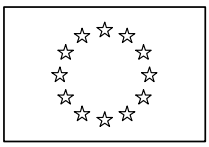

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COMMUNICATION FROM THE COMMISSION

"i2010 – A European Information Society for growth and employment"

EXTENDED IMPACT ASSESSMENT

{COM(2005) 229 final}

Executive Summary

This impact assessment identifies options for policy actions in the field of ICT beyond 2005. It is based upon extensive consultation and empirical evidence. In the context of the renewed Lisbon strategy for European growth and employment, it offers a timely opportunity to assess information society initiatives to follow the current eEurope Action Plan which comes to an end in 2005. This Extended Impact Assessment is presented as a supporting document to a forthcoming Communication which will take into account the following assessment and go one step further to deliver the policy strategy for the next five years.

Information and communication technologies (ICT) now penetrate all parts of society. They bring efficiency benefits to businesses and organisations, and new lifestyle options to individuals. Recent economic evidence confirms that ICT drive growth and improve competitiveness. However, the EU is not fully exploiting the opportunities offered by these technologies and is still behind its major competitors both in terms of investment and use.[1] These technologies have the potential to move the EU to a higher growth path and thereby achieve the growth and jobs objectives of the revised Lisbon strategy[2]. To realise this potential, the EU needs a comprehensive policy approach.

The new Information Society policy initiative is to be designed to respond to this need. It should aim to ensure that Europe gets the full benefits in terms of prosperity, jobs and growth. It should provide a consistent approach to information society and media policies in the EU covering regulation, research and deployment; it should also be comprehensive, covering a wide range of public policies from promotion of innovation to new forms of governance, security or innovative services of public interest. It should look for immediate and visible results in the context of a coherent long-run strategy that promotes inclusion and cultural diversity.

The key message of the recently adopted "Spring Report"[3] is that, despite important progress in several areas, the EU is some way behind the targets set in the Lisbon agenda. The Commission proposes to revitalise the Lisbon strategy by introducing changes around three central concepts: give the EU's actions more focus, establish broad ownership of the Lisbon goals, and improve governance. The EU should concentrate on its most urgent priorities, e.g. growth and employment. While sustainable development remains the overall goal of EU policies, the new Lisbon strategy will concentrate on the economic pillar. More specifically, the Commission proposes three key areas for policy action: i) make the EU a more attractive place for investment and work, ii) invest in knowledge and innovation, and iii) create better employment.

The Spring Report acknowledges the contribution of ICT to productivity and innovation, and therefore, to growth, but it recalls that the EU is underperforming in this domain. It recommends i) increasing investment in and furthering the use of ICT, ii) taking actions in specific areas, such as ICT research and development, e-Government, broadband and rural development, and iii) proposing various policy measures where ICT has a role to play, e.g. workers' adaptability and skills for the knowledge society.

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1 See "The EU Economy: 2003 Review", COM(2003) 729.

2 Working together for growth and jobs. A new start for the Lisbon Strategy, COM(2005) 24

3 "Working together for growth and jobs. A new start for the Lisbon Strategy" COM(2005) 24

At the Spring Council in March 2005, Member States deemed that it is essential to build a fully inclusive Information Society, based on widespread use of information and communication technologies (ICT) in public services, SMEs and households. To that end, the new initiative for the next five years should focus on ICT research and innovation, content industry development, security of networks and information, as well as convergence and interoperability in order to establish a seamless information area.

The European innovation performance, crucially, is dependent on strengthening investment and the use of new technologies, particularly ICT, by both the private and public sectors. Information and Communication technologies provide the backbone for the knowledge economy. They account for around half of the productivity growth in modern economies. However, investment in ICT in Europe has been lower and later than in the United States, especially in service sectors such as transport, retail or financial services.

The Information Society has become a reality in the European Union. The regular EU benchmarking exercises reveal the huge deployment of ICT amongst individuals, households and businesses. Below are some key figures[4] for 2004:

- 83% of the population of the EU25 is the average GSM penetration rate;
- 43% of households of the EU25 is the average for internet access;
- 89 % of all enterprises in the EU 25 countries have an internet access;
- 87 % of large enterprises in the EU25 (250 + employees), 71 % of medium sized enterprises (50-294), and 52% of small firms have broadband Internet access;
- 85% of the EU15 population has broadband coverage via DSL, the dominant platform in Europe;
- 8.6 % of the EU25 population have broadband internet access; and
- 40 % of all basic public services are available online with full interactivity in the EU 25 countries.

The further the progress of the Information Society, the scope of issues to be handled by the public authorities is steadily increasing. For instance, the main focus of *e*Europe is economic and social. Although not currently within the scope of *e*Europe, ICT also has the capacity to contribute to sustainable development. Therefore, an overall picture is more and more difficult to elaborate. This document does not aim to be totally comprehensive but aims to identify the main challenges and improvements or adaptations to be made for the next five years.

Rationale for a new policy initiative

The need for a new initiative is driven by three factors that call for a reassessment of the objectives:

4 Sources: European Commission (10th Implementation Report, Draft Benchmarking Report to be published in September 2005 and studies by CapGemini and IDATE)

- New challenges: Information Society is moving from a "pilot phase" to a "wide deployment" as the ICT world becomes more mature and global. Since 2000, the ICT context has changed radically, not only from a technological point of view (e.g. 3G, Ipv6, nanotechnologies, convergence, a new generation of computers, ambient intelligent scenarios…) but also for economic players: for instance, with the entrance into a major deployment phase, after the burst of the Internet bubble, better internal market regulation, and the development of public-private partnerships.

- The forthcoming closure of the eEurope 2005 Action Plan: the current Action Plan will finish at the end of 2005. Following from this, a natural expectation arises to discuss the future of an Information Society (IS) policy initiative at EU level.

- The revision of the Lisbon Strategy: The last year of eEurope 2005 coincides with the mid-term review of the Lisbon Agenda. The focus on ICT in the renewed Lisbon vision is based on the recognition of their pivotal role of Knowledge and Innovation. What is needed now is a comprehensive and holistic strategy. The integrated guidelines are providing guidance to the Member States on how to translate these new priorities in the field of information society in their National Reform Programmes. At the same time the Commission has identified key EU level actions which will contribute to the overall information society objectives within Lisbon.

Main challenges for the next five years

Preparatory work for the new initiative was undertaken in three steps described in the section below on the consultation process. Member States have mentioned new expectations for the future and by doing so, given ideas for a new approach: the follow-up of eEurope should be an umbrella for all the Information Society activities; any new Information Society Strategy should be made more visible, more interesting, more relevant and more understandable to people.

In addition to these orientations, the Member States consultation stressed the need for a strategic dimension for any further EU initiative in the field of ICT. The Member States emphasised the support that the EU provides to ensure national IS policies remain high on the political agenda. This also influences national policy-makers in the allocation of resources to deliver Information Society objectives. The contributions highlight the role of catalyst of EU initiatives by creating common targets which help to prioritise and align national activities with those implemented at EU level. Some Member States clearly indicate that their current national policy for Information Society is based on the *e*Europe initiative.

The public consultation on a new policy initiative gave an indication about main developments that public authorities will have to take into account, by identifying "Mega-trends" in political, economic, social, and environmental areas which will constitute the environment of the future Information Society.

Domains	**Mega-Trends**
Political	An enlarged Union
Economic	The global economy/Employment
Social	The ageing population

Environmental and Quality of life	Health Protection / Energy efficiency

All these mega-trends will impact on the Information Society environment and will influence the definition of further objectives within a new policy framework at EU level. In any case, Information Society and Media policies have to face a few top challenges: to progress in an enlarged Union, to act as a global player in a global economy, to address the specific demographic trends of Europe (e.g. ageing population) and to win the investment competition, as well as to take its large part of the Lisbon challenge. Information Society challenges cover a wide range of issues: development of network and electronic services, adoption of ICT by businesses, to increase competitiveness, inclusion aspects and development of public electronic services. The stakeholders' consultations helped to identify key challenges to build up a relevant policy initiative and this section reflects the debate which took place in the preparatory phase but not necessarily the positions of the Commission services.

Growth and Competitiveness: ICT is a driver for productivity. The gains from ICT stem directly from investment in ICT, a fast growing and innovative ICT sector, and indirectly from improvements in business processes through wider use of these technologies across the economy. According to recent studies[5], the overall contribution to labour productivity growth from ICT investments and from technical progress in the production of ICT goods and services, accounted for about 40% of EU labour productivity growth over the second half of the 1990s, compared with 60% in the US.

The ICT sector, as a whole, performs fairly well in comparison with the US in terms of size (10% of GDP in the US against 8% in the EU, and also in productivity and employment creation), but less so in terms of contribution to R&D (in the US, ICT account for 30% of R&D). However, in these developments the EU has suffered from lower and delayed investments in ICT and, possibly, a less efficient use of ICT.

Convergence: Convergence of technologies, infrastructure and applications is expected to provide consumers with an access to a great diversity of attractive services and rich media and content on a wide range of devices.[6] Availability of content and services is becoming critical as the market moves to a phase where value-added services and content are key to revenue growth. The policy focus for 2010 should be the creation of a favourable environment that stimulates the competitive deployment of new converging services.

Broadband networks: Broadband now reaches 85% of the population in EU15, take–up grew by 75% in the past year and there are now around 40 million subscribers or

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5 The EU Economy: 2003 review from Directorate General for Economic and Financial Affairs – European Commission

6 In this document, the following definitions apply:
- "electronic communication services" as defined in the Directive 2002/21/EC of 7 March 2002 on a common regulatory framework for electronic communications networks and services (Framework Directive).
- "Information society services" as defined in the Directive 2000/31/EC of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market (Directive on electronic commerce).
- references to the media refer exclusively to audiovisual media.

approximately 9% of the EU25 population. This has produced a critical mass and there is already evidence that markets for high-quality content and service development are taking off. However, speeds are often still limited to enable the transmission of bandwidth-hungry applications. The review of the regulatory framework for electronic communications will start in 2006. The framework should stimulate incentives to invest and roll-out new services with increased capabilities while ensuring that competitive forces remain effective. Furthermore, new developments in wireless broadband have made spectrum availability crucial to new services and applications, and the efficient management of spectrum key to further broadband developments. Finally, the enhancement of interoperability and security are essential to and increase consumers' choice and facilitate take-up.

Contents and information society services: Convergence is creating a promising range of opportunities for the development of content and information society services making the most of ICT. The challenge for the single information space is to create the appropriate environment that will meet both business and consumer expectations while promoting the European content industry. This requires a competitive environment, where interoperability allows cross-platform competition and usage. This also requires a clear European regulatory framework with respect to content regulation and a secure environment for the distribution of digital content. Ensuring consumer acceptance pass by offering access to a great variety of flexible content and services adapted to user needs. Improving security and privacy as well as minor protection and media literacy, will allow European citizens to benefit fully form these n content and services.

Trust and security: One of the biggest challenges is to ensure the improved security of the underlying infrastructure, particularly the internet, but also other communication networks, mobile wireless and future generations. The problem is complex since the origin of the intrusions/attacks knows no geographical boundaries, attacks often exceeds the defence tools (security features deriving from regulatory obligations, anti-virus detectors, filters and firewalls) that we have at our disposal for protection and prosecution (law enforcement). The scale of these abuses will increase with further penetration of broadband and the growth of wireless Internet. Urgent action is, therefore, necessary and should combine all forces in a co-ordinated effort to develop policies and regulations, technology, education and awareness. Another key challenge is improving business and citizen confidence in using electronic services by providing a secure environment, greater awareness of potential risks and favourable environment for public services, citizens and business. Security is a key enabler for the deployment of the next generation of electronic services, and is a pre-requisite for privacy. This calls for a strong partnership with Member States and an integrated approach at EU level involving actions across research, deployment and regulation.

Innovation and research: If Europe wishes to catch-up with the levels of productivity growth of other regions of the world, it should strengthen innovation and concentrate these efforts in those sectors, like the ICT, where the value added is the highest. A pre-requisite is to increase investment in research: at present the EU devotes only 18% of research expenditure to ICT whereas the leading OECD countries allocate more than 30%. In absolute amounts, Europe's investment in ICT research is only two thirds of that of Japan and one third of that seen in the USA. Research and development is making technology simpler to use, more available and affordable; providing new ICT-based solutions that are trusted, reliable, and adaptable to users' contexts and preferences. However, research alone is not sufficient. It must be consolidated by organisational innovation. ICT must be widely adopted and supported by adequate reorganisation of business processes and by a skilled workforce. Businesses in the EU are increasingly adopting advanced ICT and are engaging in on-line

transactions but are lagging behind in the adoption of integrated business applications. This is particularly true for European SMEs.

Standardisation: Standardisation is a prerequisite for the use of ICT, and will generate and enable new business. ICT technologies are pervasive; all industries are ICT users. Industry and business want standards and standardisation infrastructures to offer timely solution driven standards. The standardisation process should be flexible and able to evolve quickly in response to market requirements. There are two different models within the IT sector**:** infrastructure standardisation; this sector is characterised by long term solutions and large investments, and the IT business: this sector is characterised by short term development, a fragmented market with aggressive competitors. The lack of interoperability between systems/applications and services will prevent emergence of e-services and undermine the possibility of a long term competitive market. The shift from hardware to software and the convergence between telecommunications and IT will create new forms of standardisation. Projects such as COPRAS should be further promoted.

Skills and work: The development of the ICT sector and the wide-spread diffusion and use of ICT in the economy and in the society bring opportunities for new employment and more creative and fulfilling jobs. Changing needs for ICT and e-Business skills (e-Skills) in the future heavily depend on innovation and the introduction of new technologies. The greatest challenge is to assess forward-looking innovations and understand what new skills will be needed, to be able to anticipate and manage changes and be effective, quick and efficient in creating new, innovative jobs.

e-Business: Though nearly all enterprises are connected to the internet, a large section of the business community is only beginning to exploit the potential of ICT. E-commerce is expected to continue to grow rapidly. More efforts are needed to improve business processes in European enterprises and fully integrate ICT providing new opportunities to reduce their costs and improve performance. Factors which will contribute to increase e-Business include promotion of take-up of e-business solutions and best practices security, addressing privacy and security concerns, availability of content and new services, increase automation of business processes, acceptance of payment for content and services, e-invoicing and e-procurement.

Public services: Public services are at the heart of the European social model, playing a key role in growth, innovation and cohesion. There is increasing evidence that a better exploitation of ICT through combined improvement of facilities, working processes and skills can significantly enhance public service's organisation provision. However, the potential remains unfulfilled due to technical, legal or organisational obstacles. For example, government services are widely available online but the demand is not sufficient and efficiency gains from back-office reorganisation are still largely underexploited. Specific challenges relate to friendly user-centric services, back-office streamlining, interoperability of key infrastructures and facilities, identity management, or privacy and trust.

e-Inclusion: Increasing impact of ICT on social inclusion and participation creates new opportunities but also barriers. Significant progress on ICT penetration across all EU regions and socio-demographic groups is not always decreasing disparities. Some specific challenges concern accessibility of ICT equipment and user-friendly interfaces, digital literacy or improved confidence and support for ICT use. Some important concerns will be: "design for all" of ICT equipment; human mediation and support for e-services; intuitive use of

affordable value-added e-content and services accessible; and efficient solutions for threats to privacy, security and harmful content threats.

Quality of life and environment: ICT can have a direct impact on the environment but also indirect social and economic consequences as a result of its application. ICT positive impact on the environment includes environmental modelling (forecasting), the miniaturisation of devices (which reduces the resources needed for manufacture and distribution), micro/nano technology and embedded systems which improve disaster management, and reduce the environmental impact of farming and fishing. ICT also enables a less resource-intensive production, thereby reducing the environmental impact of economic activities. e-Work contributes to environmental sustainability as travelling to work is reduced. Innovative transport planning systems can ease traffic congestion and optimise transport capacity. ICT can also contribute to quality of life by delivering more efficient and more effective public services and goods to individuals which in turn can improve their life chances. ICT support for comprehensive life-long learning policies (through e-learning, digital competence actions) can enable all individuals to adapt and keep the pace with the continuous social, economic and technological changes.

Objectives of the proposal

Putting all these reflections together has provided a strong orientation for policy-makers in order to build on the new trend of technological and economic developments, and to ensure that Europe gets the full benefits in terms of prosperity, employment and growth. Following on from the analysis of the issue and the needs in the previous section, the main objectives of a new strategy could be summarised around four policy priorities, which are:

- to promote a single European information space, with the aim of progressing towards an internal market to secure electronic communications and on-line services;

- to stimulate innovation or investment in research, development and deployment of ICT, by encouraging, in particular, the take up of ICT by business;

- to make the European Information Society as inclusive and participative as possible, to promote trust and confidence, and to enhance services of public interest and quality of life; and

- to contribute to the new start of the Lisbon Strategy by making Europe attractive to investment and innovation in knowledge-based goods and services.

To that effect, a new strategy should be designed as an umbrella initiative for EU information society and media policies. It should, however, not be intended as an initiative that tries to cover the enormous plethora of ongoing activities. It would try to drive the development of ICT in Europe through focused actions. Therefore, its structure should combine the three main priorities with actions for the period 2006-2010. These actions are to be defined by the Member States and the European Commission, and should be revised during the period if needed.

A single European information space

The single European information space requires an appropriate and predictable legal environment for converging markets. The current EU regulatory framework for electronic

communication services stimulates competition and encourages investment in the emerging on-line service economy. It is essential that it be transposed into national law and implemented effectively. The regulations should be reviewed to keep pace with new technological and market developments. In particular, with more advanced networks, it is essential to keep a balance between incentives to invest and roll-out new services, and effective competitive forces. New developments in wireless broadband have made spectrum availability crucial to the development of services and applications and efficient management of spectrum is key to further broadband developments. Legislation on audio-visual services, content and public sector information may need to extend to the on-line world.

New policies may prove necessary to facilitate the accessibility, use, reuse and creation of high quality online content. This may include issues such as management of rights, payments, interoperability and consumer protection. Policies may be needed to facilitate access, development and preservation of European digital content, including material in the public domain, to strengthen the single market and to preserve Europe's cultural diversity.

Convergence also raises issues of interoperability. Interoperable solutions at the levels of networks, devices and services facilitate the development of innovative applications that can be delivered on all platforms and increase consumers' choice. It should be intended to further support the development of open standards and facilitate discussions among stakeholders in this area.

Further improvement of network security and service reliability is essential to foster users' acceptance and confidence. Action is needed at the level of network dependability and with regard to the security of individual usage. Any proposals need to be carried out in cooperation with all stakeholders at Member State level as well as EU level. They should address Internet threats, and Critical Information Infrastructure protection, and should consider the interaction between legal, technological and societal issues.

The objective of the single European information space should be to offer affordable and secure high bandwidth communications, rich and diverse content and digital services.

Innovation and investment in research

The 6th and 7th Framework Programmes for RTD are key financial instruments for EU information society policies. For the forthcoming 7th Framework Programme on Research and Technological Development (RTD), the Commission has proposed to double the amount of Community research funds up to € 67.8 bn and, as in the current 6th Framework Programme, ICT research receives the largest share (€ 11.2 bn).

The Framework Programmes influence research in the EU in many ways. Collaborative research projects and networks and the development of pan-European research infrastructures make the EU more attractive for private investment; they strengthen the excellence of its research poles and their capabilities. The Commission has set up pilot technology platforms to facilitate the development of public-private partnerships. In addition, the EU has an important role in directing public research spending towards productivity-enhancing technologies.

A simultaneous increase in the engagement of Member States through national ICT research-related programmes is equally important. The Commission can facilitate further the

coordination of Member States strategies and efforts in ICT research, including development of joint initiatives. Moreover, EU policies play a key role in developing a favourable environment for research and innovation, for instance through standardisation, competition, intellectual property and cohesion policies.

The Commission, wishing also to strengthen the link between research and deployment initiatives, has proposed the creation of an ICT policy support programme.[7] This is intended to facilitate the development of common approaches, interoperable solutions and co-ordinated actions for the wider adoption and best use of ICT across the Union. Wide-scale pilot projects should prove the feasibility and the benefits of ICT solutions, and can be a widely applied to help a faster and more efficient roll-out of innovative services for businesses and citizens.

Innovation in business strategy is important. Adoption of ICT by businesses of all sizes can increase efficiency and streamline internal business processes, open up new markets, create new business models and facilitate collaboration with other organisations. This is currently hindered by lack of interoperability of enterprise applications and business processes. The analysis of the impact of ICT use shows that the best results are obtained by a combination of reorganisation of the processes, investment in ICT skills, collaborative working methods, organisational design, mobile applications and new workplace concepts.

The objective of innovation and investment in research should be to achieve world class performance in research and innovation in ICTs by closing the gap with Europe's leading competitors.

Inclusion, better public services and quality of life

The societal impact of ICT is growing in parallel to their increasing availability and use. This challenges public policy in three main areas: social inclusion and participation; the way in which public services are organised and delivered; and the quality of the living and working environment.

There is wide political consensus on the potential of ICT as a driver of welfare for society at large, beyond their direct economic impact. Recent consultations with Member States and the public set a priority for this dimension to be reinforced. Therefore, the new policy initiative should introduce a comprehensive policy approach that:

- provides a strategic policy framework for all EU initiatives affecting electronic inclusion and participation;

Actions would address issues such as accessibility of ICT equipment and user-friendly interfaces, digital literacy or improved confidence and support for ICT use. Some important concerns will be: "design for all" of ICT equipment; human mediation and support for e-services; intuitive use of affordable value-added e-content and services; and efficient solutions for threats to privacy, security and harmful content.

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[7] The ICT policy support programme is a specific programme of the Commission Framework Programme for Competitiveness and Innovation, adopted by the European Commission on 6 April 2005.

- further develops EU initiatives on electronic public services established under the *e*Europe action plans;

Actions would seek to strengthen a common EU area where ICT-enabled public services, at European and other levels, stimulate free and secure circulation of people, services and products across internal borders. In addition, they would address operational issues relating to interoperability aspects, key infrastructures and facilities, identity management and privacy protection, open access to information and inclusive services, and other areas where European co-ordination is particularly relevant to develop horizontal solutions that can be replicated in different sectors and local contexts.

- introduces a new priority on ICT and quality of life, with the double aim of raising the profile of existing initiatives and providing a platform for addressing emerging challenges.

Actions would focus on ICT contribution to different areas, including demographic challenges associated with ageing or migration, the improved and safer mobility of people and goods, or ways to better monitor the environment and manage natural disasters.

As ICT use becomes commonplace, policy should become more ambitious: enabling full participation of everyone through appropriate access to relevant ICT facilities and competences. This will generate broad socio-economic and cultural benefits, e.g. boosting commercial and public services online, stimulating new patterns of exchange, active contribution and knowledge creation by the largest number of people.

The objective of this priority should be to build up an Information Society that is inclusive, provides high quality public services and promotes quality of life.

These policy objectives could be supported by several Community instruments: legislation, financial support and communication. It will also be necessary that Member States, the private sector and other stakeholders support the new initiative. Nevertheless, there could be an important role for the public sector to act as driver and enabler, even to act as a catalyst, according to the objective.

Options

Three broad options for the new initiative beyond 2005 can be discerned:

- Option 1: No further Action Plan and a return to separate but parallel IS policy strands
- Option 2: A continuation of the eEurope Action Plan as in 2000-2005
- Option 3: A new and more flexible policy framework, an umbrella approach covering research, regulatory, deployment and policy

The main guide to identifying and selecting options for the new initiative are, the need for:

- Relevance: in particular with respect to the renewed Lisbon Agenda;
- A clear focus: through the three policy priorities;

- Major changes: taking into account such as the move from a "pilot phase" to a "wide deployment" as the ICT world becomes more mature and global, the emphasis on convergence, public services and quality of life, and new ways to implement;

- Impact: covering the whole of EU Information Society and Media policies (Regulation, Research and Deployment) involves a wider range of instruments beyond the traditional tools of the Open Method of Co-ordination. Partnership between all players is a key issue for better efficiency, creativity and visibility of achievements. To complement this, benchmarking aims to provide a picture of the progress towards these commonly agreed targets. This analysis should seek ways to increase the performance of these tools in meeting the goals identified.

- Respecting subsidiarity.

Impacts

The Impact assessment will focus on the priority areas, and then use some illustrations to validate its conclusions. For each option (no Action Plan, Another Action Plan, and a new policy framework), it will be examined what needs to be done to carry out the actions outline in each cluster of policy priorities (*mechanisms*), what economic, social, and environmental sustainability impacts, these actions will generate (*impacts*). Also, there is the opportunity that something could go horribly wrong or unexpectedly right, as well as remain unpredictable. (*risks and uncertainties*).

Impacts of various domains to be addressed in the next five years, according to each option proposed, are presented in detail in the body of the Impact Assessment.

Domains	Option 1: No EU initiative	Option 2: An Action Plan	Option 3: A new policy framework
Convergence	A serious risk not to be addressed by EU policy	Lack of flexibility to fully address the convergence challenge	A cross-sectoral approach, promoting a dynamic and competitive ICT and Media sector
Security	Diverse national security strategies	Maintaining status quo, better linked with the ENISA work programme	Increased focus on a coherent security strategy for the European Union
Public services	Continuation of eHealth and eGov action plans and specific new initiatives such as public procurement	Reinforce co-operation between Member States	Take a more proactive approach, building on achievements in eGov and eHealth
Inclusion	No political promotion of inclusion issues in the information society – eInclusion limited to eAccessibility	Status quo with a risk of lack of specific targets	A comprehensive framework for monitoring and stimulating inclusion and participation
Innovations and research in ICT	Separate programmes	A tighter link to the ICT support fund	Enhanced synergies of Programmes

The consultation process

The preparation of a new policy initiative was based on an extensive reflection process, particularly by allowing all stakeholders to express their views. In fact, the evaluation was organised around a consultation which took place between May 2004 and March 2005. The different steps followed to collect all views, provided clear orientations to policy-makers, not only by identifying policy priorities, but also by justifying some targeted improvements in areas where significant gains might be expected in the short term.

The consultation for the preparation of a new strategy took place through three main steps. The first step was launched during the second half of 2004 on the basis of the outcomes from the eEurope 2005 mid-term review[8], which provided some valuable inputs to improve policy guidance and to launch new actions. The period focused on thematic goals, through the Dutch

8 "eEurope 2005 Action Plan: An update" COM(2004)380

presidency study "Rethinking the European ICT Agenda", carried out by Price Waterhouse Coopers[9], which was presented and discussed among Member States during the Dutch High Level conference in Amsterdam on 29 and 30 September 2004. This first orientation was completed by the work done by the Expert Section of the eEurope Advisory Group[10] on the post-eEurope strategy, delivered in October 2004.

All these reflections were compiled and developed by the European Commission in a Commission Communication "Challenges for the European Information Society beyond 2005", adopted in November 2004. In its communication, the Commission identified a number of issues that will require the attention of policy makers during the coming years. These issues were put to the test through two consultations launched in parallel both with Member States and stakeholders, between November 2004 and February 2005. The public on-line consultation was launched on 30 November and received 70 contributions. These contributions unanimously covered the three traditional components of our society: public sector, private sector, and civil society. This situation provides a valuable support to the validity and relevance of this consultation, and can, therefore, be considered as a success[11]. Moreover, with 21 responses, the questionnaire to the Member States provided a good view of their expectations on the main issues, and the implementation approach for a new strategy.

Those views were confirmed and fine-tuned through meetings with the Member States. The Challenges Communication was discussed at the December 2004 Telecom Council, and the Council Resolution invited the Commission to prepare the follow-up of the eEurope 2005 Action Plan. Formal discussions were also undertaken with government representatives within the eEurope Advisory Group, during meetings on 22 October 2004 and 22 February 2005. At the last meeting, the draft benchmarking report[12] gave additional input to the discussion. A number of key conclusions emerged from the consultation process and these provided the main direction of the orientations proposed in the Communication.

Monitoring and evaluation

Monitoring and evaluation are conceived at two levels. At a 'meta' level, the effectiveness of a new strategy depends upon regular evaluation of its overall performance in relation to objectives, impacts, relevance, utility and lessons learned. However, a continuous monitoring of progress is needed to stimulate informed action towards meeting agreed targets. Monitoring is effected principally through measuring performance in relation to benchmarking and exchange of best practices, and is supported by a range of statistical surveys, studies and other empirical analyses. Clearly both levels are inter-linked. The following section sets out the activities being conducted or planned for each of these two levels of evaluation.

Regular evaluation of the whole initiative would be an essential component of its effective delivery. To that effect, it is proposed to draw up regular progress reports that are supported by benchmarking to measure progress and to identify new priority areas for the following

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9 "Re-thinking the European ICT Agenda", PWC, August 2004

10 "The next five years in Information Society", eEurope Advisory Group, The Expert Section, October 2004 – Available at: http://europa.eu.int/information_society/eeurope/2005/all_about/advisory_group/documents/index_en.htm

11 The public consultation report is available on the European Commission web-site: http://europa.eu.int/information_society/eeurope/2005/all_about/2010_challenges/index_en.htm

12 To be published in September 2005

period. Actions could be revised regularly to ensure flexibility in view of new developments and new initiatives launched by the European Commission, or to take account of developments and progress reported in the context of the new Lisbon governance cycle

In that context, benchmarking activities are likely to be needed to monitor progress, to assess the relevance of the implementation process followed, and to encourage Member States to make more efforts to achieve goals. To that effect, the benchmarking exercise would have to follow the move suggested by a new policy framework and to become more impact-oriented. Amongst the general principles that would lead the new initiative, the move from connectivity to impact may be a major one. Progress with connectivity has been rapid and the policy priority has switched to usage of ICT and their impact on businesses, governments and citizens. In addition, it is important for benchmarking to show market developments and these are not easy to identify from fixed indicators. A core policy aim would be to promote advanced services, and benchmarking should then include a mechanism to identify and monitor market developments. Current examples would be the growth of Voice over IP, or music and film download services. Benchmarking should also show the availability of underlying technology that is in principle capable of supporting future services and markets.

Conclusion

It is proposed that the follow up to the eEurope 2005 Action Plan should be to adopt a new policy framework (Option 3) for the development of a new ICT strategy, providing a combination of focused policy development, and a communications layer to increase the visibility and impact of actions:

- The following main policy clusters are proposed as the basis of the new ICT strategy: (i) information space, (ii) innovation and investment in research, and (iii) inclusion, public services and quality of life;

- These main policy priorities could be associated with several objectives for the medium-term (2010). Priority actions and targets can be reviewed regularly to ensure flexibility to adapt to changing requirements;

- The objectives would consolidate ongoing or planned policy initiatives (broadband, e-Business, e-Government, e-Learning…). These sectoral policy initiatives would continue;

- The idea would be to select some of those sector-specific targets and actions, in order to provide further political support and/or visibility; and

- Such support and visibility could come through a range of EU instruments, i.e. political, legal, and financial instruments, as well as co-ordination and communication mechanisms.

The proposed line to take is the option most consistent with the message from the different consultations, particularly to make more explicit the contribution of ICT to the Lisbon Strategy. In the consultation and at the eEurope Advisory Group meeting in February 2005, Member States agreed with this new policy approach.

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1. INTRODUCTION

The subject of this extended impact assessment is the ex-ante evaluation of the new European Information Society policy initiative, which will follow the *e*Europe 2005 Action Plan[13].

*e*Europe 2005 is the successor of the *e*Europe 2002 Action Plan, which was launched in June 2000 to support the Lisbon Strategy, to make the European Union the most competitive and dynamic knowledge-based economy in the world by 2010. A parallel initiative, *e*Europe+ 2003, was adopted by the Acceding and Candidate Countries with the encouragement of the European Council. Then in 2002, building on the success of the first action plan[14] in meeting most of its 65 targets, the *e*Europe 2005 Action Plan was launched.

Whereas the 2002 Action Plan targeted Internet connectivity, *e*Europe 2005 aimed to support economic growth and social cohesion through the take up of on-line services and e-business based on a secure broadband infrastructure.

*e*Europe is intended to act as a catalyst for actions within Member States. It is based upon the Open Method of Co-ordination (OMC) in which the benchmarking of targets agreed by Member States and exchanges of good practice form the key supports for policy delivery. As such, *e*Europe is of itself an evaluative activity providing an informed and consultative basis for action.

Five years after the launch of the '*e*Europe initiative' (in March 2000 at the European Council in Lisbon), there is evidence that Europe could better exploit the advantages that information and communication technologies (ICT) have to offer, to encourage ICT deployment to the maximum.

This impact assessment document identifies options for policy initiatives in the field of ICT beyond 2005 as a basis for a new strategy for the next five years, which is a product of the lessons drawn from *e*Europe. It is based upon extensive consultation and empirical evidence. The need for a new initiative is driven by three factors that call for a reassessment of the objectives:

- **New challenges:** Information Society is moving from a "pilot phase" to a "wide deployment" as the ICT world becomes more mature and global. Since 2000, the ICT context has changed substantially, not only from a technological point of view (e.g. 3G, Ipv6, nanotechnologies, convergence, a new generation of computers, ambient intelligent scenarios…) but also for economic players (for instance, with the entrance into a major deployment phase, after the burst of the Internet bubble, better internal market regulation, and the development of public-private partnerships).

- **The forthcoming closure of the eEurope 2005 Action Plan:** the current Action Plan will finish at the end of 2005. Following from this, a natural expectation arise to discuss the future of an Information Society (IS) policy initiative at the EU level.

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13 "eEurope 2005: an Information Society for All" COM(2002)263

14 "eEurope 2002 Final Report" COM(2003)66 and "eEurope 2002: Progress made in Achieving the Targets" SEC(2003)407

- **The revision of the Lisbon Strategy:** The last year of eEurope 2005 coincides with the mid-term review of the Lisbon Agenda. The Report from the High Level Group chaired by W. Kok makes a strong recommendation for Europe to reap the full benefits of ICT: *"In order to ensure future economic growth, the EU needs a comprehensive and holistic strategy to spur on the growth of the ICT sector and the diffusion of ICT in all parts of the economy"* [15]. The focus on ICT in the renewed Lisbon Agenda is based on the recognition of the pivotal role of Knowledge and Innovation.

This evaluation was undertaken in three steps. During the second half of 2004, there was an extensive reflection process launched on the basis of the outcome from the eEurope 2005 mid-term review[16]. Information Society policy post-*e*Europe 2005 has to consider both thematic goals and delivery mechanisms. Work started mid-2004 on the thematic question, through the Dutch presidency study carried out by Price Waterhouse Coopers[17], the Dutch High Level conference in Amsterdam on 29 and 30 September 2004 and, in parallel, through the work of the *e*Europe Advisory Group[18].

In November 2004, the European Commission published a Communication on the challenges to be addressed by a European Information Society strategy up to 2010[19]. This Communication highlights the need to increase research and investment in information and communication technologies, and to promote their take-up throughout both public and private sectors. The adoption of the Challenges Communication gave the opportunity to go one step further by consulting stakeholders more directly. The results of these consultations highlight the changes expected for a new strategy and provide a valuable contribution to its definition[20].

The Challenges Communication was discussed at the December Telecom Council and the Council Resolution invited the Commission to prepare the follow-up of the eEurope 2005 Action Plan. This present Extended Impact Assessment provides a further opportunity to deepen analysis on options for policy approaches, and is presented here as a supporting document to the Communication 'i2010 – A European Information Society for growth and employment'.

This document is organised in the following manner. Section 2 explains the rationale for a new initiative, and provides an overview of the main issues and obstacles that a new initiative would aim to address. Section 3 examines the objectives which are set up to overcome problems. Section 4 summarises the main options. These are: (i) no further EU initiative, (ii) another action plan as in 2000 – 2005, and (iii) a new policy framework. Sections 5 and 6 provide justification for the selection of the options in relation to their potential impacts on policy priorities and implementation mechanisms. Section 7 gives more details of the extensive consultation process. Section 8 outlines the procedures for monitoring, follow-up

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15 "Facing the Challenge - The Lisbon strategy for growth and employment" Report from the High Level Group chaired by Wim Kok, November 2004, p. 22.

16 "eEurope 2005 Action Plan: An update" COM(2004)380

17 "Re-thinking the European ICT Agenda", PWC, August 2004

18 "The next five years in Information Society", eEurope Advisory Group, The Expert Section, October 2004 – Available at: http://europa.eu.int/information_society/eeurope/2005/all_about/advisory_group/documents/index_en.htm

19 "Challenges for Europe's Information Society beyond 2005: Starting point for a new EU strategy" COM(2004)757

20 The public consultation report is available on the European Commission web-site: http://europa.eu.int/information_society/eeurope/2005/all_about/2010_challenges/index_en.htm

and evaluation. Section 9 gives a short summary and justification of the overall package of options proposed. Finally, an annex 1 provides an indicative list for actions. An annex 2 proposes an electronic glossary of the technical terms mentioned in the document.

2. THE RATIONALE FOR A NEW POLICY INITIATIVE

The Information Society has great potential to improve both productivity and the quality of life in Europe. It makes it possible to increase productivity and as a result, the growth, employment, cohesion and sustainable development. ICT will also provide citizens with more convenient access to information and communication tools.

The Information Society has become a reality in the European Union. The regular EU benchmarking exercises reveal the huge deployment of ICT amongst individuals, households and businesses. Below are some key figures[21] for 2004:

- 83% of the population of the EU25 is the average GSM penetration rate;
- 43% of households of the EU25 is the average for internet access;
- 89 % of all enterprises in the EU 25 countries have an internet access;
- 87 % of large enterprises in the EU25 (250 + employees), 71 % of medium sized enterprises (50-294), and 52% of small firms have broadband Internet access;
- 85% of the EU15 population has broadband coverage via DSL, the dominant platform in Europe;
- 8.6 % of the EU25 population have broadband internet access; and
- 40 % of all basic public services are available online with full interactivity in the EU 25 countries.

The further the progress of the Information Society, the scope of issues to be handled by the public authorities is steadily increasing. For instance, the main focus of *e*Europe is economic and social. Although not currently within the scope of *e*Europe, ICT also has the capacity to contribute to sustainable development. Therefore, an overall picture is more and more difficult to elaborate. This section does not aim to be totally comprehensive but aims to identify the main challenges and improvements or adaptations to be made for the next five years.

2.1. *e*Europe 2005 Action Plan coming to an end

As the current Action Plan finishes at the end of 2005, an expectation to discuss the future of an Information Society policy initiative at EU level arose, particularly because, overall, eEurope has been a success. It stands out as a political initiative. It addressed the right issues at the right time and in so doing, stimulated IS policy debate at national level. There were many imitations, and the *e*Europe label has been widely used as a rationale for IS policy

21 Sources: European Commission (10th Implementation Report, Draft Benchmarking Report to be published in September 2005 and studies by CapGemini and IDATE)

action around the world. It set the Commission agenda as regards IS policy issues. It also provides a good example of the Open Method of Co-ordination in action, with its balance of joint target setting and sharing of information about achievements and ways to achieve. It was, moreover, highly cost effective, given that the level of resources engaged was small compared to the visibility achieved.

However, in the consultation launched to provide input for the preparation of a new strategy, Member States stressed that the targets of the *e*Europe 2005 Action Plan had not yet been achieved in most EU countries. Therefore, there is call for continuity in EU initiatives. Also, all policy initiatives yield lessons from their weak spots. In the case of eEurope, these stem largely from the limitations of a detailed action plan as a policy tool. It is characteristic of an action plan that is short-term, simple in structure, and guided by concrete targets that can be verified. For an action plan, *e*Europe is fast becoming obsolete and some 'eEurope fatigue' is apparent amongst Member States. With the increased attention to demand and impact in *e*Europe 2005 the (mostly supply-side oriented) targets became less adequate and the demand-side targets turn out to be less verifiable. The impact on mainstream policies (including the Lisbon Agenda) has also been 'light', at both national and Community level. This is not surprising as such impacts were not direct goals of the 2005 Action Plan. However, with the increased interest in solutions and impact, the relatively simple and quantifiable targets symptomatic of an Action Plan are more difficult to define.

Beyond that, Member States have mentioned new expectations for the future and by doing so, given ideas for a new approach:

- The follow-up of *e*Europe needs to be an umbrella for the all Information Society activities: the regulatory framework for electronic communications, the audiovisual sector and ICT research, and to ensure the visibility of these activities within the renewed Lisbon framework.

- Information Society issues have been present in the Spring Report of 2004 and 2005. The Kok report has called for a "holistic and comprehensive strategy on ICT".

- The European Union may be at a turning point in the development of the Information Society. Today we are far from exploiting the advantages that these technologies offer, and we are far from having created an environment which encourages ICT deployment to the maximum.

- Any new Information Society Strategy should be made more visible, more interesting, more relevant and understandable to people. There is a need for a communications plan that delivers a simple set of messages on what ICT is doing for Europe that can be easily communicated.

In addition to these orientations, the Member States consultation stressed the need for a strategic dimension for any further EU initiative in the field of ICT. The Member States emphasised the support that the EU provides to ensure national IS policies remain high on the political agenda. This also influences national policy-makers in the allocation of resources to deliver Information Society objectives. The contributions highlight the role of catalyst of EU initiatives by creating common targets which help to prioritise and align national activities with those implemented at EU level. Some Member States clearly indicate that their current national policy for Information Society is based on the *e*Europe initiative.

Member States emphasised the specific role that the European Commission plays in harmonising and strengthening regulations and in checking the correct implementation of regulatory frameworks at national level. In a more general sense, the European Commission has to ensure greater coherence between all ICT domains and other sectors. In addition, a specific role is expected to facilitate cross-border co-ordination.

Finally, Member States welcome an EU role in implementation. They believe that EU initiatives help to better understand ICT issues in general, to concentrate on the main issues and to raise some cross-sector items. Moreover, through the exchange of best practices, raising awareness activities, and dissemination of information, EU initiatives create appropriate guidance for national activities.

These observations indicate the need to rethink the approach for the successor to eEurope. The key issues concern the need to repeat the success of *e*Europe, whilst responding to the new circumstances in which policy attention is increasingly focused on delivering solutions and impact, e.g. better quality and more efficiency, rather than promoting the quantitative supply of ICT services. The successor to eEurope needs to avoid longer term policy programmes (e.g. 5 or 10 year plans) that are likely to be rendered obsolete in the course of a 2-3 year time frame. Furthermore, five years is a long period for the ICT world and could cause a high degree of uncertainty. Consequently, the new initiative would aim at covering the widest scope of potential developments.

2.2. A renewed Lisbon Agenda

The key message of the recently adopted "Spring Report"[22] is that, despite important progress in several areas, the EU is seriously lagging behind the targets set in the Lisbon strategy. The Commission proposes to revitalise the Lisbon strategy by introducing changes around three central concepts: to give the EU's actions more focus, to establish broad ownership of the Lisbon goals, and to improve governance. The EU should concentrate on its most urgent priorities, e.g. growth and employment. While sustainable development remains the overall goal of EU policies, the new Lisbon strategy will concentrate on the economic pillar. More specifically, the Commission proposes three key areas for policy action: i) make the EU a more attractive place for investment and work, ii) invest in knowledge and innovation, and iii) create better employment.

The Spring Report acknowledges the contribution of ICT to productivity and innovation, and therefore, to growth, but it recalls that the EU is underperforming in this domain. It recommends i) increasing investment in and furthering the use of ICT, ii) taking actions in specific areas, such as ICT research and development, e-Government, broadband and rural development, and iii) proposing various policy measures where ICT has a role to play, e.g. workers' adaptability and skills for the knowledge society.

At the Spring Council in March 2005, Member States deemed that it is essential to build a fully inclusive Information Society, based on widespread use of information and communication technologies (ICT) in public services, SMEs and households. To that end, the new initiative for the next five years would focus on ICT research and innovation, content industry development, security of networks and information, as well as convergence and interoperability in order to establish a seamless information area.

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22 "Working together for growth and jobs. A new start for the Lisbon Strategy" COM(2005) 24

The European innovation performance, crucially, is dependent on strengthening investment and the use of new technologies, particularly ICT, by both the private and public sectors. Information and Communication technologies provide the backbone for the knowledge economy. They account for around half of the productivity growth in modern economies. However, European investment in ICT has occurred much later than in the United States, and the expenditure is also much less, especially in service sectors such as transport, retail or financial services.

2.2.1 Growth and competitiveness

A competitive economy is an economy which experiences high and sustained productivity gains leading to an increase in the standard of living. Higher productivity gains in the EU than in the US were a consistent feature of the post world war II period, allowing EU standards of living to converge towards US levels. This favourable trend was reversed in the mid-1990s, with a sharp contrast between the revival of US productivity and the slowdown in the EU. The annual productivity growth per hour worked dropped from 2.4 in the 1980s to 1.6% in 1996-2000 in the EU, while it increased from 1.1 to 2.3% in the US. Various factors explain these differences, including diverging trends of fiscal policies or labour market structures. But, with reference to the US, the concurrent rapid expansion of ICT was pointing to structural changes. A consensus has emerged on the central role played by ICT to boost productivity and competitiveness.

ICT is a driver for productivity. The gains from ICT stem directly from investment in ICT, a fast growing and innovative ICT sector, and indirectly from improvements in business processes through wider use of these technologies across the economy. According to recent studies[23], the overall contribution to labour productivity growth from ICT investments and from technical progress in the production of ICT goods and services, accounted for about 40% of EU labour productivity growth over the second half of the 1990s, compared with 60% in the US. In these developments the EU has suffered from lower and delayed investments in ICT and, possibly, a less efficient use of ICT.

The ICT sector is a major economic sector, covering Information Technology plus telecommunications equipment and services:

- The sector has grown from 4% of EU GDP in the early '90s to around 8% in 2000[24] and 6% of employment in 2000; and

- The ICT sector is one of the most innovative sectors, accounting for 18% of the overall R&D spending in 1999, and one of the most productive, with an annual productivity growth of 9% on average over the period 1996-2000.

The sector, as a whole, performs fairly well in comparison with the US in terms of size (10% of GDP in the US against 8% in the EU, and also in productivity and employment creation), but less so in terms of contribution to R&D (in the US, ICT account for 30% of R&D).

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[23] The EU Economy: 2003 review from Directorate General for Economic and Financial Affairs – European Commission

[24] Source: OECD

Overall, the EU invested half the US amounts in ICT: the EU total investment in ICT only grew from 2.2 to 2.6% of GDP from 1990 to 2001, while in the same period it grew from 3.3% to 4.2% in the US. Overall the EU economy is less ICT-intensive.

A consensus is emerging on the fact that ICT intensive industries have experienced higher productivity gains. ICT are general-purpose technologies. They improve business efficiencies if their use is combined with organisational changes and adequate investment in skills. Benefits reported by firms as a result of the use of ICT include: faster product development, cost and overhead reductions, faster and more reliable transactions, better relationships with customers and suppliers, and an improved level of customer service.

A key factor in the relative competitive strength of the US economy is that companies have applied ICT in a consistent way, combined with organisational renewal and improvement of skills. EU firms seem to have met more structural rigidities, which do not allow them to benefit from ICT to the same extent. This is harder to quantify, and even more difficult to trace in some specific sectors. Moreover, account must be taken of the fact that reorganisation of business process takes time and with the EU having invested later, is likely to benefit from ICT with some delay.

The ICT sector can be split into 6 segments: telecommunications services, telecommunications equipment, hardware, office equipment, software, and other IT services. The US and the EU have similar market segmentation: overall in the OECD in 2001, telecommunications accounted for the largest share (40%) and the remaining part corresponded to IT and mainly covered software and IT services.

The EU represents a large market, 30% of expenditures on ICT in the OECD in 2001, against 40% for the US and 20% for Japan. However, in terms of supply capacity, the EU is in a weaker position. For instance for ICT goods, the EU represents only 20% of world production, comparable to Japan and less than the US, who have 30%. The EU has a stronger position on services. This performance relies on strong EU global players: out of the world's top 250 companies (in terms of revenues in 2003), 25 were EU ones, representing 19% of world ICT revenues in 2003.

Within the most important individual industries, telecommunications is where the EU has an undoubted advantage over the US:

- The top 10 firms, in terms of annual revenues of the worldwide ICT sector after 2000, include major European telecom operators (France Telecom and Deutsche Telekom);

- When looking more specifically at the top-10 telecommunications service firms in the OECD, six[25] are EU companies, accounting for 50% of the total top-10 revenues in 2003 (38% in 2000) and 56% of the total top-10 employment in 2002;

- Three European companies (Nokia, Alcatel and Ericsson) are also among the top-10 communications equipment and system firms. Their combined revenues in 2003 accounted for 45% of the total revenues of the top-10 firms; and

25 France Telecom, Deutsche Telekom, Vodafone, Telecom Italia, BT and Telefonica.

- Telecommunications services have been the largest contributor to the growth of European productivity over the last few years (around 24% in the period 1996-2000, compared to 14% in the US in the same period). This good European performance reflects the size of the sector (around € 240 bn in 2003, e.g. 84% of the total of telecommunications) and its large productivity gains (10% per year in 1996-2000), compared to other sectors (1.6% for the whole economy) but also by international standards (5.9%).

In the IT segment, the EU has mixed performance:

- European firms are among the world leaders in key areas such as electronics and components, with companies like Siemens and Philips ranking 1 and 6 respectively in the top-10 electronics and components firms, a sector dominated by Asian large companies. This sub-sector, though small, has also experienced large productivity gains (+57% per year in 1996-2000), also compared to other sector and compared to the US (+53%);

- SAP (Germany), the only EU company in the top-10 software firms, ranks third in a market dominated by Microsoft (almost 50% of total top-10 revenues), Oracle and other American firms; and

- The EU does not have leading firms in the IT service segment, although Cap Gemini Ernst and Young rank 7 in the top 10.

2.2.2 Employment and ICT skills

The wide-spread diffusion and use of ICT modify employment, work and skill patterns. In the ICT sector, although there is no evidence that employment levels have changed significantly, employment has adjusted to shifts in the sector driven by the growth in ICT services. But the impact of ICT goes well beyond the sector and in the last 10 years, the share of the labour force with ICT skills[26] has steadily increased. It has been estimated that around 20% of total employment in modern economies can be classified as ICT-skilled employment[27] (using the broad definition). The share of ICT-skilled employment has been on the increase in the EU15, also after 2000 when it started to decrease in the US. The increasing trend in Europe is consistent with employment growth in the service sector while the more rapid rate of adoption of new technologies in the US, leading to a higher loss of jobs through automation might explain the decrease in the US.

Another explanation could be the recent increase in the outsourcing of ICT-related activities. The US have been outsourcing jobs considerably more than the EU (mainly to emerging countries such as India), while European companies tend to outsource less but within Europe. At the same time, some European countries are the recipients of jobs outsourced from the US.

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[26] As explained in "eSkills for Europe: Towards 2010 and Beyond", Synthesis Report of the European e-Skills Forum, September 2004, a broad definition of e-Skills includes both practitioner skills required for developing, operating and maintaining ICT systems, and also end-users required for the effective applications of tools in support of work. A third category, identified as e-Business skills, includes the capabilities needed to exploit opportunities provided by ICT to ensure more efficient and effective performance of different types of organisations, to explore possibilities for new ways of conducting business and organisational processes, and to establish new businesses. See: http://europa.eu.int/comm/enterprise/ict/policy/doc/e-skills-forum-2004-09-fsr.pdf

[27] OECD Working Party on the Information Economy: New Perspectives on ICT Skills and Employment (December 2004) DSTI/ICCP/IE(2004)10

Outsourcing is not a new phenomenon. Manufacturing jobs have been moving heavily from industrialised countries to less developed countries characterised by lower wages and lower production costs. The new aspect of this phenomenon is that the displaced workers are now white collars in the ICT service sector, i.e. highly educated employees with training and educational needs highly different from those of the blue collars in manufacturing. There are no reliable indicators for tracking outsourcing of ICT services to off-shore locations. Published statistics are very volatile and vary considerably according to the source and after each revision, but even when looking at the largest projections of off-shore employment, the figures are smaller than normal "churning". A report on "Outsourcing of ICT and related services in the EU"[28] indicates that a number of forecasts converge to estimate that between 2 and 3% of all EU service employment may be outsourced by 2015. However, it also shows that this loss of employment is typically less than normal "churn" in the sectors concerned.

Businesses outsource their activities, seeking to reduce costs and remain competitive, while facing the increasing pressure of globalisation and the challenge of an ageing population. The outsourcing economies must then be able to reallocate resources towards new activities characterised by higher added value, but also requiring different types of employment and qualifications.

Outsourcing, together with migration, has also been largely used by countries to fill skill gaps (competence shortfalls, skill shortages or education mismatches).

e-Skill gaps can have a significantly negative impact on productivity growth both in ICT-producing and on the ICT-using sectors and, as a consequence, on European competitiveness. The improvement of both ICT-practitioner skills and ICT-user skills, at the workplace, is a fundamental medium-term objective for the European Union.

It is, nevertheless, very difficult to estimate the exact level of skills deficiencies, and to forecast what will be the medium and long term situation of supply and demand at EU level.

The greatest challenge is to acknowledge the new applications of the future and which new skills will be needed. Relevant and effective research will create the knowledge and innovation will promote the spread of new technologies, improving efficiency and productivity of businesses and the quality of life of citizens. Education and training, with a strong emphasis on skills and life-long learning, will improve workforce expertise.

In addition, skills and human capital are increasingly regarded as major factors in development and growth. A broad consensus is emerging that there is a positive association between investment in human capital and economic growth.[29] Information and communication technologies play a vital role in advanced economies and new business which make new demands on skills.

2.3. Challenges and obstacles

The stakeholders' consultations helped to identify key challenges to build up a relevant policy initiative and this section reflects the debate which took place in the preparatory phase but not

28 From "Outsourcing of ICT and related services in the EU", status report commissioned by the European Monitoring Centre on Change of the European Foundation for the Improvement of Living and Working Conditions, 2004.

29 "Investing efficiently in education and training: an imperative for Europe", COM(2002) 779 final

necessarily the positions of the Commission services. This aims at addressing those concerned by the specific actions implemented by public authorities, and with an added-value if addressed at EU level.

2.3.1 Dealing with top challenges

The public consultation on a new policy initiative gave an indication about the main developments that public authorities will have to take into account, by identifying "Mega-trends" in political, economic, social, and environmental areas which will constitute the environment of the future Information Society.

Domains	**Mega-Trends**
Political	An enlarged Union
Economic	The global economy/Employment
Social	The ageing population
Environmental and Quality of life	Health Protection / Energy efficiency

All these mega-trends will impact on the Information Society environment and which will influence the definition of further objectives within a new policy framework at EU level. In any case, Information Society and Media policies have to face a few top challenges: to progress in an enlarged Union, to act as a global player in a global economy, to address the specific demographic trends of Europe (e.g. ageing population) and to win the investment competition, as well as to take its large part of the Lisbon challenge. Obviously, Information Society challenges are more related to technology and need to be more specified in the context of this impact assessment.

2.3.2 Convergence: new markets and usage forms create opportunities and challenges

"Convergence describes a process change in industry structures that combines markets through technological and economic dimensions to meet merging consumer's needs. It occurs either through competitive substitution or through the complementary merging of products and services or both at once"[30].

Convergence of technologies, infrastructure and applications is expected to provide improved and more user friendly tools. Convergence is driven by several forces, including the continued decline in the price and the continued increase in the performance of processors that lead to improved functionalities of devices, the increases in storage capacities, the improvements in compression techniques and digitisation of content; and by advances in optical and radio technologies, which lead the migration to seamless networks and improvements in network speeds.

30 Dowling M., C. Lechner and B. Thielmann (1998), "Convergence – Innovation and change of market structures between television and online services" in Electronic Markets Journal Vol. 8, No 4, pp. 31-35.

The technological process of convergence effectively started a decade ago, and its effects are already visible today. Communication networks and content services are increasingly accessed through different terminal devices, and through different platforms providing converging services. Convergence increases choice at the network, device and content level, creating new content delivery systems and channels for existing content. By enabling the mutual interaction of content, and the way content is delivered, convergence is also opening the path for ground-breaking content services. The development of online gaming or interactive TV demonstrates that the potential of convergence is not only about providing new distribution channels for existing content. Many content sectors are still in the pilot phase for the development of innovative content services, and will fully benefit from the possibilities offered by ICT, such as a high level of interactivity or community building.

Convergence also strengthens the relationship across the value chain. As such, it brings about significant industry changes and calls for a comprehensive policy framework that takes synergies into account. For the users, the aim is to create more accessibility, more services, more choices and diversity in an easier and more user friendly way. For instance, accessing movies can be done in a number of ways: by traditional broadcast in its many forms, by purchasing DVDs, by ADSL-TV broadcasting or on-demand, by downloading online, by ad-hoc network or Internet sharing, by mobile TV over 3G or via digital broadcast in various forms built into mobile devices. Telephony can likewise be performed through a series of networks and services: using IP-telephony over broadband at home or in the office, using normal mobile telephony, even using Voice over IP over Wi-Fi or, in some countries, on a mobile phone.

Deployment of broadband communications was originally delayed by a difficult financial climate. Broadband take-up started significantly in 2003. Its rapid spread, combined with the large potential market for high-speed mobile communications and for digital TV, set the scene for new opportunities of delivering content on-line. Content is becoming increasingly critical as the market moves from the initial model focussed on access to a phase contents are key to revenue growth. New opportunities, however, are accompanied by concerns regarding the viability of new business models. Content owners are still unclear about consumers' willingness to pay for content on-line, and whether new e-services will cannibalise traditional revenue flows.

Communication networks and content services are increasingly accessed through different terminal devices and through different platforms providing converging services. Three main platforms can be identified: TV, PC and mobile phones. Convergence in delivery devices is likely to come from the evolution of existing platforms as they take on new functionalities. Smart phones and mobile TVs are good examples, although their success will depend on the removal of technological constraints, such as battery life and new chipsets. Taking on new functionalities implies collaboration, and the blurring of lines between equipment manufacturers and consumer electronics.

A new wave of development is, therefore, characterising the electronic communications sector. The policy focus for 2010 should be the creation of a favourable environment that stimulates the competitive deployment of new converging services. The task facing policy makers, however, is complex. Technological and market changes are affecting the effectiveness of some of the current policies. Policies may also require integrated consideration of issues that were previously addressed separately, such as legislation concerning networks and content.

From a different perspective, it is important to also note here the fundamental "convergence" trend in the underlying basic hardware and software that fuels convergence in several, up to now well differentiated, markets: the convergence between "general purpose" (i.e. PC) microprocessors and "embedded" microprocessors (in broad terms, microprocessors for all devices that are not computers). This convergence has as result the convergence (or collision) of several market sectors: PC software and non-PC software, PC and home entertainment systems, mobile phones and video consoles, etc.

In terms of figures, embedded systems have a market size of 100 times the desktop PC market. In 2003, there was an average of 8 billion embedded programmable micro components worldwide. Conservative estimates foresee a doubling of this figure to 16 billion by 2010, or 3 embedded devices for every person on earth. An average household has easily 50 embedded systems[31]. The digitisation and networking of consumer electronics and home appliances and the convergence of PCs and home entertainment systems, are already giving rise to a new breed of intelligent consumer electronics devices.

Whilst the PC market is a highly concentrated market, the market for embedded systems is characterised by significant diversity.

This "new" convergence is at the same time a threat and an opportunity for Europe:

- A strong dominance of suppliers in the market for embedded systems, whether those suppliers are European or not, would have obvious negative consequences for European consumers and companies in this area. In this context, it is vital that the embedded system markets remain characterised by a significant and diverse presence of players, whether European or not, so as to avoid a repetition of the PC platform story in the embedded systems markets. We are already seeing Intel moving into providing chips for mobile phones and Microsoft providing operating systems for PDAs and smartphones.

- On the other hand, Europe has strong presence in high added-value system solutions (hardware and software) in important market sectors such as automotive and aeronautics) Europe, through R&D and policy measures should build and improve this strong position and seek possibilities of using this successful experience as guidance for capturing new markets.

2.3.3 Broadband networks

Among the most vital networks enabling the development of the information space are the Internet broadband networks. Broadband infrastructure has now been rolled out in all Member States, and there has been a rapid growth in the number of users. By October 2004, there were 34 million subscribers in the EU, an increase of 75% in the previous year. The October 2004 figure of 34 million is equivalent to 7.3 subscribers per 100 of the population; however, there is wide variation between Member States.

Broadband coverage is widespread in EU15. In June 2004, around 85% of the EU15 population could access broadband, an increase of 9% on the previous year. Broadband has not yet been deployed in 50% of rural areas. No data is, as yet, available for the new Member States.

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[31] Sources: "Embedded Systems Roadmap", Dutch PROGRESS program, 2002, and "Building ARTEMIS" , Artemis Technology Platform, 2004

DSL is by far the dominant platform, with 79% of broadband subscribers followed by cable with 19%. There is, as yet, little roll out of new networks such as wireless, fibre or third generation mobile networks. The 2004 household survey also showed few people were as yet accessing via Digital TV, with only the UK having any significant roll-out with 6% of households, although this is a slight reduction on last year's figure. Overall, 2004 was the first year in which signs of platform competition and convergence between fixed and mobile broadband were visible.

Although broadband is growing fast in Europe, it remains a long way behind the main international competitors. The EU is behind in terms of network speed. For example, Japan had 15.4 million broadband subscribers in April 2004, and nearly 10% of these were connected via fibre optic with downlink rates of up to 26Mbps. In the EU there are few connections with bandwidth above than 3Mbps. In most countries (the exceptions being Norway and the UK) entry price has fallen. A key factor in lowering prices is competition, especially competition between alternative platforms.

The competitive pressure has increased in the broadband market in the course of 2004. The new entrants' share of the broadband market has continued to rise and is now at 43.7%, an increase of 2.2 percentage points on last year. However, competition in broadband access is still weak in most countries.

The objective of the eEurope 2005 Action Plan was to stimulate the development of new services, applications and content based on a secure and widely available broadband infrastructure. Data shows that the infrastructure is largely available in the EU 15. No information is available yet on the new Member States. Broadband is now being rolled out across the EU, and the number of subscribers is growing very rapidly.

The main challenge is the achievement of advanced widespread seamless networks. There are three main tools available for achieving this objective: (i) the regulatory framework for electronic communications, aiming to promote and sustain competition; (ii) national broadband strategies, aiming to increase broadband coverage and stimulate take-up; and (iii) the research framework, aiming at stimulating innovation in broadband technologies.

(1) Evidence shows that the competitive environment is an important factor for improvements in price and performance. Prices and performance promote take-up and stimulate the provision of online content as the target audience grows. The **review of the regulatory framework for electronic communications** is due to start in 2006. The 2006 Review could give rise to modifications of the existing regulatory framework, which will not be adopted, transposed and eventually implemented before 2009-2010.

The framework takes the next steps in the liberalisation of the electronic communications market, enhancing competition in markets previously characterised by historical monopolies, and applying the same rules to all networks. It incorporates policies designed to:

- Prevent anti-competitive behaviour by firms enjoying significant market power;
- Ensure appropriate access to infrastructure through local loop unbundling and access provisions;
- Ensure that consumers have access to basic services, which might not be provided by the market (universal service obligations); and

- Allocate resources, such as spectrum, in ways that encourage efficient use.

The review of the regulatory framework is foreseen by the relevant Directives. It will have to take into account technological developments, and remove the barriers towards the migration to more advanced networks. As required investment costs are high, there is a concern that a move to increasingly advanced networks may occur at the expense of competition. The main challenge, therefore, is the ability to stimulate incentives to invest and roll-out new technologies and services, while ensuring that competitive forces remain effective.

This review aims to improve the functioning of the regulatory framework, and the efficiency of the institutional mechanisms on which it is based at European and national levels. It is expected that the outcome of this exercise will contribute to deliver more competition in the eCommunications markets, and to keep attracting investments in the sector. This review will be an opportunity to strengthen the internal market objective with respect to the development of competitive trans-national markets, and to the need for a greater level regulatory harmonisation at EU level. It will address a number of important issues in the areas of implementation and harmonisation mechanisms, universal service and user's rights, emerging markets and legal certainty for investors, and platform competition for the delivery of broadcasted content.

As regards radio spectrum, a more flexible management would ensure a better efficiency and spectrum availability for new wireless applications.

Television broadcasting has been defined as the initial transmission of programmes intended for reception by public. It does not include communication services providing items of information and other messages on individual demand. These services are considered as Information society services. In the context of convergence, the growing interactivity of television broadcasts may seem to blur the limits between television broadcasting services subject to the Television without frontiers Directive, and Information Society services subject to the e-Commerce Directive[32]. Therefore, the 2003 Commission Communication of the future of European audio-visual regulatory policy concluded that a revision of the Television without frontiers Directive may be necessary to take into account technological developments.

(2) **National Broadband Strategies** were drawn up by the EU15 Member States by the end of 2003. The new Member States committed to present them by the end of 2004, but only four of them have done so. Given the limited availability of broadband and the limited penetration of the PSTN in most of these countries, national broadband strategies are extremely important tools. Strategies may reveal the use of national and EU funding (such as Structural Funds) to increase broadband coverage. They may also stimulate take-up by announcing financial incentives for consumers, and/or proposing targeted actions for government procurement (for example, connecting all schools, health centres and public administrations).

(3) The **EU Research Framework** (FP6 and the upcoming FP7) include specific calls for proposals to develop the network technologies and architectures, allowing a generalised and affordable availability of wired and wireless broadband access to European users. Research and Development of new wired and wireless broadband access technologies are critical in improving the competitive environment for broadband.

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32 Cf. COM(2003) 784

Technological issues, such as interoperability and standardisation, can also be addressed through Technology Platforms' results. The research agendas of Technology Platforms might be supported partially from the Framework Programme using instruments such as Integrated Projects, Networks of Excellence or STREPs. Community programmes and Member States' programmes can support any modification of the research agenda emerging from Technological Platforms. A clear added value for Platforms is to be able to mobilise enough public and private resources in order to support the research agenda. This includes the pooling of public funding from the Member States, the Commission and other bodies, and combining it with private funding.

Finally, through the Framework Programme, Europe has created a pan-European research networking infrastructure, GÉANT, to exploit the emerging developments in telecommunication technology and to support all fields of collaborative research. GÉANT provides a stable, ubiquitous, high-capacity, public transport network for production-quality data communications. This infrastructure also constitutes an environment for demonstration and validation of advanced networking applications based on new services. The innovative characteristics of GÉANT, and the synergies being exploited through complementary research actions on IPv6, GRIDs and optical networks constitute major successes on which further actions may be built in the future. New complementary activities (notably strengthening the high-end computing infrastructure in Europe, and support to ubiquitous access to the European research infrastructure) may be deployed.

2.3.4 Content on-line

Communication networks and devices enable the development of on-line contents. In turn, increased availability of high-quality content stimulates the evolution of devices and applications. The development of innovative content and information society services, supported by attractive business models, is a vital step towards growth in the converging sectors.

Convergence will be supported by the wide availability of content and information through ICT. Content available through ICT includes content that is the digital or a digitized version of traditional content. The growing availability of business content, public domain content and information, television and radio programmes, movies, games, music, and books under digital form is facilitating the creation of services.

Content available through ICT also includes **new forms of content born in the digital age**. This covers a wide range of publicly accessible websites that are used by organisations to communicate and provide information. This also consists of content created by individuals or groups of users, such as personal websites or digital pictures that have a growing impact on the social aspects of the information space.

Given the variety and the large amount of digital content available in the information space, content search services, such as internet search engines or the Electronic Programme Guide for TV programmes, are **revolutionising the way consumers search and access content**. To a large extent, these services are also conditioning the type of content consumers can access.

The information space is also made up of a wide range of services **that are not based on the provision of on-line content**. Communication services are the first beneficiaries of ICT development, with an increase of communication channels (broadband, satellite, cable, mobile

networks), applications (email, SMS, MMS, VoIP, visio conference, etc.), and devices (mobile phone, PC, portable devices, game consoles, etc.).

Transaction services allow the realisation of financial and commercial transactions, such as the online purchasing of goods, or access to banking and payment services. The development of the information space calls for the development of e-transaction services, such as micro or wireless payments (see section 2.3.5).

The information space content and services are delivered through software running on a wide range of devices. At the same time, access to **software or computer resources** can constitute an information space service on its own. Computer services, such as utility computing, allows the provision of computing power on a flexible, metered-usage, pay-as you go basis.

Localisation services consist of the provision of spatial and location information, (e.g. maps and directions). Increasingly associated to mobile devices with location features, localisation services allow real time provision of content and information based on consumer location.

The challenge for the single information space is to create the appropriate environment to enable businesses to make the most of convergence, and to meet European consumers' expectations, while promoting the European content industry.

The need for new business models

Content, as well as technical solutions to access and protect content, are protected by IPR. Since IPR consists in granting usage monopoly on content or technology at national level, ensuring non discriminatory access to a competitive single market for on-line content is a real challenge.

Increasingly, interoperability and open standards are becoming prerequisites of functional competition in the internal market. The convergence of devices and increasing multi-platform access strengthens this development; interoperability of content and services is a cross-platform issue. For these reasons, the promotion of interoperability and standardisation is a long-standing Community policy objective.

Public content defined as content in the public domain, and publicly funded content also play a crucial role in the creation of new on-line services. Availability of geographical, location or meteorological data allows the creation of innovative information and location services. By making this type of publicly funded information available to businesses, the **Public Sector Information Directive** will facilitate the creation of new services. However, additional actions are needed to ensure that the investments in publicly funded content have a maximum impact in economic, societal and cultural terms.

Many economic players are still reluctant to move into the digital age, due to uncertainties regarding the possibilities of securing their investments, or to protect the access to their content and services. Therefore, it would seem necessary to secure the distribution of on-line content by tackling the problem of the online distribution of illegal content, and to deploy DRM solutions. In tackling the problem of illegal distribution of on-line content, this will accelerate the **migration to legitimate services**, and the development of an attractive content offer in a DRM protected environment should create appropriate conditions for the e-content market.

However, **DRM** as a key enabling technology for the development of content and services could also have the potential to be a commercial or technology licensing control point, restricting consumers' choice and hampering competition. The public consultation on the DRM high level group's report has pointed some risks and shortcomings. If not interoperable, DRM technologies are capable of transferring control of the way on-line content is used and distributed to some of the content value or other chain players. At the same time, discriminatory cost and access terms to DRM solutions could also prevent small players having access to the on-line content market. The effects of the deployment of proprietary and non interoperable DRM standards on the development of open source software may need to be examined. Therefore, while promoting the development of a secure environment for the distribution of on-line content and services, it is crucial to promote interoperability and strengthen competition in the internal market.

Meeting European consumers' expectations

The stakeholders' consultation indicates that, for the consumer, the business models should provide clear billing, predictable pricing and transparency to ensure both user acceptance and consumer rights. Consumer acceptance will also depend on the choice and flexibility of the content and services available.

Content needs to be diverse and adapted to user needs. Strong market dominance, whether by European or non-European players, in key enabling technologies may hinder the development and diversification of European digital content and services." **Online privacy** is becoming a serious concern for citizens and consumer organizations in Europe. Many of the new services and technologies have openings for both strengthening and weakening online privacy. Technologies intended to control and secure transactions and rights, also have the potential of serious invasions of privacy. Specific concerns have been raised regarding the monitoring of content use and services, by technologies like DRMs and RFID. Since some pricing mechanisms for content and services specifically rely on monitoring users, the issue of privacy is of particular concern for healthy development in this area: an unbalanced approach may have the potential of leading to either the erosion of rights or consumer defection from the technologies.

Minors are heavy and active users of online content and services. According to EC studies, parents are not always even aware of their children's' online access and behaviour. There are challenges to face regarding unwanted access to unsuitable, extreme, adult, or harmful content and to risky communications. Convergence expands the area of attention: mobile internet communications and content, as well as new forms of online, interactive TV, and mobile communities create new, beneficial, and popular arenas for minors. However, they also create new risks that need to be addressed. Ensuring digital media literacy and critical sense among children and their parents is the main challenge, alongside an understanding of risk areas and risk behaviour online, and of existing protection systems.

Increasing access to content and services lead to a potential increase in consumers' exposure to **advertising**. While advertising in itself is not an issue, ICT based advertising practices could raise specific concerns. Advertising in digital media, as well as new forms of advertising based on consumer' profiling, are raising privacy as well as minor protection concerns. Given the increase of information sources, the clear differentiation between editorial content and advertising also raises the issue of media literacy.

Finally, usability is a key factor for improving take-up. For instance, the power of efficient distribution and usability inherent in peer-to-peer systems and other super-distribution systems, promise great potential for the consumer content market, but have been hindered by the lack of robust and popular legitimate commercial applications. A serious obstacle for mining the huge potential of peer-to-peer-distribution is the lack of a solution between the copyright holders' need to enforce their rights, while keeping the usability and efficiency offered by peer-to-peer-systems.

2.3.5 e-Payments

A major new market for electronic services is emerging in the current mobile market, the emerging 3G-market, and on the internet. Cheap and flexible payment solutions will be fundamental in improving the conditions of European producers of electronic content services, and in strengthening Europe's strategic position in the global market.

Some payment services already exist but are not covered by the existing legal framework (like the e-money Directive). These services would have the potential to become EU-wide schemes in fulfilling some payment needs, such as micro payments in the internet or wireless communication services. Some payment products on the market, such as mobile operator accounts and virtual accounts (e.g. PayPal), are closer to credit transfers in a centralised account system than real bearer instruments.

Given the existence of a wide range of new payment services and the needs of the market, it would be important to analyse what would be the right legal framework for these services. This would be the objective of the New Legal Framework for Payments in the Internal Market. This New Legal Framework would not inhibit innovation, technical development and discriminate between payment instruments, and would cover all payment services. This new legal measure would intend to encourage the introduction of new payment instruments by providing legal certainty for this activity across the Single Payment Area.

The particular case of mobile payments:

The existing mobile technologies represent an important opportunity to offer customers a wide range of content-rich services. However, it is crucial that all customers are able to pay for such services using a simple and easy means of payment.

Despite the high level of expectations that have prevailed in recent years, there is still no mobile payment system or scheme that has gained significant market acceptance, with only one or two exceptions. The range of functionality offered was often limited to a particular market segment (for example, micro-payment or pre-paid).

There is uncertainty regarding the scope of the application of EC rules on e-money and money laundering to mobile pre-paid accounts, which are used to purchase digital content services from third parties. This uncertainty resulted in tangible costs and operational consequences for mobile operators, in terms of delaying the launch of new data services for their customers.

In order to solve this problem, Commission services launched a public consultation during summer 2004, in order to determine precisely when financial activities by mobile phone operators (whose customers use pre-paid cards to purchase third party content) fall under the e-Money framework. A guidance note has been published on the application of the e-money Directive to mobile operators.

The note concludes that very few mobile operators' payment services (for pre-paid mobile services) currently fulfil the definition of e-Money so as to fall within the scope of the eMoney Directive. Only mobile operators, whose payment services transfer monetary value directly, fall within the scope of the directive. Normally most mobile payments are made indirectly through grouped payments via bank transfers. For those few services, the guidance note proposes to apply the 'waiver' possibilities foreseen in the directive. The reasons for this are related to the low risks associated with the payments, and to the comparatively low value of payment services in relation to the pure mobile communications services. This interpretation was agreed in conjunction with the Banking Advisory Committee in November 2004.

The Commission has an obligation to report on the application of the eMoney Directive in 2005. Following publication of the report, amendments to the Directive may be considered necessary. An impact assessment and analysis of the costs and benefits of any changes to the eMoney Directive would need to be carried out. In addition, the impact on "hybrid" operators arising from their obligations under the eMoney Directive, as well as their obligations under any future legislation on payments may need to be considered. In particular, the appropriate consumer protection obligations of mobile operators (or other "hybrids") arising from legislation, would need to be ensured, whether it is a pre-paid, or a post-paid customer.

In the framework of research, the blue print on mobile payments, part of the ICT project SmartPay, seeks to ensure widespread access to payment services through mobile phones and mobile communications devices. The approach proposed is for market players to reach a consensus on the topics to address, and the solutions to develop. A compilation of the views and recommendations of industry will be delivered in 2005.

2.3.6 Trust and security

An essential condition for a broad deployment and use of ICT technologies by citizens and businesses is user trust, and the availability of secure networks and information systems. The importance of these issues increases with the developments of ICT systems and the convergence of various infrastructures to IP standards.

One of the biggest challenges is to ensure the improved security of the underlying infrastructure, particularly the internet, but also other communication networks, mobile wireless and future generations. As an open global platform for communication, the Internet provides unprecedented levels of connectivity and access to information. The downside is that the potential risk for security breaches and security breakdowns grow as fast as new ways are invented to use the Internet. The growing dependence of economies on the Internet induces an increasing potential for serious damage if its stability were to be threatened. A number of such breakdowns have already been reported for the mobile telephony networks, for national railway booking systems, and national administration information systems.

Today's users of advanced electronic communications, computer systems, and Internet services are exposed to vulnerabilities arising from the complex nature of the systems and to voluntary and unsolicited communications. This includes **malicious software** ('malware') **attacks**, which can have serious social and economic impact, for example, electronic identity theft. These vulnerabilities undermine the consumer's confidence on information society services, with a negative impact on its recognised potential for flourishing.

The problem is complex since the origin of the intrusions/attacks knows no geographical boundaries. The sophistication level often exceeds that of the defence tools (security features deriving from regulatory obligations, anti-virus detectors, filters and firewalls) that we have at our disposal for protection and prosecution (law enforcement).

National strategies on information security are developed in some of the Member States. They comprise clarification of responsibilities, strategy for awareness campaigns, management and technical standards, improvement of incident response, and cyber crime strategy.

The European Union has already launched several initiatives in the field of e-security: a legislative framework for telecommunications and data protection, which entered into force in 2003; actions on cyber-crime; the promotion of network and information security by means of the *e*Europe actions plans, the establishment of ENISA, the European Network and Information Agency, and the launching of research projects.

ENISA was created as a part of *e*Europe 2005. Its main objective is to provide assistance and to deliver advice to the Commission and the Member States on issues related to network and information security, in order to help the smooth functioning of the internal market. It will help to achieve an increased co-ordination and information exchange between stakeholders on information security.

The Agency is now operational, and its work should lead to a culture of network and information security in Europe.

The **ePrivacy Directive** is aiming to meet some of the security concerns. This implies, however, both:

- complementary actions with Member States, industry, and consumers for these issues are covered (see spam, security provisions, locations data and spyware to probably come up); and

- an investigation of any elements that would not be covered in the Directive, and which would require regulatory or non-regulatory interventions to raise acceptance levels. An opportunity for the above will be provided by the 2006 review.

A **communication on privacy-enhancing technologies** is planned, which intends to clarify this concept and is currently included in the data protection Directive, and will promote the development and use of privacy-enhancing technologies.

In the field of research, the priority under the 2003-2004 Work Programme is to strengthen security and enhance dependability of ICT, and to ensure trust and confidence in the use of ICT by addressing new security and dependability challenges. In the Fifth Framework Programme, four projects are dealing with the Internet security area. In the Sixth Framework Programme, **EU research** is continuing with the long-term effort to develop secure value-added technology and services.

Another challenge is to improve the confidence of citizens in using electronic services. Therefore, accessing new services in a secure way and ensuring the stability of the underlying infrastructure, requires the development of specific mechanisms, such as authentification tools.

The use of electronic networks to exchange content, access e-government services, and perform e-commerce transactions requires the means to identify citizens in the electronic space. Establishing trust through **secure access and identification** over heterogeneous networks implies a considerable technological and management effort. At the same time, it raises legal and social issues concerning data protection, risks of identity theft, and the protection of privacy.

Pan-European interoperable solutions for electronic identification/authentication are needed to remove barriers on e-authentication. There are some on-going actions in this area under the IDABC programme.

The **eSignature Directive** (Directive 1999/93/EC) establishes a legal framework for electronic signatures and certification. Electronic signatures, in fulfilling certain security requirements (called "qualified electronic signatures"), satisfy the requirements of handwritten signatures. The use of e-signature technologies via, for example, the deployment of PKI's, could help to implement security solutions. The e-signature technology is a good instrument for a strong identification and authentication of data.

Another challenge is to provide favourable secure environments for both businesses and public services in their daily operations. Business partner relationships are complex and rely heavily on network and information systems. Too many organisations, particularly SMEs, are not fully aware of the potential risks for security breaches and security breakdowns, and are not using adequate risk management techniques to mitigate these risks. Businesses, like citizens, will have access to official documents provided by their government. Such services impose security requirements, such as confidentiality, integrity, and authentication of data and user. One particular case is the use of e-signatures for electronic public procurement and the associated security issues, including the implementation of electronic signatures infrastructures across Europe for electronic public procurement, without creating barriers to cross-border trade.

Consumer confidence also relates to the functioning of the internet and other electronic communication networks as a **critical infrastructure**: much of the work in this area relates to realising the fast developments towards complex infrastructures. ENISA is to identify best practices on protecting critical information infrastructure at national level. Another action would concern the promotion in Member States of the development and adoption of risk-based methods for the assessment of ICT infrastructures. Research in FP6-ICT will provide longer term solutions to the complexities and interdependencies of Critical Infrastructures. It will also help to establish, in co-ordination with Member States, large scale IP-based test beds for security technologies to fight threats.

In May 2005, a European ministerial conference will be organised by the Dutch government in Rotterdam addressing the topic.

In order to protect critical infrastructures, the capability and co-operation between CERTSs is reinforced. ENISA is to support this activity, and will provide assistance in the establishment of CERTs in those Member States that wish to set up such entities; ENISA is to also discuss with existing CERT co-operation groups, and take into account work that is already done within the TF-CSIRT group (TRANSIT), and other relevant work.

It is also important to favour the **co-ordination of computer emergency response teams**. To do this, **the handbook on legislative procedures** of network use may be updated in 2005 in

order to take into account the situation in the Accession Countries. The first one was published in 2002.

The Commission already gave a first comprehensive set of policy statements on **cybercrime** issues and in January 2005, the Framework Decision on Attacks against Information Systems was adopted. The decision addresses the most significant threats and forms of criminal activity against communication and information systems, based on use and spread of malicious code. These types of attack (e.g. distributed denial of service), if perpetrated in a massive way, can exploit system vulnerabilities and put down essential communication infrastructures. The line of the actions foreseen focus on prevention of security breaches, rather than any ex-post criminal investigations.

Actions in the area of security require a broad policy initiative in order to aid the linking up of the many ongoing activities. To be successful, it will need the strong engagement of public and private partners at various levels. It should aim at developing clear policy objectives. It should lead to concrete actions between Member States organisations.

As security is recognised as a key enabler for the deployment of the next generation of electronic services and is a pre-requisite for privacy, an integrated approach ensuring the visibility of these measures within the renewed Lisbon framework is necessary.

2.3.7 Innovation and research in ICT

Innovation plays a fundamental role in future economic growth and social changes. It is a very powerful factor in explaining the different performance between countries/regions and between industries/sectors. The regions reaching the highest levels of productivity growth and increased standards of life are also the most innovative ones. Moreover, innovation tends to cluster in certain industries/sectors, which, as a consequence, grow more rapidly, have a higher impact on the economy growth and on employment creation, and eventually lead to organisational and institutional changes.

If Europe wishes to catch-up with the levels of productivity growth of other regions of the world, then it should increase its own innovation activities and concentrate these activities in those sectors, like the ICT, where the value added is the highest. ICT is a major contributor to employment and economic growth, both as a sector in itself and through their adoption and use across the economy. Europe should increase its efforts in innovation so that this sector can deliver its benefits.

Innovation is at the hearth of the knowledge-based economy and is a complex, broad scope phenomenon which until recently has been insufficiently understood. Initially, technological progress was assumed to be achieved through a simple linear process starting from basic scientific research and progressing in a sort of straightforward manner through applied research, marketing and commercialisation of the new idea (invention) that science and research had produced as a starting point of the process. Following this model, all what governments needed to do was science policy and to promote large public and private investment in research.

The concept of innovation has then evolved towards a systemic model in which innovation arises from complex interactions between individuals, organisations and the environment in which they operate. Science (research) is only one among several components in successful innovation.

The Barcelona European Council's call for action to increase investment in RTD up to 3% of GDP to close the gap with Europe's main competitors is fundamental in leading to substantial positive long-term impacts on economic growth, employment, and competitiveness, but is not enough.

The European paradox lies in the fact that the problem of the European industry is not mainly the lack of investment in R&D, but the insufficient capabilities for exploiting the innovative potential. The proof is that Europe has often been more successful at invention than innovation.

While recognising that research, as the source of invention, is a major contributor to innovation, European public policy intervention should now focus also on the critical importance of parts of the innovation system other than R&D, in particular as they affect diffusion rates.

Within a "system of innovation" approach, identifying a "system failure" means identifying systemic components that are lacking or inappropriate or not working. Public policy intervention is then required to address these system failures by targeting the variables causing the failure.

A part from the "science, research and technology" component which will be analysed in detail in the second part of this section, the main categories of factors related to innovation and covered in a new initiative on ICT can be identified in the following:

- Framework conditions
    - Basic education system for ICT-skill, which determines the education standards both of the workforce and of the consumer market;
    - Communications infrastructure, in particular electronic communications (ex: broadband availability can heavily contribute to innovation, especially within SMEs);
    - Financial market, for example the ease of access to venture capital; and
    - Legislative and regulatory framework (patent law, taxation and fiscal incentives, competition rules, intellectual property rights regimes, procurement policies).
- The role of diffusion, interaction with users, suppliers and competitors
    - Take-up of ICT (for example, e-business), because focusing only on the sectors' internally produced innovation gives a misleading picture of the economic impact of innovation and technological change. Organisational and business process innovation in other sectors is often obtained through the adoption of ICT; and
    - Interaction with users is seen as the most important source of innovation by several European firms, followed by contacts with suppliers and competitors.
- Factors within the firm
    - Skilled labour force. Without skilled workers a firm cannot master new technologies and cannot innovate; and

– Entrepreneurship. To be innovative, a firm must be able to recognise market opportunities, respond innovatively and have a large knowledge base. Entrepreneurship is the key ingredient of these dynamic capabilities. Policy should help to promote entrepreneurial behaviour.

Many of those issues have already been addressed by IS policies at EU level, e.g. financial support, legal frameworks, deployment initiatives, and exchange of best practice. But if the components of a successful innovation system are identified, there is a need to go one step further by setting up a policy initiative covering the whole dimension of innovation (and not only focusing on research). Innovation as a whole, as a main driver for the ICT sector, is a key policy challenge for the next five years.

In the field of research, over recent years, the European Union has focused on a new generation of ICT applications and services that are more people-centred and easier to use. This research aims to create a world where users - citizens, students, workers, patients - are able to access and benefit from ICT in a much more convenient way. Progress towards this vision – which within the research community has become known as "Ambient Intelligence" - has been the guiding vision of ICT research in the last two EU Framework Programmes (FP5 and FP6, 1999-2006), and has influenced ICT research orientations across Europe. This vision is now leading to the creation of "assistive environments" that support people smartly in their daily activities. The services will connect and assist users anywhere, anytime in real time and will require their active involvement only when necessary or requested by them.

The research done under the European social sciences and humanities programmes in the 4th, 5th and 6th Framework Programmes for RTD, has produced and continues to produce a deeper understanding of the European economy, society and policy. This applies in particular to the understandings of the social (e.g. social cohesion, social inclusion), political (e.g. participation, debate and democracy) and cultural (e.g. understandings of other cultures in Europe).

The next wave of technologies will make systems "smaller, cheaper, and smarter", "assistive" and "always best connected". Progress and breakthroughs in ICT are driven by miniaturisation, by the convergence of computing, communications and media technologies, by the need to build systems that can learn and evolve, and by the cross-over between ICT and other science and technology fields. These new technologies will open the door to new networked devices and systems. These will enable people to interact with their surroundings and with each other in totally new ways.

The 7th RTD Framework Programme can contribute to these goals in a direct manner by funding (through grants) R&D projects of immediate industrial relevance, and encouraging the support of a larger scale trans-national public-private partnership (e.g. Joint Technology Initiatives), which is expected to make a substantial contribution to the competitiveness and growth of the industrial sectors concerned.

The 7th FP can also contribute to mobilise sources of finance other than grants, through leveraging access of RTD stakeholders to bank loan finance. The proposed FP7 Risk Sharing Finance Facility (which at EIB bears the working title "SFF RTD") is a financial instrument which, by the sharing of risk between the EIB and the Commission, should significantly improve the access of promoters of selected RTD projects to debt finance, in particular allowing greater lending to RTD projects, including riskier projects.

2.3.8 Standardisation

Standardisation is a prerequisite for broad deployment and use of ICT, and will trigger and enable new business.

The ICT market is constantly evolving. It is characterised by globalisation, telecommunication liberalisation and convergence between voice, data and images. ICT technologies are pervasive; all industries are ICT users; subsequently the ICT Standardisation community is in constant change.

Industry and business want standards and standardisation infrastructures to offer interoperable solutions available on time and in a flexible manner; the solution chosen by industry can range from the full formal standard, via the limited consensus for a standard, best practices, guidelines and ultimately, to proprietary standard. The choice will depend on the circumstances; it is for the market to decide. Industry should, however, not be driven outside the boundary of formal standardisation by weakness, real or perceived, of the formal standardisation structures.

In the ICT market, the players in the new value chain have commercial incentives to achieve end-to-end interoperability at the network/device interface, while allowing for the competitive differentiation of applications and services. Standardisation is essential, but is not sufficient to achieve network interconnection and interoperability of services at international level. Moreover, the development of open interoperability standards may involve activities that are not present in other fields of standardisation, such as interoperability testing, the creation of reference implementations, guidance, etc.

Over time the standardisation topics have changed: where in the past technical physical interfaces between peripheral and networks and between networks (ISDN, MPT) were the main topics, in the new environment, networks are increasingly built up from planes (services, control, transport, access) which are characterised by growing mutual independence in their development.

Two different models of Standardisation have co-existed so far within the ICT sector and will continue to exist namely**:**

- Infrastructure Standardisation: this sector is characterised by long term solutions and large investments, conditioned by a priori consensus on the level of interoperability. The market is usually dominated by large players; until recently by the incumbents. These requirements are resulting in open and formal standards produced by the ESO's; the infrastructure domain is conditioned by legal frameworks, especially the communication framework directives.

- Inversely, the IT business is characterised by short term development, a fragmented market with aggressive competitors; interoperability can be met by various solutions, such as gateways, API's, etc. However, the lack of interoperability between systems/applications and services will impede collaboration between businesses, prevent emergence of new e-services, facilitate the dominance of proprietary solutions, and undermine the possibility of a long term competitive market. In this framework, standardisation plays different roles: it brings innovative technology solutions or new services to the market; industry prefers to develop standards within industry consortia: participation in the consortia is limited to its members; the participants commit to implement the results of their work, and the consortia

has the exclusive ownership of the specification. At a later stage, probably when the return on investment related to the innovation phase has been recovered, industry would then open standardisation forums to the public domain; the consensus reached within the forums can be of benefit to formal standardisation bodies**.**

The shift from hardware to software and the convergence between telecommunications and IT will create new forms of standardisation, such as standardisation of process, component and system (rather than interfaces), focus on the middleware, and ex-post process (i.e. 'product first' rather than 'standard first'). This also raises fundamental questions for governments of how to be involved in this process. The standardisation should be flexible and able to evolve quickly in response to market requirements. The ESOs are confronted with a major challenge to adjust their traditional share of competence, specific membership, and delivery of methods to this new market structure.

In the ICT domain, the link between R&D and standardisation is of particular importance. Standardisation is in a position to leverage the consensus reached within R&D projects, and therefore, the results of EU research will subsequently be consolidated. In addition, with regard to the complexity of some ICT domains, a strong co-operation between standardisation and research activities is needed to make high technical expertise available. To that effect, it is necessary to think about the structure and role of the standardisation process to derive maximum benefit from targeted R&D initiatives. Projects, such as COPRAS (standardisation liaison for the 6th framework programme), should be further promoted.

2.3.9 Skills and work

Europe should not lose sight of the wide, long-term employment challenges it is facing. On the one hand, globalisation, economic integration and technological change, including ICT, are increasingly affecting the way Europeans live and work, and demand a rapid response to, and management of, change. On the other hand, population ageing is calling into question Europe's ability to remain competitive and achieve higher employment and economic growth in future. Europe needs more people in work, and working more productively.

To create further employment, Europe needs to attract and retain more people in employment and modernise its social protection systems, to improve the adaptability of workers and enterprises and the flexibility of the labour markets, and to invest more in human capital through better education and skills. In all these areas, ICT plays a potential key role in achieving success.

Attract and retain more people in employment and modernise social protection systems

Raising employment levels is the strongest means of generating economic growth and promoting socially inclusive economies to tackle the persistent employment gaps between women and men, low employment rates of older workers and of young people. The quality of employment, including pay and benefits, working conditions, job security, access to training and career prospects, as well as the support and incentives stemming from the social protection systems, are essential. ICT solutions that facilitate these objectives are important prerequisites. Examples include ICT supported flexible forms of work, in an organisational, spatial, temporal or other user/target group specific context.

Facilitating access to employment for job seekers, preventing unemployment, and ensuring that those who become unemployed remain closely attached to the labour market and increase

their employability, are essential to increase participation and combat social exclusion. This requires breaking down barriers to the labour market by assisting effective job searches, facilitating access to training. It is also necessary to strengthen the labour market infrastructures at national and EU level, including through the EURES network, so as to better anticipate and resolve possible mismatches. Full consideration must also be given to the additional labour supply resulting from immigration. This requires the more widespread and better use of ICT to create contact forums to bring together job seekers and employers, not only in one and the same region/Member State, but across the EU. ICT support systems could help to attract, retain and bring more people into jobs and to facilitate their mobility in Europe through tools for services, providing easy access to the relevant information for job seekers, job searching and matching tools, and better forecasting of future employment needs. The better mobility of workers could also been further improved through electronic devices (such as e.g. an electronic pension card).

Improve adaptability of workers and enterprises and the flexibility of the labour markets

Europe needs to improve its capacity to anticipate, trigger and absorb economic and social change. This requires employment-friendly labour costs, modern forms of work organisation and well-functioning labour markets allowing for more flexibility, combined with employment security to meet the needs of companies and workers. This should also contribute to preventing the emergence of segmented labour markets and reducing undeclared work.

ICT plays an important role in promoting flexibility by facilitating distance work, alternative and more flexible forms of work organisation, in-house and inter enterprise co-operation, and overcoming mobility and accessibility barriers, such as traffic congestion caused by imposing common work times in common locations. Greater flexibility could also lead to better use and lower cost of services supporting the employed. This includes everything from access to child care services, retail sector services and prices, the tourism industry and leisure services, etc.

The adaptability of enterprises has been improved in some countries through better on-line support for administrative information, and assistance through training for entrepreneur and SME staff, and ICT support to different networks (like to capital or product markets). In the view of increasing the effects of globalisation on our enterprises, it is important to favour innovation on the levels of technology, applications and services, but also on an organisational and social level within the enterprises. ICT tools could help to stimulate ideas and to move more rapidly from the idea to the realisation of innovative concepts.

Quality of employment could be improved through better work organisation, better working conditions through ICT support to adapt the working environments to the needs of the workers, to both the traditional and new working constraints to facilitate the workers tasks, and to avoid problems of health and safety at work, in particular due to new tools. ICT can also provide a crucial contribution to the flexibility of work. It has already provided tools for telework and mobile workers. It can also support the diversity of working time arrangements, such as optimising job or time sharing, and part time work.

Another contribution would be the support to transitions in occupational status including training, self-employment business creation. This would be one element helping to improve the situation of the workers in terms of their work-life balance. Further support could be provided through tools assisting in child and elderly care.

Invest more in human capital through better education and skills

Europe needs to invest more in human capital. Knowledge-based and service-based economies require different skills from traditional industries; skills which constantly need updating in the face of technological change and innovation. Workers, if they are to remain and progress in work, need to accumulate and renew skills regularly. The productivity of enterprises is dependent on building and maintaining a workforce that can adapt to change. Educational institutions are facing the challenge of having to respond quickly in a rapidly moving environment. Digital competence is becoming a new category of "general competency", like numeracy or literacy skills, which will encourage the potential of knowledge workers[33]. All stakeholders should be mobilised to develop and foster a true culture of lifelong learning from the earliest age. To achieve a substantial increase in public and private investment in human resources per capita, it is important to ensure a fair and transparent sharing of costs and responsibilities between all players. Member States should make better use of the Structural Funds and the European Investment Bank for investments, in education and training.

EU contribution

The European Union has already launched several initiatives in the field of ICT, employment and ICT skills. The Commission's Communication on "Strategies for Jobs in the Information Society" set out key areas of progress to seize the employment opportunities, and to enhance the living and working conditions for all citizens in the Information Society. Updated findings on the impact of the Information Society on employment were presented in the "Benchmarking Report" following this Communication. The approach was supported by *e*Europe, with an action on *Working in the knowledge-based economy* in the *e*Europe 2002 Action Plan, and renewed focus in eEurope 2005 with e-Skills.

The Report on the Implementation of the Commission's Action Plan for Skills and Mobility[34] underlines that progress has been slow on developing commonly agreed ICT skills definitions and their qualifications, as well as in promoting continuing vocational training and lifelong learning in the area of ICT skills.

A European e-Skills Forum was established in March 2003 with the goals to foster an open dialogue between stakeholders, both public and private, and to act as a catalyst for actions addressing e-skills challenges. The Forum released a synthesis report "e-Skills in Europe: Towards 2010 and Beyond" which was discussed at a major conference[35]. A Declaration was adopted inviting the EU to adopt a comprehensive strategy and calling upon all stakeholders to implement the recommendations of the Forum.

ICTs are also used as tools supporting services for job search, orientation and vocational training; provision of ICTs skills for socio-professional integration of groups at risk of exclusion is implemented by most EU countries. Moreover, new open and flexible forms of learning supported by new ICTs (e-learning) are progressively used for the re-qualification of workers, training of people under temporary contracts, and adult education. Education and training at all levels are key elements in determining the quality of the infrastructural support

33 Implementation of "Education And Training 2010" Work Programme, Working Group B "Key Competences", Key Competences For Lifelong Learning - A European Reference Framework, November 2004, http://europa.eu.int/comm/education/policies/2010/doc/basicframe.pdf

34 COM(2002)72 final

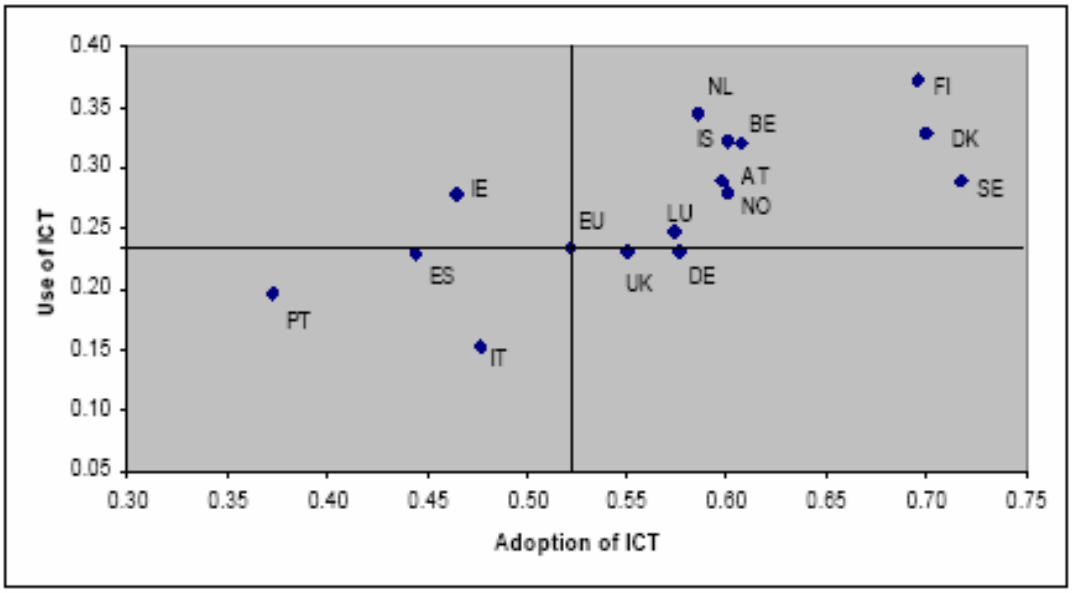
35 European e-Skills 2004 Conference, 20-21 September 2004, Thessalonica. See : http://www.eskills2004.org

for successful sustainable diffusion of ICT; the implementation of Lifelong Learning is particularly pertinent in this respect. The eLearning programme that was adopted in December 2003 support these objectives for the 2004-2006 period.

There is a continuous growing scale of and a rise in demand for education and training to respond to the requirements of the knowledge society. With an increased interest in the achievement of the Lisbon goals, it is probable that the knowledge-based society aspect of ICT policy will rise in importance. Improvement of economic performance goes hand-in-hand with organisational renewal and improvement of skills.

2.3.10 e-Business

The integration of ICT into business processes is complex. Enterprises invest in these technologies in order to increase market share and sales, increase the efficiency of the internal business processes, and reduce direct procurement costs through e-procurement. A first step towards accounting for complexity is to use a composite indicator measuring e-readiness.



A composite indicator has been developed on a pilot basis using data from the enterprise survey[36]. It combines seven basic indicators of adoption of ICT with five indicators of use of the ICT[37] integrated supply chain, use of on-line financial services, and use of internet market places. The statistical analysis showed that the components were highly correlated: high use of ICT is linked to a wide adoption of ICT. Country ranking indicates that the leaders in e-Business are the Nordic countries, the Netherlands and Belgium, while large countries like the UK or Germany, are around the EU average.

It was noted that nearly all enterprises are connected to the Internet, and most now have broadband connections. This forms the infrastructure basis for e-business, and this section

36 The e-business readiness composite indicator for 2003: a pilot study. Joint Research Centre, European Commission

37 Adoption indicators: use of internet, availability of a website, use of security facilities, use of computers by employees, broadband connection, use of LAN, intranet and extranet. Use Indicators: purchase on line, orders on line, integrated supply chain, use of on line financial services, use of internet market places

will look in more detail at how connectivity is impacting on enterprises. *e*Europe benchmarking indicators on e-business have been measured through the Enterprise survey, which captures various features of connectivity, use of ICT, and e-commerce.

- Although most firms have an internet connection (89%), far fewer have a website or homepage (58%), or use an intranet (33%), or an extranet (12%), or purchase online (27% in EU 15), or use the internet for interaction with public authorities (51%). These basic indicators suggest that a large section of the business community is only beginning to exploit the potential of ICT;

- Large enterprises remain more advanced ICT users than SMEs: overall the proportion of companies using specific ICT applications is two to three times higher for large enterprises than for SMEs. For instance, in EU 25 in 2004, 89% of large enterprises (with more than 250 employees) had a website, while this proportion falls to 77% for medium size companies (with between 50 and 249 employees), or 54% for small companies (with between 10 and 49 employees);

- Connectivity indicators point to significant progress over the last three years, with real signs of catch-up by SMEs. However, indicators on usage show no evidence of either major growth in the use of ICTs, or catch up by SMEs;

- e-Commerce is the only area where important developments have taken place in 2004 in this respect, partly due to the levelling off of the recession which followed the burst of the internet bubble: the volume of e-commerce revenues has mainly grown in SMEs, and the percentage of companies having purchased on line has grown significantly (from 13% to 30% in EU 15 between 2003 and 2004); and

More insight into the take up of ICT by businesses requires a sectoral approach. The Commission has been monitoring these developments through the 'e-Business Watch'[38].

The e-Business Watch survey is particularly interesting since it measures advanced features of business integration (business process automation, e-procurement and supply chain integration, e-marketing, and sales). With a different scope, and a slightly different methodology from the EUROSTAT business survey, the e-Business Watch confirms that the diffusion of advanced e-business solutions for automating business processes (such as ERP[39] solutions and SCM[40] software) increases by company size, but is in general low. In 2003, 36% of large enterprises used e-controlling compared with 12% small and 26% medium enterprises; 40% of large enterprises used HR support, but only 11% small enterprises and 23% medium enterprises.

More efforts are needed to improve business processes in European enterprises if the Lisbon targets of competitiveness are to be realised. European companies, under the pressure of their

38 "A pocket book of e-business indicators – 2004 edition" and "Sector impact studies 2003-04", both predominantly based on the results of the e-Business Survey 2003. The e-Business Survey 2003 covers 10 sectors in France, Germany, Italy, Spain and the UK (EU-5) as well as Norway and the 10 EU members that joint the Union in May 2004. The 10 sectors are: Textile; Chemical; Manufacture of electrical machinery and electronics; Manufacturing of transport equipment; Retail; Tourism; ICT services; Business services; Health and social services; Crafts and trade

39 Enterprise Resource Planning

40 Supply Chain Management

main international competitors, need to be looking for new opportunities to reduce their costs and improve performance, internally, and in relationships with trading partners. ICT is an important tool to increase companies' competitiveness, but their adoption is not enough, they have to be fully integrated into business processes. Factors which will contribute to increase e-Business include the promotion of take-up of e-business solutions and best practices security, privacy concerns being addressed, availability of content and new services, increased automation of business processes, acceptance of payment for content and services, and e-invoicing and e-procurement.

Technology can help SMEs maximise the value of specialisation and flexibility, two of their key strengths, and allow them to collaborate more effectively with other SMEs, or larger organisations. While e-business is often described as the SMEs gateway to global business and markets, it is often very difficult for European SMEs to grasp this type of opportunity. The European e-Business Support Network (eBSN) whose primary objective is to co-ordinate existing e-business initiatives in Europe, also provides support to SMEs in their efforts to adopt e-business practices better suited to their needs. The eBSN focuses on a number of specific practical e-business related issues, representing real problems that SMEs face. The challenge is to ensure that all SMEs across Europe can get ready to adopt e-business.

To succeed in today's competitive markets, companies have to introduce new products and services ever more quickly. Increasingly, products and services are also delivered by companies working together to share their knowledge, skills, and expertise, often in a virtual way. Knowledge management allows organisations to manage vital knowledge assets (brands, patents, research findings, customer feedback, creativity, and experience of people) so as to support innovation and growth. Successful organisations will increasingly be those that are the most open, communicative, creative, and collaborative.

2.3.11 Public services: e-Health, e-Government, e-Learning and e-Procurement

Public services are a sub-set of "services of general interest", which can be partially or totally provided by privately-owned entities. There is a strong issue of subsidiarity in this area, regardless of the ICT dimension. EU action is, therefore, only justified in two cases. First, by the existence of a legal base for EU intervention, e.g. relating to the internal market. Secondly, when there is Member State consensus on the added value of EU co-ordination. EU action related to public services mostly falls in the second scenario, involving protracted discussions and consensus-building. In some cases, it also falls in the first scenario, where provisions of Community legislation justify EU action on Public Services. This can be the case even in the areas of public administration or health, where subsidiarity is very strong.

Public services online (e-Government, e-Health, e-Learning, e-Procurement) has been a successful theme of the *e*Europe 2002 and 2005 Action Plans. In the context of increasing EU policy attention to healthcare, in 2004, the Commission adopted an action plan on e-Health[41] followed by Council conclusions. In addition, since the adoption of the Commission communication on e-Government in 2003 and the ensuing Council conclusions, much work has been done at EU level in this area. In particular, the *e*Europe Advisory Group decided to set up a specific sub-group on e-Government, which has produced several recommendations.

[41] COM(2004) 356

There is increasing evidence that ICT-enabled services of public interest can bring substantial benefits in terms of efficiency, quality of service, transparency and so forth. And yet the potential remains largely unfulfilled, thus the political interest to pursue this agenda. The situation differs from one specific field to another and from one country to another.

e-Health

As far as the general situation of e-Health in Europe is concerned some areas of progress are: the use of ICT tools in medical care (with significant contributions from EU R&D); internet use by both professionals and citizens for accessing health information (with Commission involvement in the certification of the quality of health websites); the exchange of information by e-mail and dedicated networks by professionals and institutions (doctors, care centres), with broadband connections becoming increasingly relevant considering that health is an information-consuming sector.

Some remaining challenges relate to: certification and standardisation of ICT medical products and interoperability; certification of websites' quality, where further international co-ordination involving public and private organisations is necessary; actual delivery of services to citizens, e.g. telemedicine, where the level of advancement across the EU is uneven; wider use of harmonised e-Health cards; cost of delivery and reimbursement of expenses for distance treatment, which affects patients' mobility across EU borders.

e-Government

With regard to e-Government in the EU, some areas of progress are: the use of ICT tools by public administrations with positive consequences on efficiency, e.g. generalised use of PC and e-mail; web presence of public administrations, with the main tangible benefit being that much more information is easily available to citizens and companies; increasing availability and use of interactive services (e.g. tax declaration, registration of new residence, etc.) by citizens and especially by enterprises; exchange of national experiences and co-operation between Member States supported by the Commission.

On the down side, despite the availability of online public services, actual usage is still low, and the impact is insufficiently measured and monitored so there is little evidence of actual benefits. Some remaining challenges are: inclusiveness of e-Government solutions for citizens (this is much less of a problem for companies), considering that those persons having most interaction with public services (unemployed, elderly…) are also the least acquainted with ICT; no interactive solutions as yet for many services (in general the most advanced e-Government services are those where citizens and especially companies must transfer money to administrations); largely underexploited possibilities of interacting with citizens and involving them in policy making (e.g. through online consultations and mail exchange) as well administrative processes; insufficient transparency and accountability in some countries; back-office re-organisation of administrations (actually ICT is only a catalyst of public service reform, it has little impact if it is not accompanied by the upgrading of skills and working processes); measurement of actual achievements towards public value goals like efficiency, transparency or inclusiveness, even though they are systematically mentioned to justify ICT investments.

e-Learning

Furthermore, without a better focus on 'world-class learning', Europe will be unable to sustain its competitiveness and prosperity. The integration of information technologies and the shift to use digital learning tools are opening up new pathways for better education in universities, schools and workplaces. In order to respond to the requirements of the knowledge society and the goals of Lisbon, the education sector needs to undertake significant reform to improve the learning quality and the efficiency to correspond with the needs of the society. The focus has to shift to a new basic competence for education, as important as reading, writing or arithmetic, called digital competence[42].

ICT has made a significant impact in education and training, and the provision of e-learning services has usually been accompanied by an important overhaul in the way learning is carried out, in the way the organisation operates and in the training provided to educators. This contribution is recognised through, for example, creativity and innovation, and the need for ICT to be augmented with appropriate services, content and good practice.

It is important to see the use of ICT for lifelong learning can move beyond simple e-learning, to a fundamental redesign and reform of our education and training systems for the needs of the knowledge society.

e-Learning can enrich Europe's skill base by giving individuals control of what, where, when and how to update knowledge. Much more than that, e-learning, or the effective integration of ICT into education and training, can radically change the way we learn, can help citizens to become more active and confident through lifelong learning, and can act as a catalyst for change in the organisations concerned. ICT in education and training is stimulating innovation and improving learning effectiveness. Technology can contribute to future key issues, such as creativity and innovation which are the basic resources for competitiveness and growth.

For realising the benefits of a learning society, there is still a need to support universities to provide better services through strategic alliances using ICT (Virtual Campuses). These actions will contribute to both clusters, as well as on transversal issues which affect the development, take-up and use of e-learning, such as content, IPR, quality, and standards. Future technology policy has to aim to encourage user pull rather than technology push, and that the adoption of ICT across Europe better reflects the rich landscape of different contexts, approaches, languages, and cultures. Furthermore, there is still the need for good quality, online content. New ways of interaction between teachers and students are taking off in the world of education. Online diaries, weblogs or 'blogs' are examples which show how end users put the power to create content into their hands, and show the new potential co-operation of the end users themselves.

e-Procurement

Electronic public procurement promises a double benefit to both governments and businesses in terms of greater savings, transparency and competitiveness, which is enhanced by the pervasiveness of government procurement activities throughout the economy and public administrations.

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42 Implementation of "Education And Training 2010" Work Programme, Working Group B "Key Competences", Key Competences For Lifelong Learning - A European Reference Framework, November 2004, http://europa.eu.int/comm/education/policies/2010/doc/basicframe.pdf

The use of e-procurement can improve the way in which government procurement operates, and contributes to reduce or to prevent barriers to the functioning of the internal market, thereby contributing to the achievement of the Lisbon objectives.

The main target group for e-procurement systems (tendering and ordering) in Europe can be estimated at approximately 1000 public institutions (ministries, regional authorities…), to which should be added some larger government agencies, health sector institutions (hospitals), education bodies (Universities) and the utility sector. Electronic public procurement will add benefit to national administrations, enterprises, and citizens.

In order to develop the electronic public procurement in Europe, and as requested by the *e*Europe Action Plan, the new procurement directives were adopted in April 2004, and the Member States have to implement them, by the latest, end of January 2006. The legislative package introduces detailed provisions on the use of electronic means in the public procurement process. It sets the necessary legal guarantees for carrying procedures electronically in an open, transparent, and non discriminatory manner across Europe, and introduces the use of modern innovative purchasing techniques based on electronic means of communication.

However, to release the full potential of electronic means in the procurement process, concrete reforms are required well beyond the transposition of the Directives. It is the reason why an Action Plan was adopted in October 2004, to complement the legislative package with the aim of forming a coherent and effective policy framework, able to leverage national efforts and maximise benefits for the EU as a whole. This plan, which covers the period 2005-2007, is based on 3 objectives:

- ensure a fully functioning internal market when public procurement is conducted electronically;

- achieve greater efficiency in procurement and improve governance; and

- work towards an international framework for electronic public procurement.

2.3.12 e-Inclusion

"e-Inclusion defines the ability and willingness of all individuals and communities to participate in an information and knowledge-based society and economy, as well as the removal of accessibility barriers which hinder this participation. Further, e-Inclusion refers to the degree to which ICTs contribute to equalising and promoting participation in society at all levels."[43]

The increased use of ICT raises new barriers for certain parts of the population, but also provides new opportunities for others. The assumption is that ICT can be disseminated in a way that supports greater inclusion and participation of individuals and communities, thus yielding positive benefits for society at large, in terms of cohesion and growth. This justifies public intervention. In fact, the issue of digital inclusion and participation mirrors the status and evolution of the Information Society itself. It is a moving target, just like inclusion and participation in general.

43 "e-Inclusion", Final Report, The Expert Section, eEurope Advisory Group, April 2005 (forthcoming)

The key to an inclusive information society is ensuring that citizens from all demographic groups have the opportunity to participate, including the development of intelligent systems that empower persons with special needs and the elderly to play a full role in society and to increase their autonomy.

We must be alert to risks of polarisation from differences in factors, such as learning capacities or income, so that costs and benefits of ICT development may reinforce prevailing socioeconomic inequalities. It is necessary to provide appropriate and easy access to ICT facilities as well as build and distributing appropriate learning capabilities across society, with a particular focus on new e-Learning tools for education and training provision.

While penetration of new technologies is mainly driven by market forces, public policies have the task of guaranteeing as broad as possible access to the enabling capacities of ICT.

"Even if ICT penetration is actually progressing in the EU 25 … the risk that Europe will evolve toward a more polarised, instead of a more inclusive knowledge society is still very present. … Empirical research [suggests that] different gaps may undergo a different evolution. The gender divide can be considered a temporary issue … [Likewise] older population seems to catch up albeit at slower pace; among other things, the effect of more digitally aware age cohorts progressively entering this category has to be considered. However, the development concerning low income and less educated groups may correspond [to a pattern of] evolving delays and/or permanent exclusion. The link between digital and socio-economic inclusion therefore seems to be structural [in that case. Moreover, it appears] that countries that only later reach certain ICT diffusion levels have to bear more inequality in ICT adoption."[44]

e-Inclusion is already addressed more or less directly in many European policy initiatives , e.g. *e*Europe; R&D; regulation on electronic communications; in standards' policy; in social and employment policy; in cohesion policies; in education and cultural policy. While many different EU policy initiatives are relevant to e-Inclusion and eParticipation, effective coordination is necessary to ensure that synergies are realised and that the overall impacts are effective. This is something that has already been well recognised by the European Commission on several occasions.

As ICT use becomes commonplace, the traditional approach to e-inclusion focusing on promoting basic internet access for groups "at risk of exclusion", must be complemented by a broader approach addressing higher "layers in the digital value-chain", such as skills and efficient "appropriation" of ICT yielding tangible benefits, with regard to the population "at large". It is no longer just about the "entry level" to the Information Society, i.e. having everybody on the internet, but enabling full participation according to the potential of each individual.

Information and Communication Technologies, commonly regarded as key drivers for economic growth, are often also seen as instrumental for improving economic and social cohesion, democratic participation, as well as environmental sustainability.

- **Individual inclusion:** The virtual nature of ICT networks allows a greater inclusion from individuals that, due to their changing needs, find it difficult to contribute or maintain their

[44] ESDIS at http://europa.eu.int/comm/employment_social/news/2005/feb/einclusion_en.html

contribution, to social, economic, cultural and political life. Furthermore, new assistive technologies and adapted content and services can also facilitate access to employment among specific sections of society (people with disabilities, the elderly, immigrants, etc.).

- **Organisational inclusion:** *e-Government* services for business can help to improve efficiency by easing the administrative burden and streamlining the business-public administration liaison. *e-Business* contributes to productivity by enabling an improved access to new markets, and by increasing the efficiency and effectiveness of the entire business process from production, marketing, sales and delivery of products and services. *e-Learning* can provide enterprises with much wider opportunities to deliver better, more targeted, up-to-date training.

- **Participating citizens strengthens democracy and culture:** Media is a foundation of functional democratic debate[45]. Today, some of the largest arenas for public debate are online forums, often connected to news media. Traditional media is being both challenged and complemented by interactive, participating media forms. However, there are new challenges. Whereas the traditional media's role in democracy has been safeguarded by policy measures to keep common ground, few of those measures exist, or may not even be relevant for new media. The rise of online communities and personalised media is positive, but such communities may also foster closed, self-enhancing groups, therefore, dividing the democratic debate into less communicating groups. It has been argued that this may allow for more extremism and fewer society-wide debate forums, unless active measures to promote broader debates are taken.[46] Furthermore, digital literacy is needed for active participation, and the digital divides in access and literacy still limit wide democratic participation in these forums. The limited set of tools to address these issues is an obstacle to fulfilling the democratic potential provided by interactive media; the still existing digital divide is another obstacle. Participation also takes the form of creative contribution. Large shares of online users not only participate in debates, but they also post creative content to the public. This is a clear gain for society and culture, as well as for the creative industries. Potentially, policies formed to support and regulate commercial content may create new barriers for popular creation and participation, for instance, by introducing expensive licensing schemes or control mechanisms for IPR, or introducing excessive liability responsibilities for participators and organisers. It has been particularly evident in the rising blogging communities, that the increased risk of exposure to malware, spam and other forms of unwanted attention is another obstacle connected to expanding online user participation.

- **Digital Divide/socio-economic cohesion:** The development of the information and knowledge society is particularly beneficial to less developed and isolated areas of the Union as it can prevent de-location of economic activity, and depopulation of less favoured or remote/rural areas of the Union, while enabling a more efficient and effective management of the territory. Regional and local development based on innovation, research, and an intense and strategic use of ICT, can ease infrastructure and geographical handicaps and make these areas more attractive to businesses and individuals alike (and young generation in particular), who may otherwise chose to leave.

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45 http://europa.eu.int/comm/education/policies/2010/doc/opening-up-learning-and-citizenship_en.pdf

46 Cass Sunstein: Republic.com, Princeton University Press 2001.

Provisional data published by Eurostat reveal that disparity levels among the 254 regions of the enlarged EU have substantially increased. The immediate focus of attention is in the new Member States - over 92% of population lives in regions with a GDP/head under 75% of the EU25 average. 61% of the population lives in regions below 50%. In the former EU15 countries, no region falls below this level, but 32 regions (or 14% of the population) still live in regions below 75% of the EU average while another 17 regions (16 of these in the EU15- which represent over 4% of EU25 population), would have remained under the 75% threshold without enlargement.

The information society offers opportunities to reduce these regional disparities (e.g. remoteness, socio-cultural and economic isolation and exclusion) and increase social and economic cohesion. However, the switch in focus from the information to the knowledge society increasingly reveals that the 'digital divide' is less a problem of access to ICT networks (or the mere delivery of ICT services) and more linked to the strategic use of ICT aimed at improving the regional capacity to create socio-economic and cultural contexts favourable to innovation and change, and translate this into economic value, quality of life for citizens and better growth opportunities for enterprises.

Such a strategic use of ICT puts the onus on individuals (to build on their e-skills and take advantage of new employment/learning opportunities), on enterprises (to be more receptive to knowledge, more responsive to changes in the environment and able to restructure accordingly), but also on regional and local policy makers (to facilitate interaction with and among socio-economic actors and formulate and implement policies better reflecting the needs of the territory) to improve regional performance.

This **regional capacity** is crucial given that coalitions of local stakeholders contribute to growth and competitiveness at local and regional levels.

Key determinants appear to be regional level networks that produce social and human capital, the capacity of the education/training and research systems to feed innovation, the provision of a fertile environment for entrepreneurships, and the constitution of a participative, inclusive and learning society able to meet the challenges of globalisation. Formal and informal networks (ICT-enabled or not) that connect people, organizations and public authorities are crucial to these processes.

Therefore, regional performance in the development of the knowledge society (including the ability to successfully transfer/exchange good practices) depends upon the capability to plan, accept and manage change. In turn, the rate and direction of change depends upon cultural values, organisational practices, trust, shared understanding and the relations between stakeholders in society (individuals, enterprises, public authorities, employers and trade unions organisations, universities etc).

In addition, the role of local and regional authorities in the development of the Information Society and in the achievement of the Lisbon objectives, cannot be under-estimated. An ever increasing number of delegated powers in different fields, and first-hand knowledge of the needs, strengths and difficulties of their territory, make regional and local authorities key players in the development of the information and knowledge society. In the context of structural funds, a strong regionalised *bottom-up* approach enables regional authorities to propose, negotiate and implement regional operational programmes as well as formulate and implement regional strategies specifically dedicated to the development of the information

society. The sheer number of regions and the vast variety of socio-economic and cultural context makes this strong bottom up approach an absolute necessity.

However, as the results of a recently published *"Thematic Evaluation of the Structural Funds' Contributions to the Lisbon Strategy"* (February 2005) reveal, *"the regional level cannot be expected to contribute to an implementation of the Lisbon Strategy, conceived as a systematic "roll out" of interrelated activities and reforms that are directly related to the relevant European Council conclusions, since such an implementation process does not exist"*.

The evaluation, therefore, recommends that general orientations towards the Lisbon Agenda, such as intended via the future *Community Strategic Guidelines,* are needed in parallel with a respective design of Convergence and Competitiveness objectives, the introduction of binding and precise commitments in future Operational Programmes, and the stimulation of awareness in and ownership by regions. In the current Structural Funds programming period (2000-2007), this sense of regional ownership has partly been created by the formulation and implementation of regional IS strategies based on the eEurope initiative and by the setting up of IS-specific Operational Programmes.

The evaluation confirms such a view when it reveals that *"All in all, it does not appear that the Lisbon Strategy in itself has affected the political agenda and the specific direction of public policies significantly in the fields covered in the present study. The horizontal Programme for the Information Society (OPIS) …and its strong connection with the Lisbon Strategy's eEurope initiative can be seen as the main exception to this rule.*"

A new initiative should aim to develop the information society at regional level, primarily by using the strategic guidelines for structural funds and by encouraging events aimed at improving regional networking.

2.3.13 Quality of life and environment

There are two broad ways in which ICT can impact on the environment: through their application to environmental problems; and as an indirect consequence of their economic or social application.

In terms of their application to environmental problems, ICT is already demonstrating that it can have positive effects. For example, in the field of environmental modelling, the application of new technologies has already brought improvements to forecasting, bringing real social and economic benefits[47].

The impact of ICT introduction on the environment as a by-product of its economic or social application is less well understood, and much of the evidence is ambiguous[48]. ICT helps to adequately control and monitor the food cycle, farm-to-fork, therefore guaranteeing quality. In some circumstances, ICT applications have been shown to result in environmental benefits through reducing the need to travel, in others, substitution effects have outweighed the immediate benefits. For example, a UK study concluded that e-shopping could reduce car-based shopping travel by 10%, whereas a similar Dutch study found that vehicle miles would

47 For example GALILEO, GMES and the "Improving Risk Management" Strategic Objective of the FP6 ICT Work Programme

48 WWF 2002 Sustainability at the speed of light; DG Enterprise 2003 ibid; Digital Europe 2001 Making the Net Work: Steps towards a sustainable networked world. Forum for the Future.

increase as van deliveries replaced cycle and foot trips in densely populated urban areas[49]. Well managed e-work schemes have been demonstrated to provide important sustainability benefits, including a reduced need for office space[50], although in some cases longer journeys are made in place of more frequent shorter trips.

There are concerns that the increasing energy consumption accompanying more widespread uses of ICT might outweigh any environmental benefits gained[51], although again, the evidence here is ambiguous. The European Union has been taking important measures to reduce some of the resource implications of the information society with initiatives directed at reducing energy consumption, the recycling of electrical components, and reductions in the use of lead solders[52]. The information society may also have a significant impact on the reduction of resource consumption through the dematerialisation of production, breaking the link between economic growth and resource demand, and through miniaturisation, again reducing resource requirements[53].

ICT also enables a less resource-intensive production, which in turn reduces the environmental impact of economic activities in a number of ways. Miniaturisation of devices reduces the resources needed for manufacture and distribution. Innovative transport planning systems can help to ease traffic congestion and optimise transport capacity. Micro, nano, and embedded systems may contribute to environmental efficiency by improving disaster management, and reducing the environmental impact of farming and fishing.

In summary, while there is a theoretical basis for believing that the use of ICT can have many positive environmental benefits, and at the strategic level it has been proposed that ICT, the knowledge economy, and sustainable development are complementary drivers, hard evidence to support this is lacking. It is perhaps more useful to focus on specific areas where the links are clearer (intelligent transport for example, or recycling of electronic waste).

EU information society activities that make a contribution to achieving the overall goal of sustainable development focus on the following three main areas:

Environmental modelling and disaster management:

(1) GALILEO, an EU and ESA[54] initiative to develop a satellite radio navigation system complementary with the current GPS system;

(2) Global Monitoring for Environment and Security (GMES) initiative, concerning data needs for Earth Observation[55]; and

(3) "Improving Risk Management" objective of the ICT work programme.

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49 Alakeson et al (2003) Making the Net Work: Sustainable Development in a Digital Society (findings of the EU Digital Europe Project)

50 www.sustel.org

51 Huber and Mills 2000

52 WEEE Directive 2002/96/EC on disposal of waste electrical and electronic goods

53 See for example DG Enterprise 2003 A Sustainable e-Europe: Can ICT create economic, social and environmental value? SustainIT on eco-efficiency (p.7)

54 European Space Agency

55 Different components are funded under the "aeronautics and space", "research networking" thematic priorities of FP6 as well as under the ICT programme.

Improving the efficiency and safety of transport systems:

(4) Intelligent Transport Systems and Services (ITS) policy[56] and funding for projects such as TEMPO, under the trans-European transport networks' budget;

(5) eSafety Initiative[43], a joint industry-public sector initiative to accelerate the development, deployment, and use of new technologies for increasing road safety in Europe;

(6) MARCO POLO programme to reduce road congestion and improve the environmental performance of freight transport;

(7) ICT programme strategic objective "eSafety for road and air transport" (call 1), and "Cooperative systems for road transport" (call 4); and

(8) Sustainable Surface Transport sub-theme of the sustainable development priority area of FP6.

Reducing the environmental impact of other sectors:

(9) Applying, in the agriculture and fisheries sectors, the satellite system installed as a consequence of the Galileo programme; and

(10) Improving environmental efficiency using innovative technologies (products and services engineering, micro and nano systems, embedded systems).

Co-ordination appears well developed, and is particularly strong in the area of environmental modelling and disaster management. In the area of improving the efficiency and safety of transport, systems deployment activities are driven by Transport policy (TEN Transport, Marco Polo), while IS policy focuses on RTD in preparing the next generation of ICT-based solutions to improve the sustainability of transport. Most of the stakeholders, private and public, work together in the eSafety Forum led by the European Commission, and have agreed on Technology Platform roadmaps (e.g. ERTRAC), thus ensuring the coherent alignment of research priorities, with demand for technologies from users.

The Commission presented the results of the review of the Sustainable Development Strategy at the last Spring Council in March 2005 It is intended to present a revised strategy during 2005. The European Economic and Social Committee (EESC) reflects the view that the Strategy needs to be revised and, in particular, requires a clearer definition of sustainable development, long-term objectives and better monitoring.

The role of ICT in environmental and social sustainability is ambiguous, and further research needs to be pursued in these fields. This view is supported by the results of a thematic seminar convened as part of this study. Evidence does exist that shows the potential positive benefits in some areas (the Digital Europe[57] Project provides a valuable summary here), and it is

56 See White Paper - European Transport Policy for 2010: time to decide, September 2001

57 Digital Europe project publication: "Making the Net Work: Sustainable Development in a Digital Society", 2003.

important that the application of ICT for social and environmental purposes is rewarded and good practice shared.

There has been substantial technical work in areas where ICT may bring environmental benefits. There is also a strong coherence of activities within individual work areas, such as environmental modelling and disaster management. In these areas, good links to other interested agencies exist, promoting synergies.

In line with the need to make a more tangible link between ICT and environmental sustainability, as outlined in the review of the Sustainable Development Strategy, a number of possible areas of action have been suggested such as:

- ensuring the effective and rapid implementation of the directives[58] on disposal, re-use and recycling of electrical equipment;
- reducing the power consumption reduction of PCs in stand-by mode, based on the Energy Star system;
- promoting an integrated approach to reduce energy consumption through research, and the deployment of intelligent transport technologies and environmental technologies; and
- improving environmental monitoring to build on the GMES satellite system.

3. OBJECTIVES FOR A NEW STRATEGY

Putting all these reflections together has provided a strong orientation for policy-makers in order to build on the new trend of technological and economic developments, and to ensure that Europe gets the full benefits in terms of prosperity, employment and growth.

Following on from the analysis of the issue and the needs in the previous section, the main objectives of a new strategy could be summarised around four policy priorities, which are:

- to promote a single European information space, with the aim of progressing towards an internal market for secure electronic communications and digital services;
- to stimulate innovation through investment in research, the development and deployment of ICT, and by encouraging, in particular, the take up of ICT by business;
- to make the European Information Society as inclusive and participative as possible and to enhance services of public interest and quality of life; and
- to contribute to the new start of the Lisbon Strategy by making Europe attractive to investment and innovation in knowledge-based goods and services.

To that effect, a new strategy should be designed as an umbrella initiative for EU information society and media policies. It would, however, not be intended as an initiative that tries to cover the whole plethora of ongoing activities. It should try to drive the development of ICT in Europe through focused actions. Therefore, its structure should combine the three main

58 WEEE and RoHS Directives

priorities with actions for the period 2006-2010. These actions would be defined by the Member States and the European Commission, and would be revised during the period if needed.

3.1. A single European information space

The overall objective should be to create an enabling environment for dynamic markets for electronic communications and digital services. On top of that, an emerging information space will include a variety of heterogeneous intelligent devices seamlessly connected that can exchange and receive digital services. The new initiative should promote new services and applications, and strengthen the internal market for information goods and services.

Convergence of technologies is increasing the interaction between content and the way it is delivered. New tools are available to improve communication and access to content and services. Content and services, in turn, can be accessed through a variety of devices (PC, mobile phone, television set, etc), which increasingly have new functions and need to interact with each other. Information and data are transported through networks whose capacity is continuously increasing, stimulating the evolution of devices and applications. All the issues related to the relationship between content, devices and networks call for policy attention, and for instance:

- The development of secure networks and services;
- The creation and accessibility of high quality European online content;
- The converging environment, the strengthening of the internal market, and the move towards higher speed broadband networks.

3.2. Innovation and investment in research

The overall objective should be to promote innovation and investment in ICT through the support of research, and the creation of conditions more favourable to the take-up of ICT. The Five-Year Assessment Panel for ICT-RTD (1999-2003) in its Final Report highlighted the need to "develop policies and regulation with a view to creating new markets, thereby providing incentives for the public and private sector to perform new RTD". The Panel also urged "the EC to publish a Green Paper on this crucial issue"[59]. A new initiative should look for increased commitment to investing in European ICT, both in research and in deployment, and it should encourage the adoption of ICT by businesses.

Today, Europe has leadership in ICT research in areas such as telecommunications, embedded IT, microelectronics, micro-systems and high quality audiovisual. Nevertheless, international competition is increasingly tough, and investment in ICT research in the EU is around one third that of the US, and is 30% lower than Japan. On the one side, the relations with the supplier countries are important like e.g. the EU-India strategic partnership which includes Sciences and technology: synergies, for example in research (FP 6) on open source software and high capacity research and education network. On the other side, the EU must invest more in research and development. Efforts are needed to accelerate the implementation of the

59 European Commission - Five-Year Assessment: 1999-2003 - Research and Technology Development in Information Society Technologies (Recommendation 20) – Final Panel Report, January 2005

European research area, and the goal of increasing research to 3% of EU GDP must include a significant contribution from the ICT sector.

Public-private partnerships are necessary to keep Europe in the vanguard of these developments. The Commission has launched several technology platforms with industry based on common research agendas and technology roadmaps. These intend to encourage partnerships between the Commission, the Member States and industry that deploy new technologies in a way to bring practical benefits to citizens, businesses, governments and research communities through innovative products and services.

While research in ICT is a prerequisite to strengthen the competitiveness of the European ICT sector, it also stimulates industrial innovation throughout the economy. ICT is now more and more integrated and used in working environments. Initially, the introduction of ICT was often idealised as bringing greater opportunities in the working environments. However, this view has now to be set against the real optimistic trend in the majority of enterprises. Therefore, in order to avoid worsening of work situations through modified work organisation and new constraints which become possible with ICT, work related applications need to be integrated into the working environment in a holistic view. This will allow to exploit the full potential of ICT tools like for work organisation and workplace design as well as to avoid stress and other problems related to safety and health at work.

ICT are increasingly integrated into products and services, and play a key role in improving a wide range of products and services so as to better meet consumer expectations. To that effect, the new initiative should:

- support emerging trends in industrial innovation;
- develop innovative ICT products that serve a wider population;
- enable businesses of all sizes, and especially SMEs, to develop and use innovative applications;
- design inter- and intra-organisational “systems”;
- create the conditions for the development of innovative territorial ecosystems
- promote effective adoption of ICT by businesses of all sizes
- strengthen the ICT component during all learning and training processes.

3.3. Inclusion, better public services and quality of life

Social inclusion and participation are reinforced through policy actions seeking, for the broadest range of individuals, whatever their abilities and in all EU regions, suitable and affordable access to essential ICT facilities, as well as the necessary competences and value-added services and content. This will contribute to further empowering users in their daily life and at work, improving their quality of life through enhanced participation in society including in the job market. It will also result in benefits for society and the economy at large, for instance, by boosting electronic commerce or electronic public services to the citizen, as well as creating new links and forms of communication between citizens.

Involvement of interested groups in the design and implementation of relevant initiatives, and support to local action is particularly important. In this context, ICT services and content must address the different needs associated with various socio-demographic variables.

The risk persists of a polarised European Information Society. Reinforcing social, economic and territorial cohesion by making ICT products and services more accessible, including in regions lagging behind, is a social, ethical and political imperative. Services of public interest are at the heart of the European social model, contributing to social cohesion and economic activity. The combined pressure from budgetary constraints and challenges like an ageing population and immigration means, however, that there is a constant need for public service reform. Just as in the case of commercial services, a better exploitation of ICT, through combined improvement of ICT facilities, working processes and skills, helps modernise and transform services of public interest in areas such as healthcare and education. This, in turn, enhances public value and ensures the long term sustainability of service provision. Under eEurope 2005, EU initiatives were developed in specific areas, such as, e-Government, e-Health, e-Public Procurement and e-Learning.

While the use of ICT technology presents possibilities for considerable savings for both public administrations and economic operators, there is a real risk of creating new 'e-barriers', which must be avoided. In the context of e-Government services, particular attention should therefore be given to ensuring the compatibility ('interoperability') of the electronic means and tools used by government, to ensure economic operators' free, equal and non-discriminatory access to these services across the EU, e.g. to public procurement procedures conducted electronically. This may include the need to establish precise sector-specific rules regulating the conditions for the use of electronic means/ICT technology in a given area of activity.

Ultimately, ICT can significantly contribute to quality of life and sustainable development, in particular, improving our environment and security, as well as our living conditions. This is a policy area with enormous potential, where ICT can bring many tangible benefits for citizens. This policy area should also address emerging issues related to long term societal or behavioural impacts of the information society.

The overall objective should be to exploit the potential of ICT to increase the welfare of people living in the EU. Therefore, the creation of a knowledge society calls for strengthening inclusion and participation, while ensuring individual rights, deliver more efficient services of public interest and, ultimately, improves quality of life. The three aspects are intrinsically related.

3.4. The link with the renewed Lisbon Strategy

The European Council of March 2005 relaunched **the Lisbon strategy by refocusing on growth and employment in Europe**[60] as explained in section 2.2. The i2010 initiative contributes to making Europe an attractive place to work and invest and to the knowledge and innovation priorities. In addition i2010 is fully in line with the new Lisbon governance cycle defined in the revised Lisbon strategy and based on the following:

[60] COM (2005) 24 of 02.02.2005.

- Adoption of integrated guidelines for growth and jobs for the period 2005-2008[61].
- Adoption of National Reform Programmes by the Member States based on these guidelines.
- Adoption by the Commission of a Community Action Plan covering all actions to be undertaken at European level in support of the goals of growth and employment[62].
- Reporting in spring on progress achieved both at the national and EU levels.

In the Commission document[63], the Commission has indicated that "reporting on sectoral implementation mechanism for the OMC's in the fields of information society …should be merged with future reporting on the national reform programmes." In practice this means that i2010 objectives will be met both by direct EU level actions and Member States commitments. The actions identified in this part mainly address the EU level actions. Member States commitments will be defined in the National Reform Programmes to be adopted in autumn 2005. These will be based on the integrated guidelines relevant or referring to ICTs:

Guideline 11. **To expand and improve European infrastructure and complete agreed priority cross-border projects** with the particular aim of achieving a greater integration of national markets within the enlarged EU. Member States should fully implement the agreed measures to open up the network industries to competition, and ensure effective competition in liberalised markets, allowing at the same time to guarantee the delivery of services of general economic interest. In addition, they should introduce appropriate infrastructure pricing systems to ensure the efficient use of infrastructures and the development of a sustainable modal balance.

Guideline 13. **To facilitate innovation**, Member States should focus on improvements in innovation support services, in particular for technology transfer,, the creation of innovation poles and networks bringing together universities and enterprises, the encouragement of knowledge transfer through FDI, better access to finance and affordable and clearly defined intellectual property rights. They should facilitate the uptake of ICT and related changes in the organisation of work in the economy.

Guideline 20: Promote flexibility combined with employment security and reduce labour market segmentation through: … support for transitions in occupational status, including training, self-employment, business creation and geographic mobility; the promotion and dissemination of innovative and adaptable forms of work organisation, including better health and safety and diversity of contractual and working time arrangements…

Guideline 23: Adapt education and training systems in response to new competence requirements through: better identification of occupational needs and key competences, and anticipation of future skill requirements; broadening the supply of education and training vehicles; developing frameworks to support the transparency of qualifications, their effective

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61 COM (2005) 141 of 12.04.2005.

62 This will be drawn up on the basis of the EU Lisbon Programme set out in the SEC (2005) 192.

63 SEC(2005) 622 of 02.05.2005

recognition and the validation of non-formal and informal learning; ensuring the attractiveness, openness and quality standards of education and training systems.

Member States will choose their own priorities on the basis of these guidelines and this will provide Member States contributions to i2010. Overall the i2010 initiative will cover a wide range of policies which can be illustrated as follows.

At Member States level	At EU level
Illustrative actions for a Single European Information Space:	
national broadband strategies digital switch over strategies national network and information security plans	Regulatory framework for electronic communications, spectrum policy, revision of the Television without Frontiers Directive, ENISA,etc.
Illustrative actions for Innovation and Investment in Research	
National research and innovation policies, promotion of SMEs	Framework Programme for Research and Technological Development, Technology platforms, joined technology initiatives, wide scale demonstrators in the ICT policy support Fund, eSkills Forum
Illustrative actions for Inclusion, Better Public Services and Quality of Life	
Lifelong Learning policies and digital literacy, eGovernment and eHealth action plans	R&D, Digital Divide Forum, cross-border European services, eSafety initiative

These policy objectives could be supported by several Community instruments: legislation, financial support and communication. It will also be necessary that Member States, the private sector and other stakeholders support the new initiative. Nevertheless, there could be an important role for the public sector to act as driver and enabler, even to act as a catalyst, according to the objective.

4. OPTIONS

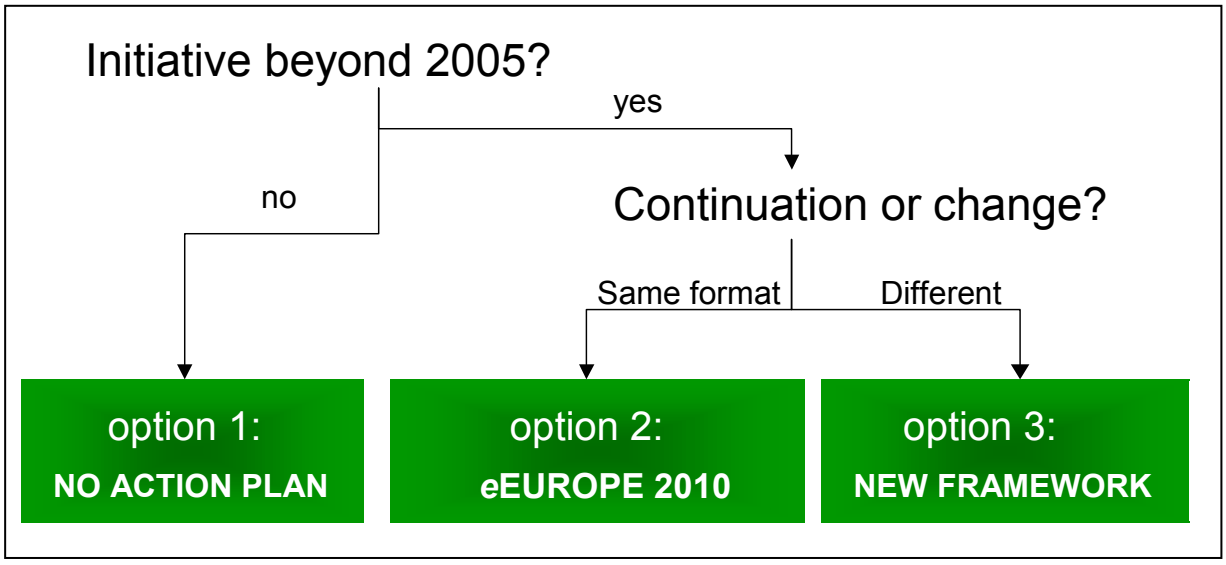
In order to achieve these objectives, the Member States and the European Commission are really confronted with two choices. The mid-term review of the *e*Europe 2005 Action Plan has provided relevant orientations as a preparatory step towards the establishment of a new

framework for ICT policy in the European Union. Firstly, is there going to be another action plan or not? If there is, is it going to take the same approach as *e*Europe 2002 and *e*Europe 2005 (working with a fixed agenda for 5 years in a limited number of areas without direct connections with research and regulatory), or is it going to be a wider and more flexible approach (covering all the Information Society and Media aspects)? Figure 1 shows the decision tree.

The first choice is essentially one between a horizontal or comprehensive policy approach, and a vertical or sectoral approach. The second choice asks whether a new initiative should follow the same format as previous eEurope Action Plans or propose a different approach providing cohesion as covering all Information Society and Media aspects and ensuring an integrated connection with research and regulatory, flexibility as actions can be more easily revised if needed, and a more demand side orientation.

The consultations launched to provide policy orientations for the next five years has seen the Member States and stakeholders agree with the need to broaden the scope of issues to be tackled. These include content and services, skills and work, and the need to improve the implementation process with a better co-ordination of related initiatives, and by increasing raising awareness activities.

Figure 1. The three instrumental options



Three broad options for the new initiative beyond 2005 can be discerned:

- **Option 1:** No further Action Plan and a return to separate but parallel IS policy strands;
- **Option 2:** A continuation of the *e*Europe Action Plan as in 2000-2005;
- **Option 3:** A new and more flexible policy framework, an umbrella approach covering Research, Regulatory, Deployment and Policy.

These options can be seen in relation to the main drivers to this revision: the forthcoming closure of the current *e*Europe Action Plan and the need for follow-up to fully achieve some

of the objectives, the emergence of important new trends which massively change the ICT environment, the new start of the Lisbon strategy, and new requirements from Member States on content and the implementation mechanism.

The following table provides some examples of major orientations for policy issues according to the option followed.

Domains	**Option 1:** **No EU initiative**	**Option 2:** **An Action Plan**	**Option 3:** **A new policy framework**
Convergence	A serious risk not to be addressed by EU policy	Lack of flexibility to fully address the convergence challenge	A cross-sectoral approach, promoting a dynamic and competitive ICT and Media sector
Security	Diverse national security strategies	Maintaining status quo, better linked with the ENISA work programme	Increased focus on a coherent security strategy for the European Union
Public services	Continuation of e-Health and e-Government action plans and specific new initiatives such as public procurement	Reinforce co-operation between Member States	Take a more proactive approach, building on achievements in e-Government & e-Health
Inclusion	No political promotion of inclusion issues in the information society - eInclusion limited to eAuthentication	Status quo with a risk of lack of specific targets	A comprehensive framework for monitoring and stimulating inclusion and participation
Innovations and research in ICT	Separate programmes	A tighter link to the ECT support fund	Enhanced synergies of Programmes, including FP

In summary of the discussion in previous sections, the main guide to identifying and selecting options for the new initiative, are the need for:

- Relevance: in particular with respect to the renewed Lisbon Agenda;
- A clear focus: through the three policy priorities;

- Taking into account major changes, such as the move from a "pilot phase" to a "wide deployment" as the ICT world becomes more mature and global, the emphasis on convergence, content, public services and quality of life, and new ways to implement;

- Impact: covering the whole of EU Information Society and Media policies (Regulation, Research and Deployment) involves a wider range of instruments beyond the traditional tools of the Open Method of Co-ordination. Partnership between all players is a key issue for better efficiency, creativity and visibility for achievements. To complement this, benchmarking aims to provide a picture of the progress towards these commonly agreed targets. This analysis should seek ways to increase the performance of these tools in meeting the goals identified; and

- Respecting subsidiarity.

The findings of the recent study on the effectiveness of the Open Method of Co-ordination in delivering eEurope Actions[64] concurs with the conclusion of the need for rolling individual Member States plans but working to common EU goals. A overall message is directed to better 'network management', i.e. mobilising wider sets of actors within and across Member States (as well as Commission Services) and linked with the broader instruments (e.g. FP, Structural Funds). Transfer of good practice and notions of peer learning need to be underpinned by a more sophisticated grasp of how change gets implemented and embedded.

5. POLICY PRIORITY IMPACTS

The objectives mentioned in Section 3 identify three clusters of policy priorities where action should be taken:

- A single European information space;

- Innovation and investment in research; and

- Inclusion, better public services and quality of life.

The Impact assessment will focus on the priority areas, and then use some illustrations to validate its conclusions.

For each option (no Action Plan, Another Action Plan, and a new policy framework), it will be examined what needs to be done to carry out the actions outline in each cluster of policy priorities (*mechanisms*), what economic, social, and environmental sustainability impacts, these actions will generate (*impacts*). Also, there is the opportunity that something could go horribly wrong or unexpectedly right, as well as remain unpredictable. (*risks and uncertainties*).

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64 The Analysis of Impacts of Benchmarking and the eEurope Actions in the Open Method of Co-ordination. Final Report by the Tavistock Institute, Net Effect Ltd, Instituto per la Ricerca Sociale, Milan. March 2005 DG Information Society

5.1. A single European information space

The overall objective should be to create an enabling environment for dynamic markets for electronic communications and digital services. The new initiative should promote new services and applications, and strengthen the internal market for information goods and services.

Regarding the large scope of issues covered by this cluster, the impact assessment focuses on a few policy issues which are the most illustrative.

For the convergence policy:

Option 1: In this option, the EU policy will not address the challenge of convergence and the need for an overall approach of converging sectors. Policies and regulations performed independently on networks, devices, media and content, supporting one without considering the others, could have unforeseen or unwanted overall consequences and would be unable to identify and address bottlenecks. Therefore, the absence of a policy viewing the issues arising from convergence as a whole involves a serious risk of regulations hindering the overall development of ICT and Media markets.

Option 2: A comprehensive EU strategy addressing the challenge of convergence for the next five years and the need for an overall approach will certainly allow removing some of the barriers hindering the developments in the ICT and Media sectors. However, in an always evolving environment where convergence is driving constant and unpredictable changes in the ICT and Media markets, a five year Action Plan does not provide the level of flexibility needed to adapt policy to new challenges. There is a real risk of a non-flexible policy being unable to properly address the challenge of convergence.

Option 3: The ICT and Media sector is highly innovative. Significant changes are currently driven by a strengthening convergence process. Convergence affects content, devices and networks, requiring coherent approaches at all levels of the value chain and a comprehensive framework. A cross-sectoral approach and expanded coordination should make it easier to efficiently promote the development of both ICT and Media.

For the Security policy:

Option 1: In this option, relevant EU initiatives and new and existing national security strategies would continue on an individual basis. ENISA is now operational and the other regulatory (e-signature, privacy) and research activities continue as planned. However, the regulation establishing ENISA gave it limited powers (mainly advisory), confined to the areas covered by the internal market. Consequently, ENISA can not deal with all the network and information security issues which fall outside the scope of the EC Treaty, such as those covered by Titles V and VI of the Treaty on European Union. What is more, different national security strategies might result in inconsistencies and use of fragmented security solutions. To avoid that, a more co-ordinated effort is needed.

Option 2: To continue with the *e*Europe 2005 approach. However, as far as the security matters are concerned, the action plan has already shown its limitations. Many policies and actions in the area of trust and security have been initiated, but they have not reached critical mass to be effective. One of possible explanations for this lack of success might be the lack of sufficient coherence between them.

Option 3: To trigger a new set of policy and research actions federated under a coherent policy umbrella. Problems related to propagation of malicious software ('malware') and spam, or ensuring stability of the Internet and other critical information infrastructure networks can only be solved if sufficient synergy is achieved between research, regulation and deployment. The response to security threats and the prevention of crime in the information space call for a close co-operation across national borders and across market sectors and the use of many forms of intervention, including research, policy actions, regulatory activities, standardisation, education, and awareness, etc. This could be realised much more efficiently via a new policy framework.

5.2. Innovation and investment in research

The overall objective is to promote innovation and investment in ICT research, and the creation more favourable conditions to the take-up of ICT.

For the innovation and research policy:

Option 1: This option would lead to a fragmented approach of the research and innovation systems. The framework program for R&D would continue without an interaction with policy inputs and national initiatives.

Option 2: A new action plan would allow for more synergy between fields of intervention as implemented in the eEurope initiative through various projects, particularly e-Government, e-Health and e-Inclusion. Specific actions would be undertaken for ensuring a better environment for innovation but would not be linked to research efforts and cross-border deployment demonstrators.

Option 3: A new policy framework, mobilising all the EU instruments would offer the appropriate conditions to tackle the whole systemic approach with a better research network and leverage effect from co-operation with financial support programs. A new policy framework would also identify and target the various "system failures" of the European system of innovation in the ICT sector.

For the e-Skills policy:

Option 1: This option is neither satisfactory nor feasible. There is a clear need for co-ordination and added value at the EU level with reference to the role of ICT in creating opportunities for new employment possibilities, more creative and fulfilling jobs and new tools for education and training;

Option 2: An action plan solution, similar to the eEurope 2005, has been of limited value to keep political momentum on learning and skills. The various initiatives launched so far in the field of ICT employment and ICT-skills showed a slow progress in estimating ICT-skills deficiencies and in forecasting what will be the situation of ICT-skills supply and demand at the EU level in the medium and long term; and

Option 3: The assessment of future ICT-skills demand and supply and forward looking innovations calls for a proactive approach at the EU level, which would link ICT skills to employment policies.

5.3. Inclusion, better public services and quality of life

The overall objective is to exploit the potential of ICT to increase the welfare of people living in the EU, by supporting the creation of a knowledge society that strengthens inclusion and participation while ensuring individual rights, deliver more efficient services of public interest and, ultimately, improves quality of life. The three aspects are intrinsically related.

For the e-Inclusion policy:

The consistent policy line of the EU and most Member States is that e-inclusion must be an essential component of Information Society policy. There is also wide consensus on the need to reinforce this component at EU level, as it comes out systematically in all consultations to Member States and other stakeholders, e.g. study conducted by PWC for the Dutch Presidency at the end of 2004, Commission consultations at the beginning of 2005, advice from independent experts to *e*Europe Advisory Group in 2005. However, the scope for EU action is limited for legal and practical reasons. Concrete achievements will depend on Member States agreeing to undertake co-ordinated action at EU level, and on the Commission playing an active role in that context. In practice, beyond funding for specific projects (e.g. through structural or R&D funding), this role can essentially be one of analysis and monitoring, co-ordination, and awareness.

Option 1: In this scenario, the new EU policy framework for the Information Society would have no reference to the role of ICT in promoting inclusion and participation. Relevant EU initiatives would continue on an individual basis, contributing more or less directly to those goals, e.g. initiatives on social inclusion or the internal market for electronic communications. From a political point of view, this option must be ruled out. There is a clear demand for more, not than less, EU involvement as recalled above.

Option 2: In reality, the current *e*Europe 2005 approach to e-Inclusion is not very distant from option 1. This topic is a horizontal concern relevant to all action lines of the *e*Europe Action Plan but, contrary to *e*Europe 2002, there is no specific target. Certainly *e*Europe provides a political reference justifying EU support for various R&D projects or deployment and dissemination initiatives. However, many of these contribute to reinforce inclusion in an indirect or partial way, without prejudice to targeted actions in well-defined areas such as e-accessibility. Such contribution does not take place in the sort of structured and comprehensive framework for action that emerges in areas like e-government and e-health.

Option 3: The proposal would not launch a new "ad-hoc" initiative on ICT for inclusion and participation, but rather establish a comprehensive framework for monitoring and stimulating ICT-enabled inclusion and participation in a broad sense, while linking the numerous EU initiatives of relevance in this area, in order to derive synergies and thus maximise positive impact. This would provide a "users' pole" within the new Information Society strategy, i.e. an intermediate policy layer as it exists in other areas mentioned. Then, within this framework, targeted initiatives would still be pursued in specific areas, such as e-accessibility, digital literacy, trust and confidence, wide participation (through affordable and friendly access to services and content of public or commercial nature), and others. The new framework would take stock and redefine the scope and links between EU actions in several domains, which are increasingly related but not at policy and operational level. The instruments considered here are basically about support analysis and monitoring, co-ordination and awareness: studies, events, benchmarking and the like. This does not exclude very punctual regulatory action, e.g. standards for accessibility of ICT equipment, or targeted

funding for research or deployment of projects. In the longer term, a closer alignment of strategic policy objectives with legal and financial instruments could be envisaged. Actual impact on the ground, i.e. on Europeans, will be rather indirect and actually difficult to assess, except in the case of specific projects. The impact will depend on how the mentioned stakeholders will play the role of intermediaries, so that goals agreed with them at European level are translated into operational actions.

For the public services policy:

There is now strong political momentum for public sector reform in response to combined pressure from societal challenges (ageing, immigration…) and budgetary constraints. The contribution of such reforms to the Lisbon objectives on sustainable growth and cohesion must be further explored. In this context, while the potential of ICT is widely acknowledged, as well as the need for sustained efforts combining investments in technology with improvement of working processes and skills, it is now time to prove the actual gains in efficiency and quality.

The debate on ICT and public services raises some vertical issues specific to "general" administration, health and education and other areas. It also raises horizontal issues, which sometimes are equally relevant to the private sector, relating *inter alia* to: maximising and measuring impact regarding public value; pan-European services and their contribution to objectives of EU policies; interoperability at various levels, including legal and organisational approaches; security, privacy and identity management; support to EU industry. While public services are basically the responsibility of Member States, the ICT dimension makes a strong case for co-ordinated action at EU level in search of greater synergies and efficiency through interoperable solutions, sharing of practices, and so forth.

Option 1: This would consist in stopping all policy co-ordination activity at EU level (perhaps just maintaining some funding for R&D and deployment projects in this area) on the grounds that the organisation of public services is a competence of the Member States. That is not a satisfactory or feasible option for several reasons. First, this is one of the main areas of success in *e*Europe, which, according to Member States, has contributed to the progress of online services of public interest across the EU (see *e*Europe action lines on e-Government, e-Health and e-Learning). There is a clear consensus from Member States on the added value of EU co-ordination and a desire to go further, as evidenced by reactions to the recommendations in 2004 from the *e*Europe e-Government sub-group and in the e-Health Action Plan. That co-operation yields practical benefits for Member States, relating in particular to economies of scale from common solutions and exchange of experience. While this dynamic of co-operation has been consolidated over the past months, it will take some time for it to bear fruit, in view of differences in national situations and the need to build gradual consensus. A 2010 horizon seems most appropriate to achieve results. Secondly, from a legal perspective, while the subsidiarity argument seems to plead for no or minimum EU action, there is actually several areas where the organisation of services of public interest do affect Community competence, thus requiring some form of harmonised approach also with regard to ICT aspects, for instance, in relation to the internal market, the issue of e-procurement.

Option 2: A comprehensive EU Information Society strategy would continue to provide a political umbrella for actions undertaken on services of public interest. This would essentially consist in reinforced co-operation with Member States, as competence in this area mainly lies with them, supported by EU funding for R&D, deployment and regional development. In

certain areas, that co-operation could be formalised in Actions plans (e.g. e-Public Procurement or other types of structured EU initiative) linked to the broader Information Society strategy. Therefore, the purpose should be to define common objectives and encourage common solutions across the EU, thus exploiting synergies. The ultimate goal should be to modernise and innovate the ways services of public interest are organised and delivered in Europe, so as to enhance their quality, efficiency and transparency. In addition, to promote cross-border and pan-European services in support of EU policies on the internal market, freedom and justice, international relations and so forth. As indicated, this is a long process and substantial results are only starting to be visible. Maintaining the current approach under the new Information Society strategy, without prejudice to agreeing on new objectives and reinforcing the instruments for co-operation and implementation, therefore seems a reasonable option.

Option 3: Same as Option2.

5.4. Summary

	No Action Plan	**Another Action Plan**	**A new policy framework**
General impacts	(+) Bottom-up approach, allowing the different policy fields to develop at their own pace (e-Government, e-Health, etc. (-) Danger of dissociation of Information Society and Media from the competitiveness focus of other policies (-) Danger of focusing on too many different policy issues and losing out of sight the requirement of a comprehensive strategy (-) more limited European initiatives opportunities	(+) A continuation of the current eEurope 2005 which is well-know outside world (-) Ultimate focus is to feed into the Lisbon strategy, i.e. the communications dimension is not sufficiently addressed (-) Difficulties to keep policy agenda in line with technological and market developments	(+) The Lisbon dimension is addressed in a consistent way in the development of the priority areas (+) consensus on broad objectives and adjustment of policy initiatives to concrete progress and needs. (+) Corresponds to the recommendations both of the Kok report and to the expectations of the Member States (-) Requires a significant level of coordination between policies, and with Member States and a forward-looking approach for all the underpinning policy fields
Convergence	(-) A serious risk of regulations hindering the overall development of ICT and Media markets. The EU policy will miss the convergence challenge	(+) Specific actions related to the convergence issue	(+) The convergence challenge requires a cross-sectoral and flexible approach with an expanded co-ordination across Commission services and Member States, in particular for regulation and legislation
Security	(-) All the security issues will not be covered (-) National strategies will create fragmented solutions and inconsistencies in a very	(-) Lack of sufficient coherence between all the security issues, such as networks integrity, data protection, malware, and eSignature	(+) To trigger a new set of policy and research actions federated under a coherent policy umbrella

	strategic domain		
Innovation and research	(-) no link between research and deployment	(-) no link between research and deployment (+) addresses innovation through eBusiness	(+) Better co-ordination between policy, innovation and research and cover the entire innovation system (+) Better leverage effect from co-operation between financial support programmes
e-Skills	(-) No co-ordination between actions at EU level (-) A risk not to cover all the issues concerned	(+) Better coordination between actions at EU level (-) A risk not to cover all the issues concerned	(+) ICT skills issue require a cross-sectoral covering work environments labour manuals social inclusion, education and …. This requires a flexible approach with an expanded co-ordination
e-Inclusion	(-) Fail to address key pillar of any IS policy (-) Ignore feedback from Member States and stakeholders	(+) No co-ordination of EU actions, fragmented approach and overlaps (-) EU competence limited	(+) Overall view and strategic line in a key IS policy pillar (-) EU competence limited
Public services	(+) In line with subsidiarity and better regulation spirit (-) Blows away long preparatory work and consensus built with or under eEurope (-) Against EU and Member States administrations call for closer EU co-operation in context of societal challenges (public sector reform ageing population…)	(+) more co-ordination, reaps fruits of long preparatory work and consensus building under eEurope (+) Efficiency and quality gains through better economies of scale (by sharing experience and common solutions) (+) Supports EU policies	(-) subsidiarity, (+) Can better contribute to new Lisbon goals on growth and jobs through common EU strategy

6. IMPLEMENTATION MECHANISMS IMPACTS

Several instruments can contribute to achieve the targets for the next five years. These are: legislation, policy governance, financial instruments, and better ownership through benchmarking, exchange of best practice, and communication.

6.1. Governance

To strengthen co-operation with the Member States and stakeholders, the *e*Europe 2005 Action Plan foresaw an 'Advisory Group' with two sections. This Group aims to provide a strategic overview of implementation of the *e*Europe 2005 Action Plan, and to offer a forum to exchange experiences between Member States (First Section). It has also allowed for the early participation of the Acceding countries. The Group invites stakeholders to express their views within a Second Section. The Group and its Second Section meet regularly, and provide

advice and suggestions to improve the implementation of *e*Europe through regular reports to the European Commission and Member States.

With the Member States

Option 1: No specific group committee is needed. Member States (at Director General level) will continue to meet, but only under the formal Councils' procedure, and in specific management committees. These meetings do not offer opportunities to discuss neither issues not strictly related to their agenda, nor preparatory work. This option is a fragmented manner to discuss and co-ordinate issues and actions, and goes clearly in the opposite direction required by the Member States.

Option 2: Member States consider the current Advisory Group as an efficient one, but call for an increasing role in order to act as a 'steering group'.

Option 3: The new policy framework, by broadening the scope of issues to be tackled, offers a more appropriate response to Member States. This should also increase the co-ordination at national level between administrations.

With the stakeholders

The *e*Europe 2005 Action Plan tested the idea of organising the dialogue with stakeholders through a dedicated Section, composed of 40 experts, within the *e*Europe Advisory Group. Its work, by delivering reports[65] on key issues, such as, the territorial coverage of broadband, e-Inclusion, and the next five years in Information Society, is recognised as a valuable contribution for the work of Member States and the European Commission. This Section has also provided contributions to specific issues, such as digital rights management, e-Learning, and implementation mechanisms.

The stakeholders' response to the policies has an impact on its efficiency. The three main objectives, identified for a new policy initiative, have a specific set of stakeholders involved. A first inventory of the stakeholders yields the following lists for each policy priority.

These lists might be either reduced or, more likely, enlarged as the analysis of the reasons why these players are seen as stakeholders is supported by evidence. However, it provides a starting point for examinations of stakeholders in the Information Society.

The roles of the stakeholders will be altered in response to different actions and initiatives within the policy priorities. The analysis of the roles and also of the motivations of stakeholders cannot be more detailed than the description of actions and initiatives.

Option 1: Without any new initiative, the dialogue with stakeholders will continue through consultations, events or groups organised by the European Commission, Member States and stakeholders, in various domains, but without co-ordination. The European Commission and the Member States will lose the benefit of regular meetings to analyse issues, particularly horizontal ones.

65 All the reports are available at: http://europa.eu.int/information_society/eeurope/2005/all_about/advisory_group/documents/index_en.htm

Option 2: Another Action Plan will propose either to set up a new 'Expert Section' or to create an 'open list' of experts, to be assembled according to issues addressed in temporary groups. Existing groups or events will continue separately. In addition, it is becoming more difficult to set up an Expert group to cover the increasing number of issues that needs to be addressed by Information Society policies.

Option 3: A new policy framework will provide a flexible approach based on a 'network of expertise', linking groups of experts across Europe, particularly at national level. This will apply a better dissemination and focus on issues not analysed, or which need to be deepened. One or two regular events could organise a regular discussion with stakeholders' communities, and provide inputs to progress reports.

6.2. Financial instruments

Community actions for promoting the adoption of ICT in business, in administrations and public sector services are currently being carried out under the *e*Europe initiative. The main instrument for this initiative is the Open Method of Co-ordination. *e*Europe is not a financial expenditure programme. However, a set of financial instruments are implemented in parallel, including:

- MODINIS: provides direct support to benchmarking activities, identification and exchange of best practice, studies, conferences, and other actions that help implement the Open Method of Co-ordination in *e*Europe. Its budget is €22 million for 2003-2005;

- eTEN: supports the validation and deployment of trans European ICT-based services. Total budget for 2000-2006 is €315 million;

- eContent (+): aimed at fostering the development of innovative European content. Budget for 2000-2004 was €100 million, and the proposed eContent+ programme for 2005-2008 will have a budget of around €163 million;

- Safer Internet (+) Action Plan: aimed at protecting young people from harmful and illegal content on the internet. Its budget for 2000-2004 was €40 million. A new proposal has been put forward for 2005-2008 for €55 million; and

- The MEDIA Plus programme: aims to strengthen the competitiveness of the European audiovisual industry with a series support measures dealing with: the development of production projects and companies; the distribution of cinematographic works and audiovisual programmes; the promotion of cinematographic works and audiovisual programmes. The programme originally ran from 2001 to 2005, and was extended for one more year to cover 2006.

In addition to these programmes, two other financial instruments contribute directly to the information society. The IST Priority is the largest of the 6th Framework Programme for Research and Technological development (FP6) with a budget of €3.6 billion for the period 2002-2006, out of a total of €16.3 billion for the overall FP6. The Structural Funds devotes around €10 billion (over 7% of its total budget) to promoting the information society for the 2000-2006 period.

Finally, the Multi-annual programme for enterprise and entrepreneurship (MAP 2001-2005) also supports information society activities such as the European e-Business Support Network (eBSN), and the e-Skills forum.

The above financial instruments ensured support of a range of pilot actions and exchange of best practice. These instruments can be improved, rationalised, and reinforced as they have often been limited in terms of resources. Many times, Member States have requested a financial layer in the *e*Europe, initiative to better support the deployment of ICT and the development of pilot projects. In April 2005, the Commission has proposed to create a financial support programme in order to integrate the activities currently undertaken by several separate programmes, such as MODINIS, eTen and eContent. This will enable the desired levels of ICT penetration and cluster to have the necessary critical mass for uptake and best use of ICT services, which in turn, should lead to the necessary productivity gains. It should also leverage new investments in the Member States for best use of ICT, in order to modernise public sector services and improve their efficiency and effectiveness.

Option 1: This option means that the programmes remain separate. This option would have an overall negative impact. The current supply-driven approach of these programmes does not always correspond to market demands and relies excessively on commitments by private sector and Member States. There is no mechanism to ensure that the outcome of these programmes feed the overall policy debate.

Option 2: Another Action Plan could give visibility to specific actions or components of the existing programmes but would fail to improve the synergies between them.

Option 3: A new policy framework with, in particular a link to the ICT Policy Support Programme. This support programme would provide for action to develop the single European information space and to strengthen the internal market for information society services; to stimulate innovation through a wider adoption of and investment in ICT; and to promote an inclusive information society. Community funding is necessary to build interoperable solutions across the Union, help overcome barriers of technical fragmentation in Member States, and build wide scale demonstrators. This option will bring about greater synergy and coherence with other EU financial instruments, in particular the new programming period of the Structural Funds (2007-2013) and the 7th Framework programme (2007-2011), thus reinforcing its impact in promoting the information society.

6.3. Better ownership

This section covers actions raising awareness, facilitating mutual comprehension, sharing experience and, as a whole, increasing participation in Information Society through a better ownership of issues.

For instance, actions to promote the exchange of best practice may include ministerial conferences, websites with databases on best practice (as is already done in e-Government and e-Health), EU level guidelines (e.g. interoperability guidelines, such as, the IDABC European Interoperability Framework) and stakeholder networks (such as the e-Skills Forum or the European Business Support Network/eBSN).

Moreover, benchmarking activities are needed to monitor progress, to assess the relevance of the implementation process followed, and to encourage Member States to make more efforts to achieve goals. To that effect, the benchmarking exercise has to follow the move suggested

by a new policy framework and to become more impact-oriented through qualitative indicators.

Finally, communication activities support the widest possible diffusion of ICT by raising awareness of the benefits of the Information Society through events, workshops, awards, consultations, high-level groups, regular reports, press releases, and so on.

Option 1: The end of an initiative at EU level will transfer the responsibility for these activities to Member States and will strongly limit the benefits from this kind of actions. In addition, discontinuing benchmarking activities would mean that policy makers would lose the main evidence base for assessment of their proposed actions.

Option 2: The continuation of an Action Plan is more or less neutral for exchange of best practice, following the same format as in 2000 – 2005 with numerous workshops to disseminate information. A new Action Plan would require a communication layer to increase the visibility of achievements. For benchmarking, the no change option is untenable as present indicators would become increasingly irrelevant as policy shifts and as indicators become saturated, e.g. the indicator of online availability of public services is approaching 100% in some countries.

Option 3: A new policy framework does not fully change the situation for exchange of best practice but encourages any new initiative to promote such a co-operation between players. Communication activities are a natural component of a more user-centric approach. To that effect, the new initiative may provide a specific strategy to increase the visibility and impact of actions. In addition, proposed changes to benchmark the new policy framework could introduce a flexible mechanism that can exploit the advantages of current benchmarks.

6.4. Summary

	No EU initiative	**Another Action Plan**	**A new Policy Framework**
Public authorities	(-) No more co-ordination between Member States at EU level, except within the formal Councils' and Management Committees' procedure. (+/-) More initiative to be undertaken by national authorities, with less coherence	(=) neutral	(+) A broader scope of issues to tackle which applies a better co-ordination at national level
Stakeholders	(-) Lack of co-ordination between the various tools to consult stakeholders (-) Difficulty to tackle horizontal issues	(=/-) neutral, even more difficult to reach a relevant representation of interests with an increasing number of priority issues	(+) Creation of a networks of expertise, linking groups of experts, particularly, at national level (+) one or two regular events for discussion with stakeholders' communities

Financial instruments	(-) lack of synergy between separate programmes (-) lack of feedback of programmes on broad policies	(+) no synergy between programmes (+) visibility to some actions/components of programmes	(+) A strong leverage effect through a ICT Policy Support Programme (+) Greater synergy and coherence with other EU financial instruments
Better ownership	(+/-) initiatives at national level with a lack of co-operation (-) loss of the connection to policy makers and capacity to make relevant measures	(=) neutral for exchange of good practice and communication activities (-) risk for benchmarking to become increasingly irrelevant as indicators become saturated	(=) neutral for exchange of good practice activities (+) a specific strategy for communication to increase visibility and impact of actions (+) a flexible mechanism for benchmarking exercise, more impact-oriented

7. CONSULTATION

As part of the Open Method of Co-ordination between Member States and the European Commission, *e*Europe is driven by an ongoing exchange of information. In that context, the preparation of a new policy initiative was based on a broad reflection process, particularly by allowing all stakeholders to express their views. In fact, the evaluation was organised around a wide consultation which took place between May 2004 and March 2005.

The different steps followed to collect all views, provided clear orientations to policy-makers, not only by identifying policy priorities, but also by justifying some targeted improvements in areas where significant gains might be expected over the short term.

7.1. The consultation process

The consultation for the preparation of a new strategy took place through the following steps:

Step 1: Preparatory studies

The first step was launched during the second half of 2004 on the basis of the outcomes from the eEurope 2005 mid-term review[66], which provided some valuable inputs to improve policy guidance and to launch new actions. The period focused on thematic goals, through the Dutch presidency study "Rethinking the European ICT Agenda", carried out by Price Waterhouse Coopers[67], which was presented and discussed among Member States during the Dutch High Level conference in Amsterdam on 29 and 30 September 2004. This first orientation was completed by the work done by the Expert Section of the eEurope Advisory Group[68] on the post-eEurope strategy, delivered in October 2004.

Step 2: A wide consultation

66 "eEurope 2005 Action Plan: An update" COM(2004)380

67 "Re-thinking the European ICT Agenda", PWC, August 2004

68 "The next five years in Information Society", eEurope Advisory Group, The Expert Section, October 2004 – Available at: http://europa.eu.int/information_society/eeurope/2005/all_about/advisory_group/documents/index_en.htm

All these reflections were compiled and developed by the European Commission in a Commission Communication "Challenges for the European Information Society beyond 2005", adopted in November 2004. In its communication, the Commission identified a number of issues that will require the attention of policy makers during the coming years.

These issues were put to the test through two consultations launched in parallel both with Member States and stakeholders, between November 2004 and February 2005. The public on-line consultation was launched on 30 November and received 70 contributions. These contributions covered completely the three traditional components of our society: public sector, private sector, and civil society. This situation provides valuable support to the validity and relevance of this consultation, and can be considered as a success[69]. Moreover, with 21 responses, the questionnaire to Member States provided a good view of their expectations on the main issues, and implementation approach for a new strategy.

Step 3: Discussions with Member States

Those views were confirmed and fine-tuned through meetings with the Member States. The Challenges Communication was discussed at the December 2004 Telecom Council, and the Council Resolution invited the Commission to prepare the follow-up of the eEurope 2005 Action Plan. Formal discussions were also undertaken with government representatives within the eEurope Advisory Group, during meetings on 22 October 2004, and 22 February 2005. At the last meeting, the draft benchmarking report[70] gave additional input to the discussion.

In addition, the whole process was completed with internal discussions within the European Commission. An Impact Assessment Steering Group was set up to mobilise Commission services involved, to discuss the new Information Society policy initiative beyond 2005. This Group met three times on 5 January, 24 February, and 15 March 2005.

7.2. Main results from the consultations

Some results are already integrated in the document. Therefore, this section will only highlight the main issues that emerged from the consultation exercise. Both consultations with Member States and stakeholders referred to the Challenges Communication, which proposed eight policy clusters. These are: e-Inclusion and citizenship, content and services, public services, skills and work, ICT as a key industry sector, interoperability, trust and dependability, and exploitation of ICT.

For Member States, the top-3 policy priorities are public services, e-Inclusion and citizenship, and trust and dependability. This opinion converges with the result of the public consultation, with the exception of the third one: stakeholders have selected content and services, with the item on trust and dependability in the fifth place.

This difference can be explained by the attention paid by public authorities to security, not only to protect network integrity and personal data but also to ensure a confidence in the internet, for transactions such as, e-Procurement, eCommerce, and e-Health.

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69 The public consultation report is available on the European Commission web-site: http://europa.eu.int/information_society/eeurope/2005/all_about/2010_challenges/index_en.htm

70 To be published in September 2005

The Member States' opinion is in line with the revised priorities of the *e*Europe 2005 Action Plan, as confirmed by the Conclusions of the Communication, on the update of the eEurope 2005 Action Plan, endorsed by the Telecom Council in June 2004: *"The Lisbon Strategy is a strong political commitment to ensure that the European Union becomes the most competitive and dynamic knowledge-based economy by 2010. If the European Union wants to play a leading role in the global Information Society, it is necessary that all three pillars of the Lisbon Strategy are fully implemented in ICT policy. These are growth and competitiveness, cohesion and sustainability. These provide an orientation for consideration of the next steps beyond 2005 and beyond the timeframe of the current eEurope Action Plan. New policy guidance such as safeguarding citizen-user-consumer interests, providing industrial policy tools and increasing e-inclusion should be taken into account."*

This result converges with other input provided for the process that will lead to the adoption of a new strategy during 2005. The top three policy priorities expressed by the Member States at the Amsterdam Event in September 2004 on the basis of the PriceWaterhouseCoopers study, are: wide e-Inclusion from access to skills; to remove barriers for an innovative telecommunication sector, convergence and interoperability through content, anytime, anywhere, on any platform. The report on challenges for the next five years published by the Expert Section of the *e*Europe Advisory Group has mentioned 3 major priorities. These are: grassroots change, creative diversity and open governance. The Fistera Delphi survey led by IPTS has also submitted three major orientations, which are: trust and security, digital divide, and innovation.

Most of the Member States did mention the overlap between the proposed clusters, particularly between public services and content and services. Some Member States have suggested re-structuring the proposed clusters into three horizontal ones, for instance: innovation, growth and competitiveness; governance, citizenship and cohesion; people, culture and sustainability.

The results of the consultation also identified interoperability, skills and work and, as mentioned before, content and services as important domains where the EU dimension needs to be strengthened.

There is a call for an improved technological approach, which includes further deployment of broadband, new generations of networks, 3G and spectrum policy. Many stakeholders require a cluster dedicated to infrastructure development, in order to offer an adequate environment for innovation in services and content. The second request is more user-centred, and covers various aspects of daily life, such as, information, knowledge, mobility, eConsumer, eParticipation and safety. These proposals seem to require improved regulation for protecting people in their ICT usage. Finally, the consultation specifies the need for better co-operation between policy, regulation and research.

In addition, several Member States consider that the instruments used for the implementation of eEurope have to be strengthened. Best practices should be more focused, better analysed and disseminated more effectively. In addition to this, both best practices and worst practices could be highlighted to learn from previous experiences. Improved co-ordination between programmes would also help avoid duplication of initiatives and develop a clearer vision at EU level. There should be a better use of existing committees. The *e*Europe Advisory Group should play a steering role and improve its organisational structure.

Similarly, an improvement in benchmarking (e.g. focus on intensity, comparisons with third countries, use of relevant indicators, user satisfaction, etc) is welcomed by most Member States. Some countries insist on reducing the frequency of the collection of data, for instance, every two years.

Finally, many contributions put emphasis on giving continuity to the current policies of *e*Europe 2005 in order to maintain the targets of the current action plan. Electronic communications legislation on equipment, services and content should be under one common legislative framework, and that there should be greater availability of innovation in content and services.

7.3. Summary

In summary, a number of key conclusions emerged from the consultation process and these provided the main direction of the orientations proposed in the Communication. These are:

- to revitalise the political momentum built among the Member States during the last five years for an Information Society policy at EU level: a better partnership is required between all the stakeholders, public and private, for better efficiency, creativity and visibility of Information Society policies;

- to strengthen the link with the Lisbon strategy: it becomes more and more difficult to maintain ICT policies high on the national agendas. In that perspective, Member States called for a vision behind the next policy initiative, and a long term policy framework. In particular, the message encourages the raising of ICT issues in the debate on economic and social policies;

- to emphasise the social benefits of ICT - it is a key enabler for quality of life, culture and inclusion objectives for society (with a holistic dimension) to increase the attention paid to stimulating demand for content and services, end-users and citizens as well;

- to give priority to employability, mobility and accessibility and by doing so, to broaden the scope of the new initiative with both research and regulatory policies, as it acts as an umbrella; and

- to turn the benchmarking exercise into a more impact-oriented mechanism and to increase the exchange of best practices, the dissemination of information and the co-ordination between various levels, with a stronger link with the financial instruments for increased efficiency in supporting projects.

8. PLANS FOR MONITORING, FOLLOW-UP AND EVALUATION

Monitoring and evaluation are designed at two levels:

- At the 'meta' level, through regular evaluation of the overall performance in relation to objectives, impacts, relevance, utility and lessons learned, and

- at the priority/action level, through measuring performance in relation to benchmarking and exchange of best practices, and supported by a range of statistical surveys, studies and other empirical analyses.

Clearly both levels are inter-linked. The following section sets out the activities being conducted or planned for each of these two levels of evaluation.

8.1. At the Meta-level: progress reports

Regular evaluation of the whole initiative is an essential component of its effective delivery. To that effect, it is proposed to draw up regular progress reports that may be supported by benchmarking to measure progress and to identify new priority areas for the following period. The current Action Plan will close at the end of 2005 and an evaluation would be launched in 2005. This would need to be in line with the new Lisbon governance cycle, so as to avoid overlap and duplication.

The final evaluation of the new initiative, at the end of 2010, would also provide an occasion for contributing to the overall impact assessment of the Information Society and Media policies.

8.2. Monitoring, review and development of indicators for the new initiative

Benchmarking has been a key element of information society policy since the beginning of the *e*Europe initiative.

The benchmarking exercise for the *e*Europe 2002 Action Plan included the definition of 23 indicators. The *e*Europe 2005 Action Plan focused on the development of broadband modern online public services and a dynamic environment for e-Business. The aim was to extend use of ICT to boost productivity and create new content services and applications. To benchmark *e*Europe 2005, the Council defined a new set of indicators in the Council *e*Europe Resolution of February 2003[71]. The major change from the *e*Europe 2002 indicators was the greater use of official statistics. Eurostat has been following both the 2002 and 2005 *e*Europe Action Plans from the start. Annual Community surveys on ICT use in enterprises/e-commerce and in households/by individuals started in 2001 and 2002, respectively. In April 2004, the European Parliament and the Council adopted an EC Regulation on Information Society Statistics (Regulation [EC] no. 808/2004). That regulation will make the above mentioned surveys mandatory within the European Union, and will ensure harmonized data for all EU-25 Member States from 2006 onwards.

The new approach to benchmarking policy post-2005 is being developed through a series of workshops during 2005. The workshops bring together policy specialists and ICT experts from the statistical Institutes and have established some general principles: **a limited number of indicators; flexibility; measuring policy effectiveness; market developments; from connectivity to impact; and pilot projects.**

In 2006, the Information Society surveys will be, for the first time, conducted under the new Regulation [EC] no. 808/2004. However, the 2006 surveys will be based on the *e*Europe 2005 benchmarking indicators, with improvements on e-government, e-skills, and broadband.

71 Council Resolution on the Implementation of the eEurope 2005 Action Plan 2003/C 48/02

8.3. At the level of specific actions: opportunities for regular adjustments

As noted above, the new benchmarking exercise would monitor progress for goals identified for the five year period in the various domains covered by the new initiative, and provide input for actions.

This mechanism, which combines monitoring and follow-up, would offer opportunities to adjust actions on a regular basis. This process could identify actions for the following period through some priorities fixed by Member States and the European Commission. Actions could be revised to ensure flexibility in view of new developments and new initiatives launched by the European Commission, or to take account of developments and progress reported in the context of the new Lisbon governance cycle.

Based on the actions preliminarily identified for the three main objectives, we would arrive at a substantial number of actions per year (around 20-30), to be managed by the European Commission. For the year 2006, several actions are already envisaged[72].

8.4. Promotion, exchange and communication

Providing a forum for exchange of good practice could be one of the most important contributions to policy development in Member States.

Exchange of best practice has been enhanced by practices, such as:

- Forums and conferences to present best practice, giving greater awareness of various experiences. Examples of this are the on-going series of Ministerial conferences on e-government and the e-health conference in 2004;

- Competitions and quality awards that put good practices in the spotlight. This method is well-developed in e-Health and e-Government;

- Support networks to promote mutual learning such as the e-Business Support Network (eBSN), and European Schoolnet in the area of e-Learning[73];

- The codification of lessons into the form of guidelines, checklists, roadmaps or technical working documents, such as the structured analysis of best practice and transferability conditions proposed in the e-Government section;

- The development of complementary quantitative and qualitative indicators that track important developments, which are not captured by the benchmarking indicators, such as growth of eContent, or patterns of use of broadband; and

- Agreement on voluntary codes of good practice based upon codification of practices.

There is a need to balance the mix of these policy instruments to optimise exchange, taking into account the level of consensus, experience and maturity in the field. There is also a need to analyse the economic and social consequences of the Information Society, with a view to facilitating policy discussions. For these reasons, there is a need to improve the dialogue with

72 See Annex (Section 10): an inventory of concrete orientations within each main policy objective.
73 http://community.eun.org/

stakeholders in a flexible manner, in order to benefit from their experience on the ground and advice to fully achieve targets. A regular event could be used to prepare progress reports, whereas meetings with industry could discuss proposals for change . This dialogue would also act as a relay ensuring the spread of information across Europe. There is a common interest between public authorities and stakeholders to increase attention in Information Society policy among media and academics.

Finally, it is obvious that all this information and analysis must be more visible and available for anyone. The European Commission website could continue to play an active role. But more importantly, the ICT Policy Support Fund could allow to launch broad awareness raising campaigns which would demonstrate the benefits of ICT to business and citizens.

9. CONCLUSION: COMMISSION DRAFT PROPOSAL AND JUSTIFICATION

The following table identifies the policy areas which will be affected by ICT developments and should therefore be considered in i2010. Without an action plan, policy responses to the challenges linked to the wider adoption of ICT might remain fragmented, eventually inconsistent.

Overlap between i 2010 and EU policy areas

	Information Space	Innovation and Investment	Inclusion, better public services and quality of life
Agriculture and Rural Development		(Adoption of ICT)	
Competition	competitive markets for content, services and networks		
Economic and Financial Affairs	better link to the integrated economic policy and employment guidelines		
Education and Culture	Good quality multilingual content	Skills e-Learning	Digital literacy Better access to Education through ICT
Employment, Social Affairs and Equal Opportunities	Harmonisation of data transfer between employment services	Work organisation and workplace design. Workers fundamental rights	Inclusion Work-life balance Equal opportunities
Enterprise and Industry	Content Interoperability security	Adoption of ICT e-Business Promoting R&D and innovation standardisation	Interoperability in e-Government Public service reform
Environment			Sustainability environmental monitoring
Fisheries and Maritime Affairs		(Adoption of ICT)	
Health and Consumer Protection	Consumer protection	e-Health	Ageing and e-Health
Internal Market and Services	Legal framework for an information space		Pan-European Public Services
Justice, Freedom and Security	Data protection		
Regional Policy			Regional development
Research		R&D policy and coordination	
Transport and Energy			Mobility
Information Society and Media	Security Regulation for electronic communications Audiovisual policy	ICT research Integrate ICT in all processes	"IS for all" Public service reform Quality of life Sustainability

It is proposed to follow up the *e*Europe 2005 Action Plan, and to adopt a new policy framework (Option 3) for the development of a new ICT strategy, providing a combination of focused policy development and communication activities to increase the visibility and impact of actions:

- The following main policy clusters are proposed as the basis of the new ICT strategy: (i) information space, (ii) innovation and investment in research, and (iii) inclusion, public services and quality of life;

- These main policy priorities would be associated with several objectives for the medium-term (2010). Priority actions and targets can be reviewed regularly to ensure flexibility to adapt to changing requirements;

- The objectives would consolidate ongoing or planned policy initiatives (broadband, e-Business, and e-Government, e-Learning…). These sectoral policy initiatives would continue;

- The idea would be to select some of those sector-specific targets and actions, in order to provide further political support and/or visibility; and

- Such support and visibility would come through a range of EU instruments, i.e. political, legal, and financial instruments, as well as coordination and communication mechanisms.

The proposed line to take is the option most consistent with the message from the different consultations, particularly to make more explicit the contribution of ICT to the Lisbon Strategy. In the consultation and at the *e*Europe Advisory Group meeting in February 2005, Member States agreed with this new policy approach.

10. ANNEX 1: INDICATIVE LIST OF ACTIONS

Priority 1: SINGLE EUROPEAN INFORMATION SPACE

Delivering services anywhere, anytime over high-speed seamless networks
Review of the regulatory framework: The review would address a number of important issues in the area of implementation and harmonisation mechanisms. One of these issues concerns the recommendation on relevant markets. Its review would evaluate regulatory experience since 2003 and examine effects of new and converging services in market boundaries.
Improving spectrum management: promote spectrum trading and ensure spectrum availability for wireless technologies, including new applications.
Enhancing cooperation with Member States: report on the implementation and the review of national broadband strategies and monitor the implementation for national plans for analogue switch-off. Exchange of best practices strengthened in the areas of the broadband digital divide and of the switchover process.
Stimulating interoperability and standardisation: Actions would aim at fostering interoperability at network/device, service/application and media/content level

through the monitoring of open cross-platforms systems and standards and supporting open standards ensuring exchange of best practices and dialogue with stakeholders.

investigate the bottlenecks by supporting the work of Technology Platforms:

- The Networked and Electronic Media Technology Platform may aim at enabling stakeholders' agreement on the definition of a Strategic Research Area on the Extended Home Environments through technology roadmaps, standardisation, and definition of new business models for convergence. Workshops with actors would enable to support a common view on the delivery of audiovisual content and services over seamless networks.
- the Mobile and Wireless Communications technology Platform

Promoting the availability of content

Adapting the legal framework
The action would aim at adapting the regulatory framework to new technological developments in order to ensure wide availability of high quality content and the creation of new content including :

- the adoption of the draft directive modifying the Television without frontiers Directive
- the follow-up to the communication on the management of rights (Proposal of Directive on collecting societies)
- the monitoring and review of the EC legal framework in the field of copyright (Report on the Copyright Directive)
- clarification of the framework for payment in particular on mobile payments in the Legal Framework for Payments in the Internal Market

Enabling the development of high quality content
The action would aim at promoting cultural diversity and knowledge expansion through the availability of high quality digital content including . geographical, cultural, educational, and scientific content by :

- implementing the eContent+ programme
- adopting the Media programme
- adopting the Communication on audiovisual rights
- improving media literacy
- monitoring and assessing acceptance of DRM solutions by consumers and industry (taking stock of research and deployment projects)

Increasing security of networks

Strategy for a secure European Information Society:
propose a Strategy for a secure European Information Society to help Member States to develop their own policies, exchange of best practice and monitor progress in the field.

The open platform of the Internet provides many levels of connectivity and access to information and content and its stability and reliability is a key factor for the deployment of further infrastructure.

Follow up of the actions launched by ENISA:
awareness raising, benchmarking, exchange of best practices…

Critical Information Infrastructure Protection:
Promotion of the development and adoption of risk-based methods for the assessment of ICT infrastructures in

the MS; development in coordination with the MS of plans for establishing large scale IP-based tests beds for security technologies to fight network threats; and cooperation with CERTs
Action 3: **Increasing Trust and confidence** Revision of the ePrivacy Directive; Recommendation on location based services; Initiatives on Internet threats, through spam and many forms of malware, spyware and attacks), taking into account also the advent of mobile IP.

Priority 2: INNOVATION AND INVESTMENT IN RESEARCH

Promoting research and deployment
Strengthen European research through the Framework Programmes The action would aim at making results from FP5 and FP6 projects available and defining FP7 priorities which would strengthen EU leadership.
Link research to wide-scale demonstrators The action would aim at strengthening the links between the research and deployment programmes, in particular: ▪ through a greater synergy between eTEN and FP6, and subsequently FP7 and the ICT policy support Fund ▪ but also at enhancing cross-breeding across programmes such as eTen, eContent, Media, Safer Internet, eLearning. ▪ GEANT would continue to be an important large scale testing play-and-use infrastructure, in particular for public services or for new authentication mechanisms.
Developing research-and innovation friendly policies for ICT ▪ Interoperability is largely relying on the development of open standards in the field of ICT. European standardisation policy can bring an important contribution linked to the ongoing revision of the EU standardisation framework and the identification of standardisation needs in the ICT sector. ▪ Public authorities are large scale ICT users and their procurement policies can play a major role in promoting more innovative and secure products and applications. ▪ Reform of the State Aid architecture to target state aids better and to facilitate public financing in the areas of innovation and research. ▪ Directive on Patentibility of Computer related inventions
Promoting ICT innovation and adoption for competitiveness and employment
Remove legal barriers to the wide take-up of ICTs by businesses The second report on the application of the eCommerce Directive is due in 2005.
Build partnership to develop innovative, SME oriented comprehensive ICT solutions ▪ Develop innovative territorial ecosystems based on the use of local assets empowered by ICTs, networks and knowledge sharing to design intra-and inter- organisational systems. ▪ Strengthen the exchange of best practice within fora such as the eBusiness Support Network or the eSkill Forum
Develop real life user environments and provide new innovative skills to generate market up take and business growth ▪ Developing a European network of Living Labs in the concept of eWork, providing services of large deployment to the industry, bringing technology test-beds into real-life user environments. ▪ Developing the value chain of Life Long Learning, eLearning and eSkills through research and innovation programmes in order to comply with the needs of new working.

Priority 3: INCLUSION, BETTER PUBLIC SERVICES AND QUALITY OF LIFE

Facilitate wider access, accessibility and digital literacy
Developing a comprehensive eInclusion strategy and further develop eAccessibility Formalise a comprehensive approach to eInclusion, improving co-ordination of relevant policies and instruments as well as awareness and monitoring. and developing a comprehensive RTD agenda in eInclusion. Follow up to the eAcessibility communication, improving eAccessibility implementation and monitoring.
Increasing Digital literacy Reforming the framework for dialogue with stakeholders and building further consensus on digital competences.
Improve the quality and efficiency of services of public interest, including pan-European services
Implementing EU strategies for ICT-enabled public services in key areas such as eGovernment and eHealth Set recommendations for efficient and high-quality services at national and international level, while catering for national, local and sectoral differences. Develop common mechanisms for monitoring, sharing of experience and implementation. Implementing these activities in particular through the eGoverment and eHealth Action Plans, including the creation of a Health information space.
Interoperable ICT-enabled services in areas of public interest, including at European level in support of the internal market and other EU policies Stimulate the deployment of key services of public interest, e.g**.** e-procurement at all levels, or pan-European services, addressing operational issues such as interoperability and identity management, including deployment of eSignatures. eTEN last Call for Proposals.
Improve the quality of the living environment
Addressing demographic challenges ICT solutions for independent living in an ageing society**:** launch an initiative on Ambient Assisted Living.
Improving mobility ICT solutions for enhanced and safer mobility: pursue the eSafety initiative.
Promoting cultural diversity launching a pan-European service of digitalised libraries in multiple languages

11. ANNEX 2: ELECTRONIC GLOSSARY

In keeping with the subject of this document, rather than provide a textual glossary, this section has the URLs of several Websites which can define technical terms and provide definitions on an ongoing basis.

- Glossary of Common Internet Terms: http://www.websecure.com/glossary.htm
- Web-ese! Glossary of WEB terms: http://www.tenet.edu/task/webese.html
- Glossary of Internet Terms: http://www.citenet.net/main/i,fo/glossary.html
- Key Internet Terms: http://www.oz.net/vr/other/terms.htm

- BABEL: A Glossary of Computer Oriented Abbreviations and Acronyms: http://cs.jbu.edu/science/compsci/babel95c.html
- Electronic Commerce Glossary: http://www.av.qnet.com/~wearls/glossary.htm
- OECD/ICCP: http://www.oecd.org/dsti/sti_ict.html
- ILC: http://www.matisse.net/files/glossary/html
- Netdictionary: http://www.netdictionary.com/html/index.html
- Telecom Information Resources: http://www.spp.umich.edu/telecom/technical-info.html