

EGOVERNMENT: WORK PROGRAMME 2005-06
IST FRAMEWORK PROGRAMME VI
Consultation workshop on 5th May 2004

WORKSHOP REPORT

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1 Executive summary

The purpose of the workshop on 5th May 2004 was to identify key research challenges for eGovernment for the preparation of the IST Workprogramme 2005-2006 within the Sixth Framework Programme (FP6). eGovernment may be defined as ‘the application of ICT, organisational change and new skills in public administrations, in order to improve public services and democratic processes and strengthen support to public policies’.

The eGovernment content in the next call must have a clear focus on the specific needs and expectations of Governments, Public Administrations (PAs) and citizens for the electronic delivery of services (eServices). These include:

- inclusive, multi-channel, multi-lingual delivery of trusted and transparent services to all citizens,
- pan-EU, interoperable provision to the mobile (roaming) citizen,
- interoperable, cross-border services for businesses and citizens operating in more than one member state,
- knowledge-based, personalized and intelligent service provision, and
- the explicit knowledge-based deployment of the PAs’ key asset of know-how about legislation, regulations and administrative procedures.

The previous eGovernment Call for Proposals had resulted in 12 projects that variously addressed the themes of user-centred eGovernment and government reorganisation. This workshop extended those themes by introducing four new perspectives and **13 research challenges** to be addressed in the IST Workprogramme 2005-2006. They are:

- User-centric – ***Understanding eCitizens’ needs; eGovernance to address voter apathy and foster societal learning; Active Citizenship via the user’s ability to understand and participate,***
- Government-centric – ***new business models for Value in eGovernment; developing best practices for Learning and Knowledge Creation in eGovernment; deep Transformation of Government Processes and hence new G2C, G2B and G2C relationships,***
- eGovernment interoperability – ***architectures and platforms for Security and Interoperability in European PAs; technology-independent Framework for Interoperable Cross-border and pan-EU Services; technologies for Reconciliation and Dynamic Resolution of pan-EU eServices,*** and
- eService-centric – ***identifying key factors and developing a Trust culture; ensuring Transparency in eServices; Intelligent Modelling and Management of eGovernment Services to address semantic heterogeneity and change-capability; Intelligent, Adaptive and Proactive eGovernment Systems enabled by knowledge of users.***

These research challenges will enable major innovations in eGovernment as called for by the conclusions from the Council of Ministers on 20 November 2003 that reinforced the roadmap proposed in the Commission Communication “The role of eGovernment for Europe’s future”¹. They will support Public Administrations in contributing to the transformation of the EU into a dynamic knowledge-based economy with sustainable economic growth and greater social cohesion, by putting public services and the public sector at the heart of the Lisbon strategy.

¹ COM(2003)567, 26 Sept 2003.

The remainder of the report covers the consultation process itself, the specific workshop objectives and an overview of pre-workshop contributions. It then summarizes and describes the key research challenges.

2 Rationale and methodology

2.1 Rationale

2.1.1 Innovation in Public Services

As part of the Lisbon agenda, the public administration is expected to play a major role to contribute to the transformation of the EU into a dynamic knowledge-based economy with sustainable economic growth and greater social cohesion. Innovation in eGovernment is expected to help public administration to meet these challenges. Research in eGovernment is driven by missions in line with community policies such as Internal Market, European Citizenship, Enlargement, EU's Security and Stability and Europe in the world. By providing innovative and advanced eGovernment services to businesses and to citizens, PAs (Public Administrations) can critically contribute to the global competitiveness of enterprises, to the deepening of the EU internal market, and to the acceleration of social and economical convergence in the enlarged EU while supporting a user-centred approach and good governance principles such as transparency, inclusiveness and productivity. According to Gartner, Sept 2003, 65% of development costs is spent on maintaining infrastructures, 30-35% is on catching up with new releases and standards and only 5-10% is actually targeted at highly innovative developments. In this background, the successful completion and deployment of research addressing the challenges identified by the workshop will make a major contribution to the PAs' ability to deliver such innovative services.

2.1.2 Socio-economic rationale

Over 20% of EU's GDP represents public sector purchases. To this figure, one should add the private investment related to the provision of services to all (telecommunications, health, etc). The importance of efficiency and productivity in public service provision is evident.

From a commercial perspective, eGovernment is a sizeable market. EITO 2002 reports that €30 billion was spent on the ICT part of administrative services excluding health, defence, education, etc. However these figures do not include the costs for re-organisation and skills that accompany the introduction of ICT.

The complexity of European administration organisation as well as its specificities do not allow simply re-using existing models from the business domain. eGovernment implies a major re-organisation of the internal process of the administration, restructuring and redrawing borders. eGovernment will contribute to a progressive transformation of the administration. This transformation may in turn impact and transform the society as a whole: providing a new balance of European, national, regional and local public institutions and integrating citizens and businesses as active participants of the transformation.

An analysis of the consultation responses identified over 30 well-identified drivers for the RTD that is needed. These include addressing the digital divide, enabling participation for all parts of the society and closing the gap between "old" and "new" EU member states, improving citizen and community engagement in democratic government processes, addressing cross-border inter-PA operations, and providing continuity of service to the mobile and isolated eCitizen.

A workshop held by the EC DG JRC-IPTS (Institute for Prospective Technological Studies) on policy and research challenges for eGovernment in the EU in 2010² also identified new factors generating new demands as *political* (e.g. Lisbon strategy), *technical* (Ambient Intelligence) and *social* (the Enlargement of Europe).

The Seville workshop concluded that “in the next decade, the EU will go through a number of socio-economic transitions (population, society with extreme cultural and religious diversity, ageing of population, changing living, working and consumption patterns, etc.), posing serious new challenges for E-Public Services, which will have to adapt to this changing societal reality.” Additionally, “as important is the driver for eGovernment to address in a dynamic way the social, economic and environmental societal needs. This has been labelled as *the creation of public value*³”.

In the specific context of developing an RTD Workprogramme specifically for eGovernment these various drivers might be interpreted as:

- inclusive, multi-channel, multi-lingual delivery of trusted and transparent services to all citizens,
- pan-EU, interoperable provision to the mobile (roaming) citizen,
- interoperable, cross-border services for businesses and citizens operating in more than one member state, and
- knowledge-based, personalized and intelligent service provision.

The DG JRC IPTS workshop also identified the increasing importance of knowledge management in the provision of public value to the PAs themselves, to citizens and to businesses. The creation and management of knowledge on users’ needs (be they citizens or 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 last are playing an increasing role in the delivery of public services.

2.1.3 Extending and broadening previous RTD

The 11 FP6-IST eGovernment projects initiated in the first call can be classified into the five foci of the Strategic Objective 2.3.1.9 as:

- Management of dynamic collaboration networks (ONTOGOV),
- Technologies for interoperability (TERREGOV, SAFIR, FLOSSPOLS),
- Open, secure, interoperable and re-configurable eGovernment platforms (GUIDE, INTELCITIES, EMAYOR, HOPS, USE-ME-GOV, COSPA),
- Managing knowledge to support innovation (QUALEG, ONTOGOV, FLOSSPOLS),
- IST as driver for government reorganisation (ONTOGOV).

These projects address leading edge R&D and provide a fair coverage of technologies that are deemed to be relevant for eGovernment transformation, although at a different extent and with a different scale (see positioning against emerging technologies graph in Figure 1 below using Gartner’s hype cycle as a reference).

Technologies addressed by these projects are the following:

² Seville, 4-5/3/2004, report to be published at <http://fiste.jrc.es/>

³ “Public value refers to the value created by governments through the provision of services, the passing of laws and regulations, and other actions” by Gavin Kelly and Stephen Muers, quoted in UN, “World Public Sector Report 2003: e-Government at the Cross-Roads”

- Web services and service oriented architectures to support the integration of eGovernment services, processes and applications: TERREGOV, INTELCITIES, eMAYOR, USE-ME.GOV
- Speech recognition and related technologies to ease interaction between citizens and administration: SAFIR, HOPS
- Comprehensive knowledge modeling and development of ontologies in the government domain: QUALEG, ONTOGOV, TERREGOV
- Identification and authentication technologies: GUIDE and to some extent (security only) eMAYOR
- Mobile technologies: USE-ME.GOV and eMAYOR
- Open source software: COSPA, FLOSSPOLs

Details of these projects are available at:
http://europa.eu.int/information_society/programmes/egov_rd/index_en.htm

A good positioning of those technologies is provided by the Gartner Hype Cycle for Government Technologies, published in June 2003 (i.e. at the time when proposals were submitted). The Hype Cycle indicates the degree of maturity of various technologies and how far they are from the so-called *plateau of productivity*, i.e. the point at which they start delivering measurable benefits.

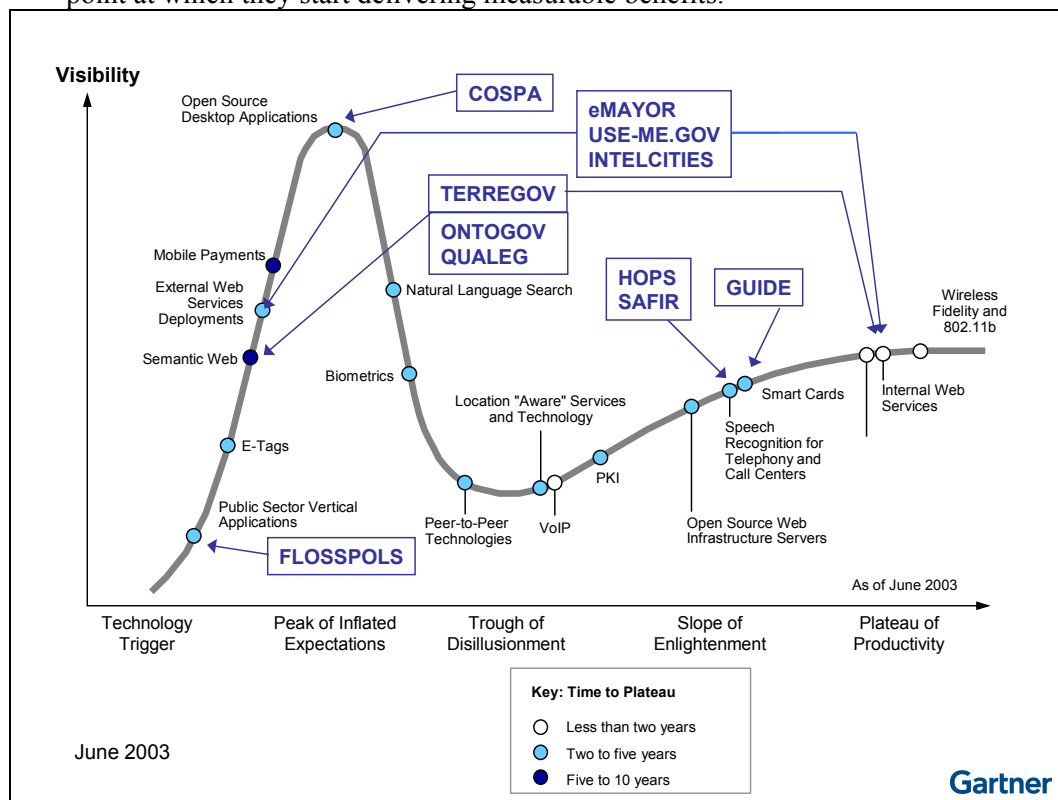


Figure 1 -.Hype Cycle of Government Technologies (source Gartner)

The key research challenges identified by the eGovernment workshop continue and extend the development of eGovernment transformation to include new User-centric, Government-centric, eGovernment interoperability and eService-centric perspectives, as described in Section 3.

2.1.4 User expectations

Users' expectations of service delivery (be they end-users, citizens, companies or other public bodies) are being conditioned by increasing use of Web-based, mobile and personalised business services, and by service responses that approach 'real-time'. With greater mobility within the EU, there is a particular need to provide seamless online cross-border administrative services. European citizens will expect to exercise all their rights and obligations without border restrictions and with similar qualities of service in different member states. At the same time PAs have to address the wide diversity of needs that characterize the new European demographics and maintain their public service obligations to provide a service to all.

These expectations have to be reflected in the themes and priorities of future calls. However, in doing so, proposers may also look at how the behaviour of increasingly connected citizens and enterprises will change, and how government services should be organised to best match those behaviours. Areas with significant potential include location-based services, community-based collaboration and participation, innovative approaches to problem solving and knowledge sharing, cutting across the boundaries between private and public service, and between service suppliers and users.

2.1.5 Need for focus

In the first FP6 call⁴, the part relating to eGovernment (2.3.1.9) had also included networked businesses, resulting in heavy oversubscription with many project proposals addressing one or other or even both. The Strategic Objective received 246 proposals (of which 162 proposals were focusing on eBusiness and 84 on eGovernment) with a total request of 1.449 M€ (of which 1.049 M€ for eBusiness and 399,9 M€ on eGovernment). 84 proposals received for eGovernment were: 22 IPs, 9 NoEs, 39 STREPS and 14 SSA/CA.. The Strategic Objective consisted of five foci, and the coverage of proposals for eGovernment were: Management of collaborative networks (10%); Technologies for Interoperability (38%); Open, secure, interoperable and re-configurable eGovernment platforms (37%); Knowledge management (5%); IST as driver for small business and government re-organisation (10%). The type of organisations involved in the proposals included: 45% government organisations from all levels (local, regional, national, international); 23% SMEs; 13% large industry. As a result of the selection process, in the domain of eGovernment, eleven proposals were selected (4 IP, 0 NoE, 6 STREP and 1 SSA) for funding.

The next call(s) relating to eGovernment would have a clear focus on the RTD requirements for a public sector which is open and transparent (accountability), inclusive (at the service of all), and productive (maximum value for taxpayers' money).

2.1.6 Specific eGovernment requirements and long term aspects

R&D for eGovernment has to deliver clear benefit to the key stakeholders in terms of solving a high priority problem, and having clear links to EU policy objectives. Governments' and businesses' drivers and priorities for IST are different, with for example governments placing much higher emphasis on tightening security and privacy safeguards, and on developing or enhancing IT architectures (Source: Gartner group, Sept 2003). In contrast, the emphasis on demonstrating the business value of IST (and reducing ICT costs) is less, because Governments have different policy priorities. (The workshop later identified a specific research challenge in characterising 'value' for eGovernments.)

⁴ eGovernment was not a specific topic for the second and third calls.

The presentation to the workshop from Jean Claude Burgelman DG JRC-IPTS (see 2.2.5) also identified a number of eGovernment-specific requirements that were mapped to the four research areas identified in the preliminary consultation (see 2.2.1).

Research bridging between FP6 and FP7 should also look at how to best support the different degrees of integration required to join-up government services, data and applications. Areas that deserve particular attention include the integration across different government tiers, and between management and operational processes, to increase quality and speed of decision making.

It would also be important to develop a model of how citizens who access the internet through different channels to interact with their employers, friends, banks and other service providers, will be willing to interact with government. Innovation in terms of services, content packaging and exploitation, and in particular bundling between public and private sector services will be essential

2.2 Methodology

2.2.1 *The consultation process for eGovernment RTD in 2005-2006*

In early 2004, DG-INFSO Unit C6, eGovernment, had carried out a series of consultation activities⁵ in planning the consultation process for eGovernment in 2005-2006. These included Web-based consultations and various workshops on Identity Management, Interoperability, eDemocracy, Knowledge and Organisational Management.

As a result, the main research areas for eGovernment were identified as:

- *User-centric eGovernment services*: access and intelligent interfaces, new devices, mobile eGovernment services, eParticipation as part of eDemocracy, multimodal user interaction and information access, multi-channel delivery of services, ubiquitous access and personalisation, citizen relationship management, ...
- *Organisational innovation & Knowledge management*: interactive, dynamic and networked collaborative organizations, mediation and advice systems, semantics and ontologies, interactive and adaptive agents, neural nets, supply chain management for public administrations, ...
- *Interoperable and secure frameworks, architectures and platforms*: security technologies for eGovernment, interoperability, open service platform for fixed and mobile services, eGovernment electronic identity and authentication, personal data protection, embedded and pervasive intelligence, networking and computing infrastructures for eGovernment such as ambient intelligence, grids, RFIDs (Radio Frequency Identification), ...
- *Other innovative technologies*: technologies, organisational, legal, social, and economic aspects for the modernisation of public administrations may also be considered, including R&D perspectives on public administrations beyond 2010.

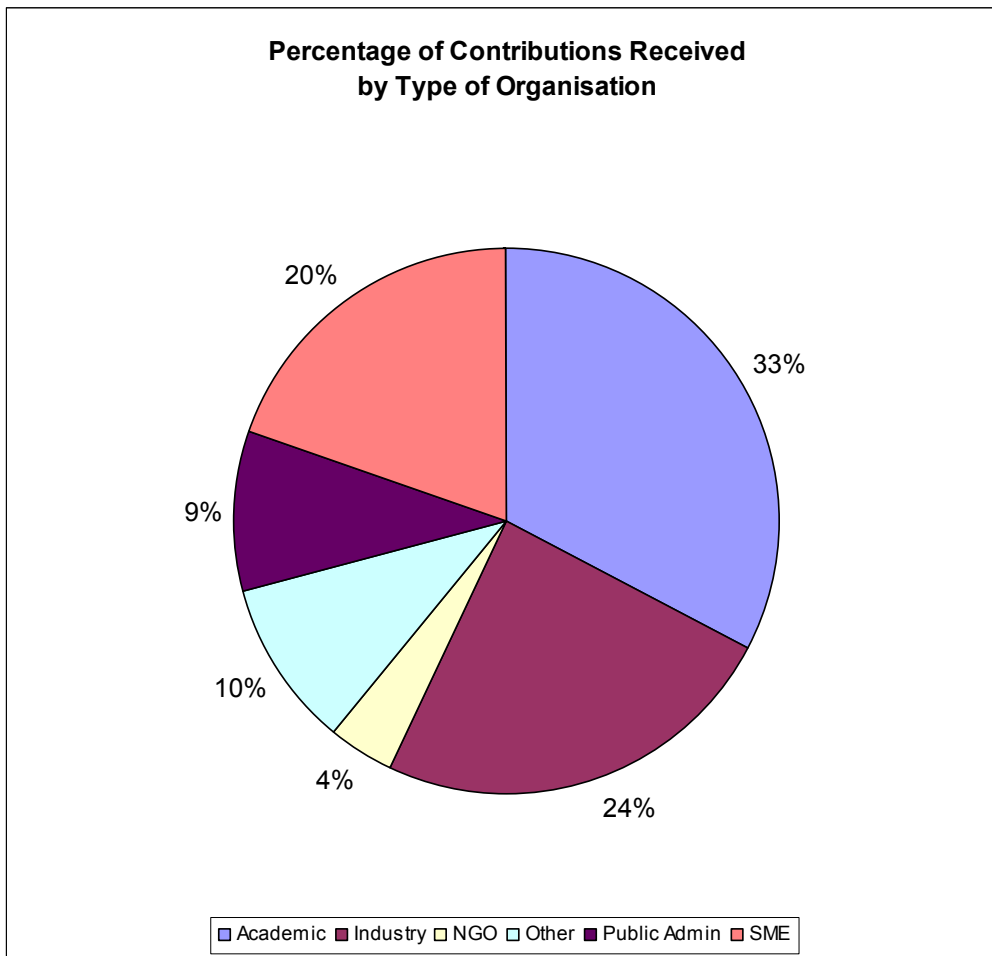
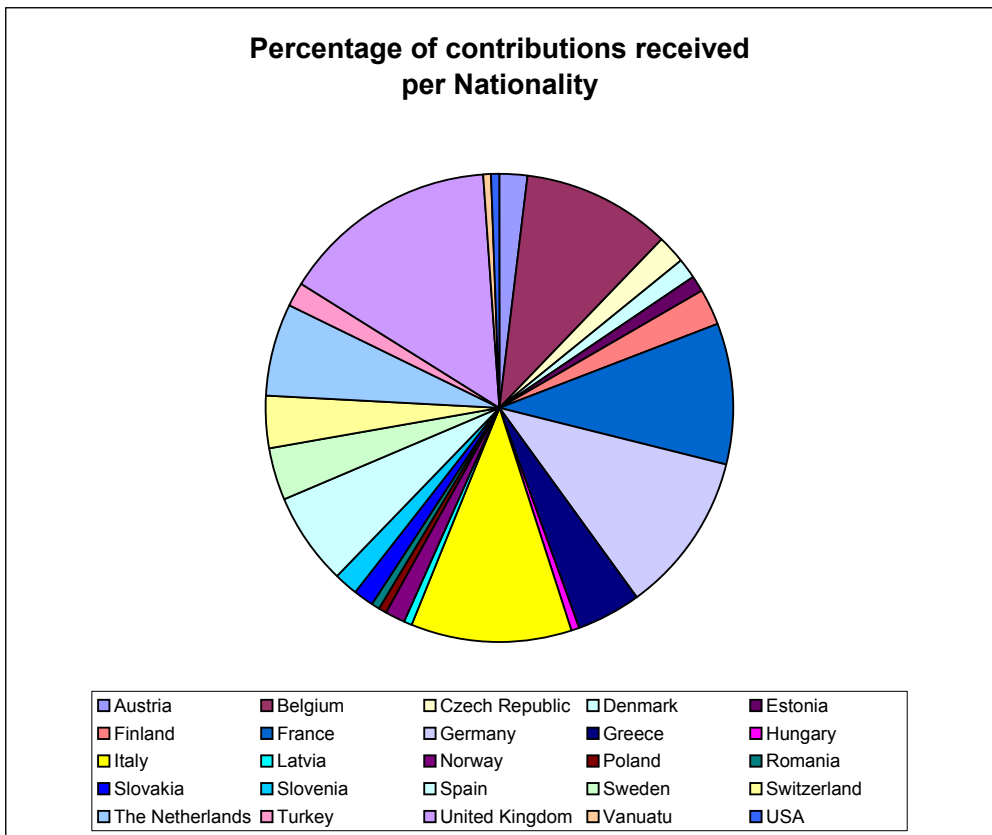
2.2.2 *Call for contributions*

A call for contributions against these research areas was initiated by Paul Timmers on 23rd March 2004 asking specifically “what is the most innovative R&D for eGovernment in the IST programme, how should it be applied, and which benefits

⁵ Reports on these activities are available from http://europa.eu.int/information_society/programmes/egov_rd/events/ec_events/index_en.htm.

should it bring?" This resulted in some 133 contributions for the consultation workshop on 5th May 2004, which are briefly reported below. Another 30 contributions were received via the Web-consultation (some contributors provided more than one contribution).

A country analysis of the 154 contributors shows a good coverage across the EU:



2.2.3 Consultation workshop

The workshop held on 5th May 2004 with invited participants was to develop specific proposals on key challenges for the eGovernment RTD Workprogramme in 2005-2006. The Agenda for the workshop is given in Annex A.

Both the contributions and the list of participants demonstrate involvement of major stake-holders and key players, that is Public Administrations, NGOs, academia, technology providers, consulting companies and industry experts.

The workshop was composed of preliminary sessions to define objectives and background, group-working in four parallel streams corresponding to the main research areas, each with animators and rapporteurs⁶, and closing sessions to review the results from the four streams.

2.2.4 Workshop objectives

With FP6, the general objectives for eGovernment had broadened, from a previous emphasis on “means for the modernization of Public Administrations” (PAs), to the “application in public administrations of ICT, organisational change and new skills, in order to improve public services and democratic processes and strengthen support to public policies”.

The workshop was intended to make a major contribution to the preparation of the 2005 work programme for the 4th Call envisaged in late 2004, and possibly for a 5th call in 2005.

The task before it was to identify key research challenges that were specific and focused for eGovernment, having a clear justification and organised by the indicative research themes of the parallel sessions. The challenges should have high European impact, acknowledge political imperatives (e.g. integration of new member states) and take account of new technologies, best practices and on-the-ground realities. At the same time they needed to maintain a critical mass and focus on long-term goals. Indications should also be given as to suitable instruments (IP, NoE, STREP), key players (stakeholders) and appropriate budgets.

2.2.5 RTD requirements for future eGovernment

As background briefing, Jean Claude Burgelman presented a ‘forward look’ on eGovernment requirements for technology, innovation and research in the EU Ambient Intelligence environment in 2010.

2.2.6 Overview of workshop contribution

The methodology and process for consultation involved the usual route of inviting contributions from key actors in eGovernment research in Europe – universities, research centres, information technology companies, European PAs and other organizations involved in eGovernment in Europe (e.g. IDA). Some groups were also able to take account of the findings of thematic workshops held previously (e.g. the two workshops on interoperability held under the auspices of the e-Forum and the TERREGOV project).

The rapporteurs had been able to review 133 inputs received before the workshop, with many inputs covering more than one topic, and contributing to more than one research area (e.g. nearly all mentioned interoperability and/or security). Example candidate

⁶ As identified in Annex B.

challenges were: services designed to benefit the various roles of the eCitizen; cross-border process interoperability and service coherence for businesses and the (mobile) user; organisational re-engineering to shift PAs to become knowledge-based, e-empowered and federated; reusable reference models and solutions embodying best practice; semantic and ontological interoperability; the raft of issues surrounding electronic identities; and balancing security, privacy and controlled data-sharing.

Some themes cut across the four areas (percentages are approximate): electronic identity (e-ID) and related issues (21%), security and privacy (19%), cross-border interoperability and mobility (15%), the need for information gathering and surveys (11%), best practice and knowledge sharing (10%), support for (largely eCitizen) decision-making (9%), and concerns about user take-up (7%).

Somewhat artificially allocating inputs to a single research area (as per 2.2.1) showed that inputs were broadly distributed across the four research areas (approximately 29%, 26%, 28% and 17% respectively).

2.2.7 The parallel workshop sessions

Workshop participants were asked to participate in one of the four groups corresponding to the research areas – see the allocations in Annex B – each with animators and rapporteurs. Groups started with presentations from rapporteurs but adopted slightly different approaches:

- Group 1, user-centric eGovernment services, (18 participants) used the analysis reported in A.3 to focus on possible research priorities.
- Group 2, organisational innovation and knowledge management, (17 participants) clustered the topics identified from 66 relevant contributions into six aspects: knowledge and process integration, organizational, social, user, reengineering and evaluation. Evaluating the interconnections between these led to an overview about the priorities of the corresponding R&D efforts.
- Group 3, interoperable and secure frameworks, architectures and platforms, (19 participants) worked by reviewing the many contributions that were involved with the key and interrelated issues of interoperability and security, and the various technologies and research initiatives that were emerging to address these..
- Group 4, other innovative technologies, (11 participants) based its work on the preliminary analysis of the contributions and a review of key issues to be solved, key technologies and approaches and social/economic benefits.

3 Key Research Challenges

3.1 Overview

The following table summarises the research challenges. It is followed by a description of each of the 13 Research Challenges, using a common format, and organised under the four perspectives of User-centric, Government-centric, eGovernment interoperability and eService-centric.

<i>Research Challenge</i>	<i>Objective</i>	<i>Rationale</i>	<i>Modalities</i>
<i>User-centric perspective</i>			
Understanding eCitizens	development of socio-technical studies and a research roadmap for 'How Government should satisfy eCitizens' (and users in general)	understanding 'what are eCitizens' is key for future user-centric eGovernment services that must be delivered to all	SSA
eGovernance	development of techniques and technologies within a socio-technical inter-dependency evaluation framework to engage society and citizens in policy-making	dramatically improving democratic legitimacy of Governments by overcoming <i>Voter Apathy</i> and Fostering <i>Societal Learning</i>	IP
Active Citizenship	Identifying conditions for active citizenship, fostering this through the development of supportive methods, standards and technologies	enabling users (citizens and businesses) to understand, accept and participate in personalised eGovernment services	IP
<i>Government-centric perspective</i>			
Value in eGovernment	establish new value-based business models specific to eGovernment, to better identify key requirements and expected outcomes, whilst ensuring proper implementation & RoI	creating a sustainable value proposition for each stakeholder is a key factor for success of eGovernment services, interpreted in a broader sense and in its various dimensions	STREP
Learning and Knowledge Creation in eGovernment	develop best practices etc to exploit the sources for learning and knowledge creation that already exist in eGovernment.	exploiting the huge potential for data and knowledge mining in eGovernment	IP and STREPs
Transforming Government processes	development of techniques, supporting technologies, frameworks, methodologies for deep transformation of Government processes and PA services	transforming the processes by which PA services are produced, enabling major transformations of G2C, G2B and G2G relationships	IP
<i>Research Challenge</i>	<i>Objective</i>	<i>Rationale</i>	<i>Modalities</i>

<i>eGovernment interoperability perspective</i>			
Security and interoperability in European PAs	architectures and platforms for security and interoperability in PAs providing cross-border, pan-European security services to citizens and organizations	addressing disparate PA requirements, leading to interoperable security solutions amongst European PAs	IP
Framework for interoperable cross-border and pan-EU services	frameworks and architectures for interoperable eGovernment that are technology independent, sustainable and respect major standards	breaking the mould of departmental and PA silos; leveraging pan-EU and national solutions	STREPs
Reconciliation and dynamic resolution of pan-EU eServices	technologies for reconciliation and dynamic resolution of national ontologies and legislation	enabling (on-demand) development of cross-border and pan-EU interoperable services	STREPs or AMs
<i>eService-centric perspective</i>			
Trust	determining the key factors and technologies for (user & PA) trust in eGovernment services, incl. sociological and cultural issues, privacy and data protection	trust (along with the prerequisite security) is a fundamental issue in building dependable eGovernment services	STREP
Transparency	identify conditions to ensure transparency in eGovernment services and develop enforcement mechanisms and methods	transparency is essential for user-aligned and accepted eGovernment services, and for avoidance of corrupt practices	STREP
Intelligent Modelling and Management of eGovernment Services	further apply, develop, and extend today's process modelling and management frameworks for tomorrow's demands on eGovernment services	ability to deal intelligently with semantic heterogeneity and to design change-capable organizational and IT infrastructures	IP or NoE + STREPS
Intelligent, Adaptive and Proactive eGovernment Systems	enable eServices to exhibit more intelligence by a more comprehensive, semantics-based management of knowledge from, for, and about users.	personalization of interfaces & interaction, better knowledge supply to citizen; enabling new PA services and/or reducing cost	STREPs

3.2 User-centric perspective

Understanding eCitizens

Research Objective – Development of studies and a research roadmap addressing ‘How Government should satisfy eCitizens’.

Rationale – Understanding ‘what are eCitizens’ is a key issue for all future research in user-centric eGovernment services. Here it is important to consider users in a wide sense, including citizens, businesses, civil servants and intermediary actors in the provision of public services (public, private, PPP’s, civil or non-governmental organisations). It is a prerequisite for positioning eGovernment needs beyond the current view of automating and/or redesigning existing processes. Unlike eBusiness that can afford to service only selected market segments, Government services must be delivered to all (citizens and businesses).

Recommended research – Current research is scattered across disciplines and usually not related to technical development. Future research should provide a more coherent socio-technical view and should in particular address:

- What are eCitizens, what are their values and what do they want
- How does a person switch from one role to another
- Ethics, rights and duties
- Why would people become eCitizens
- The role of eCommunities (e.g. local interest and user groups)
- How to ensure digital inclusion

Modalities – ‘Understanding eCitizens’ is perceived as a top priority for socio-technical studies but one requiring only a relatively low budget.

eGovernance

Research Objective – The development of techniques and supporting technologies within a socio-technical interdependency evaluation framework for society- and citizen-engagement in policy-making.

Rationale – eGovernance aims at dramatically improving the democratic legitimacy, coherence, effectiveness, efficiency, transparency and accountability of Government by engaging all stakeholders (citizens, businesses, elected people, civil servants) in policy-making life cycles. It requires taking account of several dimensions: policy/services transparency, impact on stakeholders’ relationships, multiple level governance and communities, and digital inclusion.

The key benefits associated with successful eGovernance will be:

- Overcoming *Voter Apathy* by encouraging a sense of individual responsibility for Government, public policy formulation and enactment, and its continual review for the purpose of assuring applicability and relevance, and
- Fostering *Societal Learning* in which all stakeholders learn, and contribute their intelligence in a debate resulting in more intelligent decisions.

Recommended research – Three related sub-areas were identified:

a) Socio-technical studies to establish techniques by which citizens, and more generally society, can be enabled to engage in policy debates together with elected people and

government staff and, in particular, feedback into strategy setting processes. Techniques proposed in the consultation were:

- eCommunities at local level to sustain citizen engagement on *proximity* issues,
- Polling techniques offering a low-level entry for simple engagement,
- Analysis and decision-support tools, including information processing of large pools of documents, and
- More specific technologies for supporting in-depth engagement such as Computer Supported Argumentation Visualisation.

b) The applicability of knowledge infrastructure and collaborative knowledge management technologies for policy-development should also be researched and in particular:

- support for the modelling and drafting of legislation and regulations,
- support for the simulation and systematic testing of draft legislation, and
- helping clerks in public agencies to administer complex legislation.

The suitability of emerging Semantic Web standards for representing ontologies and rules, such as the Ontology Web Language (OWL) and RuleML should be assessed. A particular concern of the research should be the coherent involvement of citizens, elected persons and administration staff in collaborative knowledge management processes.

c) Research is also needed to design a socio-technical evaluation framework that can encompass a range of qualitative and quantitative methods so that interdependencies between the political, technical and social conditions for success can be better understood and eGovernance indicators can be defined.

Modalities – eGovernance is an area that requires a combination of RTD and socio-economic research and for which IPs would be a relevant instrument.

Active Citizenship

Research Objective – To identify the conditions necessary for active citizenship, and to foster that climate through the development of supportive methods, standards and technologies.

Rationale – An active eCitizenship is a pre-condition to the success of eGovernment. The acceptance of eGovernment services heavily depends on the ability of the citizen (and users in general, including companies) to understand and participate in eGovernment services. In the eGovernment era, the general public is no longer composed of passive end-users; PAs will be dealing more and more with demanding clients who want to get the best tailor-made personalised service at the lowest cost, and proactive citizens who also intend to have their rights respected. The success of eGovernment services depends on its level of acceptance by the citizens; it is therefore essential to promote a client-citizen centric approach in public eServices.

The current areas of interaction between PAs and citizens can be further extended by deploying innovative services. Service personalisation gives the promise of a new approach in the relationship between PAs and citizens. Furthermore, additional conditions, often presented as rights, e.g. privacy and anonymity, can be further safeguarded through eGovernment services.

Recommended research – Critical areas of particular research importance include the following:

<i>Short-term:</i>	<i>Long-term:</i>
Determining what are the citizens' real needs and requirements as regards eGovernment services, an approach that has been so far somewhat neglected	Citizen transforming tools is an area of particular interest in order to ensure interaction and participation of the citizen in the various processes of eGovernment services
Citizen rights are an important pre-requisite in order to ensure acceptance of eGovernment services. Supervision and control of the operators of eGovernment services, benchmarking and measurement of performance as well as repercussions for non-performance, are measures that can be considered in this regard. Codes of behaviours should be compiled, and the possibility to issue an eCitizen Charter of Rights should be explored	Understanding the various roles of a citizen within eGovernment is quite significant. Role definition and management can be based on identity management technologies to create a role-based society under conditions of privacy and anonymity
Service personalisation is a matter of great importance. Technology now allows treating each citizen as an individual through a mesh architecture and the definition of user requirements	The needs of mobile citizens (including democratic participation through eVoting) shall also be studied
Service Design is an important element associated with citizen needs. Design needs to ensure accessibility to the services irrespective of access shortcomings. Consideration must be given to eInclusion requirements, all sorts of social, regional, cultural or age divides should be addressed and the ways and means of their reduction studied comprehensively	
Change management is associated with the need of PAs to hold staff training in order to accelerate the transition to eGovernment as well as citizens receiving guidance in order to accept eGovernment services more readily. Additionally, management techniques, awareness campaigns etc., can also be put into practice to encourage successful results	

Modalities – The size of the budget should correspond to the requirements for an IP type of project.

3.3 Government-centric perspective

Value in eGovernment

Research Objective – ‘Value’, defined in broad terms, is the area of first priority for eGovernment services that need to balance user requirements and benefits across the board. Research should establish new value-based business models specific to

eGovernment in order to better identify key requirements and expected outcomes, whilst ensuring proper implementation and a satisfactory return on investment.

Rationale – Value is a key factor for the success of eGovernment, interpreted in a broader sense and in its various dimensions. As PAs initiate eGovernment, it is essential to define the conditions to involve citizens and businesses into the value chain of eGovernment services, taking a broad approach that addresses a sustainable value proposition for each stakeholder: citizens, businesses, public administration, suppliers, private sector, PPPs, etc. Where electronic services in the private sector have resulted in a multiplicity of intermediaries, it is likely that eGovernment services might follow suit. Value is important, not merely from the perspective of return on investment, but also to address the needs of the society as a whole, geographic diversity etc. With this wider interpretation of ‘value’, work carried out to promote eInclusion will also have a significant impact in avoiding fragmentation across socio-economic, geographical, cultural and other fault lines.

Recommended research – Critical areas of particular research importance include but are not limited to the following. They are presented in order of decreasing importance. (Here as later, there is no direct mapping between short-term and long-term items.)

<i>Short-term:</i>	<i>Long-term:</i>
A clearer definition of what exactly constitutes value in eGovernment	The role of intermediaries in eGovernment services, e.g. to help the disabled and unskilled people, to provide intermediary infrastructure in rural areas, to facilitate customs administration procedures across Europe
Organisational models to represent value in eGovernment	Models to assess value for eGovernment services in support of e.g. privatisation, co-financing, etc.
Models to measure value in eGovernment services and the tangible results thereof	Managing complexity in heterogeneous eGovernment services across different territorial layers of Government (European, national, regional, local)
Proportionality in the delivery of eGovernment services to observe the conditions of social inclusion, geographic coherence, etc.	Models for Public-Private-Partnerships (PPP)
Business models for eGovernment services; these could involve PPPs, operating on the basis of an outsourced or co-sourced approach	Geographical limitations and opportunities in value chains for eGovernment services; proof of concept
Return on investment (ROI)	Models to measure the performance of eGovernment services and their acceptability for PAs, citizens and businesses
	Dynamics of value and relations created thereof
	Supply chain and network

Modalities – The size of the budget should correspond to the requirements for a STREP type of project.

Research Objective – To develop best practices, techniques and supporting tools to exploit the many sources for learning and knowledge creation that already exist in eGovernment.

Rationale – While learning is more about communicating and sharing existing knowledge within a community of people, the creation of new knowledge can be based upon communication (people create new ideas and knowledge in discussions) or upon combination (existing data and information are combined and analysed in a new manner). Both activities should be located within well-designed and facilitated (technologically, organizationally, and psycho-/sociologically) Communities of Practice (CoP) and Communities of Learning (CoL). From threaded discussions and other interaction in such communities, new knowledge can be created, the level of citizen engagement can be raised significantly, and widely dispersed members of communities of specialist expertise can significantly speed up their collective learning. In a more general sense, independent from CoPs, there is a huge potential for data and knowledge mining in the eGovernment area that is much less exploited than in the private sector. Application areas comprise statistics for preparing and monitoring politics, and for supporting the economy, but also fighting against crime and terrorism by better information management and analysis.

The impact of this research area is on inclusiveness, transparency/ openness, and engagement. Data and text mining approaches will also improve productivity.

Recommended research –

<i>More short-term oriented</i>	<i>More long-term oriented</i>
Best practices for CoPs and CoLs in eGovernment; eGovernment-specific requirements for CoPs and CoLs	Psychological, sociological, and organizational success factors for CoPs and CoLs in eGovernment
Combining learning and process management in eGovernment	Agent-mediated learning and acting in CoPs and CoLs
Use of text-mining methods for knowledge creation from threaded discussions and other CoP interaction	Text mining in the presence of many languages and many ontologies in the input data
	Text and data mining with ontological and linguistic background knowledge; NLP-based text mining on a large scale
Application scenarios for data mining in eGovernment, e.g. in the statistics area	Data mining in the presence of huge, distributed, multiple input sources (formats, degree of formality), respecting eGovernment specific requirements such as privacy
	Data mining from structured and unstructured input
Distillation of general insights from gathered best practices	Organisational learning frameworks in eGovernment
	Accumulation and compilation of knowledge in learning networks of PAs
Email management for web-based administration (automated classification, routing, organization of exchanged information in eGovernment service networks); automated question answering (for legal environment)	Emergent semantics in electronic communication and collaboration

Modalities – There is one part of this topic that should be a three-year IP (possibly and/or NoE), because investigating learning in large citizen communities requires involving different stakeholders and disciplines (also non-technical, such as social and political sciences). It also requires setting up such communication platforms in real life (in the ideal case, even international). It should involve partners (in particular public authorities) from at least 5 countries for investigating the influence of language on text mining and knowledge creation. Some STREPs on more stand-alone and high-risk areas should also be considered, such as data and text mining with huge ontological and linguistic background knowledge, or data mining from many sources, respecting confidentiality issues.

Transforming Government processes

Research Objective – The development of techniques, supporting technologies, frameworks and methodologies for deep transformation of Government processes.

Rationale – The transformation of governmental processes through eGovernment innovations is a top priority for further research, and further developments. It is now generally agreed that eGovernment goes far beyond the widespread use of ICTs within PAs: eGovernment aims at deeply transforming the production processes in which administrative services are generated and delivered, and thus aims at major transformations of the whole G2C, G2B and G2G relationships. Major changes in these processes have already been achieved but further modelling and re-engineering are still needed.

Recommended research – Critical areas of particular research importance are the following:

<i>Short term:</i>	<i>Long Term:</i>
Interoperability at a pan-European level is an essential requirement for next steps in eGovernment	The interactions (and even contradictions) between the eGovernment approach, which is quite often “top-down” and integrative, and the polycentric logics of devolution in line with the principle of subsidiarity and the so-called “new federalism”, have to be studied carefully, as does the role of technologies therein
The development of multi-lingual and cross-cultural dimensions are also key factors for success	The place and role of pan-European electronic services, of common standards and IOP, etc. in the socio-political context of contemporary multi-level governance have to be further investigated
Semantics and data harmonization are major issues that must be further investigated	Design is another long-term issue
Public-Private-Partnerships can be a very efficient way to contribute to the re-engineering of public organisations and working procedures	
Cross-sectoral approaches must be stimulated	

Modalities – Several projects should be carried out in this area. Work already accomplished within the IDA framework as well as in DG MARKT (e.g. eProcurement, eSignatures) and DG TAXUD (e.g. eInvoicing) is likely to impact the results of these projects; therefore coordination and mutual support are recommended. The size of the budget should correspond to an IP.

3.4 eGovernment interoperability perspective

Security and interoperability in European public administrations

Research Objective – Architectures and platforms for security and interoperability in PAs providing cross-border, pan-European services to citizens and organizations.

Rationale – The eEurope 2005 action plan sets security as well as interoperability as key targets in eGovernment. Security plays the prerequisite role of making sure that all actions within an eGovernment environment are protected from all sides – citizen, government, etc. While there are mature technical solutions that are already being deployed, these are currently national initiatives, and it is an urgent matter to ensure that they can interoperate across Europe and globally, and that they are trusted to do so by the user.

Recommended research – The research perspectives for the ‘security’ domain are more focused on the mid-term. This observation stems from the facts that the security issues present themselves as ‘hard’ prerequisites for all eBusiness transactions and that particular tested technologies are available and can be deployed in the field. However, developing a pan-EU approach to ensure that these technologies are interoperable across Europe is a matter of urgency, given that European governments are either in the process of committing or have already committed to particular security technologies. For example, the government of Italy has started to rollout identity cards for their citizens with biometric information, and the government of the UK has also made a decision to introduce e-ID cards. The protection of privacy and personal data are also major concerns when e-IDs are used for multiple purposes. This gives rise to the need to develop a security framework that will address the disparate PA requirements. European governments will be able to consult and follow such a framework leading to interoperable security solutions amongst European PAs.

The research should be undertaken in a large project involving representative stakeholders across Europe (Governments, service providers, accreditation authorities) to develop and demonstrate a framework for security and interoperability within a global trading context, at the same time as establishing cross-EU harmonised policies and procedures for the management of secure electronic identities and for legal liabilities.

Modalities – Most relevant instrument – IP; EU funding ~ 20 Meuro.

Framework for interoperable cross-border, pan-EU services

Research Objective – Frameworks and architectures for interoperable eGovernment that are technology independent, sustainable and respect major standards.

Rationale – Interoperable and secure eGovernment is extremely important in meeting the challenge of the Lisbon summit, and is targeted as such in the eEurope 2005 action plan. eGovernment interoperability plays the central role in moving away from eGovernment islands of automation towards joined-up administrations and interlinking online services. Such networked governments could operate in several settings,

- within a PA agency joining up its different departments,

- within the PA of a single country joining up its various PA agencies in the same or different layers of PA (local, regional),
- within the European Union joining up the PA systems of different EU countries.

While interoperability is a domain being pursued actively in information systems research in general, there is significant and particular applicability for the area of eGovernment. This results from the way PAs around the world have been organized. Given the large breadth and depth of governance responsibilities, PAs have been hierarchically organized in a very large number of agencies with separate but complementary responsibilities leading to significant cooperation needs. This has caused the domain of *interoperability* to assume a leading and important position in the quest for electronic government.

For Europe in particular and its goals of enhancing mobility within the European Union, the domain of eGovernment interoperability takes on an even more significant dimension. In this light, many domains have been found to have a pan-European interest and could thus serve as future pan-European eGovernment services. In addition, any know-how acquired in this context can be leveraged into national PAs, and conversely there is also the possibility of leveraging existing national PAs' solutions. There are many new exciting ICT solutions being actively developed, but these are as yet unproven in terms of their ability to scale to the demands of pan-EU eGovernment services. The eGovernment interoperability domain is therefore considered to be a most demanding test bed for this family of technologies when positioned in the general eBusiness setting.

Recommended research – Researching new interoperability technologies; developing a demanding eGovernment test bed for these technologies including modular, open-source software components and developing technology-independent interoperable architectures.

For the interoperability domain there are important issues that are considered to lie in both the mid-term as well as the longer-term research agendas. This domain is also leveraged by important developments in the information technology field as a whole as described by the family of technologies of the semantic web and web services (see A.5.1 and the reports of the workshops). These technologies promise seamless and “deep” interoperability amongst different information systems. However, given that such technologies often have a short life-span, research is also required on the development of technology-independent architectures for interoperability in eGovernment, building on already on-going work (e.g. FEA in the USA, the Office of the e-Envoy in the UK). Such frameworks and architectures aim at assisting governments through sets of models, re-engineered modes of operation, specifications, standards and policies to achieve interoperability.

Modalities – Most relevant instrument – STREPs; EU funding ~ 15 Meuro.

Reconciliation and dynamic resolution of pan-EU eServices

Research Objective – Technologies for reconciliation and dynamic resolution of national ontologies and legislation enabling pan-European PA services.

Rationale – Achieving the goal of cross-border interoperable services requires reconciliation of the rules and procedures that are currently encoded in national PA systems. Encoding these rules and procedures on an ontological basis, and comparing (ideally harmonised) national ontologies should help PAs in identifying what needs to change. This goes beyond *application interoperability* (the ability to exchange

functionality and interpretable data between software entities) to *semantic interoperability* (based on a conceptual understanding of the information that is shared) and *organizational, legal and cultural interoperability* (whereby organizational, legal and cultural barriers are addressed to achieve a higher-level of eGovernment interoperability).

In the longer-term, techniques for dynamically reconciling ontologies might allow the development of on-demand construction of services, e.g. deploying resources to cope with catastrophic cross-border flooding. The key research challenge is whether it is possible to construct and deliver on-demand eGovernment services at the pan-EU level.

Recommended research – developing metadata and ontologies, and encoding the rules and regulations that underpin a representative set of diverse PA services; standardizing a government metadata model or a reference ontology for the eGovernment domain, local eGovernment domain ontologies with links to a global ontology; developing advice systems and dynamic techniques for the reconciliation of such ontology-based encodings; deploying those techniques in the plan-based construction of systems to meet situations such as cross-border emergencies and in dynamically constructing responses to user queries which involve reconciling and/or aggregating information for PAs in different members states.

Modalities – STREPS or Accompanying Measures are recommended because of the early research stages nature of this area; EU funding ~ 5 Meuro.

3.5 eService-centric perspective

Trust

Research Objective – To determine the key trust factors for eGovernment services from both user and PA perspectives, including sociological and cultural issues. To identify and/or develop appropriate technologies for privacy and protection of personal data within a pan-EU framework for managing and monitoring trust and privacy.

Rationale – While security is a prerequisite for all eGovernment services, trust is also a fundamental issue in building dependable eGovernment services and requires additional attention in order to underpin its repercussions from an eGovernment viewpoint. *Trust* in the field of eGovernment has a double meaning. Firstly, it refers to the conditions under which citizens trust governmental institutions (G2C dimension) and are willing to trust a service and its organisational context as made available by a PA, including its ability to preserve privacy, confidentiality and protection of personal data which are significant factors in the level of confidence that citizens have in their public institutions.

But trust also refers to the relationship between the various government services, ministerial departments, public agencies that compose the public sector (G2G dimension). Service interoperability and cross-border implementation also have a better chance of success if carried out among organisations that trust each other. Trust mechanisms, which are dependent on shared experiences, culture, or sometimes, organisational conditions, must be given great consideration when planning and setting up eGovernment services.

Recommended research – Critical areas of particular research importance include but are not limited to the following:

<i>Short-term:</i>	<i>Long-term:</i>
The trust of the citizens in governmental institutions is dependent on the responsibility and accountability procedures (governments being responsible to citizens while bureaucrats are accountable to governments); within that general framework, determining more precisely the key trust factors regarding especially eGovernment	Research on how apply the trust factors in developing a culture of “e-trust” among PAs and between PAs and citizens
The eGovernment revolution (cf. Belgium’s Copernicus plan) cannot be achieved without a high level of trust among PAs; the ways and means of reducing the usual compartmentalisation between PAs and a promoting co-operative exercises between them should be investigated	Communication aspects, which determine the ability of PAs to reach out to the citizens in a way that is accepted and understood, should also be addressed
To develop a harmonised policy framework and methodology for managing and monitoring trust and privacy protection; also to develop mechanisms and technologies for preserving individual privacy.	Aspects of ethics in the public sector, especially through the training of public employees, should also be considered
Technical aspects of trust can also be addressed in order to determine which are the technologies and their organisational structures that lead to greater efficiency in eGovernment	

Modalities – The size of the budget should correspond to the requirements for a STREP type of project.

Transparency

Research Objective – To identify the conditions under which transparency in eGovernment services is ensured, and to develop mechanisms and methods that enforce those conditions.

Rationale – Transparency is a leading concern in building dependable eGovernment services and the avoidance of corrupt practices. Transparency is required to ensure that Government reforms are in line with end user requirements. The acceptance of eGovernment services also depends on the ability of the citizen to participate in a process, to trust others engaged in that process, to actively query a process, and to measure and rely on the results of it. Service interoperability and cross border implementation have a better chance of success if carried out through responsive and accountable organisations that can communicate and interoperate with each other.

Recommended research – Critical areas of particular research importance include but are not limited to the following:

<i>Short term:</i>	<i>Long Term:</i>
Assurance and assessment are aspects that contribute to the quality, integrity and dependability of eGovernment services; policies and procedures should be drawn up in order to lead to greater transparency, dependability and the avoidance of corrupt practices through accountability, feedback and assessment	A more in-depth reflection on the interactions between the growing use of eGovernment tools and fundamental questions on ethics and transparency in the public sector should be launched (for example, does everything have to be accessible immediately?)
The setting up of performance measurement schemes, trust labels and benchmarking systems could help determining the true value of eGovernment services	Multi-lingual and cross-cultural issues are also to be addressed
Access, through ICT tools, of the interested citizens and NGOs to decision-making processes within the public sector, especially to the preparation and drafting of legislation, is a key dimension of the need for an increased transparency	
Freedom of access to public documents goes in the same direction, and its precise conditions of technical and non-technical feasibility in each national context should be studied carefully	
Communication conditions underline the ability of the PA to reach out to its citizens in a way that is accepted and understood. Communication should be addressed as a short-term goal within Transparency	

Modalities – The size of the budget should correspond to the requirements for a STREP type of project.

Intelligent Modelling and Management of eGovernment Services

Research Objective – The aim is to further apply, develop, and extend today’s process modelling (process analysis, engineering, and re-engineering) and management frameworks (process enactment, as well as usage-driven evolution of knowledge and process models) in such a way that they better reflect tomorrow’s high demands on knowledge orientation, cross-organizational and cross-border processes, flexibility, and continuous improvement.

Rationale – At any given time, dealing intelligently with semantic heterogeneity in government and administration services, as well as suitable reflection of eGovernment specific modelling requirements, is a prerequisite for one-stop eGovernment to be provided on a large scale, for a longer time, with a reasonable productivity. From a dynamic viewpoint, the technical topics proposed show the way to sustainable organizational and IT infrastructures, designed for change. In a time of European enlargement, rapidly changing socio-economic and political circumstances (especially on a global scale), and growing EC-wide and worldwide business and commerce (which must be supported, monitored, and accompanied by the PA), such a design for

change is an indispensable need. Lastly, more semantic and/or reference models of knowledge areas, law, and processes, can become a significant driver for European harmonization.

The impact of this research area is mainly on productivity and effectiveness of PAs, also on flexibility and extensibility of systems and processes.

Recommended research – Research should aim at designing new and better processes, instead of automating sub-optimal existing services. It must address change management holistically (psychological, socio-economic, legal, and organizational), and it must take into account the particularities of eGovernment, which impose particular emphasis on modelling and realization aspects such as confidentiality, privacy, competence and authority, or law enforcement. It requires semantic interoperability of heterogeneous process and knowledge models, as well as dynamic configuration and re-configuration under changing circumstances.

Since ontologies and metadata are a key technology for this area, the specific requirements of eGovernment in ontology engineering, management, and evolution play a particular role (such as multilinguality, the link between ontological and lexical layers, deontic aspects, or harmonization needs). Further, the integration of more knowledge sources into process enactment, as well as the improved knowledge flow between different stakeholders (politicians, regional government, local public authorities, citizen and companies) in process design and enactment must be emphasised to increase transparency in one direction and to improve processes by feedback in the other direction.

Technical topics to be addressed are:

<i>More short-term oriented</i>	<i>More long-term oriented</i>
Reference processes for eGovernment Services and KM in eGovernment; process harmonization	Semantics-based reconfiguration of systems and services; continuous process improvement from usage analysis
Reference ontologies for eGovernment areas; metadata standards in eGovernment	Link of reference ontologies to lexical layer and text-based resources
Business-Process Oriented Knowledge Management in eGovernment; knowledge-oriented cross-border process re-design	Long-term evaluations of system influence on behaviour, social structures, and performance
eGovernment specific process and service modelling (includes semantic modelling of privacy, confidentiality, legal regulations, etc.)	Agent-Mediated Knowledge Management; Ontology Negotiation between systems
Law Enforcement	Applying AI to improve legal information retrieval, documentation of legal argumentation and decision structures, suggested solutions or partial automation of decisions.
Ontology and workflow/ CSCW infrastructures (open source?) for the public area	
Adaptation of Quality Management (e.g. TQM) and Service Management (e.g. ITIL) methods to eGovernment	

Modalities – The harmonization of modelling and enactment of processes can profit much from standardization – which requires a critical mass of support for a certain approach. Further, there is already a significant industry in the area of process

modelling and enactment (e.g. ERP system providers and their consulting partners, workflow tool providers, etc.), as well as several standardization bodies that affect this area (e.g. W3C, OMG, BPMI, SWSI). Hence the efforts in this area must be coordinated and consolidated. This can be achieved by an IP or at least a NoE in this area. However, there are also some very specific, high-risk research approaches such as Ontology Negotiation, Agent-Based KM, use of legal AI on a large scale, etc. The IP or NoE should be therefore complemented by several STREPs to cover these special approaches.

The mid-term topics above start from an already well-prepared status quo, and there are also some existing projects on which to build. Hence these activities should be started as soon as possible.

Intelligent, Adaptive and Proactive eGovernment Systems

Research Objective – The major aim of this research area is to enable eServices to exhibit more intelligence in relation to users (citizens and/or businesses), to improve comfort of front-office services and to achieve greater transparency of back-office activities, by a more comprehensive, semantics-based management of knowledge from, for, and about users. It has to address:

- New service models – the current definition of services must be challenged to dwell upon user needs rather than governmental processes. This should enable the emergence of new organizational models, e.g. government services becoming ‘invisible’ or ‘utilities’,
- Adaptation – personalising service content, transactions and interactivity to individual citizen needs and policy changes, and
- Proactive service – Governments should be able to anticipate the needs for services of a given user and automatically deliver them.

Rationale – Intelligent, Adaptive and Proactive eGovernment Systems will allow a better personalization of interfaces and interaction processes and a better knowledge supply to the citizen (ability to explain process steps, support with difficult interactions, automatically criticize etc.). Better personalized interfaces and maybe even personalized eGovernment interface agents will much improve access to eGovernment services. It will improve the quality of life for the citizen and reinvigorate participation by citizens in the democratic process. For PAs, it will free up front office resources, enabling delivery of new services and/or reducing the cost of Government.

Usage mining methods can improve the design of systems and services on-line, and will allow for personalized systems. In the ideal case, eGovernment systems will proactively and context-sensitively act and automatically start relevant processes, route important documents and forward required data. Intelligent front-ends and personal eGovernment interaction agents might even take over complex activities. Such services are not only important for citizens as end users, but also for companies. Many of these methods will also be applicable within PAs, not only at the end user interface. As a side effect, having deep knowledge about user profiles and user interactions, and having semantic models of systems and services, learning and analysing specific user behaviours might help with the fight against crime and terrorism (e.g. identifying people who try to cover their tracks).

In particular, more intelligence is necessary in PAs’ services, service interaction, and service personalization. For cross-European services this can involve many different PAs in different countries, processing many times the same data and information in different service parts, and involving processes the citizen is not even aware of (that he

or she should do something). This has special importance for immigration and travelling, as well as for cross-European business.

The impact of this research area is mainly on productivity and inclusiveness.

Recommended research –

<i>More short/mid-term oriented</i>	<i>More long-term oriented</i>
Define new business/service ‘fit-for-purpose’ models centred on user needs. Consider the involvement of private actors as intermediaries	
Research the definition and management of the service promise for service delivery through multiple channels	Use of context-aware systems personalizing services on the basis of user profile, location, time and dynamic priorities
Facilitate user access and cognitive compatibility for all sorts of devices (PCs, mobiles, interactive TV, new devices)	Creation of appropriate user profiles. Seamless semantic integration of information from various government institutions
Semantic user profiles; web usage mining for adaptive services	Semantic web and NLP technologies at eGovernment service interfaces
Pro-active services and systems (cf. BPOKM methods)	“Electronic citizen record” or personalized eGovernment interaction agents for improved access
Integration of intelligent modules in user interfaces (critiquing components, explanation components), modelling eGovernment/ PA procedures and decision-making, while taking account of the particularities and subsidiarities of eGovernment (legal environment etc.)	
	Multilinguality and process heterogeneity in cross-border processes; also knowledge and legal heterogeneity
	Adaptivity and flexibility in long-running eGovernment services (e.g. environmental planning)
	User identification from usage logs (for fighting terrorism and crime)

Modalities – The area of ‘Intelligent eGovernment services’ encompasses a number of sub-issues that should be addressed through a series of individual research projects as STREPs. The technical topics for Adaptive and Proactive systems are diverse and more long-term/high-risk, and many basic enabling technologies are not yet that mature. Hence a number of STREPs are also proposed covering several aspects from different perspectives.

4. Links to other programmes

Research in eGovernment should exploit synergies with complementary activities in Europe (eg. IDA and eTEN), national and regional programmes, and issues of particular importance to New Member States. eTEN focuses strongly on public services(http://europa.eu.int/information_society/programmes/eten/about/intro/index_en.htm) and is designed to help the deployment of telecommunication networks based services (e-services) with a trans-European dimension. IDA programme mainly focusses on improving the effectiveness of cross-border cooperation between public administrations.(<http://europa.eu.int/ISPO/ida/>). In addition, policy links to Internal Market, eEurope etc. should also be explored.

5 Conclusions

The consultation elicited a substantial response that enabled the identification of significant research topics for the four main research areas, both for topics that were specific to one of those areas, and for those that were applicable to eGovernment more generally.

Based on those analyses, preliminary presentations and discussions within the four groups, the workshop has succeeded in identifying 13 key research challenges, each with supporting rationale and a description of the research topics required to address those challenges. Not surprisingly, some research topics occur in more than one research challenge, and there are further opportunities for consolidating and coordinating these (e.g. through NoEs) that are not addressed here.

The relationship between the 13 research challenges may be characterised in terms of four points of view, centring on the User, on Government itself, interoperability of eGovernment and qualities of eServices.

6 Acknowledgements

The workshop greatly benefited from the inputs from the on-line Web-based consultations, the inputs received in response to the call for contributions, and the active involvement of the workshop participants, the group animators and rapporteurs.

Section 3 was consolidated largely from material provided by the group rapporteurs⁷. The overall editing and production of the remaining material was done by the workshop rapporteur, David Shorter. The views expressed in this report do not necessarily reflect the official position of the European Commission.

⁷ Group rapporteurs are listed in Annex B.

Annex A, Workshop agenda

AGENDA



EUROPEAN COMMISSION
Information Society Directorate-General

Components and subsystems. Applications
eGovernment

EGOVERNMENT: WORK PROGRAMME 2005-06
IST FRAMEWORK PROGRAMME VI
Consultation workshop on 5th May 2004, Charlemagne building, rue
de la loi 170, Brussels
09:30- 17:00hrs

- 09:30 Workshop Objectives and expected outcome: (Charlemagne, Loi 170, Room S1)
Paul Timmers, Head of Unit eGovernment
Michael Arentoft, Head of Sector of the the Strategy for ICT Research and Development
Unit
- 10:15 Initial synthesis of contributions:
Aniyan Varghese, eGovernment Unit
- 10:30 Key Note Speech: Technology, innovation and research: requirements for future eGovernment
(Jean Claude Burgelman, DG JRC-IPTS)
- 11:00 Breakout for Parallel sessions:
- **User centred eGovernment services** (*Rue de la Loi 86, Room C1*) Animators:
Ms Grazyna Wojcieszko, Mr Thanassis Chrissafis and Rapporteur Mr Benamou
 - **Organisational innovation & Knowledge management** (*Rue de la loi 170, 01/37*)
- Animators: Ms Agnès Bradier & Mr Gareth Macnaughton, Rapporteurs: Mr Abacher/ Mr Stojanovic
 - **Interoperable and secure frameworks, architectures and platforms** (*Rue de la loi 170 01/47*)
Animator: Mr Alejandro Moya and Aniyan Varghese
Rapporteur: Mr Konstantinos Tarabanis
 - **Other innovative technologies** (*Rue de la Loi 86, Room C2*)
Animators: Mr Paul Timmers & Frederic Loerng, Rapporteurs: Mr Mitrakas, Mr Eymeri.
- 13:30 Continuation of Parallel sessions
- 15:15 Plenary: (*Charlemagne, S1*): Paul Timmers
Report from each of the parallel sessions and discussions
- 16:30 Conclusions and next steps: Paul Timmers and Aniyan Varghese
- 17:00 Close

Annex B, Workshop participants

Group 1 – User centred eGovernment services

Cyrille	Bataller	Accenture
Norbert	Benamou	BFC (Rapporteur)
Thanassis	Chrissafis	DG INFSO (Animator)
Serge	Druais	Thales
Åke	Grönlund	Örebro University
Trond	Knudsen	Research Council of Norway
Gregor	Lietz	EDS
Ann	Macintosh	Napier University
Mike	Nidd	IBM
Veli-Pekka	Niitamo	Nokia
Ian	Paterson	Birmingham City Council
Matt	Poelmans	ICTU
Pierre-Yves	Saintoyant	Microsoft
Christian	Seele	IWI
Roberto	Tavano	Unysis
Liliana	Terranova	SOGEI-Telecom
Grazyna	Wojcieszko	DG INFSO (Animator)
Paul	Willems	PFS Finance

Group 2 – Organisational innovation & Knowledge management

Andreas	Abecher	FZI (Rapporteur)
Christophe	Alviset	French Ministry of Economy, Finance and Industry
Monica	Beltrametti	Xerox
Leon	Bobrowski	Blalystok tech Uni
Agnès	Bradier	DG INFSO (Animator)
Jean Claude	Burgelman	EC DG JRC-IPTS
Ferran	Cabrer	CONSEN (EEIG)
Cédric	Grutman	Cisco
Andy	Hamilton	University of Salford
Gareth	Macnaughton	DG INFSO (Animator)
Gudrun	Magnusdottir	Otenet ESTeam AB
Paola	Montironi	RSO Consulting Company
Ladislav	Németh	Novitech a.s.
Andreas	Oikonomopoulos	Delta Singular
Ljiljana	Stojanovic	FZI (Rapporteur)
Roland	Traunmüller	University of Linz
Patrick	Wauters	CGEY

Group 3 – Interoperable and secure frameworks, architectures and platforms

Peter	Blascke	Siemens
John	Bullard	INDENTRUS
Elixabete	Ostolaza Esnal	European Software Institute
Juha	Hintsä	HEC Lausanne
Peter	Lipp	A-SIT/ Graz University of Technology
Justin	Meadows	C International
Dietmar	Möller	University of Hamburg
Alejandro	Moya	DG INFSO (Animator)
Enrico	Nardelli	NESTOR - University of Roma “Tor Vergata”
Javier	Ossandon	Elanet
Christian	Pinaud	France Telecom
Reinhard	Riedl	Uni Zurich
David	Shorter	IT Focus (Workshop Rapporteur)
Konstantinos	Tarabanis	University of Macedonia (Rapporteur)
Vincent	Tilman	Eurochambres
Volker	Tschammer	Fraunhofer
Lorenzo	Valeri	Rand
Aniyan	Varghese	DG INFSO (Animator)
Paolo	Zuliani	Uni Bolzano

Group 4 – Other innovative technologies

Christopher	Corbin	EUROGI
Clara	Centeno	EC DG JRC-IPTS
Tanguy	Deschuyteneer	Logica
Jean-Michel	Eymeri	University of Toulouse (Rapporteur)
Frederic	Loeurng	DG INFSO (Animator)
Andreas	Mitrakas	Ubizen (Rapporteur)
Jens	Mortensen	Oracle
Patrice-Emmanuel	Schmitz	Unisys Belgium
Madeleine	Siösteen Thiel	VINNOVA
Paul	Timmers	DG INFSO (Animator)
Tom	Van Engers	Univ Amsterdam

An analysis of participation by country demonstrates EU-wide participation:

