Bringing Together and Accelerating eGovernment Research in EU

eGovernment evolution towards 2020

July 2007

Executive summary

The present document addresses the evolution of eGovernment towards 2020 as seen through the results of the IST priority in FP6.

Issues to affect eGovernment by 2020 include developments in the public sector and in ICT. These are examined in the light of conclusions arising out of recent independent reports used by IST research projects and serve as a foundation layer for building the evolutionary track for eGovernment.

The general outlook for eGovernment is subsequently examined, based on the opinions of experts on the impact of technology. This is assessed with respect to government and public eServices in general as well as social issues such as eInclusion and the digital divide.

Finally, technology capabilities and possibilities are seen as mere enablers of eGovernment development by 2020, precedence belonging to the general political and socioeconomic climate prevailing at the time. Under this point of view, prediction of the future of eGovernment makes no sense unless embedded in certain regions of a socio-political evolution space. This space has been defined by IST research as being three dimensional on which eight different eGovernment courses of evolution ("scenarios") can be projected.

The conclusion at which IST research points to is that eGovernment in 2020 will be shaped to a lesser extent by technologies and to a greater extent by socioeconomic conditions and successful implementation of appropriate policies.

Table of Contents

List of figures

List of tables

11

1 Introduction: a global perspective towards 2020

In an age of uncertainty, peering 13 years into the future cannot be done while ignoring long-term demographic, economic and corporate trends. Understanding the long-term future is vital in ensuring that strategies are sustainable, that opportunities are identified at an early stage and that challenges are addressed before they become unconquerable. The next 10-15 years will bring further massive changes to the shape of the world economy, to the landscape of major industries and to the microenvironment companies. The major findings and principal trends of the Foresight 2020[1] survey are summarised below:

♦ **Globalisation**. It's too early to talk of Asia's century, but there will be a redistribution of economic power. Emerging markets, and China and India in particular, will take a greater slice of the world economy. Non-OECD markets will account for a higher share of revenue growth between now and 2020 than OECD economies. Labour-intensive production processes will continue to shift to lower-cost economies, which will still enjoy a massive wage advantage over developed markets. The pace of globalisation will be arguably the critical determinant of the rate of world economic growth.

♦ **Demographics**. Population shifts will have a significant impact on economies, companies and customers. The favourable demographic profile of the US will help to spur growth; ageing populations in Europe will inhibit it. Industries will target more products and services at ageing populations, from investment advice to low-cost, functional cars. Workforces in more mature markets will become older and more female.

♦ **Atomisation**. Globalisation and networking technologies will enable firms to use the world as their supply base for talent and materials. Processes, firms, customers and supply chains will fragment as companies expand overseas, as work flows to where it is best done and as information digitises. As a result, effective collaboration will become more important. The boundaries between different functions, organisations and even industries will blur. Data formats and technologies will standardise.

♦ **Personalisation**. Price and quality will matter as much as ever, but customers in developed and developing markets will place more emphasis on personalisation. Products and services will be customisable, leading firms to design products in a modular fashion and, in the case of manufacturers, assemble them in response to specific customer orders. Customers and suppliers will be treated in different ways, depending on their personal preferences and their importance to the business.

♦ **Knowledge management**. Running an efficient organisation is no easy task but it is unlikely on its own to offer lasting competitive advantage. Products are too easily commoditised; automation of simple processes is increasingly widespread. Instead, the focus of management attention will be on the areas of the business, from innovation to customer service, where personal chemistry or creative insight matter more than rules and processes. Improving the productivity of knowledge workers through technology, training and organisational change will be the major boardroom challenge of the next 15 years.

1.1 Public sector trends towards 2020

In the Foresight 2020 report on "Economic, industry and corporate trends" (Economist Intelligence Unit, 2006), sponsored by Cisco Systems, a separate chapter is dedicated to the public sector.

There, amongst other items, the following points are stressed:

---

[1] http://newsroom.cisco.com/dlls/tln/research_studies/2020foresight/pdf/2020foresight_full_report.pdf

♦ **The external environment:** Public agencies will struggle with an array of profound challenges over the next 15 years, made worse by funding constraints and rising citizen expectations. Ageing populations and rising healthcare costs will feature among the greatest challenges.

♦ **The public-sector landscape:** Budget constraints and swelling demand mean that agencies will be expected to do more with less. There will be greater emphasis on technology deployment, on performance management and measurement, and on outsourcing of non-core services as a result.

♦ **Changing relationships:** Government services will be designed and delivered to meet the needs of citizens and businesses. Effective collaboration with other agencies and private-sector organisations will be critical in enabling public-service organisations both to deliver better service and control expenditure.

♦ **Agency strategies:** There will be a significant decrease in the number of simple processes being conducted by humans, as eGovernment spreads. Public-sector organisations will place an increasingly high premium on recruiting, training and redeploying employees capable of sophisticated judgements and communication.

From security threats to ageing populations, education requirements to healthcare costs, governments and public agencies will struggle with an array of profound challenges over the next 13 years. By 2020, for instance, the world's developed nations — including the US, Western Europe, Australia, New Zealand and Japan — will have no choice but to confront the problem of *demographics.*

"*Five years from now the baby boomers will begin retiring*", says John Rother, policy director at the American Association for Retired People (AARP)[2]. "*Over the next 10-25 years, there's going to be a lot more people retiring than there are entering the workforce*".

As the size of the workforce declines, governments inevitably are expected to reduce funding for healthcare and pension assistance. Compounding the problem is an erosion in the private sector's willingness to deliver defined healthcare and retirement benefits to the majority of their employees, as well as longer mortality and rising healthcare costs. Governments will wrestle with a number of options, from higher retirement ages to tax-free income beyond the minimum retirement age, with the fundamental choice being between higher taxes and lower benefits.

Another critical issue for governments and societies is workforce education. Determining how best to educate a workforce ready for the challenges of a globalised 2020 economy is of critical importance.

According to Marty Markowitz, president of the borough of Brooklyn[3], New York: "*Our public schools are simply not educating the workforce we will need in the future*". As well as changes to school curricula, expect wider use of incentive pay for the most successful public school teachers and districts, as well as vouchers, a sort of tax rebate that allows families to pay for the school of their choice (essentially forcing public schools to compete both with one another and the private sector). Issues such as healthcare and education also plague many emerging-market nations, of course, though often from a vastly different perspective.

In the health-care domain, high costs for advanced medicines and therapies opens the way for many emerging-market nations to focus primarily on finding the capital, often based on public-private partnerships, for basic infrastructure improvements.

Whatever the issue, whether ensuring national security or setting environmental and energy policy, the scale of the task facing the public sector is made even more daunting by rising citizen expectations. Consumers of government services are increasingly demanding, intolerant of both poor service and higher taxes.

---

[2] www.aarp.org

[3] www.brooklyn-usa.org

"*People pay an awful lot of taxes, and they expect better service from government*", says Steve Westly, controller for the state of California in the US (Foresight 2020)[4]. The rules-driven, inflexible, one-size-fits-all approach to government is on its last legs: 80% of respondents in the Foresight 2020 study say that in 13 years, their "customers" (citizens and businesses) will place a higher premium on personalisation of service.

The above excerpt of the Economist report more than sufficiently covers the field of eGovernment services and infrastructures from an "external" point of view. From an "internal" (i.e. IST research in eGovernment) point of view, the OneStopGov (A Life-event Oriented Framework and Platform for One-Stop Government) project experts stress the following points as being basic tendencies for future government which are compliant with what was mentioned before:

♦ Public agencies will struggle with tougher funding constraints.

♦ At the same time, public agencies will struggle with rising citizen expectations.

♦ Public agencies will have to achieve more (for their citizens) with less (money).

♦ There will be greater emphasis on technology deployment, on performance management and measurement and on outsourcing of non-core services as a result.

♦ Government services will be designed and delivered to meet the needs of citizens and businesses.

♦ Effective collaboration with other agencies and private-sector organisations will be critical in enabling public-service organisations both to deliver better service and control expenditure.

♦ There will be a significant decrease in the number of simple processes being conducted by humans, as eGovernment spreads. Public-sector organisations will place an increasingly-high premium on recruiting, training and redeploying employees capable of sophisticated judgements and communication.

OneStopGov builds the entirety of its use plan and exploitation exercise based on the above seven business hypotheses. They can be regarded as being equally important as the requirements that are collected directly by the user partners of the project while, on the other hand, not showing the short-sightedness that in many cases adheres to public sector officials.

1.1.1   Customer-oriented eGovernment services

There's an increasing call for government to be more customer-oriented. Customers of government services today expect what they want, when they want it. Consequently, government agencies have to become more responsive and develop the tools to deal with a more sophisticated and demanding consumer. What that means in practice is making simple processes even easier, usually through greater use of IT enhancing the quality and accuracy of complex procedures. Moreover, *customers* of public agencies expect to see a significant decrease in the number of simple processes being conducted by humans, as e-government spreads.

Examples in Europe already flourish. In Northern Ireland, a majority of solicitors are using a digitised land registry service to conduct conveyancing of property and land. More than 10% of Finnish companies perform their value-added tax (VAT) reporting online. Citizens are increasingly provided with web access to help save time with everything from applying for healthcare benefits to renewing automobile registrations or licence permits.

---

[4] http://newsroom.cisco.com/dlls/tln/research_studies/2020foresight/pdf/2020foresight_full_report.pdf

Self-service options and automation will become more important, but personal interactions between citizens and public-sector employees will also need to change and improve. Softer relationship skills will be critical to the public-sector employee of the future.

Public bodies need to invest in developing management and interpersonal skills and communication / presentation skills as the qualities that will be most important to their organisation in 2020. The overall size of the workforce may not necessarily increase, but public servants will have to be well educated to keep up with the higher expectations of customers.

Moreover, because problems are often multidisciplinary, staff will need significant cross training. Public entities are recognising that they need professional capabilities to deal with ever more sophisticated customers. Such high-value skills do not come cheap, of course, and most agencies will continue to be constrained by limited public funding. But public sector respondents see plenty of scope to improve productivity through better communication and more efficient organisational structures.

Frontline employees will also become more technologically knowledgeable: enhanced use of IT is seen as the most likely route to improved performance in areas that require developed communication and knowledge skills. Citizens expect the focus of technology investment for public-sector organisations to shift from general IT infrastructure, procurement and financial management and reporting today to strategy and business development, knowledge management and product development by 2020.

Interestingly, ageing populations may play to the public sector's advantage, at least in this regard. The large wave of retirements expected to occur within government workforces in the forthcoming years will enable an influx of more technology-proficient employees.

1.1.2 The importance of collaboration

Better knowledge management, reconfigured organisations and more skilled personnel will enable organisations to collaborate more effectively, another major trend of the next 13 years. "*A lot of local government agencies are learning that there's mutual benefit to co-operating or collaborating with the public they are in place to serve*", says Bill Beach, director of the centre for data analysis at the U.S. Heritage Foundation[5]. "*Much of the time, an effective response requires multiple groups in the community or multiple agencies to work together*". Nine out of ten stakeholders say they will increase or significantly increase collaborative teamwork outside the organisation to solve complex problems (Foresight 2020)[6]. Partnership and collaboration is essential when balancing the competing interests of different groups.

Collaboration will also take the form of outsourcing and off shoring arrangements with outside contractors. As a spokesman at Commonwealth Business Council Technologies[7] explains: "*As citizens demand that their local boroughs and councils do more with less—they shouldn't be surprised when the agencies use offshoring to do so*". Various UK ministries have already off shored activities ranging from traffic control to diagnostic radiology services.

To be effective, such collaboration will require a massive standardisation of processes, data formats and technologies across government. The public sector will also collaborate more intensively with local community groups and businesses to solicit manpower and resources, reducing costs and improving outcomes in the process. The great division of the 21st century will be between those governments who try to do everything for everyone and those agencies that seek partnerships and collaborations within their communities to share the burdens.

---

[5] www.heritage.org/

[6] http://newsroom.cisco.com/dlls/tln/research_studies/2020foresight/pdf/2020foresight_full_report.pdf

[7] www.cbcglobelink.org

1.2 Visions on the future of ICT in Europe

To offer insights on the prospects of ICT, one needs to understand first the underlying forces and environments that influence ICT research, development and deployment. These forces are influenced by "drivers", "trends" and "challenges". Drivers are factors that have an important influence themselves on the developments of a technology. They may cause a direct influence on the IST deployment; give impulse in particular research directions and stimulating the particular technological trajectories. Challenges, in contrast, contain a certain normative component. They are hurdles that one needs to overcome in order to move in a certain direction. They are frequently the result of conflicts between various trends and/or aims, which require resolution to integrate IST use in European society. Challenges may become drivers and vice versa[8].

Trends will affect whatever is foreseen and planed. Thus, they need to be considered seriously. For instance, one major trend is the ageing population, which will influence labour and consumer market development, requirements for ICT applications in education and health, and so on. FISTERA's first step was to analyse National Foresight studies, to review some major European IST scenario studies, and to identify the trends and other drivers and challenges that these portrayed as likely to be important influences on future societal changes. The relationship and dependency between these different factors revealed to be complex.

The factors are of technological (e.g., miniaturisation), social (e.g., increasing demand for mobility) or economic (e.g., reduction of the cost per unit of functionality) nature and they often do not reconcile. They can even be collocated. For example, "more personalisation" or "more security" is at the expense of the factor "cost" or "privacy". Thus, a fully consistent picture cannot be established, but we can assert that in order for an ICT to conquer the market, a number of factors need to coincide and it should respond to a real need. It must respond to a demand, be appropriately priced and functional, and be in line with the political structure.

Figure 1 summarises a number of key factors that appear to be specifically important for the development of the ICT industry and services sector (social, technological, political and economic). For a detailed description of these factors see *"Key Factors driving the IST in the ERA a Synthesis Report of FISTERA", September 2004, IPTS)*[9].
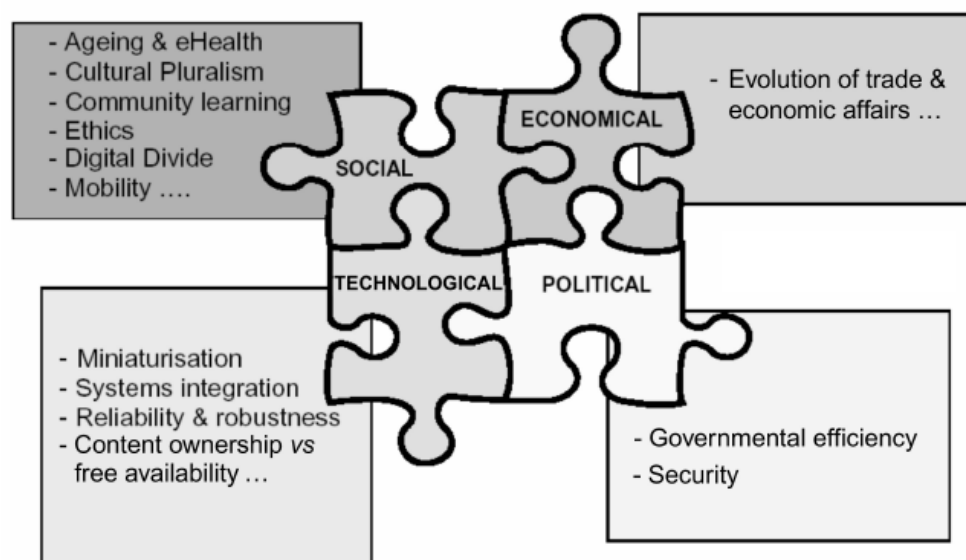

Figure 1. Key factors and the ICT industry
(Reproduced from the Synthesis Report of FISTERA, 2004)

---

[8] http://fistera.jrc.es/pages/books/content%20FFC%20book/02outline.pdf
[9] ftp://ftp.jrc.es/pub/EURdoc/21310-ExeSumm.pdf

These factors have been identified from desk research (review of scenario studies, technological reviews, national foresight studies, etc) and augmented in discussions by the consortium. An important key element of the FISTERA methodology employed is to combine as much as possible a range of foresight tools. Elements of a "classical foresight toolbox" are fully fledged foresight exercises, technology road-mapping, Delphi studies or scenario development exercises. Taken in isolation, each of these tools offers useful, but partial information. In FISTERA a number of tools is combined and adapted in order to make best use of their complementarily to analyse specific tasks.

	Strengths and Weaknesses	Opportunities, threats and challenges
Technology-related factors	Bibliometric analysis of patents, publications and secondary sources (such as R&D funding), assessments included in national foresight studies.	Analysis of technology trajectories and disruptions, assessments included in nation foresight studies.
Economic and political factors	Information from national foresights and literature.	Online Delphi and targeted workshops, information from national foresights and literature.
Socio-related factors	Information gathering from literature search and online Delphi.	Scenario-building exercises, workshops, and online Delphi.
S&T-based competitiveness	Information gathering through desk research and check by interviews: online-Delphi	Scenario-building exercises and workshops.

Table 1. A SWOT analysis for Europe
(Reproduced from the Synthesis Report of FISTERA, 2004)

FISTERA analysts have also tried to integrate all the findings in a systematic fashion. For instance the different methodologies were grouped following a SWOT pattern (
Table 1), in an attempt to draw conclusions about the opportunities, threats and challenges for Europe and ways to improve Europe's position.

In the FISTERA study, IST sector-specific analyses have been constructed for the enlarged Europe (EU 25) taking into account national foresight exercises, and building upon existing general comparisons of foresight studies. Differences between foresight studies in different countries have been explained, and conclusions have been drawn on IST developments and IST-foresight requirements at the European level.

The novelty of this effort lies in the fact that there has been no analysis and comparison of many of the more recent foresight studies, and the fact that no comparison has had its focus so far specifically on Information Society Technologies (IST).

The First Synthesis (ITAS, 2003)[10] analysed eight foresight exercises from Austria, the Czech Republic, France, Germany, Hungary, Spain, Sweden, and the United Kingdom. During the second phase, work has been done on new foresight exercises undertaken within the enlarged EU (Rader, 2004)[11], and also *non-European* studies (Greece, Sweden, Israel, USA, Korea, Canada and Japan). References are also made to major exercises already covered in the first synthesis report (Rader et al. 2003)[12] where these activities have been continued. In an intermediate stage, a "fast track" analysis involving three recent Foresight exercises from Canada, Germany and Sweden was carried out in order to examine the influence of the

---

[10] http://www.itas.fzk.de/

[11] Rader, M. (2004): First Findings from Three Recent Foresight Studies on the Subjects of Security, Convergence and the "New Economy. http://fistera.jrc.es/docs/CDROM%20oct2004/DeltaPapier.pdf

[12] Rader et al. (2003): Rader, M. Böhle, K., Hoffmann, B. Orwat, C. Riehm, U.: First Report on Review and Analysis of National Foresight. Report on Findings from Eight Selected National Foresight Exercises. http://www.itas.fzk.de/eng/projects/fistera/deliverables.htm

"bursting" of the e-commerce or "new economy" bubble in the late 1990s, and the terrorist attacks of September 11, 2001.

Some noteworthy points emerge with respect to technologies and their trajectories (see Rader *et al.* 2003).

♦ *Firstly*, national foresight reports contain little on emerging key technologies or technology trajectories.

♦ *Secondly*, most of the studies limit themselves to identifying subjects worthy of support at the national level only.

♦ *Thirdly*, the scenarios resulting from the process are often not particularly technology-specific, but do provide justification for the support of projects contributing to progress in key areas of technology, such as artificial intelligence.

To sum up, national foresight exercises do not generally cover the whole chain from technology assessment to assessment of technology's impact on society and offer limited value for conclusions on the EU as a whole.

Up until now, *security* has been treated in foresight studies as an important aspect only as regards individual technologies. In all three recent foresight exercises, however, it has figured heavily and was addressed in the second report (see Rader 2004).

The bursting of the "new economy bubble" has had little visible impact on the three cases studied in the second phase. *Trust* and *security* were obviously critical factors in the "new economy" and these continue to be so in current foresight. A cross-checking of the two syntheses of national foresight studies (2001 and 2005) against the FISTERA technology trajectories and Delphi results has shown some common patterns: life-long learning, healthcare, support for disabled/elderly people, eGovernment – participation of civil society, tele-working, and virtual companies.

Some divergent/convergent trends seem to emerge: security ("post-terrorist attacks effect") seems to be overestimated; eHealth is not apparently a topic of concern, while eGovernment and eLearning are becoming increasingly important.

Cultural diversity is both a challenge and an opportunity for Europe. If Europe will not become successful in maintaining social cohesion, diversity could lead to problems and social unrest. If Europe develops concepts for integration which it can successfully implement, this diversity can prove to be a strength in the development of applications of technology. Certainly, a major challenge will be ageing of the European society. Europe's position in research and development is regarded as likely to be challenged by regions such as China and India.

1.2.1   Socially beneficial ICT

The Delphi study[13], conducted in 2004-5, involved three types of expert: i.e. policy-makers, the business sector and researchers in the science base. The FISTERA Delphi, launched in the summer of 2004 and concluded on 1 February 2005, was carried out in two rounds. Respondents were invited to revise their inputs to the second round in light of the results of the first round. Participation in the survey was high (515 respondents). Round 1 gathered views from some 363 respondents and Round 2 involved 242, of which 152 were new "informed participants".

The report shows many areas where EU and non-EU results are rather similar (this information could be potentially used to promote future R&D cooperation programmes or projects in those areas (e.g. social and institutional innovations).

---

[13] http://fistera.jrc.es/docs/RP_FISTERA_Delphi_special_report_eEurope_DG_III.pdf

Comparisons by regions and sectors proved useful in identifying biases and priorities.

The FISTERA Delphi set out to determine expert views on the following issues:

♦ What are the main challenges that R&D needs to address in Information Society Technologies (IST)?

♦ What are the main impediments for developing IST applications?

♦ What actions should the European Union (EU) implement to achieve more effective and socially beneficial IST development and application?

♦ How do specific IST application areas (*e.g.*, government, health, education, etc.) contribute to specific EU goals (*e.g.*, job and wealth creation, competitiveness, etc.)?

♦ Which IST application areas are liable to contribute most significantly to the success of European knowledge economies?

♦ What are the EU's capabilities for generating IST applications and for industrial exploitation of IST?

♦ How well prepared are public and private research sectors to seize the opportunities presented by developing IST?

♦ Which stakeholders can contribute most to the development of specific IST application areas?

The FISTERA Delphi examined the period to 2010 and beyond. 2010 is the date to which the Lisbon Objectives (i.e. improvement of job and wealth creation, competitiveness, social cohesion and inclusion, and environmental quality in the European Union) are oriented, and is thus an important reference point. However, the full implications of many emerging IST applications are unlikely to be fully realised until after that date, and the European Information Society will certainly continue to evolve beyond then.

1.2.2 An overview of the main results

♦ Most EU organisations associated with IST are positioning themselves on the average, while a few were felt to be cutting-edge as regards their capability in developing and exploiting IST in the various areas.

♦ Most researchers feel "moderately" prepared to seize new IST opportunities in the application areas, with only a couple of areas (*e.g.*, transport) where researchers are generally well-prepared.

♦ The outstanding result of the survey is the strong endorsement given to one particular application area – "Education and learning" which repeatedly emerges as an application area for IST that contributes to numerous EU social and economic goals and is central to the construction of a European knowledge society.

♦ IST applications in government, social welfare and public services, and cultural diversity contribute to many EU goals. However, applications in work organisation and in management are seen as contributing particularly strongly to the economic goals.

♦ There was no strong consensus on the major problems impeding development of IST applications. The main problems were seen as those concerning social inequalities in access to IST, and lack of adequate finance for innovations. The challenges seen as confronting R&D in EU IST were more differentiated in terms of the numbers of respondents identifying them as important. The two issues which received most endorsement were establishing more user-friendly systems, and enhancing the security of transactions and personal information.

♦ A fairly strong pattern of emphasis emerged when it came to actions that the EU would need to undertake, with the two topics *Social and institutional innovations*, and *Reducing the digital divide* coming ahead of many other actions – including such familiar ones as *Improving the communications infrastructure*; *Developing new and improved IST applications*, and *achieving better IST training and awareness programmes*.

♦ There are many intriguing variations across regions and occupational groups.

♦ Results also showed that the majority of respondents see *National governments*, *Large firms in IS* and *Small and medium sized firms in IST* as the "key players" improving IST applications in nearly all areas. In this respect the EU is believed to significantly contribute to the improvement of applications in four main areas: social welfare and public services; cultural diversity; transport and work organisation.

1.2.3 Exploring emerging applications

The FISTERA project is intended to help the process of decision-making in research and development (R&D) for Information Society Technologies (IST) in the European Union. It is designed to provide useful information about key technological developments and potentials, applications that have social and economic benefits and the challenges and opportunities that arise in this context. It is also intended to help bring a wider range of informed participants into discussions on these topics.

The workshop held in Seville on 17–18 June, 2004 was a first scenario workshop that contributed to the major objectives of the project such as investigating issues related to IST in Europe and R&D challenges, as well as exploring experts' opinions about partially prepared "desk" scenarios. It involved 31 participants that were asked to undertake four main activities: brainstorming on IST application areas, prioritisation of 12 key IST application areas (using Lisbon's EU goals as a framework), scenario workshop on future developments of IST in Europe and piloting the FISTERA Delphi on IST applications.

Scenario 1

Progress and polarisation
Competitive and Dynamic Knowledge Society:
• rapid growth in IST use
• economy-driven innovations
• uneven development

Scenario 2

Catch Up and creative
Cohesive & Integrated Knowledge Society:
• rapid growth in IST use
• economy-driven innovations
• much reduction in disparities across EU

Challenged Knowledge Society:
• slow and very uneven growth in IST use
• innovations in specific areas
• major concerns about technology & market

Challenged and contested
Scenario 3

Sustainable & Inclusive Knowledge Society:
• new paradigms of IST use
• social & community-driven innovations
• environmental and other objectives
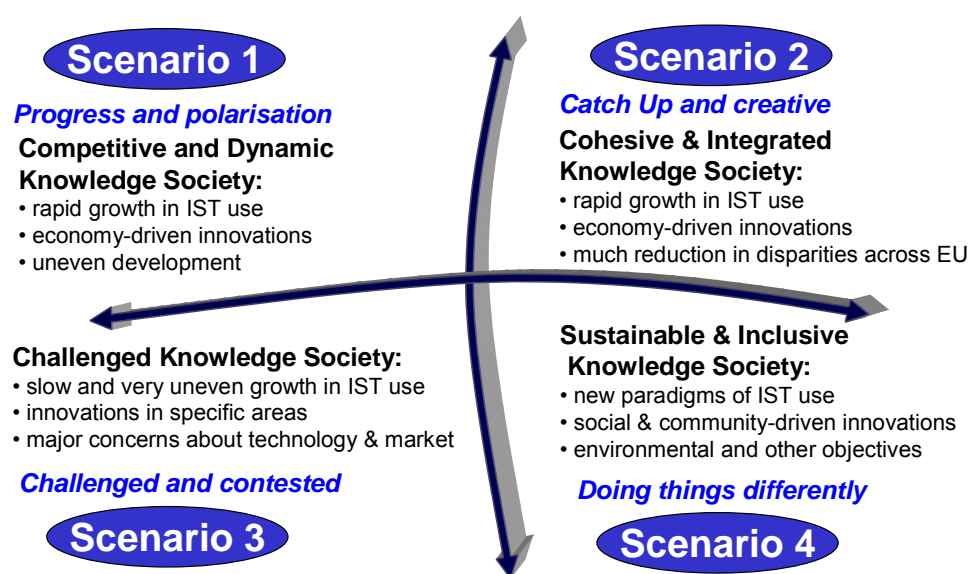
Doing things differently
Scenario 4

Figure 2. Four profiles for the future
(Reproduced from the Seville workshop, 2004)

Various issues were investigated, including IST applications (the group envisioned and discussed various specific applications) and R&D needs. Four profiles of the future were presented to the group, as shown in the figure above. Subgroups were asked to develop

plausible scenarios indicating how the EU might move towards each of these alternative futures, and what that world would look like in consequence. As well as these detailed accounts. The workshop examined how far the likely future might look like each of these scenarios[14].

As we would expect, none of the four scenarios was thought likely to be "completely" represented in the future. Indeed, overall, the most common rating was that the scenarios would be captured "a little bit" in the future. The results indicate quite distinctive views as to the distribution of scores being very distinctive for each scenario. However, each of scenarios 1, 2 and 3 are rated by a majority (almost 2/3) of participants as characterising the future to "moderate" and "considerable" extents.

♦ **Scenario 1** ("competitive and dynamic") received a wide spread of reactions, with the most common view being that it would be reflected "to a moderate amount". (This is the only scenario where this is the case.) Overall, it just manages to achieve the largest share of ratings for "moderate" and "considerable" amounts, but this is due to one vote only.

♦ **Scenario 2** ("cohesive and integrated") is outstanding in that all participants consider it to have some representation in the future – there were no votes for "not at all". The most common expectation was that it would be captured only "a little bit" in the future that will be achieved. (It shares this feature with scenario 4, but differs from that in that there is otherwise more expectation that more of this scenario will be realised.)

♦ **Scenario 3** ("challenged") is the one which is felt most often to be substantially represented in the future. However, it evoked differing responses from participants. The most common expectation (though still a minority view) was that it would be realised "to a considerable extent" – and this was the only scenario where this proved to be the case. But more people thought this scenario would not happen "at all" than was applied to any other scenario, (The "considerable extent" rating was the smallest "peak" of ratings across the four scenarios, and indeed the distribution of views as to this scenario is somewhat bimodal with both "not at all" and "considerable extent" receiving more votes than "a little bit" and "a moderate amount".).

♦ **Scenario 4** (the "different" scenario) was predominantly felt to be captured only "a little bit" in the future that will be realised. (More people actually felt that scenario 3 would be realised "not at all" than felt this for scenario 4, which was next in terms of this response.) This scenario had the fewest people believing that the future would reflect this scenario to a considerable extent.

The scenarios were presented and discussed in a plenary session, following which the voting described earlier took place. A number of points were raised which are important for considering further development of the scenarios.

♦ It was agreed that there were numerous feasible courses of development, while none of the scenarios was completely convincing in its current form (as the voting indicated). They conveyed elements of the possible future, but how these elements might be combined is a big question, with several possible answers.

♦ Some scenarios – not just scenario 4 - were seen to require major cultural change to be fully realised.

♦ It was noted that there was very little consideration of disruptive technologies in these accounts. The major exception is the rise of Open Systems in Scenario 4 – and the shift to this induced by social change. The local developments that might happen in Scenario 3 were not portrayed as having systemic significance. (It could be useful for a workshop to focus explicitly on possible disruptions, even though surprising disruptions are tautologically difficult to foresee. It was also suggested that more time could be spent with wild cards.)

---

[14] http://fistera.jrc.es/pages/roadshows/manchester%202005/1scenarios%20chapter%20IM.doc

♦ Some "techno-push" was felt to be evident in most scenarios, and there was possibly insufficient attention to the user orientation of applications, though some scenarios did identify this as a key issue.

The workshop also provided some impressions as to the various drivers that would promote each one of the scenarios[15].

---

[15] http://fistera.jrc.es/pages/roadshows/manchester%202005/1scenarios%20chapter%20IM.doc

2   eGovernment in 2020: a general outlook

Although the definition and the scope of eGovernment is accepted by nearly everybody dealing with the subject today, the wider results, societal implications and ultimate expectations associated with it exhibit considerable variance among stakeholders. To be able to draw some conclusions on the state of eGovernment for the next decade and up to 2020, one needs a collective view of what eGovernment potentially represents, in other words: what is our perception that eGovernment is about?

We borrow a set of comprehensive answers to this question given by Riel Miller[16] on the occasion of the workshop organised by eLOST last year in Paris.

According to Miller, the primary attribute of technological innovation for eGovernment will not be on the hardware (physical) dimensions but on the organisational side, the context and the uses to which tools are put. eGovernment is not about delivery of services but the enabling of a learning society in which eGovernment will be as different from the welfare state as the welfare state was from its despotic/elitist predecessors. eGovernment is about enabling decentralised ownership of privacy, health records, identity, etc.. At the core of this is the granting of cyber-citizenship so that people can establish their undeniable identity on the net when they want it. There also needs to be a right to anonymity. The transaction models of cyber-currency issued by a state in a form that cannot be repudiated (under most conditions – eg. wireless everywhere) and is peer-to-peer (Singapore is a noteworthy example) is key. Other, specific areas isolated by Miller as answers to the question "what is eGovernment about" are:

♦ Funding the R&D necessary to make the data mining and personalisation work.
♦ R&D for interoperability (modular, standards evolution – governance of dynamic (easy birth, death, entry exit))
♦ The semantic web that takes search beyond commercial services to encompass the full social benefits – **Google cannot and should not be expected to be the supplier and guardian of the Universal Index of Human Knowledge**.
♦ Funding the development of social software that facilitates participation and individual/community empowerment – through verification laws/mechanisms that reduce the cost of establishing and sustaining trust.
♦ Helping to establish a role for virtual reality in personal identity creation, income, etc..
♦ R&D to break through into simulation as one of the primary delivery mechanisms for learning by doing.
♦ Being the pioneers and diffusers of immersive learning environments, using play and history to give access to learning that respects multiple intelligences and build understanding of moral codes – why team work (social solidarity) matters, etc..
♦ Human capital banking (reputation systems) – developing the trust and assessment infrastructure necessary to be able to demonstrate and discover what people know.
♦ Copy theft and the new transaction systems that accompany a new contract - IPR regime that allows for new business models.

It is therefore evident from the above that eGovernment, when seen in its broadest sense, encompasses a wide range of implications and expectations. It is in this light that evolution to 2020 should be seen.

The general outlook presented in this chapter the result of the foresight study made in the framework of eLOST[17]. Around 20 experts from industry and research were interviewed either in person or through e-mail and asked to express their views on the 10-15 year outlook for various eGovernment areas. The compiled answers can be summarised in what follows.

2.1   eGovernment services: technology-driven changes

---

[16] Expert Workshop - eLOST Foresight, Paris, 3 July 2006
[17] "Foresight Study", Deliverables D4.1, D4.2, eLOST Specific Support Action, September 2006

Future automation of processes will mean that one does not need to remember to transact; instead based on one's life events, age or other attributes different governmental processes start. This would mean less intervention from the authorities: only special cases will be handled manually. The way clients use and governments offer services will also be different: Digitalisation of processes and services wherever possible, getting value (effectiveness, efficiency) from e-investment. Services or parts of services (such as Front Office) will, of course, be available through Internet and mobile channels.

eServices are based not as much on interaction but on e-forms. Many of the existing legacy systems (10 – 15 years old) are not able to support electronic processes. There will certainly be a services transformation but this will not be driven by technology, but by overall eGovernment developments. The new services will be integrated to the actual process, so that customers are able to see what and when is happening and by whom. Technology available today can support such services, the problem is, however, that this represents a huge integration exercise, which will require the redesign and implementation of existing applications.

Much more information will be available through all sorts of mobile or ambient technology, plus iTV. Beyond general information, eVoting is under development, utilising many different technologies (such as trials of Smart Card technologies for iTV boxes). Mobile use will expand, saving time and reducing costs, which are the main criteria for a service to be successful.

The ability for full transactions will be increased. Certain bureaucratic annoying aspects will be eliminated (such as having to bring proof of this and that before you can register to university, etc.). Digital availability and integration will make filling of forms, report cards, etc. obsolete. Electronic signatures, still underdeveloped today, will become widely available.

National and European inter-operable solutions (such as standardised modules and integrated back-office interfaces) will become available under a variety of user interfaces serving specific needs and cultural differences. This will lead to cross-border public eServices and electronic documents accredited online across borders.

Offices of civil servants will function as multiple delivery channels: persons will be able to be there physically or virtually by telephone, mail, Internet and e-mail. Eventually, the "electronic track" will dominate and the other forms of communication will disappear. The trend will be more towards electronic transactions under a high level of automation, especially once legal protection issues are solved. By 2020, we will not be speaking of "eGovernment" but rather just of "government": it will become obvious that everybody refers to eGovernment, where everything is done online. The development of the Internet is irreversible.

2.2 New and emerging technologies: impact on eGovernment

Technologies available today fulfil most of our needs. It is mainly a matter of availability and accessibility, which will of course significantly increase, aided by the penetration of broadband communications. What will become increasingly in demand is process and ICT management innovation. Technologies which will play a key part in the development of eGovernment are:

♦ Mobile high speed network connections
♦ Speech recognition and processing
♦ Display technologies
♦ RFID-like tags and location sensing
♦ Business process management, business event driven architectures, business activity monitoring
♦ Semantic web and inference technologies.

Following the development of advanced speech processing technologies (natural language, speaker-independent speech recognition), Interactive Speech Response (ISR) systems could have a significant impact, especially by enabling the implementation of attractive and easy-to-use services through the telephone.

eServices after 10-15 years will become more proactive, will utilise all existing information about the customer and will be driven by developments in business intelligence and multi-channel solutions (web, mobile, digital TV).

Security issues for eServices will become obsolete. Even today, in Finland, solutions for authentication already implemented have addressed the security concerns. BY 2020 the government Semantic Web will be a reality and e-mail will become obsolete. Semantic Web technologies inside government offices will enhance employee productivity and aid decision making, with manual intervention limited to the final decision making stages.

RFID tags will play a role, for example registering any new purchase on a personal database or even account could facilitate tax declarations, automatically calculate depreciation rates etc. Data security issues like fear of data abuse may slow down such developments although there is no technology problem.

iTV could play a role for administrative processes which require not much information to be sent. With the help of Speech Recognition technologies, "forms" could be filled through TV sets or equipped PCs: governmental data would be broadcast permanently on a free digital network channel so that simple interactive screens on TV could either present textual information or even have "avatars" asking the user for oral information. This information could be recorded, transcoded and displayed on screen to be confirmed by the user before transmission.

Smart Card technology will, of course, be used for all sorts of digital transactions, such as those mentioned above. The issue which is important here is the alignment of services, process and technology and not technology itself. The current lack of management in this process of change will become a critical success factor.

Mobility will be a key aspect in the future. TV, mobile phones, etc. will soon be continuously online. This implies that eGovernment (or simply government) will become available 24 hours a day. Increased mobility will also mean that not only government will become available but that the citizen becomes available as well.

Communication devices will soon become IP compliant, but the implications are not yet understood. The technologies will enable broadband, faster services, video-conferencing, human assistance in Internet sites and, in general, more friendly websites.

An important vision is integrated handling of different types and forms of citizens applications which flow through multiple channels. This means integrated databases and an advanced CRM-like system to processes files obtained by post, fax, email, Internet and phone (voice messages transformed to electronic text). Although a human "dispatcher" may be used at the beginning for such a system, ultimately, everything will become fully automated.

2.3 New and emerging technologies: affecting inclusion and the digital divide by 2020

Technology can only **enable** citizens by making things available, it will not **motivate** them to use eGovernment – this is a policy task! The task of technology in this respect is to become much easier to use: users should not be even aware that they are using a computer, while the tasks required by low socioeconomic groups are undertaken by automated process and process innovations.

As stated before, new technologies in themselves will not have a direct influence on eGovernment as such. They will have a much greater influence on the private sphere (e.g. an entire household becoming digital) but they will only indirectly facilitate inclusion – the most significant factors are socio-political. The danger is that some kind of digital "analphabetism" develops. To prevent it, educational and training initiatives are of particular importance. As long as there is no 100 per cent digitisation, the different contact channels currently available to the citizen must remain in the public sector.

The "digital divide" will not be a technology issue in 10–15 years' time. Technology itself can increase or decrease the digital divide. It all depends on how technology is used in services. In this respect, appropriate management of change, strategies, the ability to implement strategies and development of services become the critical success factors.

For example, marketing arguments proclaim that digital iTV can serve as an alternative to Internet PCs for the poor and the PC-illiterate. Some experts dispute this claim by stating that there is much to be done before iTV becomes a real opportunity and that terminals with relevant technological options will not be much cheaper (if at all) than current PCs. Therefore, one should be somewhat hesitant to believe that technology can bring more than a change of means, unless well-designed public eServices are advertised and connected with "motivating gimmicks". Most important demands are: more usability and less complexity of eServices, more free public terminals and more awareness building. eServices should, with time, follow current developments to ensure that they are not even less attractive than before. This cannot be achieved by mere transfer to other technologies, however. Real improvement of eGovernment can be achieved through new technologies if new use scenarios make life easier and nicer for people.

Making broadband communications more usable and affordable could also be a good measure to include LSGs and increase attractiveness (quicker reaction, less patience required, more interaction, more animation such as avatars, etc.), and thus usage rates for all sorts of ICT services.
Main obstacles that hinder wide use of e-Government are related to self-identification and e-signature. Technological solutions do exist, but they are not simple enough and not applied in practice. The keyword is Usability. The implementation of these solutions is a long process.
Another barrier is the lack of common infrastructure. Today the e-Gov (in Israel) is a set of dispersed and different services, with no interconnection and inter-communication between them. The ability to unify infrastructure and services is limited. Basic common infrastructure is desired. Appropriate infrastructure for secure online payments is very important. This is the basis that promotes all other services.

2.4 Conclusions and further remarks

According to the above, eGovernment in 2020 will be shaped to a lesser extent by technologies and to a greater extent by socioeconomic conditions and successful implementation of appropriate policies. In this respect, technology (which is the main concern of an FP6 programme such as IST) can only shape the "real-life" face of the prevailing social, economic and political climate of the time. Given that this "climate" will become the leader of change, prediction of the face of eGovernment in 2020 is rather impossible, unless based on alternative scenarios which visualise this "climate". This line of study has been followed by the eGovRTD2020 Specific Support Action and the results are presented and commented on in the next chapter.

What we summarise below is the technological capabilities expected to be available in 2020 and their effect on eGovernment, as coded by the eLOST Foresight study[18].

According to this vision, access to telecommunications networks including the Internet will become seamless, ubiquitous and "transparent". Simple-to-use and intuitive eGovernment services will most probably be easily available for everyone, anytime and anywhere. There is a wide agreement that the services will function via multiple channels and multiple interfaces. As stated in the OECD's report "e-Government imperative" (2003), one of the most important guiding principles is *"No wrong door: citizens should have a choice in the method of interacting with government. Adoption of eServices should not reduce choice"*. Nevertheless, the level of automation will be much higher. Moreover, as noted in a recent IPTS report[19], it is likely that within 10-20 years, "when the youth of today become responsible citizens and

---

[18] "Foresight Study", Deliverables D4.1, D4.2, eLOST Specific Support Action, September 2006

[19] Centano C. et al, "e-Government in the EU in the next decade: the vision and key challenges", IPTS Technical Report, EUR 21376 EN, August 2004

workers, concepts of eGovernment, eSecurity and eInclusion will change dramatically if not disappear altogether, and the technology will probably also have changed out of all recognition." The following technology areas have been identified as likely to have significant impact on future eGovernment services and use:

- ♦ Ambient Intelligence
- ♦ Multi-modal and multi-channel access, including Multi-Channel Information Management
- ♦ Advanced speech recognition (natural language, speaker-independent).
- ♦ Virtual/Augmented Reality
- ♦ Automatic translation (near real-time)
- ♦ High-Speed Broadband Communications (e.g. FTTH, Fibre to the home)
- ♦ Interactive TV (incl. Video)
- ♦ Wearable Computing
- ♦ Future Web Technologies (Web 2.0 or beyond, Semantic Web, etc)
- ♦ Advanced authentication/security technologies
- ♦ Advanced Mobile/Wireless networks (3G/4G or beyond, WiMax, etc.)
- ♦ Advanced mobile displays (e.g. e-paper)
- ♦ Intuitive/adaptive interfaces
- ♦ Advanced usage of Smart Cards
- ♦ RFID Tags
- ♦ Mobile high-speed networks
- ♦ Technologies addressing cognitive overload (e.g. virtual e-agents).

3 Embedding eGovernment in the general socioeconomic and political environment of 2020

As concluded in the previous chapter, socioeconomic and political conditions take precedence over technology in shaping the future of eGovernment. This view, taken by the eGovRTD2020 Specific Support Action[20], has resulted in a structured series of "…visionary images on future governments' activities, on their interaction with the constituency and their use of innovative and newly emerging technology." These inputs were presented at 7 regional workshops organised by the project with the participation of 140 experts from governments, ICT industry, consulting and academia. The workshops resulted in the development of alternative scenarios, "… which represent a set of coherent, alternative visions of the future for society, government, and ICTs in 2020."

The method of eGovRTD2020 allows separation of technology capabilities and possibilities from the general political and socioeconomic environment in 2020. In this way, technological progress and trends are seen primarily as enablers in the execution of policies and secondarily as shapers of policies.
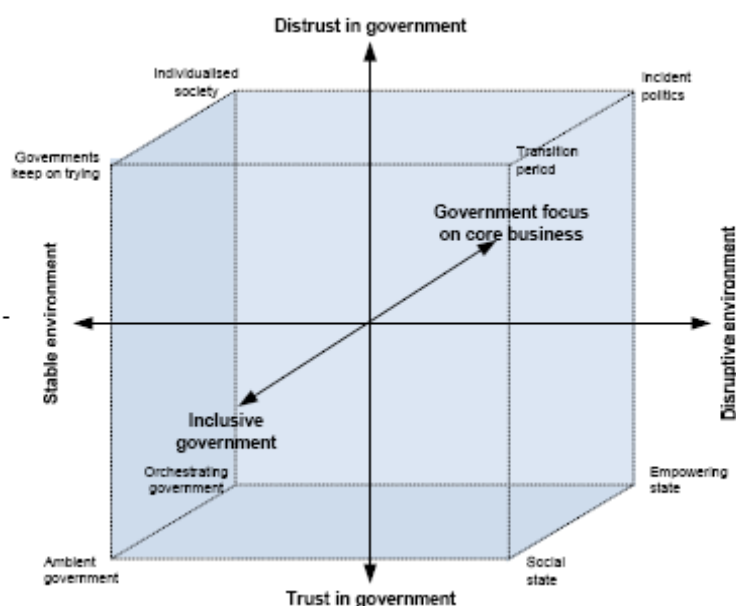

Figure 3. Final scenarios within the evolution space
(reproduced from eGovRTD2020)

As seen in Figure 3 above, the scenarios for eGovernment evolution are placed within a three-dimensional "government evolution space" which resulted from merging the original 11 identified dimensions in the workshops according to the degree of correlation and inter-dependency they exhibited. The three axes of the evolution space as described by eGovRTD2020 are:

1. **Environment** (*from stable to disruptive*): The environment can either be stable or disruptive. A stable environment can be characterised by economic growth, balanced world order, harmonious living. In a disruptive environment all kinds of crises and incidents occur: the war on terrorisms continues, cyber crimes, viruses and bugs escape

---

[20] "Roadmapping eGovernment Research Visions and Measures towards Innovative Governments in 2020", edited by Cristiano Codagnone and Maria A. Wimmer, eGovRTD2020 Project Consortium, 2007.

from labs, religious tensions and wars do appear. A large social divide exists, which results in riots.

2. **Attitude towards government** (*from trust to distrust*): On the one hand, citizens can have a positive attitude towards government and have faith in government. In this case, they trust that the government takes care of them. Individuals like to participate in policymaking and democratic processes and believe they can influence the outcomes of governmental decision-making, and they perceive the outcomes as fair. On the other hand, there might be heavy distrust in government. In such cases, the government is not transparent, decisions are hard to comprehend and the results of participation in decision-making are ignored.

3. **Government scope** (*from all-inclusive to core business*): Governments can either focus on their core business and leave as much as possible to the private sector (lean government), including social security, or have a large scope and provide as many services as possible. Governments focusing on their core business might determine laws, regulations and policies to guide and steer the private sector. Thereby, focus lies on core business, whilst as many activities as possible are outsourced to the private and civic sectors. Governments having a large scope and providing as many services as possible with the intention to be all-inclusive hardly outsource their ICT or business processes and try to retain everything in-house.

It is of interest to note that the view shared by the eLOST project, that socioeconomic and political conditions take precedence over technology in shaping the future of eGovernment are also shared by the experts who participated in the workshops of eGovRTD2020. As the projects reports "…most of the participants expected that future eGovernment challenges would come from the changes in the societal and interaction environments which are more likely to determine the methods of monitoring, interaction, collaboration, policy making and enforcement. As such, the participants expected that societal changes and modernisation of government will primarily influence the different futures. Technology was viewed as an instrument to help solve problems of society."

In general, the scenarios chosen follow two main traces: either trusted governments that provide all inclusive service offers, and this in a stable environment; or governments which are distrusted and provide only core services most probably because the environment is disruptive.

Of interest is also the view expressed by eGovRTD2020 that "disruptive technology cannot be predicted", therefore "eGovernment innovations are expected to result from the use of foreseeable technologies within a certain context."

Although the eGovRTD2020 scenario approach is grounded in the assumption that the future cannot be fully predicted, there is a stated expectation that eventually the most likely future for eGovernment in 2020 will be formed by "some combination of the wide-ranging possibilities elicited in the scenarios."

In what follows we describe the eight scenarios as shown in Figure 3 and their basic characteristics. To aid visibility the titles are listed below.

1. Orchestrating government
2. Individualised society
3. Ambient government
4. Government keeps on trying
5. Transition period
6. Incident politics
7. Social state
8. Empowering state

3.1 Orchestrating government

Disruptive developments predicted at the beginning of the 21st century did not occur, or these had only a modest effect on societies. Because of the benign and stable environment, along with greater equality and productivity, government adopts a facilitating, but limited, role in society, which is broadly supported by citizens who turn to the private sector for many services. Technology does not dominate but serves to support interaction and coordination among different systems and service channels.

Position in Evolution Space		
Environment (y-axis)	Attitude towards government (z-axis)	Government scope (x-axis)
STABLE	TRUST	CORE BUSINESS

Technology

Technology aspects do not dominate society. Each governmental organisation has its own systems, technologies and mechanisms to pass information to other organisations. Standards are developed to integrate and connect systems. Due to the fragmentation, "pollution" of information and information overload are challenges which lead to bad decisions or not providing services to those who have the right to get the service. Some citizens' information is available from anywhere for all government agencies interacting with citizens or businesses. All interactions in each channel are stored and can be used for interacting with other channels.

3.2 Individualised society

People have become more individualistic and self-reliant. They want individual choice as a means to maximise their own potential and social security. Interest in politics is low, and government only takes care of essential facilities and services. Because of the stable environment, the private sector is in a position to compensate for the lack of service capacity in the public sector. Technology serves individual needs to manage information and relationships, and to bridge cultures and languages.

Position in Evolution Space		
Environment (y-axis)	Attitude towards government (z-axis)	Government scope (x-axis)
STABLE	DISTRUST	CORE BUSINESS

Technology

Individuals have found ways to deal with the loads of information they have to process to be successful in today's society. ICT is being used to bridge cultures and languages, by providing context-aware translation services. As each individual is part of different social and business networks, ICT is increasingly being used to maximise the potential value that exists in these networks of contacts by using peer-to-peer exchange mechanisms and technologies for all kinds of information. This helps people in distinguishing relevant information from irrelevant, and in getting a grasp on information quality. As a consequence of the fact that information is power, hierarchies have flattened even more. A second mechanism that increased personal power and efficiency is the rise of personal brokers, i.e. small software tools or organisations that match the demand and supply of information based on personal preferences. These brokers do actively monitor certain information demands and suggest actions. For instance, a broker annually checks whether the current insurance agreement better be moved to another company, and if so, the broker prepares all administrative tasks to accomplish the move.

3.3 Ambient government

Government is all around us with high levels of cooperation across boundaries and more emphasis on local government. Social tensions are low and citizens have high confidence in government to effectively and efficiently settle issues for the common good. Technology supports personalised services and high levels of citizen interaction and participation.

Position in Evolution Space		
Environment (y-axis)	Attitude towards government (z-axis)	Government scope (x-axis)
STABLE	TRUST	INCLUSIVE

Technology

The deployment of ICT for public value creation leads to highly intelligent and personalised services, as well as transparent decision-making processes. Furthermore, ICT promotes participation through online consultation and decision-making systems. And data collection and data mining systems deliver high quality and opinion poll data to politicians for supporting their decision-making.

The European Union has taken up a leading role in developing new eServices, together with private partnerships. It has also helped in establishing security standards. Regulation of markets for ICT-infrastructures and services is still based on sector-specific regulations, because its network characteristics did not allow general antitrust laws to take over the role. As a consequence of governmental attention and the establishment of a strong market, the quality of eServices is high: they are highly intelligent and personalised. Service-oriented architectures have become the legacy architecture. Automated translation technologies enable the EU to communicate and interact with its citizens.

3.4 Government keeps on trying

Despite its efforts to be involved in improving the quality of life on all fronts, trust in government is low. Privacy continues to be a challenge and the organisation of government remains traditional and highly structured. A wide gap exists between a technocratic government and the ability of individuals to take part in it.

Position in Evolution Space		
Environment (y-axis)	Attitude towards government (z-axis)	Government scope (x-axis)
STABLE	DISTRUST	INCLUSIVE

Technology

Although government becomes technocratic, most citizens cannot profit from eGovernment because technology has not become comprehensible to non-experts. There is a shortage of ICT skills in society which counteracts the governmental efforts to improve its public value delivery through deploying ICT. Service-oriented architectures are widely used, although they did not lead to a reduced ICT-workforce.

3.5 Transition period

In a highly polarised world with cultural tensions and intense competition for key resources, governments provide an extensive range of services. Socio-economic policies emphasise individual responsibility, a position widely supported by society. Many traditional public services are provided by the market under strong government regulation. Individuals strongly identify themselves with their local communities, feel alienated from government and use their extensive ICT skills for both personal and political activities.

Position in Evolution Space		
Environment (y-axis)	Attitude towards government (z-axis)	Government scope (x-axis)
DISRUPTIVE	DISTRUST	INCLUSIVE

Technology

On the technological side, the increased competition for resources between regional power blocks has resulted in a fading out of global standards. Different ICT standards come from economic bodies in the US, the European Union and Asia. It is believed that regional standards are a way of protectionism and that the own markets are big enough to reach the critical mass to make technology profitable. More protectionism is also visible when it comes to software. The open source movement has been banned to historical text-books, while they have not been able to deliver robust quality and innovativeness comparable to proprietary software suppliers.

3.6 Incident politics

A two-class society exits due to massive immigration: young, well-educated citizens always on the move and older citizens with a strong attachment to place and only limited understanding of ICT. Society has become largely individualistic, with only a small role for government. The environment is characterised by severe tensions in the world, low trust in government, and a large social divide. Citizens demand security, and government deploys ICT for that purpose. Government also uses ICT to increase efficiency and effectiveness.

Position in Evolution Space		
Environment (y-axis)	Attitude towards government (z-axis)	Government scope (x-axis)
DISRUPTIVE	DISTRUST	CORE BUSINESS

Technology

Technology is aimed at supporting the individual at any place and any time. Ubiquitous networks have been developed. Technology makes eLearning the standard. Programmes of education are customisable by individuals. Individual electronic identities are fully authenticated, but no privacy protection exists. Each person takes care of protecting his or her own data.

3.7 Social state

Society has changed dramatically because of demographic and security-related developments stemming from immigration, ethnic and religious tensions, and unequal distribution of wealth. Government keeps its focus on the common good and has been able to keep up with high citizen expectations for all inclusive, coordinated services, using state-of-the-art technology with sophisticated security controls.

Position in Evolution Space		
Environment (y-axis)	Attitude towards government (z-axis)	Government scope (x-axis)
DISRUPTIVE	TRUST	INCLUSIVE

Technology

Government has taken up an active role in helping citizens with formalities imposed by laws and regulations. Many services are being provided semi-automatically, by informing people about their (administrative) duties while at the same time suggesting an answer, so that only consent is needed.

This development is visible in the private sector too: Technology is more and more helping people to selectively use information and assure its quality, taking over (time-consuming) search for information out of the hands of humans. Many eProcesses are being executed by large shared service centres, so that advantageous economies of scale for eServices and ICT infrastructures can be used throughout the European Union. For the purposes of controllability, cost and reliability, large data centres are in use, too.

3.8   Empowering state

In a rapidly changing, confusing world, characterised by continuing economic and aggravated tensions as well as ongoing terrorism, citizens rely heavily on basic government services to become more self-reliant. Personal ICT devices help them deal with the complexities of life. Government focuses effectively on its core business. It also persists in its role as care-taker for society but continues to be ineffective.

Position in Evolution Space		
Environment (y-axis)	Attitude towards government (z-axis)	Government scope (x-axis)
DISRUPTIVE	TRUST	CORE BUSINESS

Technology

Everybody carries a personalised device for identification, information processing, visualisation of information and payment. Technologies have converged and the devices have the intelligence to continue to adjust to the ever-changing preferences of the user and the environment. This means that all services can be customised and are location-based. The devices manage identity, profiling and information exchange with governments and companies. Over time, these devices are also able to expand a citizen's personal profile and preferences. The devices are used to observe and monitor people. When an accident happens all information of those involved become automatically available to the first responders.

3.9   Other trends in government change

As eGovRTD2020 reports, Buhigas-Schubert and Martens[21] expect that societies will change in such a way that, on a global scale, the importance of regional structures will grow, and regions will work more closely together, potentially sharing services and infrastructure. This implies the need for new governmental structures and cooperation across borders. Thus, a

---

[21] Buhigas-Schubert, C., Martens, H., "An Agenda for Sustainable Growth in Europe", IST at the service of a changing Europe by 2020: Learning from world views, 2005.

trend to reconstruct government at all levels could occur. The European Union itself is the best example of such a development.

Gartner, the ICT consulting company, developed future scenarios and identified and assessed the following trends for eGovernment 2020[22]:

1. The provision of a single point of contact is not fully realisable, because intermediaries are central for service delivery and will inhibit it.
2. Smaller and more active governments will occur by pooling at the inter-agency level, thus reducing local responsibilities and efforts.
3. Responsibilities and resources will significantly shift between different tiers of governments, whereby data analytics and business intelligence play a major role.
4. A greater consolidation and shared services to support integration will occur, in order to be more efficient, or to satisfy an increasing reliance on external service providers.
5. There will be no single system for government-controlled identity management because of privacy concerns, or because of the established role of intermediaries in service delivery.

Correlating these trends to the eight scenarios mentioned before, we note that trend 5 on the non existence of a single government-controlled identification system means that the position in the evolution space is characterised as follows:

Position in Evolution Space		
Environment (y-axis)	Attitude towards government (z-axis)	Government scope (x-axis)
STABLE or DISRUPTIVE	DISTRUST	CORE BUSINESS

This, in turn points to the scenarios (see before):

♦   Individualised Society
♦   Incident politics.

Referring back to the technology characteristics of both scenarios, we note that there is one common feature: individuals have found their own ways of dealing with data security and privacy. This is also compatible with trend 1 on the infeasibility of the single-point-of-contact principle, which emphasises the individualism present in the view presented by Gartner.

3.10 Conclusions

As has been pointed out before, the scenarios presented show no major role for new and/or disruptive technologies in shaping the future of eGovernment by 2020.

As eGovRTD2020 point out, innovations are expected to play a role in bridging the gap between technology and context. This means to improve and apply current technology in such a way that it can solve a societal or governmental problem. One explanation for this might be that disruptive technology cannot be predicted. Another explanation is that a lot of technology is available and waiting to be deployed on a large scale and only affecting society after being in place.

Participants in the eGovRTD2020 workshops concluded that future eGovernment challenges are expected to come from the changes in the society and in the interaction of government with their environment which are more likely to determine the methods of monitoring, interaction, collaboration, policy making and enforcement. Technology is viewed as an instrument to help solving societal problems. The general view is that society in 2020 will be different from now and that the current struggle with the translation of these technologies into

---

[22] Di Maio, A., Kreizman, G., Harris, R. G., Rust, B, Sood, R., "Government in 2020: Taking the Long View", 2005, http://www.gartner.com/it/products/research/asset_129541_2395.jsp.

government applications will be solved. Thinking in terms of cooperation in communities, solving the privacy problems and ensuring safety and the local focus to stay close to citizens seems to have been the vision of most of the session participants. Sensing, information exchange and processing, and connectivity at a semantic level with other governments, but also with private parties, are also considered key points for the effective functioning of government. As the project concludes:

♦ **"It is expected that breakthroughs in eGovernment will not occur because of a specific application or disruptive technology, but primarily due to the deployment of technology in governments interacting with their constituencies."**

4 Conclusions

IST research in FP6 has addressed the future of eGovernment via two routes: direct pre-dictions on what eGovernment is to achieve by 2020 and environment-dependent courses of possible evolution (scenarios). The first route has given general trends concerning progress in major areas of application, such as eIdentification, interoperability and interactive services, while the second has offered more precise, albeit socio-politically dependent, directions of evolution in all facets of eGovernment: society, inclusion, services and technologies.

What appears to be the "universal" conclusion (i.e. that on which all researchers agree) is that eGovernment in 2020 will be shaped to a lesser extent by technologies and to a greater extent by socioeconomic conditions and successful implementation of appropriate policies. In this respect, technology is viewed as an instrument in solving societal problems. Changes in society and governments-environment interaction are factors which are more likely to shape eGovernment in the future compared to technological developments alone.