives for the second round of national Action Plans" endorsed by the Council in November 2002: http://europa.eu.int/comm/employment_social/soc-prot/soc-incl/counciltext_en.pdf

[64] European Commission, 2005al, p. 2.

[65] see National Action Plans against poverty and social exclusion 2003-2005: http://europa.eu.int/comm/employment_social/soc-prot/soc-incl/index_en.htm

The EU's high level policy goals aimed at promoting social inclusion and regional cohesion, as sketched above, are all founded on the tenets of the European Social Model. This major EU policy area addresses the social, economic and political divides in Europe, and particularly those dimensions related to income, age, gender, employment, education, (dis)ability, ethnicity, and location. A number of socio-economic macro-theories and concepts offer perspectives and explanations of the transformation of modern society and their social and cultural impacts, for instance the theories of post-modernism, capitalism, political economy and urban change.[66] While these approaches shed light on different aspects of the transformation, it is self-evident that any major shift in the architecture of society will see winners and losers. In other words, societal change will redefine the conditions for social inclusion.[67]

Further, the changes brought about by the knowledge society are often considered non-spatially, or at least only in terms of Member States level. But as globalisation and the effects of new information and communications technology (ICT) have affected us all wherever we live, they are also restructuring and reshaping the regions, though in a variety of ways and often with highly differentiated results.

Previously, assets like relative location, raw materials and proximity to markets were determining factors in regional prosperity. In the digital economy, on the other hand, knowledge, creative talent and innovation, based upon the local development of human resources and institutional structures, are more important. Thus, location is still vital, but now depends much more on how local assets (both existing and latent) are perceived and developed. It depends on government and enterprises thinking and acting both locally and globally at the same time. Locally because the vital assets like people and institutions largely remain local, and globally because competition, trade and investment now take place on an increasingly global scale. It is, in fact, new types of interplay between the local and the global, including the role of ICT in this, which make up the ingredients of the new regional agenda.

[66] cf. Webster, Frank, (1995), Theories of the Information Society. Routledge, London

[67] Mansell, R., Steinmueller, E.W., (2000), Mobilizing the Information Society. Strategies for Growth and Opportunity. Oxford University Press, pp. 41-68.

Overview of eGovernment research requirements for social inclusion and regional cohesion policy

X Research themes necessary to achieve the policies in question

Questionnaires: future recommended effort		Recent Europ deploy-ment [68]	Recent Europ strength [69]	*Questionnaires & content analysis: recent effort*			*Research Themes*	*General EU objectives* **Policies for social inclusion and regional cohesion**	*eGovernment specific objectives* **Policies to support government in enhancing social inclusion and regional cohesion**			*eGovernment operational objectives* **Policies to support government operations for social inclusion and regional cohesion**		
Non-European	Europe			Non-European	*EC*[70]	*Europe*[71]			1. Social inclusion policy	2. Regional cohesion policy	3. Policy for measuring (e)government inclusion & cohesion effects	4. Service design & delivery policy	5. Service use policy	6. Policy for measuring (e)government operations to support inclusion & cohesion
2%	7%	1	✓	3%	2%	2%	17. Public value creation	X						
3%	3%	2	✓✓	3%	4%	4%	16. Evaluation & benchmarking				X			
0%	2%	1	✓✓✓	1%	2%	2%	15. eGov at EU level		X	X				
1%	7%	1	✓	1%	1%	3%	14. Innovative governance		X	X				
8%	5%	1	**0**	9%	2%	1%	13. Cross-sectoral services		X	X				
3%	1%	2	✓✓	4%	4%	5%	12. Quality & performance							X
9%	8%	3	✓✓	5%	9%	9%	11. Trust & security					X	X	
1%	1%	3	✓✓	4%	5%	3%	10. Open source							
5%	10%	3	✓✓✓	3%	8%	8%	9. eDemocracy						X	
8%	7%	2	✓✓	1%	4%	2%	8. Socio-economic inclusion						X	
10%	11%	3	✓	6%	10%	6%	7. User Needs						X	
11%	4%	2	✓	5%	1%	6%	6. Multi-channel					X		
7%	8%	2	✓	6%	4%	5%	5. Networked government					X		
9%	9%	3	✓	10%	14%	11%	4. Value chains					X		
7%	6%	2	✓✓✓	6%	1%	6%	3. Change in public sector							
5%	5%	3	✓	14%	11%	10%	2. Integration & interoperability							
11%	6%	4	✓✓	19%	18%	17%	1. Data & knowledge management							
100%	*100%*			*100%*	*100%*	*100%*								

[68] Current European research deployment, scored from 1 to 4 for increasing progress towards deployment of research results (see Annex 10).
[69] Current European strength in relation to coverage of research scope, content and research challenges: **0** is very low, ✓ low, ✓✓ strong, ✓✓✓ very strong (see Annex 9.2).
[70] Research funded by the EC's DG Information Society and Media only, during the 5th and 6th IST Framework Programmes and through the Modins Programme
[71] All European research, including that funded by the EC's DG Information Society and Media.

Regional differences, in fact, remain the prime sources of competitive advantage. But a region also provides a sense of place and belonging, which is necessary for social and economic cohesion and stability in such a globalised world. This mirrors the fundamental contribution of regions in the Information Society as the twin anchors of continuity and diversity, both of which are necessary for innovation, prosperity and an improving quality of life. Indeed, regional identity, and the territorial expression of this through the integration of economic, political, environmental, social and cultural assets and characteristics, lies at the heart of the new regional thinking in the Information Society.[72]

An increasingly important aspect pf social inclusion and regional cohesion is the so-called 'digital divide', and there is now strong evidence that this is strongly correlated with the other divides, both acting as a partial cause of them as well as resulting from them.[73] Thus, people from already disadvantaged social groups who cannot afford access to and usage of ICTs are in danger of falling further behind and of becoming excluded from information society opportunities. Therefore, counteracting the digital divide can be regarded as a policy instrument and a means of promoting social inclusion. The danger is that the current digital divide will widen rather than close if no pro-active policy measures are taken.

ICTs play an increasing role in enhancing social inclusion for two reasons. First, computing and ICT are becoming ubiquitous, and thus indispensable for participation in the knowledge society. Computing devices play an increasingly important role to accomplish tasks in everyday life, to communicate, to have access to information and entertainment services, to work and conduct business and for learning. In this context, there is no longer a 'typical' computer user. Information artefacts are used by diverse user groups, including people with different cultural, educational, training and employment backgrounds, novice and experienced computer users, the very young and the elderly, and people with different types of disabilities[74]. It becomes a central premise that, in the information society, the ability to access, adapt and create knowledge using information and communication technologies is critical to social inclusion.

Second, social inclusion and eInclusion are interdependent and reinforcing. eInclusion is a component of social inclusion. When individuals, social groups or specific localities experience (usually a combination of linked) problems such as unemployment, poor skills, low incomes, poor housing or bad health in relation to other groups, or at a higher than average rate, the causes are interconnected, and the effects themselves become causes of further exclusion. For example, poverty is both a key cause of social exclusion and a key effect.

[72] Millard, J (2002) ""Regional development and cohesion in the European Information Society – a review", working paper, March 2002, Danish Technological Institute: http://www.beepregional.org.

[73] European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206 http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html

[74] Stephanidis, Constantine (ed.), (2001), User Interfaces for All - Concepts, Methods, and Tools. Lawrence Erlbaum Associates, Mahwah, NJ.

eGovernment research requirements for the general EU objectives level:

- Public value creation (RT17) – Very little research has been undertaken on the direct importance of eGovernment to the high level social and regional policies of social inclusion or regional cohesion, certainly not attempts which show the differential impact of eGovernment.[75] A major research effort is required to better understand and exploit both the general and differentiated impacts of government and eGovernment on social and regional objectives in order to improve policy making and maximise development results.

5.3.2 Specific eGovernment objectives and research requirements

Social inclusion and regional cohesion can thus be defined as conditions in which citizens are integrated within society with respect to basic economic, cultural and social conditions, regardless of who they are or where they live. The recent 2005 report prepared jointly by the European Commission and ESDIS[76] concludes that digital and social participation clearly appear closely intertwined in a society which becomes progressively more technical and where the technology needs to become more social. Women have overtaken men in the past three years in their pace of Internet take-up, and the over 55s are also increasingly gaining computer skills, and this trend is set to continue. However, the poorly educated and poorly paid are not catching up as quickly and this is denying them new opportunities. Education, age and income remain the most important areas in the social, regional and digital divides. Failing to acquire information skills compounds the difficulties faced by the poor and long-term unemployed, producing the 'eExcluded', but access to the Internet and computer skills can help people escape from, and avoid, poverty. However, more information, particularly from national sources, is needed so that policies to help people access the information society can be better targeted. Without action, Europe may become even more polarised between the (e)included and the (e)excluded. Education is fundamental to being (e)included, for example, high Internet use seems to remain clearly and consistently related to higher educational and occupational status.

Regional cohesion and social inclusion are two sides of the same coin. Most eInclusion initiatives take place at local level. The prohibitive cost of personal computers (PC) is one of the obstacles to reducing the digital divide. The main reason for not using the Internet across the EU was not having a PC at home. This is particularly acute in the new Member States, and remote and rural areas in the EU often still lack even basic Internet connections. They also have a slower take up of new technologies, increasing the digital divide between rural and urban areas.

The report also concluded that there are five main issues which need tackling to support social inclusion and regional cohesion in the context of the knowledge society, and in which government (the public sector) has an important role to play:[77]

[75] The existing research drawn upon to develop this section is referenced in Annex 1.18.

[76] ESDIS is the High Level Group of Member States' Experts on the Employment and Social Dimensions of the Information Society.

[77] European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206, p. 27: http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html

i) Coordinated public intervention at different levels – European, national, regional, local – as well as the constant commitment and synergy of the main relevant players: governments, private sector and civil society in its various forms, are still needed to ensure the evolution toward a more sustainable and inclusive knowledge society.

ii) The success of strategies for social and digital inclusion is largely dependent on a context-based approach, whereby targeted groups are considered within their geographical, social and cultural environment.

iii) Provision of adequate infrastructure and access to eServices – especially to underserved or remote areas and groups at risk of exclusion – is crucial for guaranteeing European standards of social inclusion and regional cohesion.

iv) Social inclusion and participation depends on the level of both general and digital literacy of users, as well as on the availability of (digital) content and services responding to their specific needs.

v) Although various policies and strategies have been implemented so far, their impact is not easily identified because of inadequate, or lack of, proper measurement, indicators and benchmarking.

Given some of these potential impacts of government on overall inclusion and cohesion, the specific roles of eGovernment can be articulated in support of this. A synthesis of the results of a number of reports and studies,[78] including the present one, shows that eGovernment has the potential to **support government in enhancing social inclusion and regional cohesion** by adopting a number of policies as follows.

1) Social inclusion policy

The main aspects of this policy which can be supported by eGovernment through better data collection, better performance measurement, improved decision-making and communication, and better coordination, are:

- Improved societal and economic policy-making, policy coordination and monitoring, including evidence-based policy-making, policies to encourage social integration, poverty reduction, support for households, families, child care, work-life balance, and communities.
- Improved policies for the labour market and converting undeclared work into lawful employment, supporting new forms of work organisation and greater diversity of contractual arrangements for workers and businesses, and better combinations of workplace flexibility with security, education / training / skills and work-place policies.

[78] European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206: http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html; Millard, J (2002) ""Regional development and cohesion in the European Information Society – a review", working paper, March 2002, Danish Technological Institute: http://www.beepregional.org.; Beep project, social inclusion and regional development domains: http://www.beepsocial.org and http://www.beepregional.org; PRISMA (2003d): http://www.prisma-eu.org; European Commission (2005f); and feedback from this study's questionnaires and consultations.

- Improved governance of society and the social realm, e.g. determining and supporting the role of different societal actors (public, private, civil), setting legal, institutional and investment frameworks, funding, regulation, and law-making.[79]
- Improving the design and implementation of policies for tackling the democratic deficit, the demand for more participation, openness, accountability, justice and transparency in society and in government.
- Focusing on equal opportunities, the ageing population, immigration, multi-ethnic and 'mosaic' communities, cultural diversity, increasing individualisation, the trend toward the wellness and leisure society, security and enlargement.
- Improved public sector policies and coordination of social protection, care, and health systems, human capital investment and education/training systems, etc.
- Improved ability of government to support the "everyday life processes of citizens", including "domestication" processes, the citizen's potential to influence technology and service innovation, and the blurring of boundaries between work and home, real and virtual, public and private, local/national/transnational spheres, etc.[80]
- Improved policies aimed at the overall population, e.g. policies for raising awareness and providing computer literacy, as well as access to common infrastructures of knowledge, such as the creation of public access points in libraries, community centres, cyber cafés; the provision of internet connection to all educational institutions, integration of ICTs in school curricula at all educational levels, and the development of *e*Learning and tele-education.
- Policies targeted at specific groups at risk of exclusion, such as younger people in situations of disadvantage, women, low-income, unemployed, retired, people, older citizens, etc.[81]
- Direct benefits to users, whether generally or in the specific targeting of certain groups, through appropriate and high quality eContent and eServices, such as greater transparency and access, time saved, money saved, increased convenience, greater participation and empowerment,[82] more satisfactory service fulfilment, improved digital/life skills and literacy, better experience of eServices embedded in everyday life,[83] etc.
- Strengthened EU level and cross-border initiatives.

[79] European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206, p. 13: http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html

[80] European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206, p. 16: http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html

[81] European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206, p. 13: http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html

[82] European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206, p. 11: http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html

[83] European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206, p. 17: http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html

2) Regional cohesion policy

The main aspects of this policy which can be supported by eGovernment through better data collection, better performance measurement, improved decision-making and communication, and better coordination, are:

- Improved regional and regional development policy-making, policy coordination and monitoring, including evidence-based policy-making, socio-economic and environmental development, transport, technology infrastructures, labour market, education / training / skills and work-place policies, and the interplay between local-regional-national-global strategies.
- Seeking and creating new sources of jobs in services to individuals and businesses, in the social economy, in countryside management and environmental protection and in new industrial occupations, partly through promotion of local growth and employment partnerships.
- Improved regional governance, e.g. determining and supporting the role of different regional actors (public, private, civil), setting legal, institutional and investment frameworks, funding, regulation, and law-making.[84]
- Policies targeted at specific regions or types of region which need tailored support, whether remote, rural, island, old industrial, high unemployment, environmentally degraded, etc.
- Direct benefits to regions, whether generally or in the specific targeting of certain regions, through appropriate and high quality eContent and eServices, such as greater transparency and access, higher quality, time saved, money saved, increased convenience, greater participation, and more satisfactory service fulfilment.
- Strengthened EU level and cross-border initiatives.

eGovernment research requirements for the social inclusion and regional cohesion policies:

– eGovernment at EU level (RT 15) – In order to have a continent wide and coordinated impact, for example through the workings and further enhancement of the EU's Information Society for All policies, the Structural Funds and the new i2010 initiative, as well as to enhance cross-border social and regional policies and impacts, greater eGovernment research is needed to support the EU-level impact of government social and regional policies.

– Innovative governance (RT 14) – Research is needed on how eGovernment can contribute to innovating the overall frameworks of government and governance, particularly in relation to social inclusion and regional cohesion policies, including political leadership. It focuses on change and innovation across the whole public sector. It should thus cover organisational learning, good practice, planning, foresight, roadmaps, decision- and (evidence-based) policy making, as well as governance structures and the role of the state, law, legal and regulatory aspects, and relations with the market and civil society.

[84] European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206, p. 13: http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html

– Cross-sectoral public services (RT 13) – Research is needed which examines the cross-sectoral aspects of all electronic public services and eGovernment. It should explicitly cover the relationships between sectors, including health, education, transport, social care and security, police and legal, environmental, housing, utilities, consumer protection, business support, social protection and care,, cultural and community support, etc., with eGovernment which in Europe is often narrowly treated largely as just eAdministration. This research should consider the cross-sectoral aspects and synergies in the public sector seen as a whole instead of segmented as is often the case.

3) Policy for measuring (e)government inclusion and cohesion effects – the use of measurement systems and benchmarks for the impact of eGovernment on social inclusion and regional cohesion.

eGovernment research requirements for measuring (e)government effectiveness:

– Evaluation and benchmarking (RT 16) – Research is needed on developing and deploying measures and benchmarks of the overall effects and outcomes of eGovernment at the specific objectives level, as well as overall evaluation frameworks and methodologies. The focus should be on measuring and understanding the ICT use process in the public sector, i.e. whether ICT is used appropriately or inappropriately to achieve the specific objectives. These include, for example, savings in time and money by citizens, less bureaucracy, more convenience, more efficient and lighter administrative procedures, easier and wider access to services by citizens regardless of who they are or where they live, service fulfilment experienced by citizens, more transparency and accountability, the quality and effectiveness of social and regional decision-making, more effective and holistic coordination between public sectors and services, greater inclusion and cohesion impact on the population as a whole as well as on specific groups, etc., and how these are evaluated and benchmarked.

5.3.3 Operational eGovernment objectives and research requirements

Government can support social inclusion and regional cohesion through, *inter alia*, ICT-enabled public services, for example the three flagship ICT initiatives on key social challenges proposed by the new i2010 Initiative.[85] First, the needs of the ageing society, addressing technologies for wellbeing, independent living and health. Second, smarter, safer and cleaner transport, the intelligent car, and addressing environmental and safety issues arising from increased road use. Third, cultural diversity, such as digital libraries making multimedia sources easier and more interesting to use. This will build on Europe's rich heritage combining multicultural and multilingual environments with technological advances and new business models.

Given the potential impacts of government on inclusion and cohesion described previously, the operational roles of eGovernment can be articulated in support of this. A synthesis of the results of a number of reports and studies,[86] including the present one,

[85] European Commission (2005) "i2010 – A European Information Society for growth and employment" Brussels, 1.6.2005, {SEC(2005) 717}, COM(2005) 229 final.

[86] European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206: http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html;

shows that eGovernment has the potential to **support government operations for social inclusion and regional cohesion** by adopting a number of policies as follows.

4) Service design and delivery policy

The main aspects of this policy which can be supported by eGovernment are:

- Greater trust and security within government and the value chain.
- Lower service delivery costs and better and more flexible service delivery and choice through user self-service, proactive services, intermediated services, etc.
- Improved supply chain and chain management.
- Improved Citizen Relations Management.
- Improved service content through PPPs and cooperation with the civil sector in eService design and delivery, including user and locality/regional inputs.
- Improved and more cost-effective coordination, burden- and facility-sharing, and common service design and delivery between different government levels, whether local, regional, national, EU.
- Better networked and coordinated (e)government for the greater diffusion of services and content,[87] taking account of the significant differences between central and peripheral, and urban and rural locations, the needs of local communities and the development of 'local nets',[88] supporting 'learning regions' and 'creative localities',[89] the interplay (opportunities and threats) between the local and the global, local networks and systems, the need for micro-eGovernment at local level,[90] and the fact that the vast majority of eInclusion initiatives take place at the local level.[91]

eGovernment research requirements for the service design and delivery policy:

– Trust and security (RT 11) – Research is needed to ensure trust and security in partnering with the private sector through PPPs and the civil sector and in designing better eGovernment services for citizens, particularly the tools, methods, technologies and policies of information assurance. Massive data transfers and exploitation between the public, private and civil sectors require sound data

Millard, J (2002) ""Regional development and cohesion in the European Information Society – a review", working paper, March 2002, Danish Technological Institute: http://www.beepregional.org.; Beep project, social inclusion and regional development domains: http://www.beepsocial.org and http://www.beepregional.org; PRISMA (2003d): http://www.prisma-eu.org; European Commission (2005f); and feedback from this study's questionnaires and consultations.

87 European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206, p. 11: http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html

88 European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206, p. 25: http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html

89 OECD (2001a) "Cities and Regions in the New Learning Economy" Education and Skills, Paris, http://www1.oecd.org/publications/e-book/9601021e.pdf.

90 European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206, p. 26: http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html

91 European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206, p. 24: http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html

protection based on legal, technical and institutional safeguards and standards. This includes network and data security, data protection, identity management, authentification, privacy, surveillance, and digital rights management (DRM).

- Multi-channel service design and delivery (RT 6) – Research is needed into how government services are designed and delivered to citizens within the context of a modernising public sector adopting ICT. By service design is meant the functionalities and formats adopted, whether using ICT directly or indirectly. By channel is meant different infrastructures, platforms and interfaces, i.e. the delivery media used in government service delivery to citizens. Regardless of the type of citizen, this research should cover the fact that 'e' is just one channel for delivering government services and is unlikely to completely replace other channels, like face-to-face, post or telephone, but rather will complement and support them. The 'e' channel can thus become the backbone or infrastructure for all channels regardless of which channel is actually experienced by the citizen, thereby improving both the internal and external quality and scope of any service.
- Networked, multi-level and coordinated eGovernment and services (RT 5) – Research is needed on the networking, coordination and cooperation required between and within the different jurisdictions of the public sector itself for the purposes of service supply and delivery to citizens and the civil sector, and particularly between different levels of government: national, regional and local, as well as cross-border services. It should also covers coordination between different public sector entities at the same level for the purposes of such service supply and delivery, such as local authorities within a region. Features here include middle offices, shared services and service centres, localised front-end services built on shared back end architectures, etc.
- Value chains, service design and delivery models (RT 4) – Research is required into eGovernment delivery models for citizens and their business case. Special focus should be on partnership, cooperation or coordination between the public sector and the private and civil sectors, i.e. different actors along the value chain for designing and delivering services to citizens, and ensuring that the appropriate type of content and services are developed. It also focuses on the creation and design of public sector information content, such as MIS, GIS and similar, through value-adding knowledge, with a public benefit. On the production side it includes PPPs, procurement and outsourcing for design, financing and roll-out. On the distribution side it includes the roles of private and civil sector intermediaries, such as banks, garages, shops, civic organisations and community or family individuals. Such delivery models are not only economic, but also organisational, legal and political.

6) Service use policy

The main aspects of this policy which can be supported by eGovernment are:

- Improved provision of eContent and eServices, especially those supporting citizens and social inclusion and regional cohesion.
- Increased quality, comprehensiveness and outreach of these eServices.

- Improved access to different (technology) channels, including broadband and PIAPs where necessary.[92]
- Increased take-up and use of eServices by citizens and regions based on differential targeting and marketing, and improved benefits experienced by citizens and regions.
- Better tailored content, services and systems for specific socio-economic groups delivered by on-line services, especially as such different groups seem to experience different evolutionary paths to (e)inclusion and (e)cohesion, so that differences due to gender and age narrow quite quickly, whereas differences due to income and educational seem to persist.[93]
- Improved citizen satisfaction and confidence in open, transparent and accurate e-supported systems
- Greater trust, security and safety for citizen users through e-supported systems.

eGovernment research requirements for the service provider policy:

– Trust and security (RT 11) – Research is needed to ensure trust and security between government and citizens and the civil sector as users of government services, whether these be direct services or framework services conditioning the social or regional environment in which they live and work, particularly the tools, methods, technologies and policies of information assurance. Massive data transfers and exploitation between the public and private and civil sectors require sound data protection based on legal, technical and institutional safeguards and standards. This includes network and data security, data protection, identity management, authentification, privacy, surveillance, and digital rights management (DRM).

– eDemocrcay and eParticipation (RT 9) – Research is required in the areas of eDemocracy, eParticipation, eEngagement, eConsultation, eInvolvement, eVoting and eReferenda, as well as community, social and informal networking. This should include the power relations between citizens and government, how to make government more transparent, open, responsive, free from corruption and unnecessary bureaucracy, freedom of information, dialogue, discourse and democratic decision-making. It can also encompass new forms and structures of democracy and democratic representation, including empowerment and the balance of powers, rights and responsibilities.

– Socio-economic inclusion (RT 8) – Given the two broad approaches recommended in the 2005 eInclusion report,[94] i.e. aimed at the overall population (covered by RT 7) and the need to target specific groups at risk of inclusion, research is needed which specifically focuses on those individuals or groups of users who are disadvantaged in some way, and who are thus (potentially) beyond the so-called ‘digital divide’. Such users could include the disabled, the elderly, the poor, inhabitants of inaccessible

[92] European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206, p. 27: http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html

[93] European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206, p. 12: http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html

[94] European Commission (2005) "e-Inclusion revisited: the local dimension of the information society", DG Employment, SEC(2005)206, p. 13: http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html

locations, minority groups, etc. In other words, all users who require deliberate and special consideration or help in order to ensure that they can access and exploit services, which 'mainstream' users otherwise enjoy. Included here is therefore design-for-all, inclusion, assistive technology, combating exclusion and the digital divide, and so-called universal service and access. These groups are disadvantaged in that government has to think about specific ways to support them given that the normal offerings provided by the public sector, or by the market, may not, or may be slow to, offer support.

– Understanding user needs (RT 7) – Research is required into the direct needs or demands of citizens and civil users, whether as individuals, families, households, communities, civil sector organisations, NGOs, etc., or within specific localities or regions. This should cover citizen relationships with government, user skills, expectations and activities in relation to public services, including understanding different types of citizens/civil organisations and their characteristics and situations which will contribute to determining which channel mix they need and how they are to be used. This includes the context of use, service initiation and control, the delivery environment, service visibility/findability, utility/usefulness, access/availability, and service quality and fulfilment in relation to the specific citizen user or group.

6) Policy for measuring (e)government operational support for inclusion and cohesion – the use of measurement systems and benchmarks for the operational performance and quality of eGovernment systems, services, organisations, etc., in support of eGovernment specific objectives related to social inclusion and regional cohesion.

eGovernment research requirements for operational support for inclusion and cohesion:

– Quality and performance management and monitoring (RT 12) – Research is needed on developing and deploying the operational level measurement of quality and performance. The focus should be on measuring and understanding the ICT conversion process in the public sector, i.e. how ICT expenditure and implementation result in the achievement of operational objectives through ICT management and conversion activities. This includes measuring service qualities, citizen satisfaction and preferences, internal government operations, processes and performance, and technical and data reliability and quality (errors, failures), and the evaluation and testing of these. It can also cover hard-, middle- and software systems, processes and services, their availability, quality and performance as experienced by both government and citizens, and how they are organised, managed and monitored.

5.3.4 eGovernment research recommendations

The social inclusion and regional cohesion policy dimension is relatively complex and comprehensive, especially the regional development component which can also include regional economic issues. It is thus relatively difficult to link directly to specific roles and actions of (e)government, and a large number of the eGovernment research themes have some role to play in supporting these policies. However, by breaking up the policy

area into its sub policies, as described above, particular research requirements can be more easily ascribed to each one, as well as showing that there is considerable overlap.

The table at the beginning of section 5.3 summarises the research requirements for the inclusion and cohesion policy area and the recent and recommended future status of each research theme. This shows that there are a number of gaps between the recent research being carried out in Europe and by the EC and the research required to fully support the EU's 2010 policies.

Two main dimensions of such a re-focusing are recommended. Firstly, greater effort on research at the specific objective and the general EU objective levels is necessary in order to be better tuned to EU policies (which is the purpose of the present study). This means a more directive, top-down and policy-driven research policy is required which analyses the specific links (both direct and indirect) between eGovernment, government and EU policies, and is able to feed this back into the design and development of such policies, as well as into research policy itself. Until there is a much better understanding of how government and eGovernment can contribute to public value and the main EU policy goals, much research will continue to be risky and arbitrary from this perspective.

Second, the specific research in support of the operational objectives level is also extremely important, especially which supports the outward-facing aspects of eGovernment (user needs, socio-economic inclusion and eDemocracy). Research at the interface between government and citizens is also important, including ensuring the development and delivery of appropriate content, services and citizens, that relevant channel mixes are available, and that government itself is networked, coordinated and joined-up. In addition, trust and security need continued, if not further emphasis, as an essential theme linking governments and citizens. Some research is also essential into measurement and benchmarking at all objectives levels, although in relative terms, this can be downgraded somewhat.

5.4 Quality of life, welfare, social security and consumer protection

5.4.1 General EU objectives and research requirements

According to the Consolidated Version of the Treaty Establishing the European Union, EU policies in this area are supposed to "contribute to protecting the health, safety and economic interests of consumers, as well as to promoting their right to information, education and to organise themselves in order to safeguard their interests" (TEU, Article 153.1). Furthermore, Article 152.1 refers to the need for all Community policies to define and implement a "high level of human health protection", which is related to the Quality of Life.

The European Commission's Directorate General for Research carried out a programme of research into Quality of Life and Management of Living Resources in the Fifth Framework Programme. This research programme focused on the following key actions:

- Food, Nutrition and Health
- Control of Infectious Diseases
- The "Cell Factory"

Overview of eGovernment research requirements for quality of life, welfare, social security & consumer protection policy

X Research themes necessary to achieve the policies in question

Questionnaires: future recommended effort		Recent Europ deploy-ment [95]	Recent Europ strength [96]	*Questionnaires & content analysis: recent effort*				*General EU objectives* **Policies for quality of life, welfare, social security & consumer protection**	*eGovernment specific objectives* **Policies to support government in enhancing quality of life, welfare, social security & consumer protection**					*eGovernment operational objectives* **Policies to support government operations for quality of life, welfare, social security & consumer protection**			
Non-European	Europe			Non-European	$E^{97}C$	*Europe* [98]	*Research Themes*		1. Improving health protection policy	2. Harmonising social security policy	3. Developing environ-mentally sustainable transport policy	4. Improving living conditions policy	5. Policy for measuring (e)government quality of life, etc., effects	6. Internal performance policy	7. Service design & delivery policy	8. Service use policy	9. Policy for measuring (e)government operations to support to quality of life, etc.
2%	7%	1	✓	3%	2%	2%	17. Public value creation	X									
3%	3%	2	✓✓	3%	4%	4%	16. Evaluation & benchmarking						X				
0%	2%	1	✓✓✓	1%	2%	2%	15. eGov at EU level		X	X	X	X					
1%	7%	1	✓	1%	1%	3%	14. Innovative governance			X		X					
8%	5%	1	**0**	9%	2%	1%	13. Cross-sectoral services		X		X	X					
3%	1%	2	✓✓	4%	4%	5%	12. Quality & performance										X
9%	8%	3	✓✓	5%	9%	9%	11. Trust & security								X	X	
1%	1%	3	✓✓	4%	5%	3%	10. Open source										
5%	10%	3	✓✓✓	3%	8%	8%	9. eDemocracy										
8%	7%	2	✓✓	1%	4%	2%	8. Socio-economic inclusion									X	
10%	11%	3	✓	6%	10%	6%	7. User Needs									X	
11%	4%	2	✓	5%	1%	6%	6. Multi-channel										
7%	8%	2	✓	6%	4%	5%	5. Networked government								X		
9%	9%	3	✓	10%	14%	11%	4. Value chains								X		
7%	6%	2	✓✓✓	6%	1%	6%	3. Change in public sector		X								
5%	5%	3	✓	14%	11%	10%	2. Integration & interoperability		X								
11%	6%	4	✓✓	19%	18%	17%	1. Data & knowledge managemnt										
100%	*100%*			*100%*	*100%*	*100%*											

[95] Current European research deployment, scored from 1 to 4 for increasing progress towards deployment of research results (see Annex 10).
[96] Current European strength in relation to coverage of research scope, content and research challenges: **0** is very low, ✓ low, ✓✓ strong, ✓✓✓ very strong (see Annex 9.2).
[97] Research funded by the EC's DG Information Society and Media only, during the 5th and 6th IST Framework Programmes and through the Modinis Programme
[98] All European research, including that funded by the EC's DG Information Society and Media.

- Environment and Health
- Sustainable Agriculture, Fisheries and Forestry, and Integrated Development of Rural Areas including Mountain Areas
- The Ageing Population and Disabilities[99]

Many of these areas are concerned with the impact of science on health and our environment. For an improvement in the quality of life for future generations, consideration of environmental issues must be raised, as was noted by the Göteborg European Council Presidency Conclusions of 2001,[100] and reinforced by the Mid-term review of the Lisbon Strategy in March 2005 at the Brussels European Council.[101]

In April of 2005, the European Commission launched a joint programme for health and consumer protection, linking together Articles 152 and 153 of the TEU).[102] This initiative attempts to carry out objectives present in other policy areas in this study, namely bring citizens closer to the EU (see Policy Area 4) and enhance the competitiveness of the EU (see Policy Area 1). By combining the two, the Commission has recognised that these two aspects are different sides of the same coin – that of Quality of Life.

Social Security is a European Community competence (Article 137), and according to the Lisbon Strategy priorities agreed in March 2000, modernising social protection is one of the key aims driving Europe's vision to become a competitive and dynamic knowledge-based economy. The renewed Lisbon Agenda sees: "Jobs, Growth, the Environment, and a Proper Social Network" as the keys for Europe's future.[103]

The welfare of Europe's citizens is of crucial importance to the broader EU goals and visions for 2010, which include the development of a healthy working force, and an environmentally sustainable Europe: all of these contribute towards a socially stronger European Union.

The competencies as outlined in the Consolidated Treaty, promote a European Union which considers the model of Europe to be one that contains social elements. The fact that one of the continued main aims of the European Union is to further develop the Single European Market reveal that more than economic and market considerations lie behind this approach: rather than a Europe that only considers market-based issues from a traditional neo-liberal perspective, the Internal Market focuses upon the two concepts of competitiveness and citizenship. Citizenship (as described in another policy area) also takes issues such as the quality of life into consideration.

From this outline of the policy area, a few key issues can be raised, in which EU policies and policy makers can contribute towards improving the EU. They are:

[99] http://www.cordis.lu/life/, accessed September 4, 2005.
[100] http://ue.eu.int/ueDocs/cms_Data/docs/pressData/en/ec/00200-r1.en1.pdf, accessed September 4, 2005
[101] Relaunching the Lisbon Strategy: a partnership for growth and employment (Mid-term review of Lisbon Strategy", Presidency Conclusions, 22-23 March 2005, European Council, Brussels, DOC/05/1)
[102] European Commission (2005) *Healthier, safer, more confident citizens: a Health and Consumer protection strategy. Proposal for a Decision of the European Parliament and of the Council establishing a Programme of Community action in the field of Health and Consumer protection 2007-2013*, Brussels. COM (2005)115
[103] http://europa.eu.int/growthandjobs/index_en.htm, accessed September 1, 2005.

- Improving health protection, including biotechnology research, providing information and education on health and consumer issues.
- Harmonising social security and ensuring mobility of individuals and retail services.
- Developing environmentally sustainable means of transport, working, and learning.
- Improving living conditions.

eGovernment research requirements for the general EU objectives level:

- Public value creation (RT 17) – Research impact of eGovernment and other ICT developments on the quality of life, welfare of workers and consumers (as well as citizens) needs to be further developed. There is a missing link between the development of services and the study of their uptake and subsequent impact. Due to the early phases of most eGovernment activity, this is to be expected, but by 2010, research should be carried out to work towards a greater understanding of how eGovernment can be used to provide a positive impact on the broader policy goals mentioned above.

5.4.2 Specific eGovernment objectives and research requirements

In the recently published i2010 initiative, several flagship ICT initiatives have been identified as one way to show the connection between the Information Society and improvement of the quality of life of European citizens. These concern 'the needs of the aging society', 'safe and clean transport', and 'cultural diversity'.

Regarding this policy area, several generic activities can take place that will encourage sharing of information, which will inevitably promote learning and implementation of better policies at the EU level.

This can be the development of new collections of data, which were difficult if not impossible to gather at the EU level before the introduction of large databases with complex processing power. Similarly, harmonisation, or semantic interoperability, of existing datasets currently available in many member states can also take place now. Public administrations can continue to connect together at various levels to ensure that information regarding health and welfare of citizens can be disseminated, and action can be taken to ensure that information is used to achieve the general objectives described above.

Indicators have been developed in a research project carried out by a consortium funded by the European Commission to identify quality of life, defined by the research consortium as: "immaterial aspects of the living situation like health, social relations or the quality of the natural environment."[104] In both helath and consumer protection, similar types of policymaking tools are used, namely "information to citizens, consultation of stakeholders, mainstreaming activities, risk assessment".[105]

[104] Argyle, M. "Subjective Well-Being", in Offer, A. *In pursuit of the quality of life*, Oxford, UK, Oxford University Press, January 1997, pp. 18-45.

[105] European Commission (2005) *Healthier, safer, more confident citizens: a Health and Consumer protection strategy*, Brussels. COM (2005)115: p. 2

These can be further developed using data collected by various administrations and statistical bodies in a networked manner. This will enable measurement of quality of life across the EU: common systems can be built to ensure that the statistics generated are comparable across the EU.

Work should be carried out in this area to link up different sectors that relate to the policy area: for example, education and employment, or environment and health. These are already apparent in national contexts, such as in the UK government's 'Learning Grid' and 'University for Life' initiatives, and sharing best practice amongst the relevant partners would be useful.

IDABC's TESTA network is already in application across many policy sectors that contribute towards quality of life and welfare such as pharmaceutical information, and there are intentions to increase this to including social security as well (Interview with Commission staff, July 2005). In terms of use of public administration networks, Europe-wide use of TESTA can be far broader in terms of shared information in different sectors, depending upon political decisions taken at the General Objectives Level.

Innovative methods of governance, can also be developed using new methods of communication that are afforded by application of existing and emerging technologies. The concerns here are mainly legal, requiring regulatory changes to take place.

Specifically, the areas identified as general objectives of EU policies and the relationship to eGovernment are described below. All the research themes 13-16 are covered in these descriptions, with a focus on RT15, eGovernment at the EU level for this particular area.

1) Improving health protection policy and information and education relevant to health and consumer issues

Firstly, in improving health protection, the European Commission has a couple of highly specific roles: alongside public health legislation in relation to "the safety and quality of blood, blood derivates, human tissues and human cells used in medical treatments", the Commission's role is also "to help EU countries pool their expertise on health, to identify and share best practice and to help coordinate the EU wide response to health threats such as infectious disease outbreaks. Fostering cooperation between EU countries' healthcare systems is also becoming an increasingly important area of activity."[106] In terms of consumer protection, this relates to the need to disseminate consumer-related information to as many citizens as possible.

As this policy area is an agreed area of common interest for EU institutions and member states alike, there is a clear opportunity for interaction between all levels of government and policy making. The sharing of information across the EU is given a high standing in this field, and is precisely one area in which public administrations can make use of computer networks and their associated applications. Already, the IDA programme has

[106] http://europa.eu.int/comm/dgs/health_consumer/publichealth.htm, accessed September 5, 2005.

linked together national administrations in at least three projects in the health sector: EUPHIN, EUDRA, and REITOX.[107]

2) Harmonising social security policy and ensuring mobility of individuals and retail services

The Commission proposal for a Council Decision on a joint health and consumer programme for 2007-2013 highlights the need to ensure that retail services are fully operational in a Single European Market.

At the end of 2004, a proposed plan of action was agreed by the Administrative Commission on Social Security for Migrant Workers (unpublished Plan of Action: source: Commission interviewee, July 2005). This plan of action outlined a manner of intensifying data exchange between social security institutions across the EU. It is hoped that a system could be developed that will reduce the need for lengthy – in some cases up to eight year – disputes over the rights of individuals working and residing in, or originating from, different countries in the EU (Commission official interview, July 2005). This is one example of how eGovernment can be used to harmonise social security systems, or at least make them interoperable so that action towards ensuring complete mobility (and mobility of the social security) of individuals can take place at the European level. In terms of welfare and social security, the EU's general objectives would continue to benefit from further development of the implementation of IDABC (as recognised at the political level by the legislation converting the original IDA programmes into IDABC).

3) Developing environmentally sustainable means of transport policy

The quality of life of European citizens and residents can be improved by developing environmentally sustainable means of transport, working practices, and learning spaces which do not place extra strain on either individuals or the world's scarce resources. eGovernment can contribute towards this by providing new learning and working environments, and simulations of transport networks in the early phases of policy making. One of the i2010 flagship ICT initiatives considers the development of a 'smarter, safer, and cleaner' intelligent car, "addressing environmental and safety issues arising from increased road use".[108]

4) Improving living conditions policy

An improvement in living conditions can be made through better simulation of future scenarios for demographic change, impact of urban developments, etc.. One of the i2010 flagship ICT initiatives for improving the quality of life will concern caring for people in an aging society, which addresses technologies for wellbeing, independent living, and health.[109]

Much of the research to be carried out in this domain will take place also at the operational objectives level, particularly in terms of improving the front-office.

[107] European Commission, Concerning the Evaluation of the IDA Programme and a Second Phase of the IDA Programme. COM(97)661 final. Brussels.
[108] i2010, p.11.
[109] i2010, p.11.

eGovernment research requirements for the specific objectives level:

- eGovernment at EU level (RT 15) – Research into the implementation of sharing information at the EU level would be necessary to ensure that systems developed on a Europe wide basis are actually compatible with existing national systems, and do not exceed the limitations placed within the Treaties of EU and the mandate of the European institutions.
- Innovative governance (RT 14) – Research is needed on how eGovernment can contribute to innovating both the links and integration across the whole of government in order to support a 'whole of life' philosophy for citizens, and to ensure that new approaches to, and understandings of, quality of life are developed. It should thus cover organisational learning, good practice, planning, foresight, roadmaps, decision- and (evidence-based) policy making, as well as governance structures and the role of the state, law, legal and regulatory aspects, and relations with the market and civil society.
- Cross-sectoral public services (RT13) – one way in which eGovernment can contribute to this policy area is to enable harmonisation of interaction between different departments in public administrations, to ensure that citizens are given efficient and effective service.

5) Policy for measuring (e)government quality of life, etc., effects – the use of measurement systems and benchmarks for the impact of eGovernment on quality of life welfare, social security and consumer protection, at the specific objectives level

eGovernment research requirements for measuring (e)government effectiveness on quality of life, etc, at the specific objectives level:

– Evaluation and benchmarking (RT 16) – In the areas of Health and Consumer Protection, measuring tools have been developed to a fairly high level and continue to be refined. The Eurobarometer tool provides for surveys on specific consumer and health issues when requested, and a specific tool for consumer satisfaction has been proposed by a research team working for the European Commission.[110] However, these instruments can be complemented by a greater understanding of the methodologies being developed in the eGovernment environment.

5.4.3 Operational eGovernment objectives and research requirements

Clearly, given the high level political ambitions outlined in this policy area, there is a connection between several of the research themes outlined in this study and the proposed policy area.

Taking each general objective one step further, and bearing in mind the specific objectives described above, we are able to develop our description of the operational objectives, which form the 'nuts and bolts' of the eGovernment. These can be described systematically in terms of the research map described in a previous chapter of this study.

[110] INRA and Deloitte (2005) *Development of indicators on consumer satisfaction and Pilot survey: final report*, Brussels: European Commission. Available from http://europa.eu.int/comm/consumers/topics/consumer_satisfaction_final_rep_en.pdf. Accessed September 12, 2005.

6) Internal performance policy (back-office efficiencies)

- Increasing efficiency through sharing data and information between public administrations.
- Harmonising data management systems.
- Understanding the effect of implementation of new forms of change.

eGovernment research requirements for internal performance policy

- Integration and interoperability (RT 2) – Sharing data and information is essential to all aspects of eGovernment in the EU, and therefore presents a major research challenge in almost every policy area. However, in this area, which considers quality of life, welfare, Social Security systems and Consumer Protection, there is a lack of research in this area, according to the survey carried out in an earlier phase of our research. In terms of health protection, we have seen that one of the major tasks at the EU level is to ensure that information is shared across the EU. This creates a need for shared information systems which are capable of dealing with diverse sets of information that are interoperable. The challenges in implementing eGovernment here (and therefore the research challenges) revolve mainly around the idea of developing interoperable systems that allow different parts of public administration to interact with each other. These are, in the main, regulatory challenges, although technical and technological systems can be developed that will help ease the pressures on regulatory and institutional change. This could include some sort of Digital Rights Management system which enables various departments at different levels only to view the information essential to their activity, thereby not compromising the individual's privacy.
- Change in the public sector (RT3) – Given the general objectives clearly state that social security systems should be harmonised, this not only requires integration in technical terms, but also a change in the organisational framework outlined in RT3 (interview with Commission official). This will facilitate smooth operation of the systems that are put in place, and needs to be done before systems are developed to ensure that the systems will be efficient and effective.

7) Service design and delivery policy

Design and delivery of services for improving this policy area should include the following considerations:

- Linking departments and administrations to improve efficiencies in citizen interaction with government.
- Constant management and evaluation within the process of change and implementation of new systems and applications.

eGovernment research requirements for service design and delivery policy

- Trust and security (RT11) – security of information is a key concern for public administrations, particularly in the domain of social security, where information is confidential and highly sensitive for individuals. Public administrations cannot allow for any vulnerability of personal data of its citizens. Therefore, the security element of this research theme is paramount for public administrations.

- Networked, multi-level eGovernment and services (RT5) – Following on from understanding how to effect change in the back offices, there is a need to work towards making governmental departments at all levels work together to ensure that the general objectives in this policy area are met. This must be done without prejudice to the legal and ethical rights of individuals.
- Value chains (RT4) – one aspect of improving the quality of life not included in RT8 is the need to ensure that value chains are established that ensure that all socio-economic groups are supported in their interaction with public administration. Sometimes, this can include the need for intermediaries, and the precise role of intermediaries should be understood in this context.

8) Service use policy

Use of services for improving this policy area should taking into consideration the following aspects of the policy area:

- Taking into consideration special needs of certain socio-economic groups.
- Dealing with the users' needs.

eGovernment research requirements for service use policy

- Trust and security (RT11) – trust in the systems that provide eGovernment services to users is vital if uptake is to be high. This is related to confidence of users in the systems that are used by public administrations.
- eGovernment for socio-economic inclusion (RT8) – These changes in public administrations can be further augmented with research into how to understand the end users' needs. RT8 is of vital importance here as most eGovernment for welfare and social security is intended to make public services easier to access for those citizens who require the most attention, and it is for these who services should be designed.
- Understanding individual users' needs (RT7) – Services should not only focus on special socio-economic groups, where specific applications may need to be developed, but on the general user interface between users and providers. Individual users' needs need to be taken into consideration.

9) Policy for measuring (e)government operational support for quality of life, etc. – the use of measurement systems and benchmarks for the operational performance and quality of eGovernment systems, services, organisations, etc., in support of eGovernment specific objectives related to quality of life, welfare, social security and consumer protection.

eGovernment research requirements for operational support for quality of life, etc.:

- Quality and performance management and monitoring (RT12) – As has been recognised through conversations with practitioners, many of the challenges to successful implementation of eGovernment applications lie in the regulatory, legislative, and organisational frameworks that govern the limits of EU-level activity. Therefore, monitoring and performance management, to ensure that citizens are

receiving high levels of service post-eGovernment implementation, must be put in place.

5.4.4 eGovernment research recommendations

The diversity of this policy area leads to a variety of different application of eGovernment policies. In turn, the recommendations for this area are therefore wide-ranging. They focus on the key areas of the EU policies of health and living quality improvement, welfare, and social security harmonisation. Specifically, this requires work to be carried out at the European level in a far more consistent manner, as required for efficient functioning of the four fundamental freedoms as enshrined in the Treaties of European Union and the European Community. It also would benefit from greater cross-sectoral work being carried out at the EU and national and regional levels, due to the fact that this policy area crosses many traditional boundaries in our traditional understandings of the workings of public administrations.

The table at the beginning of section 5.4 summarises the research requirements for the quality of life policy area and the recent and recommended future status of each research theme. This shows that there are many gaps between the recent research being carried out in Europe and by the EC and the research required to fully support the EU's 2010 economic policies.

In this policy area, although there are many aspects of research which can be undertaken in improving usability of interfaces between public administrations and citizens, the focus of attention at the operational level is given to service design and back-office developments that can be researched to help accomplish the goals as stated in the general objectives.

Back office improvements, as suggested through the desk research and in consultation with interviewees, can be carried out in terms of integration and interoperability, with the specific aim of achieving. interoperability, both at the semantic and the systems level, across the EU. The changes that need to be implemented are not just technical, but also consider legal and regulatory challenges, which, in the back-office can be examined by researching into change in the public sector.

Services can be developed which work across all levels of government and public administration, therefore facilitating the citizen's interaction with public administration; these services should also focus on being inclusive and responding to the needs of individual citizens and their proxies (or intermediaries).

5.5 Citizenship and EU citizenship

5.5.1 General EU objectives and research requirements

Citizenship in the European Union is a contested concept by lawyers and policy analysts alike, but there are specific attributes that can be accorded to the vision for European Citizenship, brought into existence with the completion of the Maastricht Treaty in 1993.

The EC Treaty accords **certain rights to EU citizens**, such as the:[111]

- freedom of movement and the right of residence within the territory of the Member States;
- right to vote and stand as a candidate at elections to the European Parliament and at municipal elections in the Member State of residence;
- right to diplomatic and consular protection;
- right of petition to the European Parliament; and
- right to refer to the Ombudsman.

Within these rights accorded to nationals of the EU's member states, a whole host of policy issues arises, such as the movement of citizens across the EU. These have consequences for policy at both the national and the European level.

The Treaty of Amsterdam (1997) arguably took some of the first concrete steps towards recognizing the importance of security and justice at the European level with the introduction of a new title headed: "Visas, asylum, immigration and other policies related to free movement of persons" into the Treaty establishing the European Community.[112] In Tampere in 1999, the European Council agreed to further develop the idea of a European Union of freedom, security, and justice.[113] The conclusions of the European Council meeting there drew out the fact that the EU is based on a "shared commitment to freedom based on human rights, democratic institutions and the rule of law."[114]

Citizenship is also emerging as a complex array of linkages between local, national, and (in Europe) European institutions, to which some or many or all citizens may feel an affinity. Outlining citizenship goals for the EU is not as simple as setting out a series of rights; there is also an institutional aspect to take into consideration: **democratic institutions and their impact on society**.

One of the fundamental criteria for membership of the EU is the existence of a set of democratic institutions. Democratic improvement is therefore an essential part of the EU's vision and mandate, and will continue to be an aim after 2010. Building better governance, and giving citizens a greater understanding and share of the decision making process is crucial to developing the role of citizens in Europe (cf. White Paper on Governance). This is particularly apparent at the EU level, where discussions on the democratic deficit in the EU have been apparent for many years.

[111] Source: http://europa.eu.int/youreurope/nav/en/citizens/factsheets/eu/eucitizenship/eucitizenship/en.html, accessed September 1, 2005.
[112] http://europa.eu.int/scadplus/leg/en/lvb/a11000.htm, accessed September 10, 2005.
[113] http://europa.eu.int/council/off/conclu/oct99/oct99_en.htm, accessed September 9, 2005.
[114] http://europa.eu.int/council/off/conclu/oct99/oct99_en.htm, accessed September 9, 2005.

From this outline of the policy area, a few key issues can be raised, in which EU policies and policy makers can contribute towards improving the EU. They are:

- Improving the relationship between represented and representatives.
- Providing information to ensure citizens are aware of the complete set of political institutions, and the possibilities available to them for having an impact on the decision-making process.
- Improving the democratic process within the EU institutions and all its constituent parts, which also looks at how a European identity can be developed.[115]

eGovernment research requirements for the general EU objectives level

- Public value creation (RT 17) – In order to create a policy area focused on the relationship between citizens and their institutions, there is a need to focus on democratic and legal issues relating to human and individual rights and freedoms: furthermore, in Europe, this needs to look at such issues as mobility of individuals. As well as this, the relationship between citizens and political institutions needs to be further developed, and a greater awareness of the use of new technologies in society needs to be developed so that the institutional response can be more effective.

[115] See, amongst others, Proposal for a DECISION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing for the period 2007-2013 the programme "Citizens for Europe" to promote active European citizenship, COM (2005) 116, 6 April 2005, p. 2.

Overview of eGovernment research requirements for citizenship and EU citizenship policy

X Research themes necessary to achieve the policies in question

Questionnaires: future recommended effort		Recent Europ deploy-ment [116]	Recent Europ strength [117]	*Questionnaires & content analysis: recent efffort*				*General EU objectives* **Policies for citizenship and EU citizenship**	*eGovernment specific objectives* **Policies to support government in enhancing citizenship and EU citizenship**				*eGovernment operational objectives* **Policies to support government operations for citizenship and EU citizenship**		
Non-European	Europe			Non-European	*EC[118]*	*Europe [119]*	*Research Themes*		1. Improving relations between represented & representative policy	2. Providing information policy	3. Improving the democratic process policy	4. Policy for measuring (e)government (EU) citizenship effects	5. Enabling environments for participa-tion (service design & delivery policy)	6. Encouraging active citizenship (service use policy)	7. Policy for measuring (e)government operations to support (EU) citizenship
2%	7%	1	✓	3%	2%	2%	17. Public value creation	X							
3%	3%	2	✓✓	3%	4%	4%	16. Evaluation & benchmarking					X			
0%	2%	1	✓✓✓	1%	2%	2%	15. eGov at EU level			X	X				
1%	7%	1	✓	1%	1%	3%	14. Innovative governance		X		X				
8%	5%	1	**0**	9%	2%	1%	13. Cross-sectoral services		X	X	X				
3%	1%	2	✓✓	4%	4%	5%	12. Quality & performance								X
9%	8%	3	✓✓	5%	9%	9%	11. Trust & security						X		
1%	1%	3	✓✓	4%	5%	3%	10. Open source							X	
5%	10%	3	✓✓✓	3%	8%	8%	9. eDemocracy							X	
8%	7%	2	✓✓	1%	4%	2%	8. Socio-economic inclusion								
10%	11%	3	✓	6%	10%	6%	7. User Needs								
11%	4%	2	✓	5%	1%	6%	6. Multi-channel								
7%	8%	2	✓	6%	4%	5%	5. Networked government						X		
9%	9%	3	✓	10%	14%	11%	4. Value chains						X		
7%	6%	2	✓✓✓	6%	1%	6%	3. Change in public sector								
5%	5%	3	✓	14%	11%	10%	2. Integration & interoperability								
11%	6%	4	✓✓	19%	18%	17%	1. Data & knowledge managemnt								
100%	*100%*			*100%*	*100%*	*100%*									

[116] Current European research deployment, scored from 1 to 4 for increasing progress towards deployment of research results (see Annex 10).
[117] Current European strength in relation to coverage of research scope, content and research challenges: **0** is very low, ✓ low, ✓✓ strong, ✓✓✓ very strong (see Annex 9.2).
[118] Research funded by the EC's DG Information Society and Media only, during the 5th and 6th IST Framework Programmes and through the Modinis Programme
[119] All European research, including that funded by the EC's DG Information Society and Media.

5.5.2 Specific eGovernment objectives and research requirements

The European Commission's White Paper on Governance[120] outlined a couple of areas where ICT-based tools and technologies could provide a positive impact on the governance of the EU, some of which have already been implemented to a degree. These have been translated into a very small number of activities at the European Commission level, including the Interactive Policy Making (IPM) tool, and the CONECCS database.

In essence, this policy area is about creating a European Union that focuses on improving the relationship between governors and governed – it is about creating an EU that concentrates on building better governance.

In this area, eGovernment has many possibilities for supporting this change in relationships. Many different applications can be used to facilitate communication between citizens and institutions, including interactive websites, discussion fora, multimedia guides etc. Most of these are not technological or technical in nature, but concern the role of regulations and laws, and institutional change.

Examining each general objective in turn, we are faced with a list of policies that need to be pursued in order to achieve success in this policy area.

1) Policy for improving the relationship between represented and representatives

Democratic representation as a political process is constantly evolving, and therefore the relationship between citizens and their representatives is subject to change. The impact of new communications technology on the role of politicians is now beginning to evoke widespread recognition that politics and politicians must change their approach to those who they represent. The challenges are many: there is an overall need to better understand how governments and public administrations can govern effectively in the face of the challenges of globalisation and demographic change within societies.

Although at the European level, there is little activity or intervention in the democratic processes that take place at the national level, a common set of experiences is being shared by all politicians in Europe and beyond. Therefore, a sharing of knowledge and practices in various countries can be considered useful at the European level.

2) Policy for providing information to ensure citizens are aware of the complete set of political institutions, and the possibilities available to them for having an impact on the decision-making process

One of the crucial challenges for modern democracies and other political institutions is the dissemination of information regarding the policy-making process. This can be general information regarding the role of political institutions and also concerning specific policy areas, where the consultation process is of crucial importance.

[120] European Commission (2001g).

The European Commission is responsible for the "largest public website in the world", and has recognised that it needs to develop from being a website based on the institutional structure of the EU to one that is centred around thematic topics.[121]

Concerning building better governance, there is a need to ensure that policies that are implemented are appropriate and relevant to the societies in which they are developed. This is more about developing new methods of governance, which can utilise new ICTs to help facilitate their development. This can concern, for example, the development of new ways of setting political agendas, by using ICTs to collect data from different intermediary organisations which then package and provide information to public administrations in a way which enables a prioritisation of political activity. This passive form of interactive policy making was attempted by the European Commission through use of its European Business Test Panel and, more generally, the IPM Feedback tool.[122]

3) Policy for improving the democratic process within the EU institutions and all its constituent parts

The democratic process includes the whole range of activity carried out in a democratic polity: including voting, agenda-setting, decision-making, and policy creation. ICTs can play a role in facilitating an improvement in this process in many different ways, but many of the potential benefits of an eDemocracy are contingent upon a whole host of variables, not least of which concerns the individual user: take-up, education, willingness to participate in the democratic process, etc.

One of the principal concerns of the eDemocracy debate concerns how ICTs can be developed to encourage participation by citizens. This is, in itself, not a question for eGovernment alone, but a policy area focused upon (EU) citizenship should attempt to address these questions.

eGovernment research requirements for the specific objectives level:

- eGovernment at EU level (RT 15) – Research into the implementation of sharing information at the EU level would be necessary to ensure that systems developed on a Europe wide basis are actually compatible with existing national systems, and do not exceed the limitations placed within the Treaties of EU and the mandate of the European institutions.
- Innovative governance (RT14) – by reconsidering the way in which departments in public administrations interact with each other, we can also start to examine novel ways in which citizens can use new technologies to interact with government and public administration. The European Commission's IPM feedback tool is one primary example of an innovative method of governance which requires a wholesale rethink of the way in which public administrations and politicians govern and set agendas for policymaking. It also contributes to better regulation models.
- Cross-sectoral public services (RT13) – one way in which eGovernment can contribute to this policy area is to enable harmonisation of interaction between

[121] European Commission (2005) *Action plan to Improve Communicating Europe by the Commission.* Brussels

[122] The European Evaluation Consortium (2005) *Mid-term Evaluation of the Interactive Policy-Making Programme: Final Report*, http://europa.eu.int/comm/dgs/internal_market/docs/evaluation/ipm_en.pdf, accessed September 10, 2005.

different departments in public administrations, to ensure that citizens are given efficient and effective service.

4) Policy for measuring (e)government quality of life, etc., effects – the use of measurement systems and benchmarks for the impact of eGovernment on citizenship and EU citizenship, at the specific objectives level

eGovernment research requirements for measuring (e)government effectiveness on citizen and EU citizenship:

– Evaluation and benchmarking (RT 16) – as in all policy areas, a continual reference to the impact of eGovernment tools and applications, as well as the new forms of governance that may emerge in relation to use of new technologies, needs to be carried out. There is also a need for sharing of best practices and the creation of benchmarks which will help developing tools and applications across Europe.

5.5.3 Operational eGovernment objectives and research requirements

In order to have an active citizenry in terms of eGovernment, it is necessary for governments and public administrations to be inclusive and informative, as well as open to participation. The recent i2010 initiative highlights inclusion as one of its most important objectives. It outlines the development of an inclusive Information Society as one of its major objectives.

The potential impact of eGovernment on the policy area can be achieved by following a number of policies in relation to the research map identified in this study, including those outlined here:

5) Policy for providing enabling environments for participation (service design and delivery policy)

Government can improve active citizenship by ensuring enabling environments for participation are present. This can be done through:

- Establishing tools and applications, and
- Focusing on the different roles of individuals and institutions in the democratic (and broader societal) environment.

eGovernment research requirements for providing enabling environments for participation

- Trust and Security (RT11) – In order for the Information Society to be an environment for active citizenship, there is a need to ensure that all citizens trust and feel comfortable in the environment in which they participate.
- Value chains (RT 4) – Understanding how intermediaries can act as an interface between government and citizens in terms of providing information and helping citizens interact in a broader sense with policymakers and service providers. This area is highly contentious as some interviewees have stated that there is little need for intermediaries, whereas others have highlighted the importance of intermediaries, especially in terms of use of new ICTs to interact with government.

6) Policy for encouraging active citizenship (service use policy)

Considering citizenship in the broader sense of the activity of an individual citizen in relation to the state, government, public administration and civil society: i.e. as a social, economic, and political 'consumer', there are a few policies government can encourage active participation between citizens and all sectors of society through new ICTs as one channel.

eGovernment research requirements for encouraging active citizenship

- Open source tools and applications (RT10) – The use of open source applications and tools should be encouraged in this area, as this would enable civil society organisations to use common applications to encourage interaction not only with government, but also amongst themselves.
- eDemocracy and eParticipation (RT9) – Arguably the most important research theme for a policy area concentrating on citizenship, there is a need to understand more clearly how public administrations and other political institutions can concentrate on developing new methods of communicating and interacting with citizens. This involves helping develop eDemocracy, eParticipation, eEngagement, eConsultation, eVoting, eInvolvement and eReferenda, as well as community, social, and informal networking. It should also focus on 'legal technologies' that can be developed to facilitate all of the abovementioned tools.

7) Policy for measuring (e)government operational support for (EU) citizenship – the use of measurement systems and benchmarks for the operational performance and quality of eGovernment systems, services, organisations, etc., in support of eGovernment specific objectives related to (EU) citizenship.

eGovernment research requirements for operational support for quality of life, etc.:

- Quality and performance management and monitoring (RT12) – Quality and performance management and monitoring is a crucial part of this policy area, as in many other policy areas.

5.5.4 eGovernment research recommendations

The table at the beginning of section 5.5 summarises the research requirements for the (EU) citizenship policy area and the recent and recommended future status of each research theme. This shows that there are many gaps between the recent research being carried out in Europe and by the EC and the research required to fully support the EU's 2010 economic policies.

(EU) citizenship is a highly focused policy area, which concentrates on the idea of building better governance in all political institutions in the EU area. In order to carry this out, it has been recognised at the EU level that specific action is necessary to promote active citizenship through provision of information regarding the democratic process and by attempting to improve the relationship between representatives and represented, or citizens and governors. Work can also be carried out to see how precisely new ICTs (and therefore eGovernment) can contribute towards improving the democratic process.

At the operational level, work should be done to encourage active citizenship, and to provide enabling environments for participation. This can be carried out by examining the potential role of intermediaries and other actors in the 'democratic value chain', and ensuring that citizens are aware of the risks of electronic communication (which thereby leads to trust). Open source tools and applications can play a great role in this, as they can provide a base system which can be adapted to the needs of specific groups.

5.6 EU enlargement and EU research

5.6.1 General EU objectives and research requirements

The management of the EU enlargement process, both in terms of post-2000 enlargement and in dealing with the EU's most recent (and massive) enlargement are crucial political tasks for the period until 2010. In terms of research policy, this is mainly about harmonising and coordinating the European Research Area across 25 (27-28) member states by 2010. Given the disparities in recent research activity – even across long-time members of the EU – there are many areas which are in need of discussion and work.

The EU's current Research Framework Programme (FP6) is due to be completed by 2007, and its successor is expected to run from then until 2013. Therefore, the 2010 boundary will occur halfway through FP7. Therefore, the goals for 2010 must take into consideration those which are carried forth from FP6 into its successor programme.

It has been noted that a research environment that spans the whole EU will work towards building a stronger EU.[123] EU Research and Development Policy in this context is one of the major contributors towards several of the other Policy Areas identified in this study. The strengthening of the European knowledge-based economy requires a strong research base, as identified in the original Lisbon Strategy for 2000-2005. Later on, EU Research was seen as a way to 'unblock the blockages' to achieving the Lisbon goals by 2010.[124] EU enlargement was seen as a challenge to be overcome in the same document.

In the context of EU enlargement and EU research, there is a need to ensure that a member-state specific, but common research area is developed, which contributes to achieving many of the other major EU political goals and visions. A strong research base can be seen as one of the main fundamentals of a strong economy and society.

From this brief outline of the policy area, a few key issues can be raised, in which EU policies and policy makers can contribute towards improving the EU in terms of EU research and enlargement. They include:

- Encouraging harmonisation of research and education across the EU
- Using the results of research to achieve policy goals

[123] Brussels European Council Presidency Conclusions, 22-23 March 2005European Council (2005am), Presidency Conclusions, 22-23 March 2005, Brussels, DOC/05/1: pp. 2, 3-4.

[124] Kok Report: Kok et al, 2004,

eGovernment research requirements for the general EU objectives level

- Public value creation (RT 17) – In order to encourage a common research area, that takes into consideration the effects and impacts of enlargement on the EU, there is a need to understand exactly what role a common research programme for the whole of the EU can play in the general visions of the European Union. This should include studies on the impact of research into eGovernment on public administrations across the EU, as well as an analysis of how exactly research can contribute to the development of eGovernment.

5.6.2 Specific eGovernment objectives and research requirements

Education plays a crucial role in helping develop a central area for excellence in terms of research.

Examining each general objective in turn, we are faced with a list of topics that need to be addressed in order to achieve success in this policy area.

1) Policy for encouraging harmonisation of research and education across the EU

The harmonisation of research across the EU is a crucial task for the present and forthcoming Framework Programmes. As a result of the latest enlargement of the EU, there remains a large amount of work to be done in this area. The Bologna Process,[125] started with the Bologna Declaration of June 1999 started the movement towards a common area for education across the EU. In terms of eGovernment, harmonisation can be facilitated by establishment of common databases, such as the one for cultural heritage suggested by the European Commission in its i2010 initiative.[126]

[125] http://europa.eu.int/comm/education/policies/educ/bologna/bologna_en.html, accessed September 10, 2005.
[126] European Commission, 2005aj, p.11..

Overview of eGovernment research requirements for EU enlargement and EU research policy

X Research themes necessary to achieve the policies in question

Questionnaires: future recommended effort		Recent Europ deploy-ment [127]	Recent Europ strength [128]	*Questionnaires & content analysis: recent effort*				*General EU objectives* **Policies for EU enlargement and EU research**			
Non-European	Europe			Non-European	*EC*[129]	*Europe*[130]	*Research Themes*				
2%	7%	1	✓	3%	2%	2%	17. Public value creation				**X**
								eGovernment specific objectives **Policies to support government in enhancing EU enlargement & EU research**			
								1. Harmonising research capacity policy	2. Policy for using research	3. Policy for measuring (e)gov EU enlargement & research effects	
3%	3%	2	✓✓	3%	4%	4%	16. Evaluation & benchmarking				**X**
0%	2%	1	✓✓✓	1%	2%	2%	15. eGov at EU level	**X**	**X**		
1%	7%	1	✓	1%	1%	3%	14. Innovative governance	**X**	**X**		
8%	5%	1	**0**	9%	2%	1%	13. Cross-sectoral services	**X**	**X**		
								eGovernment operational objectives **Policies to support government operations for EU enlargement and EU research**			
								4. Research infrastructures (internal performance policy)	5. Enabling environments for EU research (design & delivery policy)	6. Encouraging implementation of EU research (service use policy	7. Policy for measuring (e)gov operations to support EU enlargement & research
3%	1%	2	✓✓	4%	4%	5%	12. Quality & performance				**X**
9%	8%	3	✓✓	5%	9%	9%	11. Trust & security		**X**		
1%	1%	3	✓✓	4%	5%	3%	10. Open source		**X**		
5%	10%	3	✓✓✓	3%	8%	8%	9. eDemocracy				
8%	7%	2	✓✓	1%	4%	2%	8. Socio-economic inclusion				
10%	11%	3	✓	6%	10%	6%	7. User Needs			**X**	
11%	4%	2	✓	5%	1%	6%	6. Multi-channel				
7%	8%	2	✓	6%	4%	5%	5. Networked government				
9%	9%	3	✓	10%	14%	11%	4. Value chains		**X**		
7%	6%	2	✓✓✓	6%	1%	6%	3. Change in public sector				
5%	5%	3	✓	14%	11%	10%	2. Integration & interoperability	**X**			
11%	6%	4	✓✓	19%	18%	17%	1. Data & knowledge managemnt	**X**			
100%	*100%*			*100%*	*100%*	*100%*					

[127] Current European research deployment, scored from 1 to 4 for increasing progress towards deployment of research results (see Annex 10).
[128] Current European strength in relation to coverage of research scope, content and research challenges: **0** is very low, ✓ low, ✓✓ strong, ✓✓✓ very strong (see Annex 9.2).
[129] Research funded by the EC's DG Information Society and Media only, during the 5th and 6th IST Framework Programmes and through the Modinis Programme
[130] All European research, including that funded by the EC's DG Information Society and Media.

2) Policy for using the results of research to achieve policy goals

A constant issue regarding (EU) research has always been the link between research and policies (as this study identifies). In this context, the original Lisbon Agenda called for research to play a more active role, which was linked to major EU policies. An EU which focuses on the development of a common research area (the 'European Research Area') needs to attempt to disseminate its funded research results more widely, and needs to attempt to generate research that appropriately deals with recent and future policy challenges.

eGovernment research requirements for the specific objectives level:

- eGovernment at EU level (RT 15) – as outlined in more recent documents looking towards FP7, collaboration and cooperation have been highlighted as key objectives for European research. This involves finding ways of integrating efforts carried out at the national level with those undertaken at the EU level. Special attention should be given to the new member states of the EU.
- Innovative governance (RT 14) – Research is needed on how eGovernment can contribute to innovating the harmonisation of EU research and enlargement policies and how these should be used. It should thus cover organisational learning, good practice, planning, foresight, roadmaps, decision- and (evidence-based) policy making, as well as governance structures and the role of the state, law, legal and regulatory aspects, and relations with the market and civil society.
- Cross-sectoral public services (RT 13) – Research is needed which examines the cross-sectoral aspects of both research and enlargement and how the public sector generally, and (e)government specifically, can support this. It should explicitly cover the relationships between sectors, including health, education, transport, social care and security, police and legal, environmental, housing, utilities, consumer protection, business support, social protection and care, cultural and community support, etc., with eGovernment which in Europe is often narrowly treated largely as just eAdministration. This research should consider the cross-sectoral aspects and synergies in the public sector seen as a whole instead of segmented as is often the case.

3) Policy for measuring (e)government effects on EU enlargement and research – the use of measurement systems and benchmarks for the impact of eGovernment on EU enlargement and EU research at the specific objectives level

eGovernment research requirements for measuring (e)government effects on EU enlargement and research at the specific objectives level:

- Evaluating and Benchmarking eGovernment (RT16) – Research carried out in a European context should be evaluated and monitored to see whether it fits in with the general objectives of EU visions. eGovernment can contribute to this by developing frameworks for evaluation and monitoring, and sharing best practices across the EU.

5.6.3 Operational eGovernment objectives and research requirements

To deal with the impacts of enlargement in terms of European research, there is a need for governments and public administrations to think carefully about the role of research in society and state. This requires a wholesale rethink of the purpose of research,

including the mechanisms of how to construct such a capacity in terms of infrastructure and personnel.[131] Implementation of research also requires monitoring to ensure that policy goals are achieved by the requested research.

4) Policy for research infrastructures (internal performance policy)

In order to develop common research infrastructures, one of the key components of the policy area, the following activities can be carried out:

- Developing tools to ensure interaction between researchers.
- Developing tools to encourage interaction between funding agencies.

eGovernment research requirements for research infrastructures

- Integration and interoperability (RT2) – Coordination within and amongst research funding agencies at all levels (regional, national, and European) will require interoperable systems that will encourage interaction, not only between back-offices, but also amongst research projects and initiatives.

5) Policy for research environments (service design and delivery policy)

Establishing research environments is both a physical and an intellectual exercise.

- Trust and security (RT 11) – trust and security in research networks is a crucial aspect of the development of useable and 'inhabitable' environments.
- Open source tools and applications (RT 10) – Open source tools and applications are particularly suited to encouraging Europe wide participation in research communities due to their open participatory nature. Development of tools to encourage interaction will possibly aid this process. Further investigation needs to be made into the different types of 'open source'.
- Value chains (RT 4) – The interaction between policymakers and researchers, as well as end users of products and ideas that are generated through European research should be organised in such a way that enables the most efficient transmission of ideas from pre-competitive research to actual implementation. Examining the structure and role of value chains in this process is a vital exercise.

6) Policy for the implementation of research (service use policy)

As this type of research (public-policy oriented and funded) is implemented, there is a need to ensure that it is carried out in a programmatic fashion, which continues to consider the original policy goals. This can be ensured by developing tools which measure quality and performance.

eGovernment research requirements for the implementation of research

- User needs (RT 7) – the needs of researchers should be taken into account here, with usability studies being present in the research process. In fact, there is a need to ensure that research networks contain a large element of bottom-up networking, ensuring that the networks are ideas-driven. This should, of course, be tempered with a top-down approach which identifies areas in need of research.

[131] http://www.cordis.lu/fp7/faq.htm, accessed September 10, 2005.

7) Policy for measuring (e)government operational support for EU enlargement and EU research – the use of measurement systems and benchmarks for the operational performance and quality of eGovernment systems, services, organisations, etc., in support of eGovernment specific objectives related to EU enlargement and EU research.

eGovernment research requirements for operational support for quality of life, etc.:

- Quality and performance management and monitoring (RT 12) – European research projects have often been criticised for heavy administrative tasks, which attempt to facilitate the funding and monitoring processes. The entire process can be possibly streamlined, as has been done for submission of proposals, through use of an online tool. Research should be undertaken into the most effective way to monitor the quality and performance of EU funded research.

5.6.4 eGovernment research recommendations

The policy area here is highly specific and targeted towards creating a common European Research Area, which will contribute towards many of the other policy areas mentioned above. The table at the beginning of section 5.6 summarises the research requirements for the economic policy area and the recent and recommended future status of each research theme. This shows that there are many gaps between the recent research being carried out in Europe and by the EC and the research required to fully support the EU's 2010 economic policies.

The research recommendations for this area tend to focus on creating a European environment which is prone towards information sharing and information dissemination. Therefore the specific and operational objectives of this policy area concern the infrastructures and implementation of research and education within the EU, ensuring that a certain level of harmonisation of quality (but not expertise) is encouraged. Benchmarking of research exercises across the EU can be useful in this regard, and should be encouraged.

Operationally, eGovernment can contribute by helping to establish research frameworks, such as the current EU RTD Framework Programmes. These research frameworks should be further integrated with national level research programmes, to ensure that a common set of quality standards are maintained across Europe. For this purpose, quality and performance management and monitoring is of utmost importance. To help develop these 'cyberinfrastructures' as well as 'human infrastructures', a certain level of integration and interoperability should take place within the EU and national level research programmes. Open source tools and applications (part of the so-called 'cyberinfrastructures') can be put to good use to encourage and exploit human and knowledge infrastructures.

6 European strengths and weaknesses and research recommendations

6.1 Introduction

In this section, the eGovernment research requirements for each policy area, described in section 5, are matched against recent European and EC research, the global context of that research, and what stakeholders have told us about their requirements for future areas of research. This enables an analysis to be made of Europe's current strengths and weaknesses in eGovernment research. On this basis, detailed recommendations can be made about where future research effort should be focused if EU policies are to be supported, including the opportunities and threats Europe faces as a result.

The accompanying table provides an overview of Europe's strengths and weaknesses seen in a global context. Strengths and weaknesses are analysed by examining European coverage of the scope, content and research challenges of each research theme. The latter are designed to represent a combination of the state of the art in eGovernment research issues globally, so they represent an ideal type for comparison purposes. In Annex 9, full details are given of how strengths and weaknesses are measured and assessed, through questionnaires, content analysis and intervention research. The results from each source are generally very consistent with each other.

The table below, which focuses on European strengths and weaknesses, should also be seen in combination with the table in section 3.5 above, where Europe is directly compared with other global regions. In the centre of the table, the research themes are listed and a summary is given as to which policy areas they support (marked with Xs in the five policy columns). A detailed analysis of how these research themes support the policies in question was described in the previous section of this study. To the left, summary data for each research theme, showing *inter alia* its recent and future recommended status, is provided, enabling a full interpretation of the status, potential and likely problems associated with each research theme. To the right, a strengths and weaknesses summary is given. Finally a summary of recommendations is made drawing on all the information in the table, as well as other information presented in section 5.

Examination of the table below shows that there are many gaps between the recent research being carried out in Europe and the research required to fully support the EU's 2010 policy areas. There are therefore some dangers of sub-optimal impact of eGovernment research on these policies if a re-focusing of the relative research effort in the ways proposed is not pursued. Precisely how this re-focusing should take place depends, of course, on the policies, or policy combinations, selected.

Strengths and weaknesses in European eGovernment research in relation to global activity are identified in section 6.2. They build upon the table provided below. By understanding the position of European research in a global context, key recommendations for future research can be identified. Strengths are divided into first and second order strengths in this section, with weaknesses following. In the areas of weakness, reference is made to regions that are dominating activity in these areas. By carrying out this exercise, an understanding of why European research dominates in

certain areas will be developed. This will help with understanding the specific characteristics of European and DG Information Society-funded research, which will in turn facilitate our understanding of what research can be carried out at the EU level to achieve broader policy goals, for example those identified in section 5.

Building upon the linkages already made between EU policy areas and eGovernment research, an elaboration on the challenges for research will be developed. This identification of research challenges serves a dual purpose: firstly it identifies the types of questions that should be asked by eGovernment research, and secondly it makes use of the intervention logic to show how these research challenges can be used to solve central policy questions at a higher level. This interaction between research and policy areas is often difficult to achieve, and so an elaboration of the challenges will prove useful in this context. This will help uncover externalities that provide varying degrees of risk, and will reveal, where possible, the assumptions that exist in the intervention logic as described in section 4.

SWOT overview of eGovernment research in global context (chart 1 of 3)

GENERAL EU OBJECTIVES LEVEL and eGOVERNMENT SPECIFIC OBJECTIVES LEVEL

X	Research themes necessary to achieve the policies in question

Questionnaires: future recommended effort		Recent Europ deploy-ment [132]	Recent Europ strength [133]	*Questionnaires & content analysis: recent effort*				**2010 Policy Area relevance**						
Non-European	Europe			Non-European	*EC* [134]	*Europe* [135]	**Research Themes**	Econ	Soc	QoL	Citiz	EU	**Strengths & weaknesses summary** (refer also to the table in section 3.5)	**Recommendation summary** [136]
2%	7%	1	✓	3%	2%	2%	17. Public value creation	**X**	**X**	**X**	**X**	**X**	A highly important RT across all policies. Although it is weak in Europe, and its results a long way from being deployed, it is also weak globally, so that Europe is a global leader together with North America.	There should be much more research focus on this RT in future, probably at least up to 7% as recommended by the stakeholders, and an expansion of the content and scope of research. Greater effort is also needed on how research results can be more directly deployed.
3%	3%	2	✓✓	3%	4%	4%	16. Evaluation & benchmarking	**X**	**X**	**X**	**X**	**X**	An important RT across all policies, but Europe is probably strong enough at present, although, and is a global leader together with Australasia.	The recent level of research effort is probably OK, and is perhaps too much in future, as long as effort is not reduced too much now that good standard approaches have and are being developed, and efforts are made to improved research impact on deployment.
0%	2%	1	✓✓✓	1%	2%	2%	15. eGov at EU level	**X**	**X**	**X**	**X**	**X**	A highly important RT across all policies in the European eGovernment context, and one in which Europe is of course strong and the global leader.	There are divided views about future research effort, with the stakeholders recommending no change, although we would recommend a small increase, say up to 4% or 5% over the next five years. Even more important is for much greater effort on how research results can be more directly deployed.
1%	7%	1	✓	1%	1%	3%	14. Innovative governance	**X**	**X**	**X**	**X**	**X**	A highly important RT across all policies, but one in which Europe is quite weak, and its results a long way from being deployed, although can be said to be a global leader as no-one is stronger.	There should be much more research focus on this RT in future, although the RT may be too broad and imprecise as presently defined (see text). Also greater effort is also needed on how research results can be more directly deployed.
8%	5%	1	**0**	9%	2%	1%	13. Cross-sectoral services	**X**	**X**	**X**	**X**	**X**	A highly important RT across most policies, but one in which Europe is very weak, and with a low level of deployment of research results.	This RT is under-researched and applied in Europe, so should be much more research focus in future, better coverage of research issues and focus on deployment of research results. Europe should also look to North America, and particularly Asia.

[132] Current European research deployment, scored from 1 to 4 for increasing progress towards deployment of research results (see Annex 10).
[133] Current European strength in relation to coverage of research scope, content and research challenges: **0** is very low, ✓ low, ✓✓ strong, ✓✓✓ very strong (see Annex 9.2).
[134] Research funded by the EC's DG Information Society and Media only, during the 5th and 6th IST Framework Programmes and through the Modinis Programme
[135] All European research, including that funded by the EC's DG Information Society and Media.
[136] All recommendations are in terms of relative, not absolute, size of effort, and are here not policy-specific. For policy specific recommendations, see section 5.

SWOT overview of eGovernment research in global context (chart 2 of 3)

eGOVERNMENT OPERATIONAL OBJECTIVES LEVEL (1 of 2)

X	Research themes necessary to achieve the policies in question

Questionnaires: future recommended effort		Recent Europ deploy-ment [137]	Recent Europ strength [138]	*Questionnaires & content analysis: recent effort*				**2010 Policy Area relevance**						
Non-European	Europe			Non-European	*EC* [139]	*Europe*[140]	**Research Themes**	Econ	Soc	QoL	Citiz	EU	**Strengths & weaknesses summary** (refer also to the table in section 3.5)	**Recommendation summary**[141]
3%	1%	2	✓✓	4%	4%	5%	12. Quality & performance	**X**	**X**	**X**	**X**	**X**	An important RT across all policies, but Europe is probably strong enough at present, and is a global leader together with North America and Australasia.	The recent level of research effort is probably OK, and is perhaps too much in future, as long as effort is not reduced too much now that good standard approaches have and are being developed, and efforts are made to improved research impact on deployment.
9%	8%	3	✓✓	5%	9%	9%	11. Trust & security	**X**	**X**	**X**	**X**	**X**	A highly important RT across all policies, with high research effort, although Europe is not the global leader.	This RT could be stronger in Europe, but does not need more effort, rather improved focus and coordination, perhaps looking at Australasia. Although progress to deployment is good, even more effort should be made on this.
1%	1%	3	✓✓	4%	5%	3%	10. Open source	**X**			**X**	**X**	An important RT for some policies, with quite low research effort (though higher in EC projects). .	While Europe is a global leader in many aspects of OSS R&D with good progress to deployment, most derived benefits are dominated by US companies. Needs improved focus and coordination, and even more effort on deployment, perhaps looking at North America,
5%	10%	3	✓✓✓	3%	8%	8%	9. eDemocracy		**X**		**X**	**X**	A highly important RT for a number of policies, and one in which Europe is a clear global leader with good progress to deployment.	Europe's global leadership should be maintained, especially given the likely increase in importance in future, e.g. to support the European social model. Even more focus should be directed at research coverage of new issues (such as representatives), and, especially, of research deployment.
8%	7%	2	✓✓	1%	4%	2%	8. Socio-economic inclusion		**X**	**X**			A highly important RT for a number of policies, in which Europe is a global leader, but has too little recent effort and insufficient deployment of results..	Effort should be increased much more in future in order to strengthen the global lead and provide support to the European social model. A particular focus should be greater research coverage, and, especially, research deployment.
10%	11%	3	✓	6%	10%	6%	7. User Needs	**X**	**X**	**X**		**X**	A highly important RT for most policies, but one in which Europe remains weak although progress to deployment is good.	This RT needs more research focus, perhaps looking to North America and Australasia as global leaders. A particular focus should be greater research coverage, but also even more deployment of research results.

[137] Current European research deployment, scored from 1 to 4 for increasing progress towards deployment of research results (see Annex 10).
[138] Current European strength in relation to coverage of research scope, content and research challenges: **0** is very low, ✓ low, ✓✓ strong, ✓✓✓ very strong (see Annex 9.2).
[139] Research funded by the EC's DG Information Society and Media only, during the 5th and 6th IST Framework Programmes and through the Modins Programme
[140] All European research, including that funded by the EC's DG Information Society and Media.
[141] All recommendations are in terms of relative, not absolute, size of effort, and are here not policy-specific. For policy specific recommendations, see section 5.

SWOT overview of eGovernment research in global context (chart 3 of 3)

eGOVERNMENT OPERATIONAL OBJECTIVES LEVEL (2 of 2)

X	Research themes necessary to achieve the policies in question

Questionnaires: future recommended effort		Recent Europ deploy-ment [142]	Recent Europ strength [143]	*Questionnaires & content analysis: recent effort*				**2010 Policy Area relevance**						
Non-European	Europe			Non-European	*EC* [144]	*Europe* [145]	**Research Themes**	Econ	Soc	QoL	Citiz	EU	**Strengths & weaknesses summary** (refer also to the table in section 3.5)	**Recommendation summary**[146]
11%	4%	2	✓	5%	1%	6%	6. Multi-channel	X	X				An important RT for several policies, with good recent effort. but Europe is weak in terms of coverage.	The recent level of research effort is probably OK, and is perhaps too much in future, as long as effort is not reduced too much given the continued strong importance of multi-channel approaches. However, effort should be re-focused on greatly improving coverage and on deployment impact.
7%	8%	2	✓	6%	4%	5%	5. Networked government	X	X	X	X		A highly important RT across many policies, but one in which Europe is quite weak, although can be said to be a global leader as no-one is stronger.	This RT remains too weak in Europe and needs still more relative research effort in this important new area of eGovernment research. In particular there should be both better coverage and deployment of research results.
9%	9%	3	✓	10%	14%	11%	4. Value chains	X	X	X	X	X	A highly important RT across all policies, but one in which Europe is too weak in a global context.	This RT remains weak in Europe, but does not need more effort, rather improved focus and coordination, looking at North America, as well as Australasia and Asia. Deployment impact is good, though could be further improved, but much better coverage is needed.
7%	6%	2	✓✓✓	6%	1%	6%	3. Change in public sector	X		X			An important RT for several policies, and one in which Europe is a global leader together with Australasia, although deployment of research results is quite poor. Recent effort is quite high, though probably too low in EC projects.	The recent level of research effort is probably about right, given past effort, but still needs significant attention given the continued strong importance of organisational and related change policies. However, despite Europe being a global leader in coverage, the deployment of research results needs to be considerably improved.
5%	5%	3	✓	14%	11%	10%	2. Integration & interoperability	X		X		X	An important RT for several policies, and already receiving large research focus in Europe with good deployment, but without good coverage of research issues.	This RT remains weak in Europe, but does not need more effort (on the contrary a reduction is probably required), rather improved focus and coordination by extending the coverage of research and improving its deployment even more, perhaps by looking particularly at North America, and Australasia.
11%	6%	4	✓✓	19%	18%	17%	1. Data & knowledge management	X				X	An important RT for several policies, already receiving very large research focus in Europe with very good deployment impact. Globally Europe is also quite strong, although certainly not a leader compared to North America & Asia.	The relative level of research effort is too high, given the progress which has already been made, also in deployment of research results, so could be reduced somewhat in the future, but not to insignificance given the continued strong importance of the issues. Main effort needs to be on improving research coverage and maintaining deployment impact.
100%	*100%*			*100%*	*100*	*100%*								

[142] Current European research deployment, scored from 1 to 4 for increasing progress towards deployment of research results (see Annex 10).
[143] Current European strength in relation to coverage of research scope, content and research challenges: **0** is very low, ✓ low, ✓✓ strong, ✓✓✓ very strong (see Annex 9.2).
[144] Research funded by the EC's DG Information Society and Media only, during the 5th and 6th IST Framework Programmes and through the Modins Programme
[145] All European research, including that funded by the EC's DG Information Society and Media.
[146] All recommendations are in terms of relative, not absolute, size of effort, and are here not policy-specific. For policy specific recommendations, see section 5.

Finally, section 6.3 concludes by summarising the main recommendations and research challenges for European eGovernment research policy. The specific recommendations made in this section in relation to each research theme are in terms of relative research focus, rather than absolute research effort. The latter depends upon total research budgets.

6.2 European eGovernment research strengths and weaknesses

The following analysis highlights areas of relative strength and weakness in the European eGovernment portfolio. Although these can be described as strengths and weaknesses, the results also provide a preliminary explanation as to why certain research flourishes in different regional settings and at different levels of activity. When combined with the opportunities and risks described in the following sub-section, which relate specifically to the relationship between European policy and eGovernment research, a series of recommendations can be made as to where research should be focused and how research efforts should be used in relation to major policy goals.

6.2.1 Strengths

The research strengths outlined in this section reveal that European research is, relatively, focusing upon change in the back and front offices (i.e. internal government performance and service use respectively), and is also looking at the role of the European level in terms of eGovernment. These strengths show that European research is well positioned to examine the higher-level research themes outlined in the research map in section 3. This should be capitalised upon in future research policies, and will be further described in the concluding part of this section.

First order strengths

European eGovernment research is very strong in terms of the following three research themes:[147]

- eDemocracy and eParticipation.
- Change in the public sector.
- eGovernment at the EU level.

The identification of European research as being strong in these three areas is in terms of coverage of the global state-of-the-art research agenda. These strengths are typical of a European research agenda that is directed towards a relative positive outlook on change.

Two of these themes (eDemocracy and eParticipation, and change in the public sector) are operational objectives and describe the systems put in place and the processes that government and public administration must undertake to achieve links towards the specific objectives of eGovernment and general EU policies. The reason these research themes are strong is due to the particular characteristics of the European research landscape.

[147] These three research themes are scored the maximum score of 3, i.e. very strong, in Annex 9.2.

In the case of eDemocracy and eParticipation, the strength arises from the fact that much of this research is done at a pan-European level, or at least between a number of individual EU Member States, as well as being strong in individual countries. For example, such research is particularly strong in the UK, and the EC has been funding and supporting pan-European research in this theme for a number of years.

As far as change in the public sector is concerned, research is very strong at national and regional levels. However, very little research is funded by the EC at present, perhaps because the EU does not have any competence in this area.[148] However, there are more opportunities here given that the EU itself is a relatively new political institution, which therefore does not suffer from the inertia experienced by many public administrations around the world, and has the opportunity to be more flexible in its application of eGovernment research. This is also, in part, due to the fact that the EU institutions are not required to 'interface' with citizens to the same degree as national public administrations. On the other hand, the EU is governed by quite formalised subsidiarity structures which can be difficult to change given the unanimity required across all Member States.

In the change in the public sector research theme (as well as in innovative governance research) there are also several opportunities to directly contribute towards many of the policy aims and goals of the EU at the EU level. These include simplifying regulatory procedures across all levels, regions, and sectors in the EU, encouraging national action through measurement and benchmarking, and providing pan-European services, which encourage and stimulate the Single European Market. The Commissioner of DG Information Society and Research has also recently proposed wide-scale demonstrators to test and deploy pan-European services.[149] This is also an area where recent research is quite strong in Europe, so this strength can be used to create an opportunity for achieving major policy goals as described in section 5. This strength can be exercised at all three levels of the intervention logic: the operational (where interoperability is a key example), the specific (where research into linking together pan-European public sector activities can take place), and the general (where eGovernment can actually contribute to the higher level policy goals of the EU, such as EU citizenship or economic competitiveness).

Thus, there is considerable opportunity for future research into change in governance institutions. Due to the fact that much of the research undertaken in Europe has looked at the way in which change is being dealt with in public administrations, it appears opportune to examine how these changes lead to developments in the governance process, or building better governance. This would, in turn, considerably strengthen research into innovative governance (see below).

Opportunities arise in this area when public administrations cease to only consider themselves as 'sole proprietors' of the public sector, and encourage individuals, businesses, intermediaries, and the civil sector to get involved in governance. This is

[148] Although in November 2005 a call was issued for such research by DG Information Society and Media.

[149] "i2010: The European Commission's new programme to boost competitiveness in the ICT sector" speech by Viviane Reding, European Commissioner responsible for Information Society and Media, Microsoft's Government Leaders Forum, Prague, 31 January 2005, SPEECH/05/61, p. 4.

clearly an area which needs further research (cf. the value chain, networked government, and user needs research themes), but the advances made in terms of change in the public sector lead the way to an advantageous working environment for future research.

Europe is understandably also very strong in research on eGovernment at the EU level. European aspects of eGovernment and aspects that transgress national boundaries, such as the inter-exchange of data between Member States' administrations or the inclusion of other policy priorities into eGovernment, are central to this research theme. As a result, much of the focus is on socio-economic aspects of change, which is common to most European public administrations and eGovernment initiatives taking place in European countries.

The fact that eGovernment research in Europe is also focused on change for both the public sector and in relation to citizens is an important point, which highlights the forward-looking nature of research in Europe when compared to much of that taking place elsewhere. It should be noted that a strong bias exists on an institutional approach towards eGovernment: i.e. what public administrations should do and can do to change their processes.

However, the evidence seems to show that deployment of the results of these research strengths is highly variable, and is particularly low in relation to change in the public sector, so the question arises in relation to policy relevance, whether or not Europe is getting value for money in exploiting the results of these research strengths.

Thus, although these strengths should be recognised and maintained as far as possible, it is clear that more effort needs to be directed to increasing deployment impact. Furthermore, as will be outlined when considering the weaknesses of eGovernment research, it is clear that without a holistic approach to eGovernment, which also examines impact and other higher level implications and consequences of eGovernment and eGovernment research, it is possible that major policy goals will not be achieved.

Second order strengths

European eGovernment research is relatively strong in the following areas, which comprise six research themes:[150]

- Data and knowledge management.
- Socio-economic inclusion.
- Open source.
- Trust and security.
- Measurement (RTs 12 and 16).

These areas are where Europe is considered to be carrying out a reasonable amount of relevant and leading edge research in relation to coverage of the global state-of-the-art research agenda for eGovernment. Given the requirements of European level policy (completion of the Single European Market, eEurope's goals for a cheaper, faster, and

[150] These research themes are scored at 2, i.e. strong, in Annex 9.2.

safer Internet, social and regional cohesion), there is indication of an already existing 'intervention logic' which encourages relevant research to take place in the areas above. Given the already existing propensity of the European Commission to monitor and evaluate policies, and given the global trends in attempting to compare and share examples of best practices through various tools and mechanisms, it is not surprising that European level research contains a high level of measurement initiatives. Methodologies for evaluating eGovernment are of crucial importance here, and seem to be very well covered in the EU-level research. By nature of the European research landscape, this is one area where active and useful research can be directly delivered to policy makers, thereby proving incredibly useful. Due to its usefulness, it is quite well advanced in the Europe. However, each of these second order strengths only has moderate deployment impact at present, so this is an area where more focus needs to be placed in future.

Research that examines these more basic building blocks of eGovernment processes is vital to helping eGovernment move up towards approaching the concept of public value, and thereby achieving major policy goals in specific areas and/or visions of how public administrations should deal with citizens and businesses and other users. Without a clear understanding of how to get to grips with data and knowledge management and other operational objectives, the specific objectives will be far more difficult to achieve.

On the other hand, a lack of direction towards specific and general objectives at the operational level will most likely considerably impair the policy value of research.

6.2.2 Weaknesses

Europe is relatively weak in relation to the global state-of-the-art research agenda in the following research themes:[151]

- Integration and interoperability.
- Value chains for designing, producing and delivering eGovernment services, particularly in relation to public-private partnerships as well as partnerships with the civil sector.
- Networked government.
- Multi-channel.
- User needs.
- Cross-sectoral.
- Innovative governance.
- Public value creation.

Essentially, one of the fundamental weaknesses of the European eGovernment research landscape as a whole is the relative lack of relevant and leading edge research into the interaction between users and providers, i.e. specifically the interface between the back- and front-office where content / service design, production and delivery take place. Much of the research appears to lead to supply-led solutions in Europe, which does not take into consideration many of the risks associated with achieving uptake and therefore

[151] These three research themes are scored either 0 (very weak) or 1 (weak) in Annex 9.2.

attaining a change in government processes which will allow eGovernment to contribute towards the broader European goals and visions.

Loosely using the conceptual framework in section 4, these weaknesses can be separated into several distinct areas, or building blocks (note, the commentary here is on European research as a whole and not in relation to EC-sponsored research, unless otherwise stated):

Back office (internal government performance)

In terms of back office organisation, the European research landscape is weaker in focus on integration and interoperability than both North America and Australasia. This area is crucial for EU policies, as interoperability across different Member States is a key enabler for full implementation of the Single European Market and associated tools and instruments. Without information systems that are able to communicate across European frontiers and borders, there is a very high probability that most European policy goals will remain under-achieved. The weakness stems not from the lack of research being carried out, but from the lack of focus within the research taking place.[152]

Interface between front and back office (content and service design, production and delivery)

In all three research themes described in this block, Europe is relatively weak in terms of eGovernment research. This is maybe due to the fact that much of the research that takes place in Europe either focuses on the public administrations or (some aspects of) the users, but does not examine the relationship between the two, and thus how suitable content and services can be designed, produced and delivered. In terms of networked government, this is a highly difficult area in an EU where borders are continually contested and subsidiarity limits the amount of interaction between levels.

Furthermore, in Western Europe, where bureaucracies are firmly established and have their own inertia, there is an understandable resistance to involving new partners in achieving policy objectives and implementing policy initiatives. This networked governance research theme appears to be a topic which is understudied across the globe, so despite Europe's weakness in terms of the state-of-the-art research agenda, no other global region is doing better. Multi-channel service design and delivery is a theme that is accorded a high level of attention in Asia and Australasia, whereas hardly any EC-funded research has taken place in this area in the recent past (perhaps reflecting the recent technological focus apparent in DG Information Society funding programmes). Value chains are strong research topics in North America and Australasia, and despite the relative weak coverage of the topic in Europe, the EC itself funds a large amount of the research in this area.

Front office (service use)

Although European eGovernment research is strong in the area of eDemocracy and eParticipation, there is a lack of relevant and leading edge research focusing on user

[152] In 2005, however, the EC launched a major research study on interoperability, as part of the Modinis programme, which should go some way to redressing this imbalance at the EU, if not other levels. Also, in 2005 the EC launched its revised European Interoperability Framework (European Commission 2004j and 2005v).

needs in comparison with North America and Australasia. This appears to be driven by the tendency to research the public administration perspective in Europe, rather than focusing upon users and their take-up patterns of new technologies in relation to government services. Despite this being categorised as a weakness, DG Information Society provides a lot of support for examining user needs. This, however, needs to be more focused.

eGovernment specific objectives and the research weaknesses

Europe is very weak in carrying out research that links together activities across the public sector as a whole, and quite weak in innovative governance research.

In terms of the weakness in cross-sectoral research in Europe as a whole, the inertia in established institutions plays a large role. Asia and North America, both areas where institutional compartmentalisation is perhaps not as historically fixed as in Europe, lead the way in terms of cross-sectoral eGovernment research. This weakness is examined in more detail in recommendation 6 in section 6.3.1 below.

In terms of innovative governance, no single global region is strong. For this reason and because of the emerging complexity and importance of issues in this research theme, it may be useful to separate the issues concerned with government's governance/conditioning role (focusing on structures and the role of the state, law, legal and regulatory aspects, and relations with the market and civil society) from government as a social, economic and regional actor in its own right (focusing on innovations in investment and spending across the whole public sector), resulting in two separate research themes. The EC's contribution to this research theme has been rather weak, though very recently has been improving with the launch of the Modinis programme and other initiatives.

Both cross-sectoral and innovative governance are themes in which research is generally weak in Europe (the latter being weak globally), given that we are only now seeing a development in the maturity of eGovernment. This means that eGovernment is now emerging from a technologically-based, hype stage into a more widely adopted set of technologies. As a consequence of this maturity, the time is proving ripe to examine the potential possibilities for linking different sectors together and using new digital applications to promote opportunities for innovative governance. Therefore these weaknesses should be considered a call for future research and new opportunities.

Public value creation

Although Europe is a leader in this research theme, it is still very weak in terms of coverage of the state-of-the-art research agenda, and stakeholders have recommended that it be allocated a large increase in relative effort in future. This is due to the fact that, as with the justification for more research at the specific objectives level, there is a need to understand the relationship between eGovernment and more general policy goals much better than we do at present. The ultimate goal of eGovernment should be measured in its contribution towards wider policy goals, and not just, for example, in the rollout of services or re-trained staff. However, this cannot take place without carrying out research into exactly what form this contribution can take.

Although, the EC's research projects in this area in the recent past have been no stronger than the average European position (as well as the non-European position), recent EC initiatives are changing this situation significantly. For example, RTD calls for eGovernment research in the Sixth Framework IST Programme are now linked to Lisbon policy goals and proposers are requested to make such a link specific. Also, several projects in the current Modinis and other programmes are already focusing more heavily on public value.

The opportunity over the next few years is to focus on public value in much more detail and more deliberately, for example by using the three-level model approach (see sections 4 and 5), especially in terms of how research results can be deployed.

6.2.3 Conclusions and summary of opportunities and risks

Europe's relative eGovernment research strengths and weaknesses have been outlined above in order to develop a greater understanding of what and how eGovernment research policy can facilitate better eGovernment, which also contributes towards more efficient and effective government, as well as contributing towards public value. By carrying out the data analysis and the subsequent prioritising of strengths and weaknesses, a clarification of the areas needing focus can begin. This is summarised in the following Section 6.3 (research recommendations). Section 7 will make recommendations for the organisation of the research.

The retention of Europe's strengths is central to the global competitiveness of the European research community, and should therefore be treated as a focal point for continuation in Europe's research agenda. Weaknesses, where they are crucial to specific policy areas (as described in Section 5), need to be acted upon. However, as has been demonstrated, there are great opportunities to reinforce strengths and address weaknesses in future, including learning from other regions of the world in certain cases.

The opportunities for eGovernment research in Europe are as tantalising as they were when eGovernment emerged as a subject worthy of research. As section 4 outlines, there is a clear need to take into consideration an intervention logic when dealing with the opportunities for eGovernment research. This is due to the fact that eGovernment can only achieve a purpose if it contributes towards a broader agenda which concerns itself with policy objectives.

One of Europe's biggest challenges is its diversity, especially at pan-European level, be it in terms of research, education, policymaking, or culture. This, however, should be treated as an opportunity and an asset, and not just a barrier, to eGovernment research. This sense of diversity incorporates not only languages and cultures, but can also be extended to the idea of creating interoperable systems that work across a wide array of users and public administrations. Diversity also provides rich content and the possibility of value-adding public (and other) information services for both citizens and businesses. This idea of diversity, inherent in all European 'ventures', provides the eGovernment research landscape with a clear advantage, which can be turned into an opportunity if dealt with vigorously. It also makes Europe more like the global mosaic than, for

example, the USA, which, although in many ways is quite diverse internally, does not tend to reflect this diversity in governance or eGovernment systems.

Opportunities do not come alone from Europe's existing strengths or Europe's current institutional makeup. They will also emerge as Europe's eGovernment research community develops new ideas and as it interacts on subject matter. These, however, need to have a solid base that emerges through common infrastructures and a better common understanding of terminology, etc. As well as future eGovernment research enabling further opportunities, there is also the expectation that external influences will create more opportunities and risks. Therefore in Section 7 of this study, an approach is suggested to enable such a dynamic and flexible model of research organisation.

There are also some potential risks which need to be tackled, sometimes dependent on the EU level policy to be pursued (as analysed in Section 5):

- There are weaknesses in interface research (between the back- and the front-offices), i.e. in the design, production and delivery of services, especially in relation to organisational, social and economic aspects. Failure to improve European strengths here will (continue to) result in generally poor, mediocre quality and un-innovative services, even if there are big improvements in the back-office and much better understanding of user needs. But note that the user needs research theme is also weak in Europe. These research themes do have relatively high recent efforts, especially through EC-sponsored research (though more is also recommended), and existing research results are often quite well linked to deployment, but their coverage in relation to the global state-of-the-art research agenda is too weak.
- The specific European weakness relating to low priority being given to cross public sector eGovernment research (RT 13), could be a risk if not addressed. As described above, however, there is much opportunity especially post 2010 to focus more on joined-up, networked government, and innovative governance across the whole public sector, and to link this to the private and civil sectors. This is examined in more detail in recommendation 6 in section 6.3.1 below.
- One of the biggest risks in Europe generally (though not with EC-sponsored research, see below) is that the direct impact of research results on deployment is generally very low. This perhaps does not matter too much from an academic perspective, but in the context of this study with its focus on the contribution eGovernment research should be having on EU policies, this is an important shortcoming. (See also section 3.3.4 above.) Part of this risk is a political problem. Some politicians interviewed for the study had the view that “we’ve been talking about eGovernment for ten years but nothing much has happened!” This should also been seen in the context of the short periods of political office (between elections), and the fact that there is often a backlash from politicians if eGovernment does not deliver results with which they can be associated. This risk is examined in more detail in recommendation 2 in section 6.3.1 below.
- There is also a risk in not better addressing coverage of the global state-of-the-art research agenda, and deployment impact of, all research themes at the specific and general objectives levels. One of the major challenges for European research is to ensure application towards chosen policy goals, but this has not been addressed very well in the past, although during 2005 important advances have been made

especially by the EC in this regard. This risk is examined in more detail in recommendation 1 in section 6.3.1 below.

- Failing to learn from and cooperate with other global regions, where this is relevant and useful to Europe, is a risk which can be countered both through better funded and more formal cooperation, but also better antennae for synthesising what is going on. (See also section 7 below).
- Finally there is a potential general risk from external global threats. Recent events of man-made origin (e.g. terrorism, political and military disputes), natural origin (e.g. tsunamis and earthquakes, as well as floods in Europe) and perhaps a combination of the two (such as bird flu), are leading to increasing global uncertainty. (Although this could be disputed if the argument is simply that we are now more aware of these threats because of 24 hour news and the Internet.) There is also a legal framework issue to many of these risks, such as the correct balance to strike between anti-terror laws and civil rights. The public sector, and governance structures and institutions generally, are in the front line in both predicting/monitoring and countering/coping with such risks, and so far results have been highly variable. eGovernment has a huge potential role to play in these, but the costs, efforts and outcomes are largely unknown, as are the consequences of ignoring the risk.

6.3 Main recommendations and research challenges

6.3.1 Main research policy recommendations

This section provides a summary of the main research recommendations, which will enable Europe to focus on its strengths and learn from its weaknesses in eGovernment research. These recommendations are also intended to ensure that the EU can take hold of opportunities and counter the risks that might emerge in the context of broader policy goals.

Europe's research strengths in eGovernment put it in a positive situation regarding future possibilities for application and relevance to certain policy goals. However there is a lot of work to do in certain areas.

Focusing on Europe's strengths is one way of looking forward to the future. There is clearly a lot of positive work being carried out in terms of eGovernment research in Europe, especially by the EC at the European level, but this must be continuously developed. There are also some holes in Europe's research capacity, which are, in some cases, reflected around the world, and in others Europe lags behind other regions.

All these concerns are summarised into eight main research policy recommendations, as detailed below, related both to eGovernment research content as well as to how each can specifically be addressed at European level by the EU and other actors.

When addressing ways to implement each of the eight research policy recommendations at European level, it needs to be borne in mind that government and public sector issues are firmly within the competence of Member States. This means that the EU can only act in this area when requested to coordinate, provide support frameworks, and act as advisor. Subsidiarity principles also suggest, however, that the EU should take the leading role in defining pan- and trans-European eService requirements for a set of

strategic priorities. This should be limited to the resources available, so that funds are highly focused and not too thinly spread for maximum impact, and undertaken in cooperation with the MS.

The specific roles the EU can play in the eGovernment context are to foster and support vigorous and dynamic communities of research, policy and practice at European level and to link these closely with national, regional, industrial and academic networks at all levels. Section 7 will show in detail how this could be done, i.e. through seeding innovation, supporting policy priorities (e.g. through research clusters), creating synergies, enhancing relevance and quality, and establishing an infrastructure for eGovernment research. This needs to be done through agreements with Member States, or groups of Member States, as well as with industry and academia.

Each of the eight research policy recommendations made in the following can be strongly supported at European level through such initiatives, and these are therefore the main mechanisms recommended in order to implement them. In addition, however, each has some specific characteristics which could require a particular approach within this broader framework, as suggested below:

1. First and foremost, desk research, questionnaires, and interviews have all shown that a **shift is required from a focus on operational research towards examination of the impact of eGovernment particularly at both eGovernment and EU policy levels**. This should ensure that sufficient and relevant research takes place into higher level policy and political implications for eGovernment implementation, recognising that eGovernment has reached a stage of maturity and that research should capitalise upon this rather than attempt to focus on 'rebuilding the wheel' at every possible opportunity. Section 3.3.4 has shown that the EC is already quite advanced in this regard, so this approach should be strengthened and the EC's role in European research as a whole further focused on providing leadership and a framework to make this happen more widely. For example:
   i) 2005 RTD calls for eGovernment research in the Sixth Framework IST Programme have been linked to Lisbon policy goals and proposers requested to make such a link specific.
   ii) The work now being done by the eGovernment Unit in DG Information Society to develop an eGovernment Action Plan by April 2006 as part of the i2010 Programme which will link directly to 2010 and post-2010 policy.
   iii) The results of the European Ministerial eGovernment Conference at the end of November 2005 including the Ministerial Declaration issued with its focus on transforming the whole of the public sector.
   iv) Recent EC research projects (such as in the Modinis Programme) are already focusing more heavily on public value and consciously linking to EU policy.

   Thus, the main specific implementation focus should be in relation to the revised Lisbon and Gothenburg strategic goals (particularly growth and jobs) by national and regional governments working with industry and academia around their own National Action Plans. Clearly, such eGovernment research will, and should, also support regional and national policy priorities. In this context, much can be gained from learning about the experiences of others through good practice exchange.

2. Arising out of recommendation 1, **specific policy relevant research recommendations**, derived from Section 5, can also be made:
   i) **All five policies** examined pointed to the need for greater effort on research at the specific objective and the general EU objective levels in order to be better tuned to EU policies (which is the purpose of the present study). This means a more directive, top-down and policy-driven research policy is required which analyses the specific links (both direct and indirect) between eGovernment, government and EU policies, and is able to feed this back into the design and development of such policies, as well as into research policy itself. Until there is a much better understanding of how government and eGovernment can contribute to public value and the main EU policy goals, much research will continue to be risky and arbitrary from this perspective. In addition, some continued research is also essential across all policies into measurement and benchmarking at all objectives levels.
   ii) For the **economic growth, competitiveness, jobs and innovation policy**, there are four operational level research themes which should remain either just as important as they are at present or receive significantly more research focus in future. These are, first and foremost, trust and security, as well as value chain partnerships, networked government and user needs.
   iii) For the **social inclusion and regional cohesion policy**, more research is needed which supports the outward-facing aspects of eGovernment (user needs, socio-economic inclusion and eDemocracy). Research at the interface between government and citizens is also important, including ensuring the development and delivery of appropriate content, services and citizens, that relevant channel mixes are available, and that government itself is networked, coordinated and joined-up. In addition, trust and security need continued, if not further emphasis, as an essential theme linking governments and citizens.
   iv) For the **quality of life, welfare, social security and consumer protection policy**, the focus of attention at the operational level is given to service design and back-office developments. The latter can be carried out by focusing on achieving integration and interoperability, both at the semantic and the systems level across the EU. The changes that need to be implemented are not just technical, but should also consider legal and regulatory challenges, which, in the back-office can be examined by researching into change in the public sector. Services can be developed which work across all levels of government and public administration, therefore facilitating the citizen's interaction with public administration; these services should also focus on being inclusive and responding to the needs of individual citizens and their proxies (or intermediaries).
   v) For the **citizenship and EU citizenship policy**, specific action is necessary to promote active citizenship through provision of information regarding the democratic process and by attempting to improve the relationship between representatives and represented, or citizens and governors. Work can also be carried out to see how precisely new ICT (and therefore eGovernment) can contribute towards improving the democratic process. At the operational level, work should be done to encourage active citizenship, and to provide enabling environments for participation. This can be carried out by examining the

potential role of intermediaries and other actors in the 'democratic value chain', and ensuring that citizens are aware of the risks of electronic communication (which thereby leads to trust). Open source tools and applications can play a great role in this, as they can provide a base system which can be adapted to the needs of specific groups.

vi) For the **EU enlargement and EU research policy**, there is a need to focus on creating a European environment which is prone towards information sharing and information dissemination. Therefore, the specific and operational objectives of this policy area concern the infrastructures and implementation of research and education within the EU, ensuring that a certain level of harmonisation of quality (but not expertise) is encouraged. Benchmarking of research exercises across the EU can be useful in this regard, and should be encouraged. Operationally, eGovernment can contribute by helping to establish research frameworks, such as the current EU RTD Framework Programmes. These research frameworks should be further integrated with national level research programmes, to ensure that a common set of quality standards are maintained across Europe. For this purpose, quality and performance management and monitoring is of utmost importance. To help develop these 'cyberinfrastructures' as well as 'human infrastructures', a certain level of integration and interoperability should take place within the EU and national level research programmes. Open source tools and applications (part of the so-called 'cyberinfrastructures') can be put to good use to encourage and exploit human and knowledge infrastructures.

3. Third, in the context of linking eGovernment research more directly to policy impacts, there should be **greater focus on the deployment of the research results**. Again, the EC has over the last few years been leading efforts to better link eGovernment research to EU level policies (many of which are now also national policies). As analysed in Section 3.3.4 above, it is clear that EC-sponsored research activities are, not only generally closer to deployment and thus more likely to have a direct impact on EU policy, but also involve a higher number of stakeholders (i.e. are more multi-stakeholder) including a larger proportion of public sector and ICT industry stakeholders, and cover a larger number of research themes (i.e. are more multi-disciplinary) than the other research examined in this study. In fact, EC-sponsored research seems to play a very specific role in European research generally, and successfully complements this wider European research, providing, overall, a well balanced eGovernment research portfolio from the perspective of stakeholder mix and research type. Indeed from the evidence presented in Section 3, the EC is clearly showing the way for other European researchers in linking eGovernment research to deployment and thus to major policy goals, as well as providing a framework within which such deployment and policy linking can better take place. This role needs to be strengthened and made even more proactive in the future.

   In addition, whether or not the EC is directly involved in supporting such research, deployment requires close cooperation between the public sector, ICT industry, and in some cases users as well. This is an area where learning about deployment good practice and sharing experiences and solutions between these actors is crucial.

4. Fourth, despite the European strength in **change in the public sector** in terms of coverage of the global research agenda, research in this theme is still mainly focused at national and regional levels and is not sufficiently close to deployment. These challenges need to be better addressed in the future, and, in fact, the EC issued a call in November 2005 for research on organisational change for citizen-centric eGovernment which should go some way to address this. Other on-going initiatives which should be further strengthened include simplifying regulatory procedures across all levels, regions, and sectors in the EU, encouraging national action through measurement and benchmarking, and providing pan-European services which encourage and stimulate the Single European Market. For example, the Commissioner of DG Information Society and Research has also recently proposed wide-scale demonstrators to test and deploy pan-European services.[153]

   Change in the public sector is firmly a Member State competence, and each has its own particular set of challenges and opportunities. This and other studies have shown, however, that there are many common elements which can be the subject of mutual learning and experience exchange without any infringement of national sovereignty or priorities.

5. The weakness of recent European **research into the interface between front and back office** (content and service design, production and delivery), especially in terms of deploying research results, should be addressed more forcibly. This weakness maybe due to the fact that much of the research that takes place in Europe either focuses on the public administrations or (some aspects of) the users, but does not examine the relationship between the two, and thus how suitable content and services can be designed, produced and delivered. In terms of networked government, this is a highly difficult area in an EU where borders are continually contested and subsidiarity limits the amount of interaction between levels.

   There is clearly a specific need here for a new eGovernment research focus particularly on partnerships with other agencies within the public sector, with ICT industry and with user organisations, as well as with academics and consultants. This should examine new ways to deliver appropriate services, for example a better understanding of multi-channelling, and of intermediaries as one type of channel, which could have a significant deployment effect.[154]

6. Also, more focused research is needed into **front office and service use** aspects, both to further strengthen the existing European strengths of eDemocracy/eParticipation and socio-economic inclusion, but also to tackle Europe's weakness in user needs issues. There is a lack of relevant and leading edge research in Europe generally focusing on user needs in comparison with North America and Australasia, from where some learning could take place. This appears to be driven by the tendency to research the public administration perspective in Europe, rather than focusing upon users and their take-up patterns of new

[153] "i2010: The European Commission's new programme to boost competitiveness in the ICT sector" speech by Viviane Reding, European Commissioner responsible for Information Society and Media, Microsoft's Government Leaders Forum, Prague, 31 January 2005, SPEECH/05/61, p. 4.

[154] A forthcoming publication from the eUSER research project shows that multi-or 'flexi-channelling', which includes the 'e' channel, has a clear positive effect on the quality and quantity of citizen contact with government, and that the role of intermediaries is significantly greater than previously envisaged: eUser project (2006 forthcoming) evidence-based support for the design and delivery of user-centred online public services, eGovernment report, European Commission IST 6th Framework IST Programme.

technologies in relation to government services. However, the EC does already provide a lot of support for examining user needs, so this should be strengthened and focused even more.

Implementing this recommendation also requires close cooperation between the public sector, ICT industry, as well as with users. This is an area where learning about deployment good practice and sharing experiences and solutions between these actors is crucial. Linking into the agendas of the main pan-European and national user interest groups (such as for the disabled, the elderly, the regions, SMEs, ethnic groups, youth, etc.) would provide a positive way forward.

7. **Cross sectoral services**, i.e. spanning and integrating the public sector as a whole, needs more focus. Historically, the EC has not been able to lead or encourage research in this area because of lack of mandate at EU level and a history of compartmentalisation. The opportunity now is to look at other countries (especially in North America and Asia), build common infrastructures and economies of scale, learn between sectors, develop the user perspective, avoid sub-optimisation of resource use and of impacts, learn from intervention logics, and similar. However, of course, Europe should continue to respect diversity. In many situations a cross-sectoral approach would be beneficial for users as well as for governments (as in cases of policies to support families with problems through linking education, social security, youth services, police services, etc.), although in other cases it may not be in the user's interest, for example, they may not want their social security data to be seen by the police. These opportunities could perhaps be exploited post 2010 and be signposted in the EC's eGovernment Action Plan due for publication in April 2006. Indications of such a move were also made at the European Ministerial eGovernment Conference at the end of November 2005, and in the Ministerial Declaration issued with its focus on transforming the whole of the public sector. Also some relevant projects are now being funded by the EC.

   As mentioned above, changing the way the public sector operates, particularly in the context of 'joined-up' government, is firmly a Member State competence, and each has its own particular set of challenges and opportunities. This and other studies have shown, however, that there are many common elements which can be the subject of mutual learning and experience exchange without any infringement of national sovereignty or priorities.

8. Finally, notwithstanding the different perspectives which often characterises the debate about the precise role of basic technology research in eGovernment, there is a need for a **strong technology research function** which:
   i) Monitors relevant technology developments in other domains for their value to government, for example, in ICT industry and in the private sector generally, as well as globally.
   ii) Examines how such relevant technology developments could/should be integrated into the eGovernment domain.
   iii) Actively investigates the future needs by government and the public sector for new, advanced and basic technology. When such needs are clearly identified, then there is a strong case for supporting the necessary research, preferably through cooperation between relevant stakeholders (such as the public sector and ICT industry).

iv) Investigates how technology is integrated into government (back-office, interface, front-office, etc.).

v) Positively contributes to linking technology innovation to innovative eGovernment.

vi) Develops a purposeful technology policy for eGovernment, including how it is linked to the other government disciplines, which is robust and practical and based on innovation and integration.

vii) Tackles real challenges, such as those listed under technological research challenges for each research theme in Annexes 12 to 28, and works against 'islands of innovation' in technology exploitation.

viii) Encourages close collaboration between the major stakeholders, particularly but not only the public sector and ICT industry.

ix) Investigates the potential for wide-scale demonstrators to test and deploy pan-European eGovernment services.[155]

x) Investigates the potential for a common European repository of basic standard but high quality and high value eGovernment service modules for sharing and adaptation between Member States and regions, with or without appropriate charges.[156]

xi) And, critically, ensures that technology research plays its full role in moving eGovernment research towards deployment (and hence towards supporting the major EU policy goals), which many research themes are currently rather poor at doing.

To summarise, there should be two main strands of technology research for eGovernment:

i) Look at future possible government functions and then determine which technologies and technology research is needed to bring them about.

ii) Look at wider technology developments and research activities, especially those which take place in the private sector, and investigate which aspects could be exploited by eGovernment.

There is a prime role for ICT industry as well as for the public sector in implementing this recommendation. Many ICT industry organisations cross borders and are pan-European, even global, They thus have an almost unique insight and ability for mobilising research and rolling out its results which could be beneficial for other stakeholders. At the other end of the scale, many smaller ICT firms are local and regional, but nevertheless play a critical role in local research networks and in supporting local economic growth and jobs. Some of these issues are taken up again in section 7.4

[155] Identified by Commissioner Reding in her speech "i2010: The European Commission's new programme to boost competitiveness in the ICT sector", Microsoft's Government Leaders Forum, Prague, 31 January 2005, SPEECH/05/61, p. 4.

[156] Recent evidence gives support to the belief that such an initiative would be viable, for example it was stated at the open meeting of stakeholders held in Brussels, 21 September 2005, that Estonia would be willing to make it's modules available for such a repository.

6.3.2 Main research challenges

In this sub-section, a summary of research challenges, synthesised and validated from those described in Annexes 12 to 28 of this study, is drawn up for each objectives level. For the full array of detailed research challenges for each research theme, reference is made to those annexes. For each given policy to be pursued, these research challenges could be collated into a comprehensive dossier of research challenges and recommendations. This is beyond the scope of the present study, but the material has been provided to enable this to be done.

Operational objectives

Generally, the primary research challenge at the operational level is of interoperability, in the broadest sense of the word. Particularly at the European level, there is a need to ensure that technologies, semantics, and interfaces are interchangeable. This will provide for a greater opportunity to ensure the aims of the general policies of the EU.

Secondary research challenges at the operational objectives level, which are no less important, but stem from the issue of 'interoperability' include:

- Networking government and public administration in an environment that encourages all sectors of society to interact efficiently and effectively
- Improving service design, production and delivery to increase the type, relevance, quality, usability and take up of eGovernment services for individuals and specific socio-economic groups

Political and strategic challenges at the operational level include how to manage and control the freedoms of information, mobility, etc. Data and information should, in order to achieve policies, be as free-flowing as possible; this relates especially to public sector information. This includes questions of access to information, which can include discussion over Digital Rights Management and the ethics associated with implementation of such technologies. Briefly, the following challenges need to be addressed:

- Use of information and separation of information from documentation (separation of content and form), which includes understanding the principles of dissemination of information (multi-channel).
- Ethical analysis of use of personal and private information.
- Stocktaking and evaluating where we are already in terms of eGovernment applications and the relationship between new and old systems and processes.

Structural, organisational, and institutional challenges at this level concern cooperation between public agencies and other institutions and actors. This concerns the relationships between different organisations, inter-jurisdictional issues, and value chains, that deal with public services, specifically the operational role of networked government and the position and tasks of intermediaries in the design, production and delivery of public services. The following challenges need to be addressed, amongst others:

- The role of the public administration in providing services, which includes a greater understanding of the relationship between the public sector and public services.
- Joined-up, networked, decentralised (e)Government and the consequences for political institutions.
- Moving from government-centric to user centric public services, including the principles of consumer choice (which also involves multi-channel research).
- Determining which level of government should be most appropriate for implementation and use of eGovernment services.
- Value (supply and delivery) chains, involving the public sector in collaboration with the private and civil sectors.

Economic challenges to be overcome in terms of operational objectives include ensuring efficiency and effectiveness in order to encourage cost benefits. The implementation of eGovernment can produce cost and efficiency savings when done so properly: it is an operational task to make as much effort as possible to ensure that savings are made and that these are then channelled into achieving higher policy goals, or returning the benefits to citizens in the form of lesser government spending. Challenges to be addressed include, but are not limited to:

- Understanding the economics of implementing certain services, such as DRM, and what this means for future interaction between public administrations and citizens and businesses.
- Exploring the (re)use of public sector information, open source and open standards and the economic models that can be applied in each case.
- The consequences of implementing new applications and systems in the public sector in terms of economic developments need to be addressed.

Social challenges include delivering high quality services, both in terms of access and relevance. The needs of the user are paramount in this regard. Challenges revolve around trying to assimilate the users' perspective into the research process, which is an extremely exigent task. The following challenges outline some of the areas which need to be covered:

- Design principles for usability.
- Using regional and cohesion policies to address the digital divide through not only infrastructure access, but also demand-driven services.
- The role of intermediaries needs to be better understood, given that public services are not about interacting with a public administration, but about getting a service.

Technical and technology challenges are very important at this level of eGovernment implementation and production, and include:

- How to deal with legacy technology, reduce technology redundancy and ensure this problem does not perpetuate in the future.
- Assuring technology quality, monitoring, performance and adaptability, including disaster resilience.

- Technologies for knowledge management and how to manage data and information in appropriate ways, that take into consideration the political, institutional, and structural challenges mentioned above.
- Decision-support systems, cognitive and intelligent systems, simulation and gaming, coping with complexity, real time and data mining, including for example use in engaging citizens and engaging intermediaries and political representatives.
- New types of service content, content technologies and DRM.
- The exchange, integration and interoperability of data, processes and applications, including reference process monitoring and process standardisation and commoditisation.
- The pressing issue of archiving, electronic record management and document life management.
- Semantic and ontology modelling and integration, including the development and application of the semantic web to eGovernment.
- Modelling technology architectures against organisational structures and institutional interoperabilities.
- The role of (technological and semantic) standards, open source, process repositories and other databases in contributing to better application of technology to eGovernment processes, such as shared services and service modules, including re-use of data, system architectures, etc.
- CRM and user inputs to technology design, including personalisation, agents and avatars, types of service interface, user interaction models, types of service delivery (such as government pro-active, intermediary-driven, user self-service), design for all and usability, and ambient intelligence for users of eGovernment.
- The critical issues of identity, authentification and security systems, which is often quite different in the government compared to the private sector domain, including the need for federated solutions, the identity not just of users but also of objects, the ambient intelligence context, etc.
- Future access and interface technologies, such as minicomputers, handhelds, wearables, digital television, digital paper, mobile/wireless, gestures and movements, natural language processing, data visualisation and representation, channel integration, grid, peer-to-peer, etc.

Specific objectives

In the main, the primary research challenge concerns restructuring organisational, technical, and political frameworks to gain the most benefits from the application of technology. This does not imply that technology should determine the structures that evolve as a result of the implementation of eGovernment processes. It is, rather, concerned with the impact of processes. Whereas operational objectives consider the implementation of applications and the design of processes, these specific objectives are concerned with the impact of the processes on (e)government performance, and general objectives (considered in the next sub-section), look specifically at the relationship between eGovernment research carried out at the operational and specific levels to EU high level visions.

Other research challenges which are a part of this primary one include:

- Making better use of ICT for eGovernment for citizens and businesses.
- Linking actors together.
- Sharing experiences of operational eGovernment research and outputs.
- Innovations in structures, governance and mindsets.

Political and strategic challenges at this level concern the manner in which processes are managed, and how these relate to existing systems, organisations, and institutions. For European level eGovernment, there is a clear challenge in terms of linking public administrations together and ensuring that systems are interoperable. There is a political challenge to ensure that EU level interaction takes place, not only to benefit EU-level governance, but also to ensure that research, dissemination, and learning takes place in a common framework. Common challenges include:

- Finding the political will to coherently link up services for citizens and businesses in the local, national, and European environments. This can be done by showing the benefits of such an activity. These benefits need to be discovered, as well as the potential problems that can occur.
- Understanding the role of the public sector and public administrations in working towards delivering efficient and effective public services.
- Exploring different modes and models of governance, which incorporate all levels of political interaction within and between political institutions and other organisations.
- Understanding the role of targets, measurements, and benchmarking in (e)Government processes.

Structural, organisational, and institutional challenges to be overcome at this level concern the relationship between different levels of government and their respective users. These include employers and employees as well as interdepartmental concerns. Organisational structures and administrative procedures need to be better understood if eGovernment research is to contribute towards making public administrations and related bodies more efficient and effective, and able to contribute towards public value in a more positive way. A list of suggested challenges would include the following:

- Understanding processes in public administrations across different departments and sectors.
- Encouraging change and innovation in public administrations which bears in mind the emphasis on service design and not on institutional aspects of public administrations.
- Understanding the relationship between the different levels of public administration, and the necessary and advisable reform that should be carried out to make eGovernment contribute towards major EU-level policies and towards providing public value.

Economic challenges in terms of specific objectives include the perceived value of the public service ethic: is this a value worth upholding, or should public services be ‘outsourced’ as much as possible? Furthermore, the real costs and benefits of

eGovernment need to be understood and measured, and this is a particularly challenging topic. Challenges include:

- Agreeing on whether eGovernment is just about cost-saving or is about providing better services to citizens: the two are not necessarily concomitant.
- Understanding the relationship between improving efficiency in public administrations and other policy areas, such as industrial policy.

Social challenges include understanding how to maintain and nourish key European values such as diversity. Inclusion is also a central issue for eGovernment research, given the political priority given to the idea of access for all. Furthermore, trust and confidence in electronic systems must be raised if inclusion is to be a central policy objective. Challenges include:

- Understanding how citizens will interact with public services in the future.
- Understanding how public administrations will interact with civil society in the future.
- Concentrating again on usability, and the steps that citizens will undertake to interact with their public administration. This entails focusing on demand-driven approaches of usability.

Technical and technology challenges at this level include ensuring that processes are joined-up, and that common, open systems are used that enable sharing of data between relevant services. At the same time as being open, security is an issue that relates also to trust and confidence from the users' perspective. Also of critical important is to understand how technology, as a tool (albeit very powerful and also transformatory), can be applied in order to improve the performance of government both quantitatively and qualitatively. For example, improving the cost efficiency of government, or government's openness, transparency and quality/usefulness of services. This inevitably means using technology in conjunction with other tools and with human and organisational resources and systems, including legal and cultural frameworks. The main challenge at this level is, thus, not to see technology as an end in itself, but to understand how better to use it, in conjunction with other resources, to deliver the improvements which governments, and the users of governments, want and need.

General objectives

Overall, the research challenges for the general objectives of (e)government (and therefore eGovernment research opportunities) relate to achieving EU policy goals. In this sense, they are more about policymaking as a whole rather than simply (e)government. The process, as described by the intervention logic outlined in this study, is not a simple one, requiring an understanding of when, where, and how government should intervene in order to achieve the desired goals. It also requires an understanding of the volatile and changeable environment in which government policies interact and interface with society and the economy. These risks and assumptions carry a far more important weight at the general objectives level than at the lower levels.

As with the specific objectives, general objectives are far more concerned with overall processes and outcomes than with individual instances, or examples. However, there is

a greater focus on trends analysis and vision creation in the general objectives research challenges. They are far more politically oriented, and will result in more profound questions being asked due to the fact that these challenges will consider the impacts of (e)government production and performance, at the two lower levels, on public administrations, governance, and on society as a whole.

Furthermore, a range of secondary challenges can be discerned when considering the application of eGovernment research to general policy objectives:

- Translation of research into policy (i.e. the effectiveness of the intervention logic as proposed herein).
- Understanding the link between eGovernment research and EU policy.
- Proposing an eGovernment solution to the public value question.
- Ensuring technological excellence, both in design and application of technology.

Political and strategic challenges at this level include an understanding of the future vision of the public service, including the changing role of civil servants and their institutions. What is the role of government in communicating with citizens and what position should public administrations take in this? These kinds of questions make up the challenges that need to be addressed at the general objectives level.

Structural, organisational, and institutional challenges for the general objectives concern the process of integrating all actors into a far more effective network-like policymaking structure. A need to understand the notions of networks, particularly in policymaking circles, is paramount. This provision of transparency and openness is not necessarily a technological benefit, but implementation can be facilitated through use of ICT.

Economic challenges to be overcome in terms of general objectives include achieving the main economic goals of all EU countries (and of the EU) that have been stated in the renewed Lisbon agenda.[157] eGovernment's role in achieving this relates to competitiveness, growth, jobs, and employment in the EU. eGovernment policies that invoke economic growth, for example public procurement, need to be analysed in terms of their impact on general EU economic goals, whilst bearing in mind the potential social and organisational implications of such developments.

Social challenges include understanding how to fulfil major policy objectives without leaving certain sectors of society behind. Given the social agenda within most policies in the EU, this is also to complement the challenges relating to most policy issues that do not include elements of eGovernment research.

Technical and technology challenges at this level are mainly subsumed through the lower levels of operational and specific objectives. Overall, there is a need to examine the future role of technology in supporting government deliver better public value to society, particularly on governance and government functions, and vice-versa. This also includes the social shaping of technology and the shifting boundary between what

[157] European Council (2005).

technology does best and what people do best. Another challenge in this area is how to maintain scientific and research excellence in the field of eGovernment. A key institutional, strategic, and social challenge that arises from this is to learn to understand how to apply technology to positive uses that help achieve major EU level policies. The main challenge at this level is, thus, not to see technology as an end in itself, but to understand how governments can use it better, in conjunction with other resources, to deliver improvements people want and need in their everyday working and social lives.
The summary of research challenges carried out above reveals that there are a number of challenges that are common to various research themes, or are important to research themes which require (according to the strengths and weaknesses analysis) attention as part of European eGovernment research policy. The next section looks at how these, and future, research challenges should be organised in a European context.

7 Organisation, coordination and operation of European eGovernment research

Section 6.3 provided a detailed overview of the main research policy recommendations for Europe related to research content and their specific implementation requirements. This section, in turn, provides detailed recommendations concerning organisational and coordination policies and structures at EU level which are important for all of them, as well as for other aspects of European eGovernment research more generally.

Given that the remit of the present study is to focus mainly on the European level, much of this section concerns EU eGovernment research activities as the main (though not only) actor. However, this section also addresses how the European and EU levels can be linked to national and local levels, as well as to research taking places in industry and academia. This is because one of the main purposes of EU activities is to galvanise and network research across all relevant stakeholders and levels. For example, in section 7.3, the broad cross-section of stakeholders and levels is itself considered directly.

7.1 Stakeholder feedback

Extensive feedback was obtained from stakeholders concerning the organisation, coordination and operation of European eGovernment research, through the questionnaires, desk research, and the intervention research (consultations and participation in workshops and conferences.)

Although there was often some disagreement about details, much diversity in emphasis, and a single example of strongly opposing views, the main thrusts of the feedback were remarkably consistent and can be summarised as follows:

What types of research should be carried out

- There should be a flexible mix between short and longer term types of research, but the former should explicitly lead into the latter.
- Better linking is needed along the value chain of research (between basic/theoretical, applied, developmental and review research), and these links should be made explicitly, and assessed, against EU policy and public value. The only main area of strong disagreement was evident here, with some academics arguing for eGovernment research for its own sake, whilst most other stakeholders, and especially ICT industry, arguing that research should lead directly to applications and policy impacts. This disagreement is not important in the present context, however, given that the purpose of this study is to relate eGovernment research to EU policy goals.
- All, or as many as possible, of the concerned stakeholders should be involved (perhaps at different stages of the research and at different points along the value chain: the public sector (including the EU), academics, consultants, ICT industry, and user representatives.
- The EU level together with national and local levels, should be funding research on local and regional eGovernment, not only services but also different types of structures, both legal and organisational structures.

- More focus should be placed on the use of laboratories, pilots, trials, test beds in real life situations, and prototyping.
- eGovernment is largely an application research area, rather than a pure technology research area.
- There is insufficient socio-economic and social science research, as well as multi- and inter-disciplinary research.

Coordination and funding of research

- There is a need for better overall coordination of European research generally, both within the EU and between Member States, regions, industry and users. It is not always necessary to insist that all 25+2 Member States are in step, and it may also be appropriate to assist in the coordination of groups of a smaller number of Member States or other stakeholders.
- There is a need to balance both centralised and de-centralised research efforts – we have the latter now and it is too fragmented. The EC should take on the task of central coordination.
- The basic structures and high-level principles should be done at EU level, while the more practical issues should be dealt with at local level, thus taking into account different local specificities.
- New stakeholder models are strongly needed, focusing on Public-Private-Partnerships, but more refined models than we have at present. These should include greater focus on the 'community of research', 'community of policy' and and 'community of practice' approaches.
- Funding should be consciously coordinated between the different levels, where agreement and an overlap of interests can be found (and there is much scope for this), guided by subsidiarity principles.
- This strongly suggests the need for some sort of strategic prioritising of eGovernment research by the EC, whilst leaving a healthy undergrowth of bottom-up, decentralised research to academia, ICT industry, and the public sector (although even this could be better coordinated), whilst letting the EU resources be focused largely on more top-down strategic priorities.
- There is a need for more and better communication of research: not only good results, but also bad or not so good, as long as lessons are learned and applied from the latter.
- There is a need for some sort of 'Centre for eGovernment' at European level, but independent from the Commission, although supported by it. This is needed so that all involved in eGovernment can come together to share knowledge, perhaps in the form of a one-stop shop. Right now the field is too fragmented.

The need for global collaboration

- There is a strong need for European eGovernment research to participate more systematically, vigorously and formally in global eGovernment research collaboration.
- For example, by formally agreeing areas of common interest and then providing funding for own researchers / countries to participate, i.e. an international framework

for eGovernment research. At present things are too much bottom-up and ad hoc and need a more formal framework.

- This should include clearly earmarked funds for such global cooperation, in contrast to the present situation, where such funds compete with EU-only research.

A more detailed overview of stakeholder feedback on the organisation, coordination and operation of European eGovernment research is provided in Annex 11.

The recommendations that follow draw strongly on this feedback, but are also based upon wider considerations concerning the future of EC-supported and other European eGovernment research.

7.2 Organisation of research policy

Organisational recommendations in the following relate largely to European Commission (EC) actions and initiatives, but also how these should relate to other eGovernment research at national and regional levels and as undertaken by industry, academia and the public sector within Europe.

One of the clear messages emerging from this study, and which finds support in the context provided by the significant changes in emphasis called for by the Kok Report,[158] the relaunched Lisbon Strategy,[159] the preparation of i2010,[160] and a recent speech by the new DG INFSO Commissioner,[161] is for much greater focus of EU effort and resources on specific policies and priorities as well as much greater synergy between different policies, instruments and initiatives. These and other sources also strongly imply a move away from technology-push, to be replaced by focusing on what touches ordinary people as citizens and workers, and what provides them with real tangible benefits. The focus is thus moving to research which can support the deployment of beneficial services and infrastructures rather than on technology research and deployment, and where impacts should be seen in the quality and range of services available to people.

In many ways, this implies something of a sea-change in thinking which appears to be taking place for an overall DG Information Society approach focused increasingly on the demand-side, on user-, community- and citizen-centric needs, and thereby on deployment, take-up and the productive use of eServices. Moreover, such take up and productive use need to positively support more competitiveness and employment, but also in ways which are inextricably linked to benefits for ordinary people (citizens and firms) in their social and working lives. The role of eGovernment, and thus eGovernment research supported by the EC, must be central component of such policies. This study's use of the three objectives levels linked by a strong intervention

[158] "Facing the challenge: The Lisbon strategy for growth and employment", Report from the High Level Group, chaired by Wim Kok, November 2004, European Commission: http://europa.eu.int/comm/lisbon_strategy/index_en.html.

[159] Relaunching the Lisbon Strategy: a partnership for growth and employment (Mid-term review of Lisbon Strategy)", Presidency Conclusions, 22-23 March 2005, European Council, Brussels, DOC/05/1

[160] "i2010 – A European Information Society for growth and employment" Brussels, 1.6.2005, {SEC(2005) 717}, COM(2005) 229 final.

[161] "i2010: The European Commission's new programme to boost competitiveness in the ICT sector" speech by Viviane Reding, European Commissioner responsible for Information Society and Media, Microsoft's Government Leaders Forum, Prague, 31 January 2005, SPEECH/05/61.

logic and unpinning major EU policy goals, is highly complementary to these developments.

This study proposes four interlocking strategies to meet these needs and aspirations: seeding innovation, supporting policy priorities, creating synergies and improving quality and relevance. Each of these is dealt with in the following.

7.2.1 Seeding innovation

The great bulk of recent EC research is based upon relatively specific areas of focus[162] but with a lot of leeway given to proposers in interpreting how to approach these areas, which results in a quite haphazard collection of research projects which are difficult to coordinate in a manner which optimises synergies. Clearly such an approach, within the frameworks determined, is highly important for facilitating innovation which cannot be orchestrated top-down by the EC or Member States. However, it is questionable whether this approach on its own is able to provide sufficient focus and impact on the major EU policies.

Weighing the advantages and disadvantages of this largely bottom-up approach, and considering the new climate of thinking in DG Information Society about the desirability of strengthening synergy across programmes and greater coherence with European policy, it is recommended that this approach be significantly reduced in future in favour of a more policy determined framework, as described in Section 7.2.2 below.

However, there is a clear need and role for a healthy undergrowth of bottom-up, decentralised research, responding to signals from the public and civil sectors across Europe, as well as to market signals and the needs of European ICT industry. Although the main role of the EC itself should be channelled into a strategic prioritisation of research to support policy, it must also provide sufficient funds and a suitable framework for such seed beds of innovation. This will not only benefit eGovernment at various levels across Europe, but will also have an impact on local growth and employment.

By channelling most resources in strategic research, this should make it possible for this decentralised bottom-up research to be even more open and serendipitous than it is at present. For example, one possible fruitful type of approach would be to emulate the present FET (Future Emerging Technologies Programme), but focused on eGovernment and not only concerned with technology but also with organisational, economic, legal and other relevant issues.

According to the intervention logic used in this study, there is a need to connect most research initiatives to higher policy levels. Although this requires a very positive application of a strategic posture in terms of determining research agendas, there is, in parallel to this approach, a clear need for innovation to be given as wide a remit as possible in the eGovernment research process. This should not bind researchers and

[162] For example, the 4th IST Programme Call for innovative government focused on four main areas (democratic involvement, personalised eGovernment services, eGovernment support systems and pan-European services), plus limited funding for roadmapping to 2010, the transfer of eGovernment R&D technologies, knowledge on the digital divide, and clustering of European research on electronic identity.

research groups to fixed specific policy outcomes, which may evolve over time, depending on external variables, but will attempt to ensure that the research process can be freely adapted to contemporary developments. Furthermore, innovation in research is a necessary prerequisite for research in eGovernment, which is relatively new and not fully formed in terms of agreed terminologies: the boundaries of eGovernment research are still being described and are constantly changing.

7.2.2 Supporting policy priorities

This study and other evidence point overwhelmingly to the need to concentrate much of the future eGovernment research effort supported by the EC onto a more decidedly policy-driven and strategic approach reflecting EU and, where they overlap, also MS and industrial priorities and policies. The Commissioner of DG Information Society and Media recently said: "…research needs to be more targeted, more strategic and more attractive to industry."[163] There seems to be a decisive sea-change taking place in the thinking of this DG, in the EC generally, as well as amongst Member States (MS), about an ICT approach focused increasingly on the demand-side, on user-, community- and citizen-centric needs, and thereby on deployment, take-up and the productive use of eServices, including eGovernment services.

All this points to the pressing and urgent need in the future for a more strategic approach. Too many of the present resources are letting 'one thousand flowers bloom' at the cost of long term impact, and focusing on basic technology and/or short term research, whilst many if not most projects whither after a short season of success, in the sense that their multiplication effects and overall impacts are limited.

Focussing like this by the EC is necessary, but it also assumes that other stakeholders, as of now, undertake other types of research, but also supported and seeded by the EC where appropriate. Thus, such strategic prioritisation fully reflects the specific EC role, which needs to complement the different roles of other stakeholders.

Such a strategic priority approach could be implemented either through the calls for proposals approach, as now, but with much less leeway for proposers, or, which may be more appropriate, through the calls for tender approach in which very specific research is commissioned. A call for tender need not be based on 100% funding, and could where appropriate include a competitive element in which a business deployment model is part of the tender. Actual EC funding for projects should be determined in direct relation to the interest to carry out the research, and what other funding is available. Generally, such flexible funding should be possible, if this is in the EU and public interest and conforms to the precise research needed by the EC and Member States.

Efforts to avoid distorting the (research) 'market' should be continued, but this is not seen as problematic given the nature of eGovernment research serving the public interest, which the free market alone either cannot or will not provide. Bringing in appropriate private sector partners and sponsors should also continue to be prioritised, as long as this does not favour individual firms at the expense of others, and if EC

[163] "i2010: The European Commission's new programme to boost competitiveness in the ICT sector" speech by Viviane Reding, European Commissioner responsible for Information Society and Media, Microsoft's Government Leaders Forum, Prague, 31 January 2005, SPEECH/05/61, p. 5.

support is used where appropriate to improve the conditions which private sector companies in general need to successfully undertake and apply research.

Strategic priorities should be selected on the basis of which particular EU policies need to be pursued most vigorously, or by focusing on priorities which overlap with and contribute to a number of EU policies simultaneously. Agreement on priorities is needed within the EC as a whole and with all MS, or with specific groups of MS, depending on need and circumstances. (The issue of groups of MS is addressed below.)

At the MS level, selected priorities will need to reflect the overlap of MS national goals and policies related to eGovernment, the public sector, ICT research, and the Information Society generally. It is important both in political terms but also to maximise impact, to aim for as much common commitment and common ownership of strategic priorities as possible. This and other studies[164] have shown that such an overlap is extensive and as yet largely untapped. This also implies greater coherence with other EC Programmes, as well as, of course, with national and regional programmes, and the priorities of other research stakeholders like industry and academia. For example, closer linking should take place with the EC's Structural Funds[165] and the newly proposed Competitiveness and Innovation Framework Programme,[166] which could provide significant synergistic effects for DG INFSO's eGovernment research. In this context, there could also be scope for specifically regional level priorities and policies to input to strategic priority selection.

Importantly, each of these levels will need to work together in order to maximise impact. Thus, the number of strategic priorities, as well as the scope of each, needs to be small enough to allow each of them to be relatively large, but also not too small as to reduce the overall visibility and impact of eGovernment research and deployment on society as a whole. Political visibility is also important in this context.

All this constitutes a set of highly challenging tasks, but is one shared with other current EU initiatives, not just in eGovernment. Also, it is clear in the aftermath, for example, of the Kok Report and the renewed Lisbon Strategy, as well as the fact that a large number of initiatives are being renewed at the present time, many for the 2007-2013 period, that both the EC and the MS themselves are operationally and psychologically prepared for such a challenge. This is particularly so in the case of the New Member States (NMS) as these are still finding their feet as full MS, and are thus not yet fully mired in the mud of traditional thinking. There will undoubtedly be a myriad of operational, administrative, legal and other obstacles, but the need is for clear and decisive political will, which does, indeed, now appear to be emerging.[167] It is very

[164] For example, the "Study on trans-European deployment potential, sustainability and exploitation models for public services in the context of an enlarged European Union", prepared by the Danish Technological Institute for the European Commission's eTEN Unit, February 2005.

[165] The Structural Funds support regional development within the EU.

[166] Establishing a Competitiveness and Innovation Framework Programme (2007-2013), Brussels, 6.4.2005. {SEC(2005) 433}, COM(2005) 121 final, 2005/0050 (COD)

[167] For example, the recent speech by Viviane Reding, the Commissioner responsible for Information Society and Media, "i2010: The European Commission's new programme to boost competitiveness in the ICT sector" Microsoft's Government Leaders Forum, Prague, 31 January 2005, SPEECH/05/61.

important in the period 2005-2006 to exploit this cusp of opportunities and promising conjuncture of events.

Indeed, the eEurope eGovernment Sub-Committee, representing the public sector in all MS, published their so-called Cobra Recommendations in September 2004.[168] These emphasise that now is the time to define targets and consider examples such as 25% administrative burden reduction for citizens and business, essential interoperability and enablers such as identity for pan-European services until 2010, paperless administration, society-wide take-up of key eServices, etc. Coupled with this are commitments to a concrete agenda for pan-European services, interoperability, identification and authentication, a shared European resource of building blocks, and a coherent strategy for EU-wide support for eGovernment, including through the alignment of programmes. One aim here is to start to move towards a single European eGovernment market (not 25+2 markets), given the importance of this both to the mobility of citizens and to European industry.

As concluded in Section 6 above, the strategic priority approach should entail a shift from a focus on operational research towards examination of the public value impact of eGovernment implementation and performance. This will ensure that sufficient research takes place into higher level policy and political implications for eGovernment implementation, recognising that eGovernment has reached that stage of maturity where research should capitalise upon this rather than attempt to focus on 'rebuilding the wheel' at every possible opportunity.

The main vehicle for EC research in pursuing such a strategic approach should be to determine (on the basis of major EU policies and by agreement across the EC and with MS, as described above) a number of strategic **eGovernment research clusters**. Each cluster should include individual projects that undertake particular and complementary research and which, crucially, are linked together into a value chain which addresses each of the three objectives levels. Thus, each research cluster requires one or more intervention logics (see Sections 4 and 5) for eGovernment in relation to a particular EU policy. This would enable the research needed to fill gaps in knowledge, expertise or applications, to be clearly understood and funded.

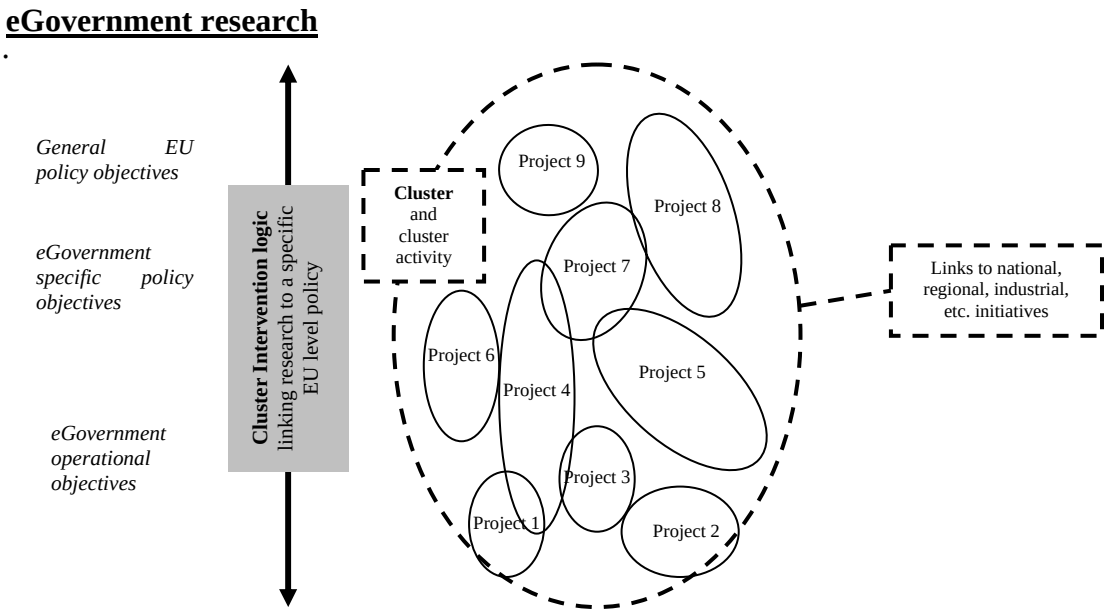
The management and coordination, both administratively and technically, of each cluster could be the subject of a specific call for tenders, perhaps as an accompanying measure which could attract 100% funding. Individual projects should in the main be relatively small with a limited number of partners. This is desirable in order to minimise the project's own internal management, which should be technical management only, rather like workpackage management in current RTD Programmes, as well as to ensure highly focused and effective research. Perhaps a better name for these 'projects' would be 'teams'. All formal, financial and administrative management should take place at the cluster level where one or more professional managers should be engaged. However, it is crucial that the cluster also has significant technical tasks, mainly ensuring that the cluster's projects collectively collaborate on achieving impacts on the EU level policy

[168] "eGovernment beyond 2005 – modern and innovative public administrations in the 2010 time horizon; the Cobra recommendations to the eEurope Advisory Group", third eEurope eGovernment subgroup meeting, Amsterdam, 27-28 September 2004.

which provides the overall rationale for the cluster. Thus, most clusters would be large, possibly in the range of 10 to 40 MEURO.

A sufficient portion of each project's funding must be earmarked for participation in the cluster, given that much of the research impact of each project individually will be magnified through collaboration on the overall impact of the cluster on EU level policies. Clusters should also be required to specifically link to national and regional research activities and agendas, and resources should be also be earmarked for this. This specific earmarking of resources for the linking of a project to its cluster (it could, in principle, also be linked to more than one cluster), and of clusters to national, regional and industrial initiatives is essential. Long experience from previous RTD Programmes shows that projects do not have time or energy for so-called 'concertation' or cluster activities unless resources are specifically set aside for this purpose and the activity is specifically programmed into the workplan. Cluster level work would also be ensured through its own workplan and funding.

The diagram below illustrates the concept of eGovernment research clusters.



This model will ensure small, focused projects, but within the context of a large multi-level cluster with clearly specified policy relevance, which can achieve critical mass, either alone or by formally linking with existing national, regional, industrial or academic research programmes, as well as other clusters where appropriate.

It is the case, of course, that contributing to high level EU policies, is typically a medium or longer term process. It is thus necessary to ensure that clusters operate over a period of at least three years and that they are highly focused on a small number of related EU policies specified at a detailed level - for example, supporting growth in remote local economies, including increased jobs, competitiveness and innovation in one or more sectors. As described in Section 4, eGovernment's successful contribution

to such a goal is also dependent on other factors, so the cluster must take these into account and assess risks and take counter measures if able to do so. These should also be described and assessed in project proposals. It should also be remembered, that the 'failure' of such research, in the sense of not, for example, being able to contribute to growth, jobs, etc., should be acceptable, as long as the reasons for this are fully documented and made available in the public domain. Thus 'failure' can be translated into 'success', even if this is success for others. We need to be more open to 'risk' and so-called 'failure' in Europe if we are to encourage innovation and growth. Note, the type of 'failure' discussed here is not failure due to poorly organised or executed research, or, worse, the mis-use of funds, both of which need to be penalised as of now. It is rather the 'failure' of a genuine research effort not achieving its originally intended goals, although it may achieve other goals, because the research process is, by definition and nature, one for which the outcome is not known in advance.

Alternatively, clusters could legitimately be formed around just two of the three objectives levels, and should be encouraged to draw directly on previous RTD from the 5th or 6th Framework Programmes (or from national or industrial programmes), rather than starting all work from scratch. Similarly, existing and relevant on-going work should be coopted in order not to reinvent the wheel and to ensure the wider impact of research investment.

7.2.3 Creating synergies

The need to link more directly and decisively to national policies, as well as to EU policies, and create better and greater synergies with them, is, as we have seen, now high on the EC's agenda. However, the version of the Open Method of Coordination (OMC) used by the Lisbon Strategy until its re-launch in 2005, and based on a loose method of comparative evaluation, is unlikely to be appropriate in the context described above without some adjustment. In the future the OMC will need to operate within the context of greater commitment and buy-in from the MS as part of the strategic priority approach suggested in this study. The OMC's use of a relatively rigid approach to benchmarking against European norms could also usefully be adjusted in favour of the norms, or agreed targets, of groups of MS. Reference to notional EU-wide norms could be retained in cases where leverage is needed to obtain political support or funding in specific cases.

In future, it will not be necessary or desirable to have exactly the same approaches or services across all MS. The scale of enlargement also necessitates this. Instead, focusing on groups of countries where appropriate should be encouraged, thereby achieving a lot more differentiation and healthy diversity. Internal MS opportunities and challenges are so different (though probably converging in the longer term), and the need to take account of the dynamism of change is so important, that a more differentiated approach is needed. Following such an approach, however, must also be balanced against the need to ensure that longer term requirements for interoperability, interconnectivity and necessary standards at a European (and in some instances at a global) level, are not compromised.

As part of the process described above, we anticipate that during the second phase of Lisbon[169] there will be closer coherence of MS policies and programmes to the main re-launched Lisbon strategies. MS governments will become more active in adopting and implementing programmes which directly link into EU policies. eGovernment research should purposefully link into these developments and thus into existing and evolving national priorities, especially where there is overlap between MS, and particularly between adjacent or similar MS, and with EU-level policies.

Subsidiarity principles suggest that the European Commission (EC) should take the leading role in defining pan- and trans-European eService requirements for a set of strategic priorities. This should be limited to the resources available, so that funds are highly focused and not too thinly spread for maximum impact, and undertaken in cooperation with the MS. In agreeing such strategic priorities, an assessment will need to be made of:

- The extent to which EC and MS policies and priorities overlap. Potential is considerable here, including but not limited to the Internal Market and the re-launched Lisbon goals, and could also include overlap with the priorities of groups of MS, rather than them all, so that for example different groups operate to different time horizons with some perhaps joining an early adopters and some a late adopters group, and benchmarking themselves against group norms rather than Europe-wide norms.[170] The upcoming eGovernment Action Plan, due to be agreed by April 2006 and linking research also to policy and practice, should provide the framework for the identification of such strategic research priorities.
- How the EC can facilitate the cooperation between MS or groups of MS.
- Existing good practice evidence for replication, demonstration or learning.
- The need for specific trans-European and cross border eGovernment services and infrastructures.
- The likely costs and benefits of research into and deployment of specific trans-European eGovernment services and infrastructures, i.e. comparing the resources needed, including those provided from public funds, with likely take-up and benefits.

The role of the EC in eGovernment research, in addition to direct funding, is to provide leadership and clarity, remove barriers and help accelerate demand. This also includes coordination to ensure that duplication and waste are minimised, that synergies are created and mutual benefits shared, and that there is better overall coherence with policy goals.

It is also imperative to create tighter, more formal and more effective synergies between European and non-European eGovernment research. A clear need exists for the 'formal' identification of common areas of interest with our major partners/competitors, and then

[169] Work in this area is, indeed, quite well advanced, for example, with the newly revised European Interoperability Framework As evidenced by "Facing the challenge: The Lisbon strategy for growth and employment", Report from the High Level Group, chaired by Wim Kok, November 2004, European Commission: http://europa.eu.int/comm/lisbon_strategy/index_en.html, "Relaunching the Lisbon Strategy: a partnership for growth and employment (Mid-term review of Lisbon Strategy)", Presidency Conclusions, 22-23 March 2005, European Council, Brussels, DOC/05/1, and "i2010 – A European Information Society for growth and employment" Brussels, 1.6.2005, {SEC(2005) 717}, COM(2005) 229 final.

[170] Work in this area is, indeed, quite well advanced, for example, with the newly revised European Interoperability Framework: European Commission 2004j and 2005v.

providing funding for European researchers to participate around these on a reciprocal basis. There needs to be an international framework for eGovernment research, as activities are much too ad hoc at present. It is important that European (as well as our partners') funding is specifically earmarked for the purpose of international research collaboration, in contrast to the present situation where such funds compete with EU-only research.

7.2.4 Enhancing relevance and quality

In order to enhance the quality and relevance of eGovernment research across Europe, a more pro-active approach to identifying needs, interests and resources could be taken.

From the EU side, a significant portion of the EC's eGovernment research resources should be re-directed to a finite number of policy-driven 'strategic priorities', as part of the process of seeking as wide as possible agreement at EU level and with as many MS policies and programmes as possible, by looking for synergies and coherence across EU and national policies (as described in section 7.2.3).

As part of this process, key actors, stakeholders, institutions, networks, users, sponsors, etc., at EU, national and regional levels, should be identified. The aim would be to secure as much political and financial support as possible in advance and thus enable two or more MS or other stakeholders to work together to encourage and help form project teams an clusters. This could be part of a pro-active brokerage service within a broader infrastructure for European eGovernment research (see section 7.4 below.).

National Contact Points, and key staff of these could support this more pro-active approach, for example by working as stagiaires (temporary assistants) in the eGovernment and related units of the European Commission for a number of months, attend as observers at eGovernment proposal evaluations, as well as at some relevant EU-level workshops. This will be designed to raise their knowledge and levels of activity, thereby providing a more pro-active service in their own country when they return.

A multi-stage process for eliciting, nurturing and selecting suitable EC eGovernment research projects could also be adopted, for example:

1. Call for good ideas described in maximum 10 pages.
2. Initial selection of the best ideas.
3. Support for the preparation of a full proposal, using a number of variations including:
   - Holding a one-on-one workshop with each idea, either by EC staff or by a 'panel of experts' which hears presentations by the proposers and gives critical feedback to assist the proposers target their research proposal better on relevant EU policies, and thereby prepare a full good quality proposal.
   - In addition to, or instead of, a workshop, allocate a 'mentor' to each selected idea, for example from an already successful eGovernment research project, who then provides 'preparation support'.
   - Perhaps (some of) this could be accomplished through a 'brokerage' system, e.g. with potential investors such as other EC units, national/regional funds, industry funds, the EIB, etc.

- Another possibility is to improve the ability of National Contact Points to provide proactive qualified support, for example in running workshops, providing feedback, etc.

4. Full proposal selection: evaluation in the normal way although with suitably adapted evaluation criteria, perhaps derived from intervention logics and a given proposal's place within an eGovernment research cluster.
5. Project implementation of selected proposals: during which close support should be given by the 'mentor' and/or the EC Project Officer who takes a more pro-active role in on-going project activities.

Point 5 implies some shift of resources within the EC administration away from 'back-office' project control towards more 'front-office' technical engagement with projects. This reflects, of course, the wider eGovernment policies the Commission is already promoting vis à vis Member States (MS), and is in line with the EC's own 'eCommission' proposals and good eGovernment practice generally. Such an approach is also recognised by the Commissioner of DG Information Society and Media: "Of course, more research alone is not enough. Its efficiency and effectiveness must be improved. I will seek changes in the Community research programme, to cut red tape and encourage more SME and corporate involvement."[171]

Another possible approach for strategic priority type projects, would be to issue a call for tenders and then select, not one 'winner', but as many for which there is budget. Contract negotiations would then take place to ensure full compliance with the strategic priority and synergy with other projects and initiatives within the research cluster.

It will also be important to accept that not all research projects will (or should) result in successful eGovernment roll-out or impact:

- Some research 'failures' are necessary for innovation and for learning.
- Some risk must be accepted, the important thing is that 'failures' lead to learning and feed back into the eGovernment programme as a whole. Lessons must be fed into the 'clearing house' and good practice framework (see section 7.4 below).

Finally, we support the proposal from the IDABC Programme[172] for a 'one-stop-shop' system for applying for any EU funding. This would ease and facilitate the work of both proposers and EC staff as a single simplified set of forms, rules and procedures would be used by all. Such a service should, of course, also be an eService, and would be eminently suitable to be supported by DG INFSO as well as by IDABC. It could perhaps become a showcase EU eGovernment service.

In fact, there is strong evidence that the relevance and quality of recent proposals to EC-sponsored eGovernment research, both in the IST and other programmes, is already quite high. However, continuing efforts should further enhance relevance and quality as described above. With an even greater move towards policy-driven 'strategic priorities',

[171] "i2010: The European Commission's new programme to boost competitiveness in the ICT sector" speech by Viviane Reding, European Commissioner responsible for Information Society and Media, Microsoft's Government Leaders Forum, Prague, 31 January 2005, SPEECH/05/61, p. 5.
[172] http://europa.eu.int/idabc/egovo

the relevance of research proposals becomes even more important. There is evidence from this study (in section 3) that the EC is clearly showing the way for other European researchers in linking eGovernment research to deployment and to major policy goals, as well as providing a framework within which such deployment and policy linking can better take place. This role should be further strengthened and continued.

7.3 The virtuous circle of eGovernment research

One of the main reasons for using the conceptual framework described in chapter 4 and applied in chapter 5 (i.e. 3 levels of objectives linked by an intervention logic) is to bind research deliberately into policy and practice. It is clear that eGovernment research on its own will have no impact on the achievement of EU high level policies like Lisbon. But it can do so by improving the practice and performance of (e)government, which, in turn, will help achieve these policies.

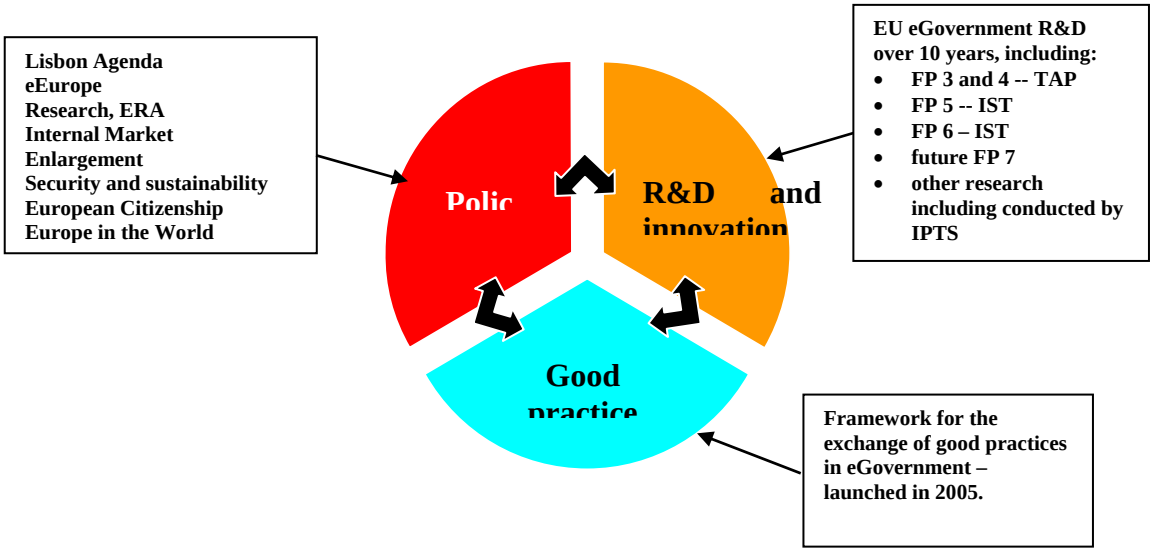
The three activities: policy, research, and practice are linked together in a virtuous circle or reinforcing feedback loop, each one driving the other, for example in the manner employed by the European Commission as shown in the diagram below.[173] One of the tasks at EU level is, indeed, to foster and support vigorous and dynamic communities of practice, policy and research, and, in the eGovernment context, there is a need to establish an infrastructure for eGovernment and eGovernment research, as proposed in Section 7.4.

The Measure study[174] estimated that about half of the RTD projects supporting public services in the Fourth and Fifth IST Programmes (between 1994 and 2002) were elements in an innovation chain, that is they were part of a technical trajectory followed by several projects in sequence, where technologies were developed into applications, and then adapted to the national or European market. These chains of projects may alternate EU and other sources of funding (mainly national), and could be the basis of stable networks and cooperation between European research, industry and user organisations. When successful, project chains result in effective know-how transfer and interaction between elements of the innovation system at different levels: national, European and/or private sources. The chain model seems particularly relevant for EU projects in the public sector, because public services are still mainly national systems, where implementation needs adaptation to national characteristics.

These project chains, linked along technical trajectories and ‘innovation paths’, should be better exploited and harnessed more purposefully to the service of EU policy, perhaps through the cluster and intervention logic approach suggested in Section 7.2.2. The Measure project in fact identified two types of innovation path drawn from the case studies it examined, i.e. those following successful innovation paths ultimately creating socio-economic impacts, and those following problematic innovation paths leading to minimal socio-economic impacts.[175] This indicates the need, at least partially, to formulate these ‘innovation paths’ in terms of an intervention logic, and thereby in relation to their potential impact on and contribution to high level policy goals.

[173] European Commission, 2005a.
[174] European Commission, 2005f.
[175] European Commission, 2005f, p. 27.

In fact, the articulation of intervention logics (as developed in Section 4 above) is needed to supply the links between the three activities of research, policy and practice in the diagram below.



In apparent support of this conclusion, the Measure project also suggested that RTD projects in the public sector "should always strive to maintain the critical alignment between their research and global technology and market developments, as a condition for ultimate success. It is very important that such projects have a realistic perception of the targeted markets' needs, which requires strategic vision. The analysis of users' requirements routinely performed by projects is not sufficient, if it is limited to mapping out the functional and ergonomic characteristics of an application without considering its global value for users in a realistic environment. These conclusions underline how it is important to analyse the innovation process rather than the innovation products (prototypes, publications) in order to assess the Programmes' impacts."[176]

One model often used to describe change in the public sector in terms of eGovernment is a four stage model based on the use of technology (as well as other tools and resources) which enables adopters to:[177]

1. do existing things cheaper, faster, better (increase efficiency),
2. do new things but without changing structures (increase effectiveness),
3. create new structures as well as do new things (structural transformation),
4. change mindsets and socio-economic norms (socio-economic transformation).

Whichever model is used of how technology and society interact, research has as number of important potential roles:

[176] European Commission, 2005f, p. 27.
[177] Jeremy Millard (DTI) at the eGovernment Workshop held in Seville in March 2004, European Commission (2004s).

(i) to assist in facilitating the transition between stages, including prior to stage one,

(ii) as an internal facilitator within each stage in order to ensure 'goods' are maximised and 'bads' minimised,

(iii) to exploit strengths, address weaknesses and try to fill gaps in order to facilitate (i) and (ii),

(iv) basic, 'inquisitory' (bottom-up or inductive) research which is not necessarily driven or legitimised by any particular vision or strategy.

To initiate a coherent virtuous circle driven by research, all types of research, except perhaps number (iv), must be driven by a clear vision of eGovernment and its related policies, strategies and scope and level of relevance (e.g. European, national, regional, etc.), though not necessarily (of course) the same for all research.

In order to further understand the added value of a virtuous circle of research, we will also need to develop more explicit research models. A critical, though as explained above not the only, focus for research is probably between stages 1 and 2 for laggards, and between stages 2 and 3 for leaders, in the stage models above. This is because, in relation to eGovernment and the Information Society generally, this is where we presently are. Thus, easing the transition between early, take-off and widespread adoption in beneficial ways is what we need right now. We also need a better understanding of the eGovernment as well as the wider Information Society context of different eGovernment development scenarios, so the role (or roles) of research can be better articulated and exploited. For example, modelling socio-economic drivers and needs, investment and other resources, research modalities (including models of cooperation, finance, organisation, etc.), deployment, impact, and evaluation.

The research virtuous circle should not just be about developing research, but also about disseminating it. It should look for existing good practice and existing templates and should then incorporate these where feasible, in order build a library of resources at European level (an eGovernment repository). This repository would also provide a space for demonstrators, which could then be rolled out more widely if and when MS wish this to happen.

The clear conclusion drawn in this study about how different mixes of types of research and stakeholders can be positioned along the path to implementation and deployment and practice was that overall the direct link of research results in Europe to deployment is generally very low. This perhaps does not matter too much from an academic perspective, but in the context of this study with its focus on the contribution eGovernment research should be having on EU policies, this is a serious shortcoming and a big potential threat. In order to promote the deployment of research results, the clear conclusion is that the public sector, ICT industry and even users need to be involved more, not instead of, but together with, academics and consultants. Indeed, on the evidence we have from this study, research activities which have a good balance across all these stakeholders, particularly where the public sector and ICT industry work closely with consultants, are most likely to be contributing strongly to deployment. Note, however, this conclusion is in relation to direct deployment potential only. This study also shows that generic/theoretical and review research are often essential early

pre-cursers to research which is closer to deployment. Again, a balance is needed, depending on policy preferences and short and longer term goals.

European eGovernment research is not just about funding strategic and policy-related research, but exploratory and independent work should also be encouraged. Although this may not be specifically part of the EU's funding regimes, the opportunity to support such research, through for example human mobility, can be a crucial part of including innovation within a more strategic and policy-oriented research agenda. To this end, independent research carried out and funded by third parties such as NGOs and universities should be given the opportunity to interact with the more policy-led research programmes of the EU and national bodies.

Furthermore, interaction between practitioners and researchers (through the idea of research clusters) should be given the utmost priority in eGovernment research. This will free up resources at the local and regional levels, where R&D is not normally part of the remit, but where, in the place of resources to search for research funding and partners, money could be spent more directly on research activities.

Sustainable local networks are a crucial building block in eGovernment rollout and take-up, without which nothing much can happen. This also implies the involvement of the private and civil sectors and especially SMEs and other small civil organisations. Such local networks can best provide 'basic' services, for example through local technical and competence centres, often with a large amount of sharing between adjacent or similar areas in order to mitigate the low levels of finance and expertise available. Encouraging appropriate research as part of these local networks is important, and the Local Authorities also play a key role here.

SMEs are a vital part of the research infrastructure, and, given they constitute the largest block of business units in Europe, are also a crucial part of the European economy. SMEs, due to their nature, are more capable of delivering innovative and tailor-made services to local actors, and thus have an impact on local growth, employment and quality of life. Therefore, they should be included in the virtuous circle of research, but this is often difficult in terms of European projects. SMEs do not have the resources, expertise or time, to get involved in Europe-wide initiatives. Regional research efforts as well as structural funding programmes present the same difficulties for SMEs.

One solution to the local and SME problem could be to organise NGOs (or other suitable 'umbrella' organisations) which are large and financially solid enough to function proactively as types of 'venture capitalists' and get them to look for ways to get SMEs involved in innovating (eGovernment) systems, and help them with EU research and structural funding, by applying for, negotiating, and managing EC funding. In this way, they could take much of the risk but also provide 'sheltered (local SME) environments'.

7.4 An infrastructure for European eGovernment research

In order to provide a coherent, flexible, yet effective infrastructure for European eGovernment research, greater cooperation is needed not just with and between MS but also within the EC and across different programmes. A cross EC **eGovernment**

strategic review should be undertaken by the eGovernment Unit in DG Information Society and Media into the identification of strategic priorities and their EU policy impacts, as an input to the forthcoming eGovernment Action Plan, scheduled for 2006. This should liaise with other DGs, the MS, regional authorities and other interested stakeholders (such as industry, academia and user groups). Such an approach must, of course, allocate roles according to subsidiarity principles, and should be designed to improve the buy-in from, and participation of, all relevant stakeholders.[178]

This strategic review should undertake a thorough analysis of the role of eGovernment and the need for eGovernment research, as described above, together with funding requirements from the EC, as well as from additional sources such as national and regional government, industry, academia, user groups, venture capitalists and the European Investment Bank, where this is realistic.

Given the above, a recommendation can be made concerning the organisation of eGovernment research policy as to the most suitable spread of resources for different types of instruments:

- 30% seeding innovation (functioning as of now, but with even more innovative leeway).
- 50% supporting major EU policy goals, e.g. through priority research clusters.
- 20% creating synergies, e.g. through strategic support functions, including ideas factory, clearing house, brokering service and good practice framework.

Whatever distribution of resources is adopted in practice, however, it is also important to retain flexibility in order to both respond to new research needs as these materialise and to maximise coherence and synergy with other programmes, whether at European, MS or regional levels.

Above all, it is important to ensure the **communication of research and research results**. This is crucial, and is not always effectively carried out at the European level. Data collection for this study was quite difficult, and relied upon several diverse sources of information, in which no coherent semantic interoperability existed. Sharing of research data and results is paramount, and at the European level, the EC's research funding initiatives are in a clearly positive position to aid in this regard, but work needs to be done to ensure that research carried out at the national and local levels is integrated into this framework. Work has already begun on this front, but needs to be considerably strengthened. For example, a European eGovernment research portal should be set up as a one-stop-shop providing a regular overview of the field without users needing to get hold of actual research which may require a fee.

A specific recommendation in this context, which could serve the needs of the recommendations described above and support better project focus and implementation,

[178] The input into such a 'review' has, in fact, already started through an open meeting of stakeholders held on 21 September 2005, followed by a meeting of the eEurope eGovernment sub-group on 28 September 2005, and an FP7 eGovernment future research workshop held in Brussels, 26-27 October 2005. The Ministerial Declaration and the eGovernment Signposts documents, published at the European eGovernment Ministerial Conference, 24-25 November 2005, under the UK Presidency, are also part of this current process.

is to set up a **(virtual) European Centre for eGovernment,**[179] but independent from the Commission, although supported financially by it. One model for this is as a virtual centre, integrating, pooling and coordinating what is already there rather than building new structures, and operating as a network. For example, building on the IDAC's eGovernment Observatory and the Open Source Observatory, pooling common basic service modules, etc. Other stakeholders, particularly European industry and the public sector should also be involved in funding such a centre, which should be seen within the framework of the development of the European Research Area (ERA). This is needed so that all involved in eGovernment can come together to share knowledge, perhaps in the form of a one-stop shop. Right now the field is too fragmented.

Such a centre could have six inter-linked strategic support functions:

1. An 'ideas factory' (or think-tank) to proactively identify both how existing and near future research can better support EU policy, and to generate original ideas for eGovernment policy and visions, associated EU policy, and research challenges for the longer term. The members of such an 'ideas factory' could rotate with overlapping participation so as not to disrupt continuity, but also to ensure innovation.[180]
2. A central 'clearing house' of ideas, projects, funding, policies and issues, services, applications, infrastructures, etc., which could match research requirements against solutions and experience. This would also assist in reducing the duplication of effort[181] in eGovernment research. This should work with, or complement, the existing eGovernment Observatory run by the IDABC Programme.[182]
3. An on-line knowledge base of good practice, sources, studies, etc., relevant to eGovernment research, policy and practice, which can be used as a searching tool on a individual basis, to support replication and knowledge transfer activities, to undertake specific research, and to support learning activities between stakeholders, including running workshops both on-line and off-line. The EC launched an early version of such a system in the Spring of 2005.
4. An active dissemination and animation function arranging conferences, workshops, supporting networks, 'multiplication' groups and communities of research, policy and practice, identifying the need for and the commissioning of studies, and similar. Section 6.4 above identified the strong need for much better communication and publicity. For example, selecting strategic priorities may also be supported by appropriate 'political headlines', such as in relation to the benefits of competitiveness or social cohesion. This would contribute strongly to awareness, publicity, political support and funding.
5. A 'brokerage' service linking potential ideas, partners and funding sources. Already partially established but needs upgrading.

[179] This has some similarities to the proposals made by the Austrian representative to the eEurope Advisory Group, for a Virtual eGovernment Centre ("Bloomsday Recommendations", 2nd eEurope eGovernment subgroup meeting, Dublin 16 June 2004).

[180] The Prelude project has recently established a 'supportive think trust' approach, which includes an eGovernment component: http://www.prelude-portal.org.

[181] Identified by Commissioner Reding in her speech "i2010: The European Commission's new programme to boost competitiveness in the ICT sector", Microsoft's Government Leaders Forum, Prague, 31 January 2005, SPEECH/05/61, p. 4.

[182] http://europa.eu.int/idabc/egovo

6. Resources for eGovernment researcher mobility and support for young researchers.

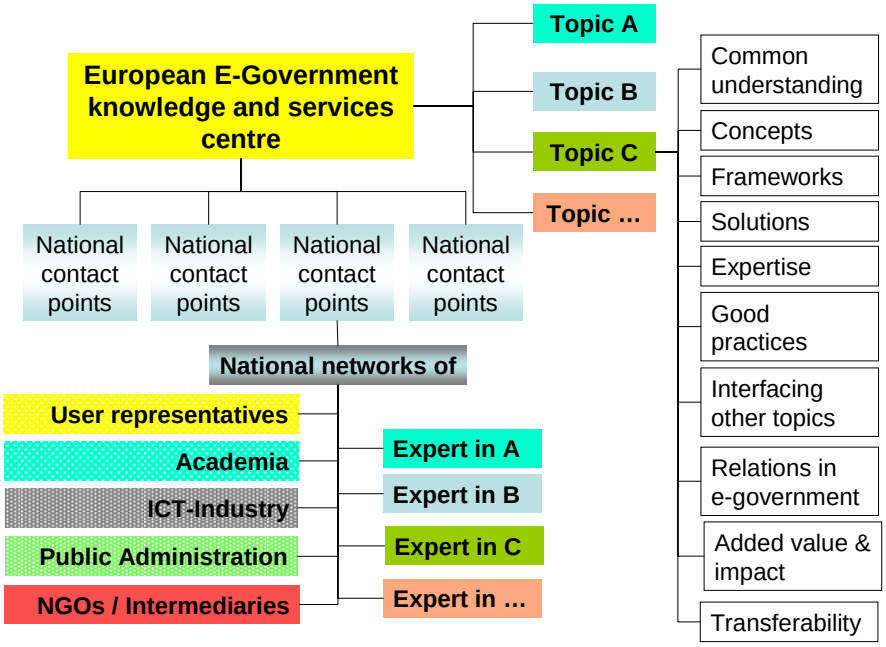
The purposes of such a European eGovernment centre would include:

- Acting as the hub (or at least an important node) in a European network of eGovernment centres, competence centres, research labs, etc. (whether under the auspices of the public sector, industry, academia, etc.), with contact points to such centres and expertise.
- Acting as an independent (supportive yet critical) voice to the EC in terms of eGovernment policy, research, deployment and practice, as well as in the EC's role in coordinating these at the European level.
- Helping to ensure that duplication and waste are minimised, that synergies are created and mutual benefits shared, and that there is better overall coherence with policy goals.
- Helping to remove barriers and accelerate demand.
- Support liaison and collaboration between all stakeholders.
- Developing a common understanding of eGovernment policy, research, deployment and practice, including a shared European eGovernment ontology and a commonly agreed European eGovernment glossary.

Much of the above could be achieved by setting up a European eGovernment research portal as a one-stop-shop providing, for example, a regular overview of the field without users needing to get hold of actual research which may require a fee. A business model needs to be developed for this.

One model designed to achieve much of the above has recently been suggested: "The structure/model of a European e-government knowledge and services centre shall be distributed among countries and shall have national contact points in each country. It shall address the different topics of e-government from distinct points of views as depicted in the figure below. The national contact points themselves shall be the linkage to a national network that covers academia of different disciplines, ICT providers, public administration stakeholders of central, regional and local government, and of NGO stakeholders / intermediaries."[183]

[183] Quote from Maria Wimmer (Federal Chancellery of Austria, ICT Operative Unit) at the IPTS workshop on the "Future of eGovernment research", 7 February 2005, Sevilla, Spain, from whom the figure has also been obtained.



Source: Maria Wimmer, Federal Chancellery of Austria, ICT Operative Unit, February 2005.

A number of suggestions can also be made regarding possibly useful studies supporting eGovernment research at the European level, which could in principle be subject to calls for tenders involving 100% funding:

- To suggest the most cost-effective modalities for establishing a 'Centre for eGovernment' at European level (as described above), including its six functions (and perhaps others).
- To suggest ways to get better (in terms of both quality and relevance) individual research project proposals.
- To support information days during which good and successful research projects are demonstrated and discussed, and with the intention of increasing the quality of research proposals submitted.
- To judge whether and how eGovernment is beneficial for end users, for public value generally, and for policy making and achievement, by developing a robust set of criteria, not necessarily benchmarks, and suggest who will need to implement them (for example, cost-benefit and stakeholder analysis, both quantitative and qualitative). This would include an analysis of the operations, specific impacts and policy contributions of eGovernment, as well as the interplay of policy, research, deployment and practice as the 'four pillars' of eGovernment. Part of this would be developing robust intervention logics for linking eGovernment research to major EU policy goals.
- To examine the potential mutually beneficial interrelations and synergies within eGovernment research:
  i) across the European institutions and across all European programmes.

ii) with and between EU research and that conducted at national and regional levels, by the ICT industry, by academia and the consultancy community, and with representative user groups.

iii) with non-European research activities.

iv) for different funding regimes and sources.

- To identify the potential for wide-scale demonstrators to test and deploy pan-European eGovernment services.[184]

[184] Identified by Commissioner Reding in her speech "i2010: The European Commission's new programme to boost competitiveness in the ICT sector", Microsoft's Government Leaders Forum, Prague, 31 January 2005, SPEECH/05/61, p. 4.

8 2020 visions

8.1 Introduction

Twenty-twenty vision is defined in optical terms as "perfect ability to see."[185] In the eGovernment context, this is the reverse of the actual situation. But however cloudy the vision might be it is imperative that we look beyond the short-term towards the longer-term if we are to start to perceive and plan for possible futures, Indeed, one could argue that this is even more vital given the present rapid pace of change, otherwise we risk being overtaken and fully consumed by simply coping with the present and leaving the future completely to itself. There is also evidence that, without a route map to guide and measure progress against a long series of relatively small seemingly insignificant evolutionary steps, we can be lead unwittingly into revolutionary or transformational change, often in unpredictable circumstances.[186] Without some form of guiding vision, such transformatory change may well not be the change we want or need.

We will not here use some of the more established techniques of scenario building and foresight, even though such would be perfectly justifiable, given the scope and mission of the present study.[187] Instead, a focus will be given to a few central trends that are perceived to be emerging as a result of work carried out in the context of this study. These trends will not be realised by the 2010 period given in this study, but may well emerge as contributing factors towards the vision of eGovernment that will be described or desired for 2020.

We use the time frame of 2020 here to indicate a longer term process than the one developed in the rest of this study. The 2010 timeframe for eGovernment research indicates a short period; as we are already approaching the end of 2005. The impact that eGovernment research can have on the improvement of the core aspects of the eGovernment vision: efficiency, effectiveness, and public value by 2010, are limited to immediate, and high impact R&D. The 2010 horizon in this study, also discussed in various European Commission documents (specifically the CoBrA recommendations), does not enable us to elaborate upon long term trends and possibilities for public administrations, which includes their 'e' component.

In this section ideas are presented which have been developed during the research and consultation undertaken for the study as part of our vision of (e)Government up to a notional '2020'. Some of these ideas, in an earlier draft, were discussed at length in an experts' workshop held in Seville at the beginning of October 2005. Subsequent to the workshop, revisions and new ideas have informed the contents of the rest of this section.

[185] Longman Dictionary of Contemporary English, 1987.

[186] According to Jochen Scholl's keynote speech at the Dexa Conference (eGov'05, Copenhagen), based upon Hegel's premise that many changes in quantity lead to transformational changes in quality, and vice versa, and the "eGov beyond 2005" doc p. 3.

[187] See, for example, the scenario session report for "eGovernment beyond 2005" report for the Dutch EU Presidency in 2004 (Zenc, 2004), and the Prisma project (2000-2003) which has done precisely this for eGovernment: http://www.prisma-eu.org/

The following two sub-sections outline, firstly, the future of eGovernment through a discussion of contemporary analyses of current eGovernment, and secondly, how this impacts on future developments and the face of (e)Government by 2020.

8.2 The eGovernment of the present: future paths and expectations

When eGovernment is examined from a purely instrumental perspective, then it clearly supports more efficient government. When examined from the perspective of the citizen, this efficiency can be beneficial, but the assumption inherent in such a discourse is that the technological 'quick fix' will be enough to rejuvenate political institutions in the eyes of their electorates. This is not necessarily the case.

This 'rejuvenating government' agenda, and its use of technology implicitly supporting the current structures of institutions, is attempting to use the phrase 'eGovernment' merely to fix a broken institutional setup. Consequences emerge from a policy that attempts to harness the Internet to strengthen existing institutions. Fear of opening Pandora's Box has held some politicians and civil servants back; a lack of understanding has contributed to the same lack of progress in some areas of eGovernment implementation. This leads the discussion from 'rejuvenating' to 'reinventing' government.

Any attempt at reinventing government will build upon process developments that have already started in both research and praxis in eGovernment. It will take into account the recognition that interaction with public servants, politicians and political institutions should not only take place in the polling station, but also in daily life.

Criticism of the way in which the eGovernment agenda deals with specific issues such as privacy and access is one major aspect, but it is assumed that these will in fact be overcome with legislative reforms and technical solutions to ensure universal access and ensure integrity and privacy. However, the more fundamental critique of the eGovernment agenda, that it is merely a tool to patch over deep-rooted problems in bureaucratic infrastructures, is often understated. Aldrich *et al* ask the simple, but central, questions "Is e-government really providing citizens with what they want?...Conversely, is eGovernment what government agencies want?...How much eGovernment should be by government agencies?"[188]

"Now that banks are giving 24-hour access, 7 days-a-week, 365 days-a-year, the moment has come for governments to rethink the way that people throughout society choose to interact with them."[189] Tat-Kei Ho concurs: "The flexibility of the Internet in providing access to goods, services, and information raises citizens' expectations of customer service in a range of contexts, including interactions with government"[190] The view that government is catching up with commercial providers of information and services provides fuel for those concerned with the evolution of citizens into consumers.

[188] Aldrich, Bertot, and McClure 2002: 351
[189] Silcock 2001: 100
[190] Tat-Kei Ho 2002: 435

Enhancing government / public sector / citizen interaction is challenging, and is not just for technology, although undoubtedly the Internet and other technological tools can facilitate this development. But by simply implementing technological solutions, an administration can be 'outdone' by its own technological advances (and lack of training and cultural change), or it can actually leave its citizens behind, by advancing too quickly with technology where there is no demand for use. Either of these situations can undermine the notion that eGovernment innovation is a forward step.

Smart, knowledge-based tools should become more important and be more widely used in public administrations, when and where there is a demand. By developing high-impact applications that can be easily and widely used now, the possibilities for greater and more profound developments in other areas of public administration and political institutional reform are made more convincing, both from the perspective of the citizen and the administration.

The central aim for a non-state polity such as the European Union would be to provide the opportunity for these networks to share resources and opinions on common issues. This is one small footstep for technology, but a giant leap for civil society and political institutions. It requires an understanding of how policy networks are managed by public institutions, and how these networks can be more effectively managed. And it necessitates a reassessment of the role of government in governing.

Of the roles of ICT in rejuvenating or reinventing government, provision of the network is the most obvious. But this is not about laying down cables as much as it is in getting social and political networks of people to use the Internet to complement their face-to-face meetings and coordinate opinions across the whole of Europe. Many of these types of networks already operate to discuss issues that they consider important. They can revolve around cities,[191] interest groups or special-issue groups.[192]

These, less technological, but more technical tasks for eGovernment need to be examined in greater detail in terms of research potential when considering the role of research in relation to medium to long term policy.

Data collected by questionnaire during the course of the study reveal that expected future research will focus predominantly on the needs of users, value chains, eDemocracy, and trust and security. These four most important areas mainly focus on the way in which services are delivered to the citizen. As technical eGovernment research topics begin to impact real-life deployment, there is a clear recognition that the demand for public services is now being considered as an increasingly important subject.

Furthermore, there is an increase in interest in Europe for research that concerns the public value creation and innovative governance research themes. This undoubtedly reflects two contrasting but mutually supporting trends. First, the increasing pressures to 'show' the economic, social and European benefits of the large investments already made in eGovernment in Europe. Second, the softer more academic and social science

[191] Such as in Tampere, where the website http://mansefoorumi.uta.fi operates -- accessed 24 October 2005.
[192] For example, welfare reforms in the UK at the website http://www.uspeak.gov.uk) -- accessed 18 January 2001.

interest which is awakening in tracing the impacts of real world infrastructure, organisational and human resource investments on society at large and on the public good.

8.3 (e)Government by 2020

It is our contention that by 2020, observers and practitioners will no longer talk about eGovernment. The focus will be on how public administrations create public value, which relates to the seventeenth and final research theme as identified in this study. Therefore, to discuss eGovernment in 2020 may be a moot point. But there is clearly a need to discuss how the public sector will use ICT in the future. Building upon the research carried out for this study, this sub-section presents a few ideas and points for further discussion in terms of eGovernment research challenges for beyond 2010.

By raising the subject of the public sector in 2020, questions about the general perception of politics and political institutions are raised. These perceptions are based on our current understandings and our observations of current trends, which may well be biased. No attempt to examine the future can express every possibility, however, given the recognition of current trends (as carried out in the previous sections), an attempt to start a dialogue on potential futures of public administration may serve useful in determining current research policy challenges.

It is clear that without a longer term guiding vision, work carried out in the present will often fail to serve a general purpose (see the description of the intervention logic described in Section 4). Whilst short- and medium-term goals (such as efficiency and effectiveness) are vital to achieving a sensible research policy, longer term visions, although inherently more risk-prone, should also be a part of the process. It is in the longer-term visions where we can start to discuss what 'type' of public administrations we wish to see in the future. Whether there will be a public administration that we can even start to compare to current institutions or not, whether a Europe-wide, centralised civil service will exist, whether most public services are outsourced to private companies, or whether civil society gains a much larger stake in the decision-making and policy implementation process, are all questions that can be asked about the state of public administrations in the future.

When thinking about visions of eGovernment for 2020, it helps to refer back to the 2010 vision and envisage (e)government as a system designed to produce the goal (or 'ends') of 'public value' through the 'means' of 'public sector modernisation', defined for 2010 as efficiency and effectiveness. The 'means' as defined in the present study are clearly the two levels of the conceptual framework introduced in Section 4, i.e. the operational and the specific eGovernment objectives levels, The 'ends' are, of course, the top, general objectives level, i.e. public value, which is not eGovernment or even government specific but to which (e)government must contribute. However, simplistic and perhaps vague this model is, its usefulness lies in the fact that it makes the 'means' subservient to the 'ends', and thereby reminds us (policy makers, practitioners and researchers alike) that, whilst working and thinking mainly at the bottom level with occasional excursions into the middle level, it is the top 'public value' level which is

what it is (or should be) all about. All too often, remembering this is highly necessary if very difficult to do.

This overarching model seems stable and axiomatic enough to retain as is for 2020. What will change, no doubt, is the content and the relations it encompasses, at all three levels, including the need to refocus on what, indeed, 'public value' in fact is at the top level?

Recent broad definitions of eGovernment can be used to guide thinking about these contents and relationships, For example, the Prisma 2003 strategic guidelines,[193] distinguished several different activities for public bodies:

- eServices -- refers to the direct provision of on-line services direct to users (citizens, businesses, non-profit organisations, etc.). This can also refer to the use of ICT to support traditional government services where such support improves quality, quantity, outreach, etc.
- eDemocracy -- relates to those aspects of eGovernment which aim to improve participation of citizens and businesses in democratic decision building by facilitating access to relevant information and by facilitating public discourse. Again, this relates to all regional levels from local, national and international (e.g. access to information from international organisations).
- eAdministration – i.e. the use of ICT to support administrative processes at any organisational level. It covers all aspects which have the objective of supporting communication processes and facilitating the exchange of information and knowledge within the public sector, both within and between administrations.

In similar vein in September 2003 The European Commission[194] published a Communication on "the role of eGovernment for Europe's future", that outlined the importance of eGovernment for achieving world-class public administrations, delivering new and better services for all citizens and businesses, and providing a major economic boost in Europe. In that paper eGovernment was defined as the use of ICT in public administrations combined with organisational change and new skills in order to improve public services and democratic processes and strengthen support to public policies. eGovernment was recognised as an enabler to realise a better and more efficient administration by improving the development and implementation of public policies and helping the public sector to cope with the conflicting demands of delivering more and better services with fewer resources.

This definition of eGovernment was further articulated as one which enables the public sector to maintain and strengthen good governance in the knowledge society. Its overall objective is modernisation and innovation in the public sector. This involves developing:

1. A public sector that is open and transparent – governments that are understandable and accountable to the citizens, open to democratic involvement and scrutiny.

[193] PRISMA (2003k) *eStrategies for Government: Prisma strategic guideline 10*: pp. 11-12
[194] European Commission, 2003b.

2. A public sector that is at the service of all – a user-centred public sector will be inclusive, that is, will exclude no one from its services and respect everyone as individuals by providing personalised services.
3. A productive public sector that delivers maximum value for taxpayers' money – it implies that less time is wasted standing in queues, errors are drastically reduced, more time is available for professional face-to-face service, and the jobs of civil servants can become more rewarding.

In policy terms, the above can be translated into three major policy goals of government / eGovernment, each with a distinction view of whom the user is, and thereby government's relation to the user, and each facing specific policy contradictions or dilemmas:

1 The search for savings: a dynamic, productivity-driven, innovative and value for money set of institutions, where:
   - the user is seen as a tax-payer.
   - the policy dilemma is how to provide 'more for less'.

2 The search for quality services: producing and delivering inter-active, user-centred, innovative, personalisable, inclusive services, maximising fulfilment and security, where:
   - the user is seen as a consumer, but where services are provided to all on the basis of need instead of (or as well as) demand.
   - the policy dilemma is how to pursue both need and demand and how to balance the two.

3 The search for good governance: open, transparent, accountable, flexible, participatory, democratic, where:
   - the user is seen as a citizen and voter.
   - there are two policy dilemmas, how to balance openness with legitimate privacy (of civil servants as well as of users), and how to balance the ultimately irreconcilable interests of society's different stakeholders (the latter is, of course, the realm of politics, but it also impacts the sphere of government operation at an apolitical level).

It is these three user roles (and there could be more) that distinguishes government from the private sector, which generally only sees the user as a consumer. Government is, thus, complex, confronts a range of complex dilemmas, and needs to fulfil complex tasks in a myriad of complex circumstances. It has to steer towards complex and often contradictory policy goals, such as simultaneously promoting economic growth, jobs, competitiveness, sustainable development, inclusion, democracy, quality of life, citizenship, trust, continuity, stability, and universal human rights. It will be noted, that these are the components of 'public value', residing in the top, general objectives level of the conceptual model used in this study.

However, although these current mindsets can guide thinking about the contents and relationships in 2020, they must only be seen as part of where we are coming from, and should not pre-determine or lock us out of desirable or likely mindset changes which are partially or even radically different.

If we look back fifteen years, instead of looking forward to 2020, we find that the technology has transformed out of all imagination, whereas the public sector, despite some notable exceptions, has hardly changed at all. The future may hold more of the same, and government will almost certainly, as in the past, find it impossible to keep up with technology. But maybe this does not matter and addresses the wrong set of issues, which are too focused on 'means' rather than 'ends'? Developing some concrete 2020 visions should help us find partial answers to this question.

8.4 Developing 2020 visions

The following visions are principally suggestions as to how the public sector could dispose of both its structure and role within a 2020 timeframe. They present different goals for public administrations, specifically concerning their structure and their role, and the part played by ICT in this. Within the different visions, the public sector can take varying institutional shapes, which constrain or bound its activity in dealing with society, i.e. networked, distributed or centralised. It can also take either a proactive, highly involved and omnipresent role in society, or a more reactive and withdrawn role. The attempt here is not to draw out a series of scenarios, but rather to elicit out a set of possible suggestions which can be used to stimulate discussion on future possibilities for research policy for e(g)overnment in the medium to long term.

eGovernment 2020 vision matrix

<table>
<tr><th>Structure
Role</th><th>Networked</th><th>Distributed</th><th>Centralised</th></tr>
<tr><td>Proactive:
• active
• omnipresent and highly involved
• provides both interventions and frameworks for others</td><td>1) A 'dynamic' public sector
2) A 'personal' public sector
3) An 'inclusive' public sector
4) A 'democratic' public sector</td><td>7) A 'diverse' public sector</td><td rowspan="2">9) A 'single' public sector</td></tr>
<tr><td>Reactive:
• passive
• partially present and only reluctantly involved
• only provides frameworks for others</td><td>5) An 'open' public sector
6) A 'user-driven' public sector</td><td>8) A 'private' public sector</td></tr>
</table>

As with the link between eGovernment research and the EU policy areas elaborated in Section 4, there is a vital link to be made between the type of activity carried out at the present time, and the chosen vision. Given the risks and knowledge gaps that will be encountered in attempting to achieve these goals, they are far less structured than the EU policy areas identified in Section 5. This does not decrease the value of the activity, as the vision is to be used as a high level policy for long-term action. It simply means that the specific and operational objectives should be flexible enough to deal with changes at the higher political vision level.

The matrix above is one method of trying to understand how government and public administrations can position themselves in terms of their attitude towards public service by the year 2020. The role, either proactive or reactive, is dependent upon the political culture of the region or country.[195] A government can either be highly involved in the lives of its citizens, or can be reactive, responding only to citizens' requests. Inherent in the former role are questions over security and privacy, whereas in the latter, inefficiency questions can be given a higher priority.

As well as varying in role, public administrations and governments can take different structural forms. The three outlined in the matrix are centralised, distributed, and networked. These nomenclatures highlight three highly different possibilities for interaction between departments and agencies in the public sector, as well as their interaction with citizens and organisations outside of the state apparatus. Again, these are restrained by existing political cultures and institutions.

A centralised administration will typically focus all control in one central department, which means that information is readily at hand to those who have access to the central system. It also means that citizens will have to deal with only one institution. Distributed government refers to a system where departments work independently and autonomously, and, as a result, citizens have to interact with various organs as and when necessary. It also means that public administrations do not have access to a coherent and complete set of records as they are distributed across various institutions. Networked government is both distributed and centralised: information flows between departments, citizens can deal with different institutions, and can gather and select information from within the network.

The rows and columns can thus be seen as representing policy/political choices (i.e. role) and technological and organisational choices (i.e. structures). Decision-takers make policy choices concerning the role of government, here epitomised and simplified as pro-active, on the one hand, and reactive on the other. Once these policy choices are made, the technological and organisational structures represent tools through which these policies can be implemented. In this case, we have epitomised and simplified these tools as networked, distributed and centralised structures. Different combinations of roles and structures give rise to different specific visions. The fact that the left-hand end of the matrix represents systems which largely do not exist today, whilst existing

[195] See Schmidt (2002). The author studies three different European countries and outlines their approach to Europeanisation and globalisation. In her analysis, the author identifies different trends and approaches towards reform and policy. This description of different approaches towards the same policy goals shows that governments and public administrations can indeed share objectives, but have different approaches to attaining them.

systems tend to be better represented as we move to the right-hand end of the matrix, means that there are more visions, and a greater need for elaboration of these visions, at the left-hand end.[196]

The visions are not meant to be inclusive, but are simplified models that can be used to initiate discussion on the various goals for which public administrations should consider their futures. It should be stressed that there are advantages and disadvantages to all of the visions described in the following paragraphs. The utility of these visions is in their descriptive ability and stimulus to new ways of thinking as part of a change in mindset, which nevertheless attempts to retain a strong link to pragmatism. The visions, along with the matrix, are to be used as points for discussion, which lead to an elaboration of how to blend, modify, and change existing political and administrative cultures by taking advantage of the different possibilities provided by the technology.

It must also be stressed that none of the nine visions excludes any other. Each vision only describes a specific state of a system or part of a system, and most public sectors consist of a mix of systems. So, for example, two or more visions could be seen as highly compatible and mutually supportive, such as a dynamic and a personal public sector which are in the same cell in the matrix. However, such compatibility is also possible across cells, such as mixing both dynamic and diverse types if the dynamism resides in each different part of the public sector, or mixing both dynamic and open if the dynamism is deliberately used to support openness. The point is, therefore, that different ideas can be generated using such a matrix but that these ideas could have wider meaning and applicability.

In the following, the nine visions are grouped according to columns in the matrix, i.e. first networked, then distributed and finally centralised. For each of these structural dimensions one or more visions is elaborated and this is followed by an examination of the technology research challenges.

8.5 Networked visions

As said above, networked government is both distributed and centralised. As information flows between departments, citizens can deal with different institutions, and can gather and select information from within the network. Networked government is characterised by flexible multiple-way linking of different systems, agencies, sectors, jurisdictions and levels. There is no single centre. Although one centre may be the most powerful, other centres (or nodes in the network) also wield significant power across one or more specific areas of competence.

Because few examples exist today of advanced networked eGovernment, at least six visions can be represented. The technology research challenges are similar for all six visions, as it is not so much the future technology which is different between networked government visions but the ways it is used. However, technology differences between the visions are also noted.

[196] These visions were presented in the Seville workshop, on 4 October 2005. Given that they were provided as starting points for discussion, the descriptions provided here need further development and analysis.

8.5.1 A dynamic public sector

Outline

A dynamic public sector is one which is a highly effective and highly (pro)active networked organisation, or networked systems of organisations, and the ultimate example of what Rifkin[197] termed 'government without a centre'. Because in this vision the public sector knows what a user (citizen or business) requires before the user knows about it or asks for it, intelligent knowledge management is necessary and this also implies seamless knowledge flow throughout the network, with intelligence everywhere and not just at the nodes.

Despite being highly pro-active and involved, this vision could result in government almost becoming 'invisible' to users, as it can provide services without the user needing to initiate the service or even to be aware that s/he needs the service at any given time.

Implications and challenges

The dynamic public sector vision implies that government must constantly be context and location aware of the user's needs and situation through monitoring, as well as through intelligent and complex decision-making. This implies extreme flexibility in system design so that it can respond to needs and demands as these change. An important component would be automatic scenario and simulation development, as well as impact assessment prognoses, in order to react appropriately to actual situations as well as anticipated future probabilities, without (necessarily) the conscious or direct intervention of civil servants or users, although this also needs to be possible. This could include automatically triggered responses to actual or threatening emergency situations.

In such a vision, government will also face the challenge that some users do not wish to receive the service, or cannot use it, despite it being offered, or 'pushed onto' the user, so that intelligence should also be used to cater for this. The implication is also that the service must, in certain situations, as determined either by civil servants or the user or by the system itself, be capable of being invoked, opened-up and being moved from invisible to visible mode.

There are many implications of such a dynamic public sector, including power, responsibility, democracy, participation and the loss of, or gain of, control and empowerment. In order to cope with these challenges, government must be negotiable and flexible. It must be possible to trace and track processes and decisions, even when these have taken place 'invisibly'. Placing of responsibility (and indeed IPR where relevant) could be critical, especially in relation to users who, by way of their status or situation, may not be able to exercise their own responsibility, such as children, the elderly, the handicapped, etc. Similarly, if things go wrong, the boundary or balance of power and responsibility between government and user becomes important, so there also needs to be an open and fair appeals procedure. Formal agreements may need to be entered into, such as a Service Level Agreement (SLA) or citizen charter, both for individual users or groups of users.

[197] Rifkin, 2004, chapter 10.

A final but very important point to note is that all this extreme flexibility, agility, complexity, and dynamic responsivity, is an essential part of all networked and proactive government visions, but that government also has a critical role as the only institution which can provide much needed continuity and stability. This is absolutely necessary for individuals, families and communities to lead meaningful and peaceful lives. It is also necessary for business in order to give them a level playing field, and some longer-term certainty about investment and future developments. The stabilising and continuity functions of government need to be preserved and further developed, even within a vision of a dynamic public sector.

8.5.2 A personal public sector

Outline

A personal public sector is one in which each citizen is dealt with individually and proactively, with completely personalised services and a 'one-to-one' relationship with their own government representative. Many aspects of the dynamic public sector vision also apply here, but there is now more focus on this personalisation, and on the government pro-actively reaching out, both physically as well as electronically, to users.

This vision is also highly pro-active, as a government representative (an individual civil servant, a small team of civil servants, and/or an electronic agent) has the responsibility to fully support individual (or groups of) users, whether these be citizens or businesses. This support would include all areas of life or business covered by legislation or other standards, and consists of standardised and personalised services, advice, and all relevant types of help and assistance. This concept could be crystallised around the term 'citizen account manager' (in order to draw an analogy with 'key account managers' in business), citizen link officer, or case officer, or sometimes the term ''street-level bureaucrat' has been used. At the European eGovernment Ministerial Conference in late November 2005, the term customer-service-director was also suggested.

Implications and challenges

The citizen account manager role requires a new approach amongst most public sector staff, who will thus exist almost exclusively to provide services directly or indirectly to users. The word 'servant' in 'civil servant' thus comes full circle. The civil servant is no longer a 'bureaucrat', and the public sector no longer a 'bureaucracy'. 'Service' is the catch- and byword for the function of government, and this directly addresses the public value vision in this study. Many of the recent moves in Europe to down-size the back-office (i.e. bureaucracy) and up-size the front-office (i.e. service), through savings in the former which release resources for re-deployment to the latter, are partial moves this direction.[198]

Support and services can best be provided in this way to users if deep knowledge is available about each, obtained both through highly intelligent ICT systems, including electronic agents, but also, critically, through human and personal experiences based on tacit knowledge which ICT cannot capture and which is only built up through contact over time and experience. Thus, the vision moves on from the earlier one-stop-shop

[198] Although it is not a given that savings in the former are not instead used for other purposes, including tax cuts: Millard, 2003d.

concept, in which a user approached a single desk (or portal) for further access to different services, but where the desk officer did not necessarily have any prior relationship with the user, to a concept in which longer-term and more stable relationships are built up over time. These are necessary for tacit knowledge, including trust, to develop. Of course, a user must be able to opt out and/or change her/his citizen account manager, as should the latter in difficult or conflict-ridden circumstances, including falling back on a team approach to the same type of relationship. Many non-technology issues are important in building up such relationships, including a clear understanding of the ethics involved, the rights and responsibilities required from all parties, and the need for trusting, two-way obligations, based on dialogue and mutual learning.

Some moves in some countries have already been made towards some aspects of this vision. For example, the use of human civil servant 'intermediaries' operating out of small citizen offices located in the more deprived areas of Berlin, and using a digital suitcase to visit old people's homes, hospitals and the like. Such beneficial mixing of technical, human and other channels is being increasingly used to target groups with special needs. Also, in Seattle in the USA a system of mobile civil servants visiting citizens, rather than citizens travelling to the town hall, is being established based on the capabilities of the city ICT backbone.

8.5.3 An inclusive public sector

Outline

An inclusive public sector is one in which all stakeholders (whether citizens, businesses, NGOs, regions, etc.) are fully included. This is defined as being fully served by appropriate services no matter who they are, what their condition and circumstances are, or where they are, as well as fully participating in the processes of government and governance to the extent that legislation allows and the individual wishes.

This is also dependent on appropriate skills, both of users and civil servants, and more broadly on breaking down educational and socio-economic barriers to inclusion and eInclusion. In the knowledge-based society, the digital divide becomes a growing threat for many social groups. As described in Section 5.3.1, many of these issues are most critical at the local and regional levels, as it is here that eCommunities, built around eParticipation, grow and flourish. Despite the ability of ICT to ignore geographic distance, eCommunities are still primarily local in nature, and much of this arises from interactions between the citizen, civil organisations and local authorities.

Implications and challenges

The most important implication of the inclusive public sector is that efficiency must serve inclusion, and not the other way around. This means that the needs of those beyond the digital divide must come above the desires of those who are not, where the two are incompatible, although policy should also attempt to find ways to avoid such incompatibility and reduce any trade-off. Above all, this inclusive public sector 2020 vision recognises that most of the challenges, as now, will be non-technical, although will rely on technology as a powerful and, indeed, transformatory tool. It recognises that all involved in (e)government, whether as direct users, indirect beneficiaries, or government staff, are people, whether as individuals or as groups. People are

undisputedly the most important factors and resources of all. People are not simply economic beings. All surveys show that purely economic factors come some way down their list of priorities. They also have needs related to their psychological well being, the quality and non-pecuniary rewards of their work, and the quality of their wider lives. Inclusive eGovernment aims first and foremost to support these goals.

Flexibility, simplicity and choice will become all-important concepts for inclusiveness eGovernment. We must avoid adding electronic concrete to existing services, and this requires the development of flexible architectures. Simplicity is achieved through a focus on content, rather than usage, but this must be content that everybody can use. However, making it simple for users, which is the main goal together with openness, could increase complexity elsewhere, for example in the context of re-organisation, business process re-engineering, the involvement of multiple stakeholders, and new technology.

Choice in eGovernment provision implies the ability to be able to opt into or out of using a service, and to enable the user to stay in control. Current eGovernment systems are not always being used through choice. Choice also implies multi-channel, in which both technical and non-technical channels need to be available, inter-changeable and mutually supportive, both in terms of technical inter-operation but also in terms of economic viability and social appropriateness.

This vision requires an engagement strategy with users, so that Europe's highly mixed and diverse populations, as well as the highly different contexts within which government services are used, are all taken into account. We need to recognise different cultures, histories and legal backgrounds. Our understanding of eInclusion itself is also subject to different definitions and contexts. There may, however, also be dangers of over-specificity and over-analysis, especially as things are changing so rapidly that we could be in danger of chasing our tails.

By 2020, eInclusion may well become 'reverse-engineered'. When everything is 'e' and 'e' is virtually without cost, and if efficiency is prioritised higher than inclusion, human contact will become expensive, given that labour costs compared to other costs will rise dramatically. Thus, the already included and better-off citizens will use their resources and skills to access human contact with government in situations where this gives them a better service (for example, in terms of personal advice, care, social support, etc.). The excluded and worse-off citizens will, however, only have recourse to the ubiquitous and inexpensive 'e' services, and will not be able to supplement these with human contact. The e-exclusion of today will thus be replaced by the h-exclusion of 2020, where 'h' refers to human service contact. The EU will need to run h-inclusion programmes.

This potential h-exclusion challenge reflects the extent to which all aspects of public services can be codified and converted to eServices. Public sector staff are in the frontline of these developments, as is the quality of their work and working lives. An inclusive public sector is not just about including all users but also about including civil servants. Both services and civil servant tasks are becoming more and more 'routinised'. Services and tasks which manipulate, match and mine data, and which require access to information and systematised intelligence, will become codified and automated by ICT,

resulting in the squeezing out of human service contact and human jobs. Human service components and jobs in the future, on the other hand, will focus even more than at present on activities which humans are innately better equipped to do than machines. Fortunately, this still appears to encompass a large potential area of growth in terms of numbers and quality, revolving around the use and creation of implicit and tacit knowledge. These areas include care, teaching, consulting, counselling, advising, controlling and coordinating, decision- and policy-making, creating, innovating, brainstorming, empathising, socialising, etc. In each case, of course, such human-centred services and work will increasingly be strongly supported by powerful ICT systems.

The uncertainty is, of course, that the boundary between what can be codified and captured by ICT and what cannot is constantly moving. What we think of today as 'routine' is part of a dynamic cycle in which new knowledge, services and tasks are created whilst older ones are 'routinised'. Thus, the boundary between what machines do best and what people do best is constantly shifting, as both change, also in response to each other. If we are to retain our humanity as ultimately sociable beings, demanding to be included, in which services, work, the economy and the public sector are just means to an end, we must be aware of, and manipulate, these shifting boundaries, and this also requires some policy intervention. (See also the private public sector vision in Section 8.6.2 below.)

8.5.4 A democratic public sector

Outline

eDemocracy refers to the use of ICT to underpin and strengthen democratic systems and processes. It ranges from the most formal aspects of electoral systems (eVoting) to less formal participation in the democratic process (access to information, communications with elected representatives and consultation, influencing decision making, and direct involvement in decision making). Moreover, ICT is increasingly seen as a useful means to improve the accountability and transparency of political systems, with the potential to improve consensus-based decision making and to build increased trust and confidence in political processes.

The main 2020 focus of this vision is user empowerment through eGovernment, in order to be involved in, and contribute to, both the decisions and workings of communities as well as of society as a whole.

Implications and challenges

Empowerment through open, participative and democratic government requires education and a focus on information literacy through inter-disciplinary cooperation with the goal of increasing the trust of citizens in government and eGovernment. It is built around connectivity, interactivity and responsivity, where a secure ID can become the whole basis of eDemocracy. Trust in government has been markedly decreasing across Europe recently, and part of the response to this must be to focus on universal human rights in the knowledge society, with strong privacy aspects and with an important role for freedom of information.

How ICT is used in human, social and economic contexts is thus crucial to empowerment. A central theme is whether ICT can in fact be empowering, or is it instead isolating? This question is whether ITC can be used to 'bridge' between heterogeneous individuals, communities and groups, or is it best at 'bonding' between similar individuals and within existing homogeneous groups? What are the roles that government can play in both cases? Existing research shows that ICT can be used for both 'bonding' and 'bridging', depending on circumstances and purpose.[199] Thus, it depends on how the technology is used, which means that decision-making and policy frameworks are crucial for successful and appropriate ICT application.

In order to prioritise economic and social empowerment, a way forward seems to be knowledge generation and exchange in learning communities and organisations, for example through 'communities of interest' as social networks of practitioners.[200] Such approaches rest heavily on the existence of trust between members, which often requires frequent face-to-face contact and the exchange of tacit or 'sticky' knowledge, whilst more codifiable or 'leaky' knowledge can be mediated by ICT. This vision therefore does not focus primarily on ICT, information and knowledge per se, but on social practice, and the communities and networks which form around it. Given the importance of the local and 'near' level in trust and inclusion activities (see Section 5.3), this vision thus strongly incorporates local and regional development issues and the role of eGovernment in this.

Trust thus seems to be one, if not the, common factor in the successful use of ICT for the purposes, not just of empowerment, but also more widely in the economy, the role of eGovernment, and in the social lives of citizens and communities. High levels of trust positively impact economic and social relations of all sorts, and reduce inequality which is itself a barrier to both empowerment and economic performance. It also minimises suspicion of new technology and change generally.[201] Trust also improves dealings with government and civil society. Reciprocal trust is critical in furthering empowerment,[202] but little research, including in the eGovernment context to which it is highly relevant, has taken place as to why and how this operates and can be increased.[203]

8.5.5 An open public sector

Outline

An open public sector provides the perfect model of transparency, where citizens can trace every single interaction with the public administration right down to the name of the individual who is dealing with their query or case in real time. In this vision there is focus on such openness rather than on proactivity, so that government becomes totally transparent.

This could include not just transparency of information, of services and their availability, or similar, but also total transparency of the whole purpose and all processes of government, i.e. total transparency of purpose, actions and outcomes. This

[199] IPTS, 2004b.
[200] IPTS, 2004b.
[201] Wilkinson, 2005, and Social Capital Project, 2005
[202] Social Capital Project, 2005
[203] See also Fukuyama, 1995

cannot happen in the private sector because here there is one interest only (i.e. profit, and shareholder value), but could be attempted in the public sector.[204]

Implications and challenges

Total transparency of purpose, actions and outcomes in the public sector means that all have access to (perfect) knowledge about what is going on, and the impact this has or is likely to have. This would make it possible to relate decisions and actions very precisely to the whole set of diverse (sometimes contradictory, sometimes complementary) needs of all stakeholders. For example, in the democracy versus efficiency debate,[205] efficiency would be seen as only the means to serving a purpose, so the question would be if democracy is (one of the) outcomes expected, the efficiency question becomes how can we most efficiently produce a high level of democracy? Or, here, how can we be as efficient as possible in delivering total transparency.

Another example would be the question of whether or not downsizing, outsourcing and cost savings in the back office, perhaps in order to reduce taxes as part of a government efficiency programme, results in a reduction in the range and quality of services and of the work of staff. But if a specific level and quality of services and the work quality of staff are seen as essential outcomes, then it would be possible in the context of total transparency to design the most efficient system imaginable using ICT and other tools to achieve these goals. Total transparency actually implies really being able to 'get what we pay for'. It should also imply the end of invisible, divisive, Kafka'esque bureaucracies not knowing what they are doing and whose needs they are serving. But without this total transparency of purpose, actions and outcomes, and without democratic decisions to the contrary, downsizing and outsourcing could easily result in worse quality work for staff, worse services, and lower standards overall.

Politics thus, in a sense, becomes more important in this vision. Total transparency makes government a better, sharper, more precise tool for fulfilling the role of governance. And thereby allows all stakeholders to be more aware of what government is, should be, and what its roles are. It also means that, even if the stakeholders themselves cannot agree with each other or what their roles are, at least there will be much greater transparency and knowledge about the views and needs of other stakeholders. It will make it possible to know what is agreed and not agreed, what government should do and not do, etc., and given this, government can be conducted as efficiently as possible. Thus, total transparency leads to better decision-making and also to better understanding as to why decisions are made, and what different stakeholders can do and not do, thereby leading in turn to better decisions next time round. Transparency can also be seen as the basis for trust, so this vision can also be linked to the democratic public sector vision.[206]

In this way, total transparency can be used not just for greater democracy but also for greater efficiency. It can bridge the gap and reduce the trade-off between them. In turn, this would also be instrumental in furthering the policy goals of universal human rights,

[204] Soete & Weehuizen, 2003, have explored some aspects of this.
[205] Betz (2005)
[206] Cf. the "European Transparency Initiative", IDABC European eGovernment News Roundup, 2 November 2005, No. 116.

citizenship, quality of life, etc., as well as of economic growth through the efficiency pillar.

Total transparency also implies appropriate legal and institutional changes which support fully open government, together with changes in the mindsets and cultures of civil servants as well as of users and of society's other stakeholders.

8.5.6 A user-driven public sector

Outline

Much current thinking in eGovernment is predicated on the concept of user- or citizen-centric systems.[207] The next step, within the 2020 time frame, should transform this into a user-driven set of concepts. This means not just designing government and services for users and taking their needs fully into account (i.e. user-centric), but drawing users themselves fully into the processes whereby government and services are determined and created (i.e. a user-driven). To borrow a phrase, not just 'government for the people' but also 'government by the people'. ICT can be a transforming instrument to help us achieve this.

The user-driven public sector vision is not just about user self services,[208] or the personalisation of services (as in the personal public sector vision). These are both examples of the user-centric approach, i.e. where the user, in essence, only reacts to what is offered, although could make some choices within the offer. Going much further, the user-driven vision brings users firmly into the whole process of service and content design, production and delivery, before they themselves as users also use the service. It provides the ultimate feedback loop, and perhaps the perfect 'market' model, but also throws up dangers and challenges.

Implications and challenges

There are many examples of user-driven services from the commercial world, albeit most are unintended and not consciously enabled by the product/service providers themselves. For example, the mushrooming of SMS messaging is an example where users saw a possibility in existing technology and drove it forward. There are many similar examples in the Internet context, which has of course been developed largely bottom-up deliberately to include the facilitation of user-driven services. The open source community, specifically for example Linux, is almost a perfect illustration, as are wikipedias, blogging, OhmyNews, and some computer games (including the Sims and HotDate, which were both invented or strongly modified by users). In the world of manufacturing, kite-surfing and mountain bikes stand out as products consumers themselves started to design and build because they were not available, before the companies understood the latent demand.

The 20th Century brought the rise of mass production, which relied on the marshalling of people and resources on a massive scale in large scale factories. According to Leadbeater (2005), the 21st Century is seeing the emergence of user-driven communities

[207] For example, the Cobra recommendations, European Commission, 2004f.

[208] Contrasted with proactive services and intermediary delivered services in the 'Back-Office' study, Millard et all, 2004.

of innovation which will open up and, in many cases, overturn the mass-production model. In this vision, which we are already starting to see, creating new products and services becomes a participative, democratic activity sustained by these communities and not just by companies. This changes the role of design and designers. Design used to be done by specialists for users, as two distinct groups. From now on, in a growing number of fields, design will be done with users and by them, as they co-create products and services with specialists, thus blurring these two groups. Why not in (e)government? At the European eGovernment Ministerial Conference in late November 2005, the term 'co-creation' was suggested as equivalent to the term 'user-driven'.

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,[209] especially in health, education and crime where few designers presently work. One example is diabetes which costs the UK National Health Service £5 million per day and is one of the main causes of premature death. The average diabetic spends just three hours a year with doctors, but thousands of hours a year managing their own condition themselves. The biggest gains will come from enabling diabetics to become more effective at self-diagnosis and self-management, equipping them with tools, techniques and peer support. Similarly, 90% of health care is delivered in the home. People want more home-based solutions that they feel they control. The health information available to patients on the Internet is transforming their role; no longer passive, they can question and participate.

The challenge for the public sector is how to enlist users as co-producers and co-designers in the way the computer games industry has. This immediately, however, hits two big issues. Firstly, that users may want, not unreasonably, some recognition of their role as joint authors of innovation. In computer games that comes in the form of recognition from within the community of gamers. Secondly, the response of the professionals, designers, doctors, teachers, civil servants, architects, etc., who feel their position may be threatened by user participation. A good example of this is what has happened to journalism which long resisted user incursions and restricted readers to the letters page only. Today we have blogs, pro-am journalism, wiki-pedias, etc. There are, however, significant questions of quality and standards, which are real challenges, but probably not insurmountable.

If only 1% of (e)government users become involved in designing and producing public sector services, that is a huge increase in the development workforce and potentially a huge increase in the relevance and use of services.

8.5.7 Technology research challenges

There are many technology challenges resulting from networked visions. First and foremost, ambient technology, systems and services which are everywhere, fully interoperable (in both technical and non-technical terms), and are instantly and unobtrusively accessed or made available through constant monitoring via network

[209] Leadbeater, 2005.

sensors and receptors of who is where, and what their needs are in changing situations. This also implies ambient Intelligent space[210] for supporting mobile users, each of which is constantly moving and being offered inter-changeable agents and objects which manifest themselves through such things as caches, liquid software, and downloadable applications. In this space, intelligence is pervasive and unobtrusive in an environment which is sensitive to the presence of living people, and supports their activities. People, physical entities and their agents/avatars share this new space, which encompasses both the physical and virtual worlds. Here, people will participate in a multiplicity of parallel, overlapping, inter-leaved and evolving one-to-one (including peer-to-peer, P2P), one-to many, and many-to-many relationships. Some of these will be very short-lived, established temporarily and instantaneously, whilst others will be longer term and more stable and permanent. Much of the communication between participants in these relationships will be asynchronous, as it is now. This means that virtuality applies to time as well as space.

Well functioning and ubiquitous federated and interoperable identity and/or authentification systems are also vital, as is user anonymity which is orthogonal to security. Security in the ambient intelligent space is of paramount concern, and will require solutions very different from those of today's systems which are predicated on relatively stable, well-defined, consistent configurations, contexts, and participants in security arrangements. The new paradigm will instead be characterised by 'conformable' security, in which the degree and nature of security associated with any particular type of action will change over time, with changing circumstances and with changing available information. Here, users' agents will negotiate a unique security agreement for the precise conditions and context pertaining.

Networked eGovernment also requires personalised and context-relevant ICT, customer (or in this case, citizen) relationship management systems, and decision-support and forecasting systems based on intelligent knowledge management and archiving. This will include technologies to support automatic scenario and simulation development, as well as rapid impact assessment prognoses. This implies seamless knowledge flow throughout the network, with intelligence everywhere and not just at the nodes. Multi-channel approaches also lie at the base of these visions, in which both technical and non-technical channels need to be available, inter-changeable and mutually interoperable, and where interfaces need to be adaptable, natural and intuitive.

Underlying all these visions, there will need to be highly reliable, resilient and pervasive networks, including large scale wireless and mobile applications, large scale knowledge grids, and re-usable and shared data. One potentially revolutionary development could be free mobile services at present based on WiFi and already operating over 30 km. This could provide many eGovernment services in real time free of charge. By 2020, if not before, everything could be mobile, free, voice activated and using standard open source software. Technologies to support semantic persons, objects, situations and standards, will be also necessary using ontology-based services and natural language processing, as well as the recognition of gestures and other intuitive signals. In all ways, all aspects

[210] ISTAG (2002), page 5.

of the public sector need to be fully joined-up, given that this is the *sine qua non* of networked government. Open source and open standards will be essential ingredients.

Given the vast amounts of data and knowledge constantly being created, sifted, analysed and stored in these visions, systems to tackle complexity and support both policy-based and experience-based decisions, both automatic and human controlled, are essential. Another important aspect of this is the need for reliable electronic record management and document life management, including storage and retrieval systems which are compatible with changing technologies over the longer term so that out-of-date archives can still be accessed.

Although most of these technological challenges are common across all networked visions, some differences in emphasis are apparent:

- In the dynamic vision there is a need for extreme flexibility with a focus on personalised and context-relevant ICT, customer (or in this case, citizen) relationship management systems, and decision-support and forecasting systems based on intelligent knowledge management and archiving of highly complex data. This will include technologies to support context and location aware sensors, automatic scenario and simulation development, as well as rapid impact assessment prognoses to order to proactively provide services without user request.
- The personal public sector vision, in particular, will rely on multi-channel systems which can be used by intermediaries (including a citizen account manager), as well as by the user, perhaps also making a distinction between services used by particular actors. This will also involve eServices complementing face-to-face contacts where control can be exercised, shared and passed between users and civil servants and other agents, as well as highly adaptable and intuitive interfaces.
- In the inclusive vision there is a focus on technologies which result in simplicity, flexibility and choice, with any complex systems hidden to users. As in the personal vision, multi-channel systems will be important, especially where technology may be hidden but still supports the service, as will be technologies which can facilitate the fine tuning of services and natural interfaces to meet the needs of specific individuals or groups.
- The democratic vision rests particularly upon systems to support both policy-based and experience-based decision-making. Also very important will be technologies which can facilitate communities of practice, debate and discourse in a multi-channel environment, given that many democratic and participatory activities will continue to rely on close human contacts, so that P2P as well as one-to-many and many-to-many systems will be important. Also of relevance will be gaming and simulation systems which are ontology-based and highly adaptable.
- The open public sector vision implies fully accessible, interoperable and semantic data archiving, exchange and processing. It will also be necessary to develop fast response, intelligent systems that can trace and track complex data in real time, as well as reconstruct previous events and seamlessly access all relevant archives.
- In the user-driven public sector, open standards and open source are particularly important, as are technologies to support diverse ICT and other skills, in order to facilitate as broad as possible participation in service creation and design. In this vision technology should be created which is independent of a particular open

source implementation. Open standards are likely to be the way forward for multiple actor involvement in service design.

8.6 Distributed visions

Distributed government refers to a system where departments work independently and autonomously. It means that the different systems, agencies, sectors, jurisdictions and levels function more or less independently, without one central authority in overall control. Thus, each system wields high levels of power across one or more specific areas of competence, and finds few if any challenges to that power.

Two 2020 visions of distributed eGovernment are elaborated relating respectively to more proactive and reactive roles, together with their technology research challenges.

8.6.1 A diverse public sector

Outline

A diverse public sector is one in which citizens interact with different levels of public administration in a distributed manner, and where the public administration is distributed rather than joined-up. Therefore, duplication can occur, but this is one of the prices of security of information and of distributed power.

In principle, governance is all about finding the balance between the centralisation and decentralisation of powers, and what the resulting allocation of ‘good’ and ‘bads’ should as a result. A summary of these is depicted in the table below.

A diverse public sector would make a specific selection of these ‘goods’ without attempting to re-dress the trade-off between them. Thus, it might be very good at meeting the precise needs of particular jurisdictions and stakeholders (for example, at the local or regional level, or of business), but it would be quite bad at reconciling such needs across all jurisdictions and stakeholders.

Implications and challenges

A diverse public sector thus means maximising specific benefits and foregoing general benefits. Unlike, the networked government visions, this vision does not therefore attempt to find the ‘sweet spot’ between too much chaos and too much order. Finding this balance, the sweet spot, means attempting to enjoy the advantages of both a centralised controlled approach and decentralised uncontrolled approach at the same time, whilst avoiding too many of the disadvantages of each.

For example, although this is ultimately a political question, the ‘sweet spot’ would involve the application of a minimum level of universal standards, while avoiding bureaucratic homogeneity and unresponsiveness, or responding to local needs while avoiding parochial and isolationist tendencies. Standardised centrally-agreed structures ensure overall efficiency, a minimisation of negative externalities and transparency. A diverse public sector does not attempt this, but attempts instead to focus on particular, rather than all, constituencies and needs, for example local adaptation which maximises on-the-ground impact.

'Goods' and 'bads' of centralised and de-centralised government systems

	'GOODS'	'BADS'
CENTRALISED / LARGE SCALE *Command analogy / top-down / order* 	■ Ensures minimum standards ■ Level playing field ■ Framework of laws, norms and appeals ■ Democracy on large scale, more inclusive ■ Ensures cohesion and inclusion ■ Promotes linkages and networks and positive externalities ■ 'Joined-up' ■ Provides simplicity and certainty ■ Promotes continuity and stability ■ Provides coordination ■ Long term planning, strategic, high impact	■ Bureaucratic, standardised, homogeneous ■ Unresponsive and insensitive ■ One size fits all ■ Rigidity and control
DECENTRALISED / DISTRIBUTED / SMALL SCALE *Market analogy / bottom-up / chaos*	■ Takes account of local needs ■ Promotes autonomy and empowerment ■ Diversity and pluralism ■ Promotes innovation and creativity ■ Democracy at a community scale ■ Short term planning, flexibility, reactivity ■ Subsidiarity	■ Local fiefdoms ■ Variable minimum standards ■ Can produce negative externalities affecting other areas ■ Isolationist ■ Tending to chaotic ■ Can be complex and create uncertainty

The role of eGovernment in the diverse public sector vision is to provide tools and services which maximise specific benefits. This could include those of certain user groups, certain locations, the private and civil sectors (for example, their participation in specific value chains creating, delivering and using services), and the use of the technology to maximise efficiency within such a context. The danger is that eGovernment will wither into inter-jurisdictional strife in which each agency and interest only strives to maximise its own efficiency, whilst larger scale effectiveness is sacrificed and forgotten.

8.6.2 A private public sector

Outline

A private public sector is the vision of a public sector that is geared to the private interests of individuals, groups or economic entities. In the latter case it tends to be more or less outsourced to private corporations, thereby leaving politicians with little recourse to affecting political decisions through anything other than market forces. The interaction between the public and private sector in terms of value chains becomes a highly important subject. Again, issues of legitimacy and accountability will arise, not only for public administrations but also for politicians. However, efficiency in terms of costs, responding to user demand (maybe at the expense of user need) is maximised.

Implications and challenges

This vision also raises the question as to whether the public sector should have a 'monopoly' over 'public' services? What is it, indeed, about the notion of 'public' which makes such services different from other services? One conventional response

would be that 'public', or government, services are all those services which 'need' to be provided but which the private sector either cannot or will not provide. Another response would include the contention that, even if the private sector would provide such services, the public sector is better at doing so, or can more readily take account of the public (i.e. the collective, or society's broad) interest. As can be seen, such a discussion is likely to raise more questions than it answers.

One aspect of this vision, as well as of other cells in the distributed and centralised parts of the vision matrix, is the start of a move back towards just single channel, only this time towards the 'e' channel, primarily for efficiency and cost saving reasons. This is especially the case with business users and specialised citizen users, such as students, who do represent groups who could be expected to have the skills, access and opportunities to use only eServices. However, the move represents a break from multi-channel principles, only recently established as electronic services were incrementally added to face-to-face services, often accompanied or preceded by telephone services, and this could work against inclusion and openness. The fact that this often takes place though outsourcing to the private sector, where the profit motive is likely to come before notions of public value and ethics, worries some. Neither does it take account of the fact that the 'e channel may not always be appropriate, even for highly skilled 'e' users. There are always some tasks (like care, nursing, teaching, counselling, brainstorming, empathy, socialising, and similar) which are unlikely ever to be completely taken over by 'e', so a move to 'e' only could degrade the overall quality of service experience and fulfilment.

There is some evidence that we are on the edge of a major move towards the commoditisation of business processes[211] and that this will also profoundly affect the public sector in the next five to ten years. All types of business processes, from developing software to hiring a CEO, are being analysed, standardised and routinised, and this knowledge is being codified and facilitated by ICT. This will lead to process commoditisation and outsourcing on a massive scale.

The public sector already faces huge challenges with outsourcing, which otherwise can provide clear benefits of cost reduction and quality enhancement, in that it needs to try to avoid the simultaneous loss of knowledge and control over basic processes and over the decisions and policies needed to support them. We need to better understand which aspects of the public sector's activities can and/or should be codified, commoditised and outsourced, and which should be retained in-house under public (democratic) control.

This is an issue which, in a fundamental way, addresses the future mandate and competence of the public sector. For example, it may be that aspects such as high level (tacit) knowledge, intelligence, management, policy- and decision-making and control should be retained in-house. The role of the public sector may be to retain competence and control over these high-level issues in the public interest and with the public good and public value in mind. The danger of not doing so could be that the public sector, as we understand it today, could disappear as everything could be commoditised,

[211] See, for example, Davenport (2005). An aspect of this approach, described as 'reference process monitoring', is mentioned by Bjoern Niehaves of ERCIS (European Research Centre for Information Systems), who was interviewed as part of this study.

outsourced and privatised. This could be one of the biggest challenges to the public service ethic as we know it in Europe today.

This vision, like the diverse public sector with its focus primarily on supporting specific needs and interests, maximises the benefits for such interests, but could lead to increased exclusion if users are left purely to their own devices and use services entirely on their own initiation. Many users are likely to be left behind by such a vision. (See also the inclusive public sector in Section 8.5.3 above.)

8.6.3 Technology research challenges

The technology challenges for distributed eGovernment are less demanding than for networked eGovernment. This is because there is less need for interoperability and joined-up government, meaning that systems can be much more stand alone. Despite the obvious disadvantages, there are also many potential advantages to this, mainly in relation to much better tailoring to the precise needs of specific agencies and their specific user constituencies, without having to take account of the need to link to other systems. Legacy technology is also less of an issue, except in the extent to which technology needs to be upgraded to meet modern efficiency and effectiveness requirements.

Security and identity issues will be easier to solve than in the networked visions, given that they need only to be related to specific agencies, services or users without the need for transferability elsewhere. In fact, most of the technical issues elaborated for networked government reappear also here, but with the important difference that there is less need for interoperability, at least between agencies or government levels, and that the efficiency of individual systems can be maximised.

Two other specific technology challenges are important for distributed eGovernment. First, a heavy focus on different multi-channel solutions for different groups of users, where the precise channel mix can be more specifically tailored to specific needs. Second, the importance of outsourcing, especially in the private public sector vision, puts a higher premium on routinising and codifying services so they are easier to outsource and to be incorporated within the technology systems of private companies, rather than be compatible with other agencies in the public sector. There are advantages here in terms of direct access to private sector technologies, despite the loss of critical mass across the public sector itself.

8.7 Centralised visions

Centralised government will typically focus all control in one central department, which means that information is readily at hand to those who have access to the central system. It also means that citizens will have to deal with only one institution. Centralised government is characterised by the one-way, top-down, hierarchical linking of different systems, agencies, sectors, jurisdictions and levels. There is one single powerful centre, and although sub-centres may exist these by and large only exercise power on behalf or discretion of the centre.

For the reasons given in the following, only one 2020 vision of centralised eGovernment is elaborated, together with its technology research challenges.

8.7.1 A single public sector

Outline

The very essence of a centralised single public sector is one that is proactive to the extent it deems necessary, and rarely 'reactive' in the sense described in the matrix above. A public sector that concentrates on developing top-down frameworks which it intends to use itself cannot be considered reactive, and therefore these two roles are merged for this final vision.

Centralisation in a public sector can provide many benefits for service delivery, particularly from the perspective of public administrations. First and foremost, it can generate a high level of efficiency. It can also provide equality of service, as everyone everywhere will be entitled to the same level of service in a centralised system. Centralisation can also provide very clear and precise rules and frameworks for public services, which enables clarity in understanding the roles of government and citizens.

Implications and Challenges

In a centralised public sector, stakeholders outside of the public administration take the passenger's seat when it comes to design, production, and delivery of services. Consultation and public participation is not considered important in this area, as the public sector clearly knows what its needs are for delivering services to citizens. In classical political theory, bureaucrats and politicians who adhere to the centralised state idea feel that democracy is a particular event which only happens once every four or five years, and after this, governments and public administrations feel that they should be 'left to get on' with business. Flexibility is not a characteristic of such systems, as hierarchies do not enable multi-way communication as efficiently as could be carried out in a networked system.

Transparency is also an issue for a closed, centralised public administration, whose internal communication methods do not easily facilitate openness within, or outside, the administration. Privacy is also a concern for individuals who live and work in administrative regions which are highly centralised.

A single centralised government vision heads in completely the opposite direction from the model of good governance suggested by the European Commission in the 2001 White Paper on European Governance,[212] which outlined five key principles: *openness, participation, accountability, effectiveness,* and *coherence*. All of these, perhaps barring effectiveness (in the context of efficiency gains) and coherence, are difficult to achieve in a centralized public administration.

The decision to take regarding this vision is whether public administrations wish to strive for efficiency and effectiveness rather than the idea of having a public sector which also aims to provide public value. At the European level, the political challenge

[212] European Commission, 2001, *White Paper on European Governance*, Brussels, COM(2001) 428 final

of centralization is one that decision makers are unwilling to discuss, given that it runs in contradiction to principles of flexibility and subsidiarity.

The vision of a centralised public sector thus implies that eGovernment could become a powerful tool for efficiency, but the real governance objective and impact could become obscure. Efficiency alone will become paramount, but for purposes which are unclear, obscure and perhaps unknowable for many. Thus, this vision avoids a full consideration of public value, what it is, how it can be achieved, and how eGovernment can support it. In other words, effectiveness becomes sidelined by the search for efficiency.

In this vision there is a danger that the public sector retreats into itself and only concerns itself with the maintenance of its own (state) power and interests, for example with a heavy focus on legal issues, law enforcement, and security aspects, plus overall bureaucratic control. Efficiency would, however, be maximised, and ICT would, of course, provide excellent tools for such a scenario.

8.7.2 Technology research challenges

ICT can play a highly effective role here, as has been shown in popular culture since the late 1940s with *1984*'s 'Big Brother' (Orwell, 1949), or, more recently, George Lucas' film *THX 1138* (1971). Centralisation of data into increasingly large databases, with computing power ever more capable of dealing with complex calculations, make this less 'science fiction' and more 'science faction'. The recent debate in the United Kingdom over the proposed Identity Card scheme, with a centralised database for the biometric data of all cardholders is one example of centralisation of data, and has, by some commentators, been hailed as the first steps towards a centralisation of individuals' data.

The technology challenges for this structure of public administration and government are less novel, as they do not require the flexibility or complexity of the other two structures. As the citizen must always find ways to accommodate to the public administration, there is no real need for developing new methods of interaction, or new interfaces for users.

Centralised systems will have to be accessible to citizens in order to increase efficiency: if a centralised system requires an intermediary (in the form of a public servant who accesses the information) then potential efficiency gains are effectively lost, both for the government – through the costs of providing centres for interaction – and the citizen, through the time required to deal with the public administration.

There are, however, some cases where centralisation of data can be useful. Further to providing more efficiency for the public administration itself (bearing in mind the comments of the previous paragraph), centralised systems can contribute towards more secure and stable environments. These include issues over national security and identity (particularly the threat of terrorism), where the centralisation of information makes it easier for individual agencies to keep track of individuals as and when necessary. The major technological challenge in this instance would be to develop a system that does not undermine the civil liberties of innocent individuals, whilst being able to concentrate on the threats posed. A centralised system, if designed properly, can also

ensure that the correct information is always available to civil servants who disseminate information regarding grants, benefits, and other information. The disadvantage of networked and distributed systems in terms of information provision is clear; without a centralised system of disseminating up-to-date information, these visions can lead to confusion and disinformation: clearly this is unavoidable and would be less likely to occur in a centralised public administration.

8.8 Whose perspective?

This study has shown that there is a clear difference of perspective between different stakeholders involved in eGovernment research. Moreover, such differences are likely to become even more significant when we look across all of society's stakeholders, as we did from an inclusion perspective in Section 8.5.3. This is a strong argument for more purposefully engaging with all sections of society in developing new visions of the future.

Many (but by no means all) of those who prepared or contributed to this report will be enjoying their well-earned retirement in 2020. Whether or not we will all still be working, each of us has learnt to use and understand ICT close to or after the onset of adulthood. But, a large proportion of those who will be leading full social and working lives in 2020 will be individuals who have grown up through their childhood with powerful computing systems, the Internet and mobile communications. ICT will be a natural part of the way they think about themselves, government and their interaction with government, in ways which are almost certainly quite alien to us.
The up-coming generation is, therefore, almost bound to have very different ideas about the issues discussed in this section compared to those of the authors. They will have grown up with computers and the Internet, so their attitudes to the use of what the older generation terms 'new technology', as well as to eServices generally, already appear to be completely different. It is possible to envisage that within 10 to 20 years, when the youth of today become responsible citizens and workers, concepts of eGovernment, eSecurity and eInclusion will change dramatically if not disappear altogether. The technology will probably also have changed out of all recognition.

In order to tap into this potentially rich vein of 2020 visions, this report recommends that serious and sustained dialogue should be undertaken with the new generation, already now. This should comprise both direct dialogue and brainstorming workshops with present day youngsters (which could also include the possibility of gaming and simulation activities), as well as action and ethnographic research examining and observing how they think and behave in ways which could have implications for the future of (e)government. One approach would be to get them to imagine how they could use, and how they think organisations (including governments) could use, the up-coming www (whole wide world) at the speed of light. In the same way that, today, we take electricity, water and other commodities for granted, so will they take the www@c as a standard and ubiquitous utility available to all in 2020

Our future work and planning should, of course, not be dictated by such inputs (any more than it should be dictated by the inputs of other groups) but their voices, attitudes

and mindsets must be taken into account much more seriously and directly than has been done to date.
However, we must also remember that the purpose of this study is not to outline specific research challenges for 2020 but to show that the logic of the objectives level approach can be used in looking towards the future of the eGovernment research landscape.

Early versions of these visions were discussed in the workshop in Seville at the beginning of October 2005. Some results of the discussion are provided in Annex 3.5.

9 Main conclusions and recommendations

In this final section, the conclusions and main recommendations of the study are outlined, all of which are derived from earlier sections where full details can be found. The conclusions and recommendations are structured in six main parts as follows:

- The existing nature and content of eGovernment research is outlined, including the positioning of Europe in its global context.
- The need to link research in a coherent manner to the proposed general (political) policies in the EU and its Member States is emphasised, and an intervention logic is used to facilitate this.
- The recent strengths and weaknesses of European eGovernment research are examined together with main opportunities and risks.
- Recommendations for the content of eGovernment research policy are presented. These relate mainly to the 2010 time-frame.
- Recommendations are made about how eGovernment research should be organised, promoted and supported.
- Finally, some conclusions are drawn about the development of longer term eGovernment priorities.

9.1 Overview of recent and future expected eGovernment research

The study began with a set of eleven research areas generated during an eGovernment research workshop in March 2004 and organised in terms of i) technology, tools and applications, ii) economic aspects, iii) sociological and social psychological aspects, and iv) EU level. These were tested through a large number of questionnaires and interviews, as well as through large scale desk research and content analysis of existing and recent eGovernment research activities. When empirically validated in this way, most of the research areas were found to be highly relevant. A few were found to be too broad and were broken down into smaller parts, and other areas of research not adequately covered by the existing eleven research areas were added. This resulted in seventeen so-called research themes in total, which for conceptual and analytical purposes were clustered into three groups to reflect the major fields of research identified during the study:

Group 1: Twelve research themes which examine the direct production and implementation of changes brought about by eGovernment:

- eGovernment inward-facing, including back-office, themes.
- eGovernment service and content design, production and delivery themes, the interface between the back- and front-office.
- eGovernment outward-facing, including front-office, themes.
- cross-cutting themes, such as trust and security, open source and measurement.

Group 2: Four eGovernment themes examining the impact and measurement of group 1 activities on the benefits or otherwise experienced by the public sector and/or eGovernment users (citizens and businesses).

Group 3: One research theme that examines the implication of group 2 impacts for wider public value and high level policy goals.

Using the empirical sources employed during the study, a research map of Europe in a global context was developed. This showed that, recently, an overwhelming amount of research is carried out in the area of the back-office and on the interface between the back- and front-office, especially focusing on technology aspects (rather than organisational or economic), including data and knowledge management, as well as in the technical aspects of interoperability, service design and production, and trust and security. A relatively large amount of research is also being carried out on eDemocracy. Overall, there is a clear recent focus on technology use and exploitation in eGovernment research.

However, at Member State and regional there is much less research focus across Europe on many of the important user-centred issues, or on the benefits of such eGovernment applications for public authorities or users, or on how these activities contribute to EU or Member State policies. The clear link between research and policy therefore emerges at this level as the most crucial missing connection when designing effective research policy for eGovernment. At the European level, on the other hand, a significant move towards policy-related research has been initiated, and corresponding cooperation between policy-makers and the research community has been set up and is being further reinforced. This also intends to raise, specifically, the interest of the eGovernment policy-community in eGovernment research issues and also, generally, the interest in the potential of innovative eGovernment for public policy making. Such approaches could also be initiated at the national level.

At the European level the link between policy and research is expressed in key documents such as the Manchester Ministerial Declaration,[213] the 'Signposts Towards eGovernment 2010' document,[214] and the Cobra recommendations (European Commission, 2004f). The opportunity now is to further strengthen this and to also look forward, beyond the 2010 timeframe, in order to make the linkage between policy and research a sustainable European strength.

Recent eGovernment research tends to be of a similar nature across the globe, often with only small regional deviations, although the OECD regions tend to be much further advanced in terms of coverage and deployment. The differences can often be explained by the nature of the political institutions and cultural systems within each region. For example, the European Union focuses on, and funds, research in areas under its mandate, which lean towards interoperability and open source solutions. European researchers are far more aware of social inclusion issues than their counterparts in other parts of the world, and have carried out more research into eDemocracy issues. Generally, non-European researchers are even more active in research on technology applications, but much less active in eDemocracy research and, of course, on research related to eGovernment at EU level. They do, however, give a higher priority to research on user needs.

[213] Agreed at the European eGovernment Ministerial Conference, 24-25 November 2005, under the UK Presidency.

[214] Also published at the European eGovernment Ministerial Conference, 24-25 November 2005, under the UK Presidency.

However, the picture changes quite dramatically when stakeholders' recommended future research is examined. Although non-Europeans tend to recommend more of the same, i.e. not highly different from what they are doing now, Europeans have almost turned the rank-order list of research upside down. Although many of the most important recent research themes are also expected to be areas of focus in the future, there are a large number of highly significant divergences. Data and knowledge management, and integration and interoperability, slip significantly down the ranking, and are replaced by user needs, value chains for developing services and content, and networked multi-level services. The outward facing, user focused research themes are also much more prominent than in recent research. Both user needs and socio-economic inclusion move significantly up the rankings, whilst eDemocracy further improves its already important position.

All this implies an important shift away from back-office inward-facing research more towards the wider organisational aspects of service design and delivery, as well as a strong shift of emphasis towards the front-office and service use. Even more significant, however, is the quite dramatic shift of emphasis of recommended research towards an examination of the impacts of eGovernment on the benefits experienced by the public sector and/or eGovernment users. Similarly, the implication of these impacts for wider public value and high level policy goals is also stressed much more.

An examination of the stakeholders involved in recent eGovernment research in Europe, as well as of the different types of research taking place, leads to a number of conclusions about the actual deployment of eGovernment research results, as a first step towards supporting policy goals:

- Despite good coverage of the research issues involved in the change in the public sector research theme (see below), most such research is still far from being deployed, probably because of the institutional and cultural barriers which still resist public sector change in Europe.
- Overall, the direct link of research results in Europe with deployment is generally quite low. This perhaps does not matter too much from an academic perspective, but in the context of this study with its focus on the contribution eGovernment research should be making to EU policies, this is an important shortcoming.
- In order to promote the deployment of research results, the clear conclusion is that the public sector, ICT industry and even users need to be involved more, not instead of, but together with, academics and consultants. Indeed, on the evidence we have from this survey, research activities which have a good balance across all these stakeholders (as do most EC-sponsored research activities), particularly where the public sector and ICT industry work closely with consultants, are most likely to be contributing strongly to deployment. Note, however, this conclusion is in relation to direct deployment potential only. This study also shows that generic/theoretical and review research are often essential early pre-cursers to research which is closer to deployment. Again, a balance is needed, depending on policy preferences and short and longer term goals.

Finally, the study shows quite clearly that EC-sponsored research activities, compared to the other research examined in this study, emphasise very similar eGovernment

themes. However, EC-sponsored research activities are significantly closer to deployment and thus more likely to have a direct impact on EU policy, and also involve a higher number of stakeholders (i.e. are more multi-stakeholder), including a larger proportion of public sector and ICT industry stakeholders, and cover a larger number of research themes (i.e. are more multi-disciplinary).

In fact, EC-sponsored research seems to play a very specific and important role in European research generally, and successfully complements the overall European research effort, providing a well balanced eGovernment research portfolio from the perspective of stakeholder mix and research type. Indeed from the evidence in this study, the EC is clearly showing the way for other European researchers in linking eGovernment research to deployment and to major policy goals, as well as providing a framework within which such deployment and policy linking can better take place.

9.2 Linking research to policy

There are at least two specific patterns that emerge when considering stakeholder assessment of the importance of eGovernment research for policy goals. The first prioritises social and inclusion policies, to some extent citizenship, and EU level policies over the others, and reflects the views of academics, the public sector and users. The second prioritises economic and cross public sector policies (i.e. linking and integrating eGovernment with what is taking place in health, education, etc.), and reflects the views of consultants, industry and non-Europeans. Non-Europeans, in particular stress cross public sector policies much more than European stakeholders. ICT industry stakeholders also weight EU level policies highly. The data provided by the study also indicate that EC-sponsored research tends, as would be expected, to be more relevant for the EU level policies like enlargement, European research policy, etc.

The current basis for policy-related research is promising. In order to further reinforce this and build on the potential and interest that is clearly present, a methodology is suggested based on the 'intervention logic', already employed in EC impact assessment exercises, which facilitates understanding of the link between eGovernment research and general policies and policy visions. These intervention logics connect three levels of objectives, each coinciding exactly with the three major groups of research themes described in Section 9.1 above, i.e.:

Level 1: The eGovernment operational objectives level, as the building blocks and detailed operations of eGovernment, which directly produce and implement change.

Level 2: The eGovernment specific objectives level, which are the eGovernment impacts (benefits or otherwise) experienced by the public sector and/or eGovernment users (citizens and businesses).

Level 3: The general objectives level, which examines the implications of Level 2 impacts for wider public value and high level policy goals.

Five detailed analyses of these three levels and their intervention logics have been developed by the study in support of major EU policy goals for the 2010 time frame, based on existing sources and consultations. These are economic policies, social and

regional policies, quality of life and welfare policies, citizenship policies, and EU enlargement and research policies.

For each of these policy goals detailed recommendations are made about the eGovernment research required to support them. In addition, the methodology also enables consideration of so-called externalities, i.e. factors beyond the control of researchers and those responsible for eGovernment research which may reduce the impacts of research results on policy achievement. It is recommended that these externalities be directly incorporated into the research policy process, so that their importance, their risk of acting as barriers, and the level of control policy makers may or may not have over them, can be clearly articulated and taken into account.

9.3 Strengths and weaknesses of European eGovernment research

Consultation with stakeholders, wide ranging desk research, participation in workshops and conferences, and an examination of the state of the art in eGovernment research issues globally, facilitated the preparation of a global state of the art research agenda for each research theme. Using this global state of the art agenda as a yardstick, the strengths and weaknesses of European eGovernment research were estimated and compared with the situation in other major global regions.

Both first and second order strengths have been identified. In the former case, European eGovernment research appears to be very strong in terms of the following three research themes:

- eDemocracy and eParticipation.
- Change in the public sector.
- eGovernment at the EU level.

Two of these themes (eDemocracy and eParticipation, and change in the public sector) are operational objectives and describe the systems put in place and the processes that government and public administration must undertake to achieve links towards the specific objectives and general EU policies.

Due to the specific characteristics of the European research landscape, there are particular reasons as to why these areas are relatively strong. These arise from the fact that much of this research is done at a pan-European level, or at least between a number of individual EU Member States, as well as being strong in individual countries. However, very little research on change in the public sector is funded by the EC at present (although a relevant call was issued in November 2005), perhaps because the EU does not have any competence in this area.

Europe is understandably also very strong in research on eGovernment at the EU level. European aspects of eGovernment and aspects that transgress national boundaries, such as the inter-exchange of data between Member States' administrations or the inclusion of other policy priorities into eGovernment, are central to this research theme. As a result, much of the focus is on socio-economic aspects of change, which is common to

most European public administrations and eGovernment initiatives taking place in European countries.

The fact that eGovernment research in Europe is also focused on change for both the public sector and in relation to citizens is an important point, which highlights the forward-looking nature of research in Europe when compared to much of that taking place elsewhere. It should be noted that a strong bias exists on an institutional approach towards eGovernment: i.e. what public administrations should do and can do to change their processes.

However, the evidence seems to show that deployment of the results of these research strengths is highly variable, and is particularly low in relation to change in the public sector, so the question arises in terms of policy relevance, whether or not Europe is getting value for money in exploiting the results of these research strengths.

Europe also has a number of second order strengths:

- Data and knowledge management.
- Socio-economic inclusion.
- Open source.
- Trust and security.
- Measurement.

These areas are where Europe is considered to be carrying out a reasonable amount of relevant and leading edge research in relation to coverage of the global state-of-the-art research agenda for eGovernment. Given the requirements of European level policy (completion of the Single European Market, eEurope's goals for a cheaper, faster, and safer Internet, social and regional cohesion), there is indication of an already existing 'intervention logic' which encourages relevant research to take place in the areas above. Given the already existing propensity of the European Commission to monitor and evaluate policies, and given the global trends in attempting to compare and share examples of best practices through various tools and mechanisms, it is not surprising that European level research contains a high level of measurement initiatives. Methodologies for evaluating eGovernment are of crucial importance here, and seem to be very well covered in the EU-level research. By nature of the European research landscape, this is one area where active and useful research can be directly delivered to policy makers, thereby proving incredibly useful. Due to its usefulness, it is quite well advanced in the Europe. However, each of these second order strengths only has moderate deployment impact at present, so this is an area where more focus needs to be placed in future.

As far as European eGovernment research weaknesses are concerned, the following have been identified:

- Integration and interoperability.
- Value chains for designing, producing and delivering eGovernment services, particularly in relation to public-private partnerships as well as partnerships with the civil sector

- Networked government.
- Multi-channel.
- User needs.
- Cross-sectoral.
- Innovative governance.
- Public value creation.

Essentially, one of the fundamental weaknesses of the European eGovernment research landscape as a whole is the relative lack of relevant and leading edge research into the interaction between users and providers, i.e. specifically the interface between the back- and front-office where content / service design, production and delivery take place. Much of the research appears to lead to supply-led solutions in Europe, which does not take into consideration many of the risks associated with achieving uptake and therefore attaining a change in government processes which will allow eGovernment to contribute towards the broader European goals and visions.

Europe is also quite weak in innovative governance research, and extremely weak in carrying out research that links together activities across the public sector as a whole. The inertia in established institutions plays a large role here. Asia and North America, both areas where institutional compartmentalisation is perhaps not as historically fixed as in Europe, lead the way in terms of cross-sectoral eGovernment research. This weakness is examined in more detail in recommendation 6 in Section 9.4 below.

No single global region is strong in examining the theme of innovative governance. For this reason and because of the emerging complexity and importance of issues in this research theme, it may be useful to separate the issues concerned with government's governance/conditioning role (focusing on structures and the role of the state, law, legal and regulatory aspects, and relations with the market and civil society) from government as a social, economic and regional actor in its own right (focusing on innovations in investment and spending across the whole public sector), resulting in two separate research themes. The EC's contribution to this research theme has been rather weak, though very recently has been improving with the launch of the Modinis programme and other initiatives.

Although Europe is a leader in the public value creation research theme, it is still very weak in terms of coverage of the state-of-the-art research agenda, and stakeholders have recommended that it be allocated a large increase in relative effort in future. This is due to the fact that, as with the justification for more research at the specific objectives level, there is a need to understand the relationship between eGovernment and more general policy goals much better than we do at present. The ultimate goal of eGovernment should be measured in its contribution towards wider policy goals, and not just, for example, in the rollout of services or re-trained staff. However, this cannot take place without carrying out research into exactly what form this contribution can take. Although, the EC's research projects in this area in the recent past have been no stronger than the average European position (as well as the non-European position), recent EC initiatives are changing this situation significantly. For example, RTD calls for eGovernment research in the Sixth Framework IST Programme are now linked to

Lisbon policy goals and proposers are requested to make such a link specific. Also, several projects in the current Modinis and other programmes are already focusing more heavily on public value.

The retention of Europe's strengths is central to the global competitiveness of the European research community, and should therefore be treated as a focal point for continuation in Europe's research agenda. Weaknesses, where they are crucial to specific policy areas, need to be acted upon. However, as has been demonstrated, there are great opportunities to reinforce strengths and address weaknesses in future, including learning from other regions of the world in certain cases.

One of Europe's biggest challenges is its diversity, especially at pan-European level, be it in terms of research, education, policymaking, or culture. This, however, should be treated as an opportunity and an asset, and not just a barrier, to eGovernment research. This sense of diversity incorporates not only languages and cultures, but can also be extended to the idea of creating interoperable systems that work across a wide array of users and public administrations. Diversity also provides rich content and the possibility of value-adding public (and other) information services for both citizens and businesses. This idea of diversity, inherent in all European 'ventures', provides the eGovernment research landscape with a clear advantage, which can be turned into an opportunity if dealt with vigorously. It also makes Europe more like the global mosaic than, for example, the USA, which, although in many ways is quite diverse internally, does not tend to reflect this diversity in governance or eGovernment systems.

There are also some potential risks which need to be tackled, sometimes dependent on the EU level policy to be pursued:

- There is an important risk in not strengthening interface research (between the back- and the front-offices), i.e. in the design, production and delivery of services, especially in relation to organisational, social and economic aspects. Failure to improve European strengths here will (continue to) result in generally poor, mediocre quality and un-innovative services, even if there are big improvements in the back-office and much better understanding of user needs.
- The specific European weakness relating to low priority being given to cross public sector eGovernment research, could be a risk if not addressed. However, there is much opportunity especially post 2010 to focus more on joined-up, networked government, and innovative governance across the whole public sector, and to link this to the private and civil sectors. This is examined in more detail in recommendation 6 in Section 9.4 below.
- One of the biggest risks in Europe generally (though not with EC-sponsored research, see below) is that the direct impact of research results on deployment is generally very low. This perhaps does not matter too much from an academic perspective, but in the context of this study with its focus on the contribution eGovernment research should be having on EU policies, this is an important shortcoming. This risk is examined in more detail in recommendation 2 in Section 9.4 below.
- There is also a risk in not better addressing coverage of the global state-of-the-art research agenda, and deployment impact of, all research themes at the specific and

general objectives levels. This risk is examined in more detail in recommendation 1 in Section 9.4 below.

- Failing to learn from and cooperate with other global regions, where this is relevant and useful to Europe, is a risk which can be countered both through better funded and more formal cooperation, but also better antennae for synthesising what is going on. (See also Section 9.5 below).
- Finally there is a potential general risk from external global threats. Recent events of man-made origin (e.g. terrorism, political and military disputes), natural origin (e.g. tsunamis and earthquakes, as well as floods in Europe) and perhaps a combination of the two (such as bird flu), are leading to increasing global uncertainty. The public sector, and governance structures and institutions generally, are in the front line in both predicting/monitoring and countering/coping with such risks, and so far results have been highly variable. eGovernment has a huge potential role to play in these, but the costs, efforts and outcomes are largely unknown, as are the consequences of ignoring the risk.

9.4 eGovernment research policy recommendations

As the objectives level approach adopted in this study demonstrates, the most important component of eGovernment research policy in optimising support for EU policies is to deliberately link research activities at each appropriate level into a more consciously articulated intervention logic. Indeed, understanding the different objectives/policy levels, and the intervention logics which link them, is arguably the most effective method available for linking research requirements to policy. Although this has been done in considerable detail in this report, further work should both validate and adjust the policies and sub-policies accordingly, as well as examine the precise eGovernment research requirements which they reveal.

It needs to be emphasised that the eGovernment research recommendations made in this report are made only in relation to the particular 2010 EU visions, policies and strategies being pursued. Thus, different policies will require different sets of recommendations, although there could also be some which are more widely applicable. Having gone through the data collected, and distinguished between research themes and their activity, it is important to state that any eGovernment research on its own will not have a direct or straightforward effect on policy outcomes. Also, given the spread of potentially relevant policy areas, it is clear that research themes would have to work together to achieve important policy benefits.

eGovernment research policy recommendations arise directly out of the need for Europe to build on its strengths, learn from its weaknesses, and take hold of opportunities emerging in the context of broader policy goals. Focusing on Europe's strengths and linking research direct to policy goals, are ways of looking forward to the future. There is clearly a lot of positive work being carried out in terms of eGovernment research in Europe, but this must be continuously developed. There are also some weaknesses in the research capacity seen across Europe as a whole, which are, in some cases, reflected around the world, and in others Europe lags behind.

In summary of the detailed recommendations made in this report, the following eight research policy recommendations stand out:

1. First and foremost, desk research, questionnaires, and interviews have all shown that a **general shift is required from a focus on operational research towards examination of the impact of eGovernment particularly at both eGovernment and EU policy levels**. This should ensure that sufficient and relevant research takes place into higher level policy and political implications for eGovernment implementation, recognising that eGovernment has reached a stage of maturity and that research should capitalise upon this rather than attempt to focus on 'rebuilding the wheel' at every possible opportunity. This study has shown that the EC is already quite advanced in this regard, so this approach should be strengthened and the EC's role in European research as a whole further focused on providing leadership and a framework to make this happen more widely.
2. Arising out of recommendation 1, **specific policy relevant research recommendations**, derived from Section 5, can also be made:
   i) **All five policies** examined pointed to the need for greater effort on research at the specific objective and the general EU objective levels in order to be better tuned to EU policies (which is the purpose of the present study). This means a more directive, top-down and policy-driven research policy is required which analyses the specific links (both direct and indirect) between eGovernment, government and EU policies, and is able to feed this back into the design and development of such policies, as well as into research policy itself.
   ii) For the **economic growth, competitiveness, jobs and innovation policy**, there are four operational level research themes which should remain either just as important as they are at present or receive significantly more research focus in future: trust and security, as well as value chain partnerships, networked government and user needs.
   iii) For the **social inclusion and regional cohesion policy**, more research is needed which supports the outward-facing aspects of eGovernment (user needs, socio-economic inclusion and eDemocracy). Research at the interface between government and citizens is also important, as is continued focus on trust and security.
   iv) For the **quality of life, welfare, social security and consumer protection policy**, the focus of attention at the operational level is given to service design and back-office developments. The changes that need to be implemented are not just technical, but should also consider legal and regulatory challenges, which, in the back-office can be examined by researching into change in the public sector. Services can be developed which work across all levels of government and public administration, therefore facilitating the citizen's interaction with public administration.
   v) For the **citizenship and EU citizenship policy**, specific action is necessary to promote active citizenship through provision of information regarding the democratic process and by attempting to improve the relationship between representatives and represented, or citizens and governors. For example, this can be carried out by examining the potential role of intermediaries and other actors in the 'democratic value chain', and ensuring that citizens are aware of the risks of electronic communication (which thereby leads to trust). Open source tools

and applications can play a great role in this, as they can provide a base system which can be adapted to the needs of specific groups.

vi) For the **EU enlargement and EU research policy**, there is a need to focus on creating a European environment which is prone towards information sharing and information dissemination. Therefore, the specific and operational objectives of this policy area concern the infrastructures and implementation of research and education within the EU, ensuring that a certain level of harmonisation of quality (but not expertise) is encouraged. European research frameworks should be further integrated with national level research programmes, to ensure that a common set of quality standards are maintained across Europe. Open source tools and applications can be put to good use to encourage and exploit human and knowledge infrastructures.

3. Third, in the context of linking eGovernment research more directly to policy impacts, there should be **greater focus on the deployment of the research results**. Again, the EC has over the last few years been leading efforts to better link eGovernment research to EU level policies (many of which are now also national policies). It is clear that EC-sponsored research activities are, not only generally closer to deployment and thus more likely to have a direct impact on EU policy, but also involve a higher number of stakeholders (i.e. are more multi-stakeholder) including a larger proportion of public sector and ICT industry stakeholders, and cover a larger number of research themes (i.e. are more multi-disciplinary) than the other research examined in this study. In fact, EC-sponsored research seems to play a very specific role in European research generally, and successfully complements this wider European research, providing, overall, a well balanced eGovernment research portfolio from the perspective of stakeholder mix and research type. The EC is clearly showing the way for other European researchers in linking eGovernment research to deployment and thus to major policy goals, as well as providing a framework within which such deployment and policy linking can better take place. This role needs to be strengthened and made even more proactive in the future.
4. Fourth, despite the European strength in **change in the public sector** in terms of coverage of the global research agenda, research in this theme is still mainly focused at national and regional levels and is not sufficiently close to deployment. These challenges need to be better addressed in the future, and, in fact, the EC issued a call in November 2005 for research on organisational change for citizen-centric eGovernment which should go some way to address this. Other on-going initiatives which should be further strengthened include simplifying regulatory procedures across all levels, regions, and sectors in the EU, encouraging national action through measurement and benchmarking, and providing pan-European services which encourage and stimulate the Single European Market.
5. The weakness of recent **research into the interface between front and back office** (content and service design, production and delivery), especially in terms of deploying research results, should be addressed more forcibly. In all three research themes described in this block, Europe is relatively weak in terms of eGovernment research. This is maybe due to the fact that much of the research that takes place in Europe either focuses on the public administrations or (some aspects of) the users, but does not examine the relationship between the two, and thus how suitable

content and services can be designed, produced and delivered. In terms of networked government, this is a highly difficult area in an EU where borders are continually contested and subsidiarity limits the amount of interaction between levels.

6. Also, more focused research is needed into **front office and service use** aspects, both to further strengthen the existing European strengths of eDemocracy/eParticipation and socio-economic inclusion, but also to tackle Europe's weakness in user needs issues. There is a lack of relevant and leading edge research in Europe generally focusing on user needs in comparison with North America and Australasia, from where some learning could take place. This appears to be driven by the tendency to research the public administration perspective in Europe, rather than focusing upon users and their take-up patterns of new technologies in relation to government services. However, the EC does already provide a lot of support for examining user needs, so this should be strengthened and focused even more.
7. **Cross sectoral services**, i.e. spanning and integrating the public sector as a whole, needs more focus. Historically, the EC has not been able to lead or encourage research in this area because of lack of mandate at EU level and a history of compartmentalisation. The opportunity now is to look at other countries (especially in North America and Asia), build common infrastructures and economies of scale, learn between sectors, develop the user perspective, avoid sub-optimisation of resource use and of impacts, learn from intervention logics, and similar. However, of course, Europe should continue to respect diversity. In many situations a cross-sectoral approach would be beneficial for users as well as for governments, although in other cases it may not be in the user's interest, for example, they may not want their social security data to be seen by the police. These opportunities could perhaps be exploited post 2010 and be signposted in the EC's eGovernment Action Plan due for publication in April 2006. Indications of such a move were also made at the European Ministerial eGovernment Conference at the end of November 2005, and in the Ministerial Declaration issued with its focus on transforming the whole of the public sector. Also some relevant projects are now being funded by the EC.
8. Finally, notwithstanding the disagreement which often characterises the debate about the precise role of basic technology research in eGovernment, there should be two main strands of **strong technology research** for eGovernment:
    iii) Look at future possible government functions and then determine which technologies and technology research is needed to bring them about.
    iv) Look at wider technology developments and research activities, especially those which take place in the private sector, and investigate which aspects could be exploited by eGovernment.

In summary of the above, there are two additional points to make concerning how European eGovernment research should be re-focused in future.

Firstly as already stressed, greater effort on research at the specific objective and the general EU objective levels is necessary in order to be better tuned to EU policies (which is the purpose of the present study). This means a more directive, top-down and policy-driven research policy is required which analyses the specific links (both direct

and indirect) between eGovernment, government and EU policies, and is able to feed this back into the design and development of such policies, as well as into research policy itself. Until there is a much better understanding of how government and eGovernment can contribute to public value and the main EU policy goals, much research will continue to be risky and arbitrary from this perspective. As described above, the EC itself is already quite advanced in linking eGovernment research to policy and is able to provide leadership across Europe to ensure this happens more widely.

Second, the first point is not an argument to significantly downgrade all research at the operational objectives level. On the contrary, such research is absolutely necessary in order to properly support the achievements at the specific objectives level, and in turn the general EU objectives level. What is called for, instead, is a re-adjustment in favour of the upper two levels, and a significant re-focusing at the operational objectives level. Indeed, in the context of the EU economic policy goals examined here, there are four operational level research themes which should remain either just as important as they are at present or receive significantly more research focus for the reasons described above. These are:

- trust and security.
- value chain design, production and delivery of content and services.
- networked government.
- user needs.

These four are in addition to other required research at this level which should continue, albeit with a lower relative effort than before. Some research is also essential into measurement and benchmarking at all objectives levels, although in relative terms, this can be downgraded to some extent.

9.5 Recommendations concerning the organisation and coordination of European eGovernment research

Organisational, coordination and operational recommendations in the following relate largely to European Commission (EC) actions and initiatives, but also how these should relate to other eGovernment research at national and regional levels and as undertaken by industry, academia and the public sector within Europe. This study proposes nine interlocking strategies to meet the needs of European eGovernment research over the next five to ten years:

1. **Seeding innovation** – Although much recent eGovernment remains too bottom-up, uncoordinated and haphazard, there is a clear need and role for a healthy undergrowth of bottom-up, decentralised research, responding to signals from the public and civil sectors across Europe, as well as to market signals and the needs of European ICT industry. Although the main role of the EC itself should be channelled into a strategic prioritisation of research to support policy, it must also provide sufficient funds and a suitable framework for such seed beds of innovation. This will not only benefit eGovernment at various levels across Europe, but will also have an impact on local growth and employment.
2. **Supporting policy priorities** – This study and other evidence point overwhelmingly to the need to concentrate much of the future eGovernment

research effort supported by the EC onto a more decidedly policy-driven and strategic approach reflecting EU and, where they overlap, also Member State (MS) and industrial priorities and policies. Such focussing like this by the EC is necessary, but it also assumes that other stakeholders, as of now, undertake other types of research, of course supported and seeded where appropriate by the EC. Thus, such strategic prioritisation fully reflects the specific EC role, which already complements the different roles of other stakeholders. Such a strategic priority approach could be implemented either through the calls for proposals approach, as now, but with much less leeway for proposers, or, which may be more appropriate, through the calls for tender approach in which very specific research is commissioned. A call for tender need not be based on 100% funding, and could where appropriate include a competitive element in which a business deployment model is part of the tender.

Strategic priorities should be selected on the basis of which particular EU policies need to be pursued most vigorously, or by focusing on priorities which overlap with and contribute to a number of EU policies simultaneously. Agreement on priorities is needed within the EC as a whole and with all MS, or with specific groups of MS, depending on need and circumstances. At the MS level, selected priorities will need to reflect the overlap of MS national goals and policies related to eGovernment, the public sector, ICT research, and the Information Society generally. However, this and other studies have shown that such an overlap is extensive and as yet largely untapped. Importantly, each of these levels will need to work together in order to maximise impact. Thus, the number of strategic priorities, as well as the scope of each, needs to be small enough to allow each of them to be relatively large, but also not too small as to reduce the overall visibility and impact of eGovernment research and deployment on society as a whole. Political visibility is also important in this context.

All this constitutes a set of highly challenging tasks, but is one shared with other current EU initiatives, not just in eGovernment. The main vehicle for EC research in pursuing such a strategic approach should be to determine (on the basis of major EU policies and by agreement across the EC and with MS, as described above) a number of strategic **eGovernment research clusters**. Each cluster should include individual projects that undertake particular and complementary research and which, crucially, are linked together into a value chain which addresses each of the three objectives levels. Thus, each research cluster requires one or more intervention logics for eGovernment in relation to a particular EU policy. This would enable the research needed to fill gaps in knowledge, expertise or applications, to be clearly understood and funded. This model will ensure small, focused projects, but within the context of a large multi-level cluster with clearly specified policy relevance, which can achieve critical mass, either alone or by formally linking with existing national, regional, industrial or academic research programmes, as well as other clusters where appropriate.

3. **Creating synergies** – The need to link more directly and decisively to national policies, as well as to EU policies, and create better and greater synergies with them, is now high on the EC's agenda. In future, it will not always be necessary or desirable to have exactly the same approaches or services across all MS. The scale of enlargement also necessitates this. Instead, focusing on groups of countries where appropriate should be encouraged, especially in relation to cross-border services,

thereby achieving a lot more differentiation and healthy diversity. Internal MS opportunities and challenges are so different (though probably converging in the longer term), and the need to take account of the dynamism of change is so important, that a more differentiated approach is needed. Following such an approach, however, must also be balanced against the need to ensure that longer term requirements for interoperability, interconnectivity and necessary standards at a European (and in some instances at a global) level, are not compromised. The role of the EC in eGovernment research which it is already carrying out very well is, in addition to direct funding, to provide leadership and clarity, remove barriers and help accelerate demand. This also includes coordination to ensure that duplication and waste are minimised, that synergies are created and mutual benefits shared, and that there is better overall coherence with policy goals.

4. **Strengthen global cooperation and synergies** – It is also imperative to create tighter, more formal and more effective synergies between European and non-European eGovernment research. A clear need exists for the 'formal' identification of common areas of interest with our major partners/ competitors, and then providing funding for European researchers to participate around these on a reciprocal basis. There needs to be an international framework for eGovernment research, as activities are much too ad hoc at present. It is important that European (as well as our partners') funding is specifically earmarked for the purpose of international research collaboration, in contrast to the present situation where such funds compete with EU-only research.
5. **Enhancing quality and relevance** – In order to enhance even more the quality and relevance of eGovernment research across Europe, a more pro-active approach to identifying needs, interests and resources could be taken. A significant portion of the EC's eGovernment research resources could be re-directed to a finite number of policy-driven 'strategic priorities', as part of the process of seeking as wide as possible agreement at EU level and with as many MS policies and programmes as possible, by looking for synergies and coherence across EU and national policies. As part of this process, key actors, stakeholders, institutions, networks, users, sponsors, etc., at EU, national and regional levels, should be identified. There could also be a multi-stage process for eliciting, nurturing and selecting suitable proposals. The aim would be to secure as much political and financial support as possible in advance and thus enable two or more MS or other stakeholders to work together to encourage and help form incipient project consortia. This could be part of a pro-active brokerage service.

   Once proposals are selected and launched, close support should be given by the EC Project Officer who should take a more pro-active role in on-going project activities. This implies, of course, some shift of resources within the EC administration away from 'back-office' project control towards more 'front-office' technical engagement with projects. This reflects, of course, the wider eGovernment policies the Commission promotes, and is in line with the 'eCommission' proposals and good eGovernment practice generally. Finally, it is also important that research 'failures' are accepted as necessary for innovation and for learning. Thus, more risk must be accepted, the important thing is that 'failures' lead to learning and feed back into the eGovernment programme as a whole.

6. **Place eGovernment research more firmly within the virtuous circle of research, policy and practice** – The European Commission is already quite advanced in doing this itself, but it needs to be more firmly coordinated across all forms of eGovernment research at all levels in Europe. In fact, the articulation of intervention logics (as proposed in this study) is needed to supply the links between the three activities of research, policy and practice. The research virtuous circle should not just be about developing research, but also about disseminating it. It should look for existing good practice and existing templates and should then incorporate these where feasible, in order build a library of resources at European level (an eGovernment repository, see below). This repository would also provide a space for demonstrators, which could then be rolled out more widely if and when MS wish this to happen.

   European eGovernment research is not just about funding strategic and policy-related research, but exploratory and independent work should also be encouraged. Although this may not be specifically part of the EU's funding regimes, the opportunity to include such research, through support, e.g. for human mobility, can be a crucial part of including innovation into a more strategic and policy-oriented research agenda. To this end, independent research carried out and funded by third parties such as NGOs and universities should be given the opportunity to interact with the more policy-led research programmes of the EU and national bodies.

   Furthermore, interaction between practitioners and researchers (through the idea of research clusters as above) should be given the utmost priority in eGovernment research. This will free up resources at the local and regional levels, where R&D is not normally part of the remit, but where, in the place of resources to search for research funding and partners, money could be spent on implementation.

   SMEs, due to their widespread nature, are more capable of delivering innovative and tailor-made services for local actors, and thus have an impact on local growth, employment and quality of life. Thus, Local Authorities also have an important role here. Both SMEs and Local Authorities should be included in the virtuous circle of research, but this is often difficult in terms of European projects. SMEs do not have the resources, expertise or time, to get involved in Europe-wide initiatives. Regional research efforts as well as structural funding programmes present the same difficulties for SMEs. One solution to the SME problem could be to organise NGOs (or other suitable 'umbrella' organisations) which are large and financially solid enough to function proactively as types of 'venture capitalists' and get them to look for ways to get SMEs involved in innovating (eGovernment) systems, and help them with EU research and structural funding, by applying for, negotiating, and managing EC funding. In this way, they could take much of the risk but also provide 'sheltered (local SME) environments'.

7. **An infrastructure for European eGovernment research** – In order to provide a coherent, flexible, yet effective infrastructure for European eGovernment research, greater cooperation is needed not just with and between MS but also within the EC and across different programmes. A cross EC **eGovernment strategic review** should be undertaken by the eGovernment Unit in DG Information Society and Media into the identification of strategic priorities and their EU policy impacts, as

an input to the forthcoming eGovernment Action Plan, scheduled for 2006.[215] This should liaise with other DGs, the MS, regional authorities and other interested stakeholders (such as industry, academia and user groups). Such an approach must, of course, allocate roles according to subsidiarity principles, and should be designed to improve the buy-in from, and participation of, all relevant stakeholders.

A specific recommendation, which could serve the needs of the recommendations described above and support better project focus and implementation, is to set up a **(virtual) European Centre for eGovernment**[216], but independent of the Commission, although supported financially by it. One model for this is as a virtual centre, integrating, pooling and coordinating what is already there rather than building new structures, and operating as a network. For example, building on the IDAC's eGovernment Observatory and the Open Source Observatory, pooling common basic service modules, etc. Other stakeholders, particularly European industry and the public sector should also be involved in funding such a centre, which should be seen within the framework of the development of the European Research Area (ERA). This is needed so that all involved in eGovernment can come together to share knowledge, perhaps in the form of a one-stop shop. Right now the field is too fragmented.

8. Related to the previous recommendation is the need for much better **communication of research and research results**. This is crucial, and is not always effectively carried out at the European level. Data collection for this study was quite difficult, and relied upon several diverse sources of information, in which no coherent semantic interoperability existed. Sharing of research data and results is paramount, and at the European level, the EC's research funding initiatives are in a clearly positive position to aid in this regard, but work needs to be done to ensure that research carried out at the national and local levels is integrated into this framework. Work has already begun on this front, but needs to be considerably strengthened. For example, a European eGovernment research portal should be set up as a one-stop-shop providing a regular overview of the field without users needing to get hold of actual research which may require a fee.

9. Finding the right balance for EC eGovernment research funding – Given the recommendations above (and the more detailed analysis provided in this report), a recommendation can be made concerning the organisation of eGovernment research policy as to the most suitable spread of resources for different types of instruments:

- 30% seeding innovation (functioning as of now, but with even more innovative leeway).
- 50% supporting major EU policy goals, e.g. through priority research clusters.
- 20% creating synergies, e.g. through strategic support functions, including ideas factory, clearing house, brokering service and good practice framework.

[215] The input into such a 'review' has, in fact, already started through an open meeting of stakeholders held on 21 September 2005, followed by a meeting of the eEurope eGovernment sub-group on 28 September 2005, and an FP7 eGovernment future research workshop held in Brussels, 26-27 October 2005. The Ministerial Declaration and the eGovernment Signposts documents, published at the European eGovernment Ministerial Conference, 24-25 November 2005, under the UK Presidency, are also part of this current process.

[216] This has some similarities to the proposals made by the Austrian representative to the eEurope Advisory Group, for a Virtual eGovernment Centre ("Bloomsday Recommendations", 2nd eEurope eGovernment subgroup meeting, Dublin 16 June 2004).

Whatever distribution of resources is adopted in practice, however, it is also important to retain flexibility in order to both respond to new research needs as these materialise and to maximise coherence and synergy with other programmes, whether at European, MS or regional levels.

9.6 Longer-term eGovernment research priorities

Finally, some thoughts are provided about the development of longer term eGovernment priorities in Europe, and the role of research in this. Nine visions are developed, principally as suggestions as to how the public sector could dispose of both its structure and role within a 2020 timeframe.

The nine visions present different goals for public administrations, and the part played by ICT in this. Within the different visions, the public sector can take varying institutional structures, which constrain or bound its activity in dealing with society, i.e. networked, distributed or centralised. It can also take either a proactive, highly involved and omnipresent role in society, or a more reactive and withdrawn role. The attempt here is not to construct a series of scenarios, but rather to elicit a set of possible suggestions which can be used to stimulate discussion on future possibilities for research policy for (e)government in the medium to long term. Briefly, the nine visions are:

Networked (e)government:

1. A dynamic public sector – is a highly effective and highly (pro)active networked organisation, in which the government knows what a user requires before the user knows about it or asks for it.
2. A personal public sector – in which the citizen is dealt with individually and proactively, with completely personalised services and a 'one-to-one' relationship with their own government representative.
3. An inclusive public sector – is one in which all stakeholders (whether citizens, businesses, NGOs, regions, etc.) are fully included. This is defined as being fully served by appropriate services no matter who they are, what their condition and circumstances are, or where they are, as well as fully participating in the processes of government and governance to the extent that legislation allows and the individual wishes.
4. A democratic public sector – is concerned with user involvement in, and contribution to, both the decisions and workings of communities as well as of society as a whole, and focuses here on user empowerment through eGovernment.
5. An open public sector – provides the perfect model of transparency, where citizens can trace every single interaction with public administrations right down to the name of the individual who is dealing with their query or case in real time. In this vision there is focus on such openness rather than on proactivity, so that government becomes totally transparent.
6. A user-driven public sector – means not just designing government and services for users and taking their needs fully into account (i.e. user-centric), but drawing users themselves fully into the processes whereby government and services are determined, designed and created.

Distributed (e)government:

7. A diverse public sector – is one in which citizens interact with different levels of public administration in a distributed manner, and where the public administration is not highly joined-up. Therefore, duplication can occur, but this is one of the prices to be paid for security of information and distributed power.
8. A private public sector – is one geared to the private interests of individuals, groups or economic entities. In the latter case it tends to be more or less outsourced to private corporations, thereby leaving politicians with little recourse to affecting political decisions through anything other than market forces. The interaction between the public and private sector in terms of value chains becomes a highly important subject. Issues of legitimacy and accountability will arise, not only for public administrations but also for politicians. However, efficiency in terms of costs, responding to user demand (maybe at the expense of user need) is maximised.

Centralised (e)government:

9. A single public sector – is a centralised body, either at the national or European level, where transparency and inclusiveness are not the main objectives. This could lead to a very efficient organisation, but one that is not legitimate according to our current understandings of accountability, openness and transparency. Democracy could be the loser in the battle for efficiency.

Finally, it is necessary to realise that the up-coming generation will naturally contribute to the evolution, perhaps revolution, of eGovernment, almost certainly beyond our current understanding. Many youth today have grown up with computers and the Internet, so their attitudes to the use of what the older generation terms ‘new technology’, as well as to eServices generally, already appear to be completely different. In order to tap into this potentially rich vein of 2020 visions, this report recommends that serious and sustained dialogue should be undertaken with the new generation, already now. They are highly likely to be living in a world where www (whole wide world) at the speed of light is as natural as turning on a light switch is for us. In the same way that, today, we take electricity, water and other commodities for granted, so will they take the *www@c* as a standard and ubiquitous utility available to all in 2020.

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Abstract

Building on the eGov vision for 2010 developed in previous report (Centeno et al 2004), the study set out to validate, prioritize and analyze these eGovernment research challenges for the enlarged European Union, through an extensive survey, in-depth interviews of eGovernment stakeholders, and research activities. It also aims to examine how eGovernment research across Europe (both at national level and in EU programmes) could support major, especially EU, policy goals up until 2010, in line with the Lisbon objectives. Additionally, the study projected an eGovernment vision for 2020 and considered its implications for eGovernment research policy in support of the European Research Area (ERA).

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