

eBusiness and eWork: The Challenges Ahead

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New Methods of Work and Electronic Commerce

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1. Introduction

Information Society Technologies (IST) are radically transforming the economy and our daily lives, whether at work, at home or while on the move. The IST sector has grown to become one of the most important in the European economy. Today, with an annual turnover of EUR 2 trillion, it already provides employment to more than 12 million people across Europe and impacts the competitiveness of all sectors of the economy. But IST is not just a powerful engine of economic growth. It creates opportunities for addressing major societal challenges in areas as diverse as employment, education, government and healthcare. Finally, it is also the source of new challenges that often require well coordinated responses at the European level, from fighting the digital divide to providing for a global information infrastructure that promotes both trust and confidence.

Eighteen months ago, at the European Council in Lisbon, the Union set an ambitious goal for itself: to become the most competitive and most dynamic knowledge-based economy in the world. At the core of this ambition lies the need to promote the development and broad adoption of novel technologies and practices for work and business and to help develop and deploy technologies that promote trust and confidence. Within the European IST Programme, the initiative in New Methods of Work and Electronic Commerce (IST – Key Action II) is playing a key role in helping achieve the short-term objectives associated with the eEurope 2002 Action Plan as well as in promoting European innovation in ebusiness and ework through a number of well-coordinated research and development efforts.

As Europe works towards preparation of its Sixth Framework Programme for Research, currently expected to start in late 2002, now is a good time to reflect on some of the main contributions of Key Action II in light of the policy objectives set at the European

Summit of Lisbon and follow-up meetings in Stockholm and Göteborg. We also outline how to best build on the achievements of this Key Action, as we transition into the next European Framework Programme for Research. A key element of this transition involves the development of a more integrated **European Research Area** that encourages cross-border industry-academia collaboration in an environment that promotes innovation and participation of all European researchers.

2. eBusiness and eWork in Europe

While as a whole Europe was at first slow to adopt the Internet, the situation is changing, thanks in part to well-coordinated efforts between Member States and the European Commission. In some areas such as mobile phones, Europe is already reaping the rewards of well-coordinated research programmes and policies, with mobile phone ownership now reaching 60% of the European population – well ahead of the United States for instance.

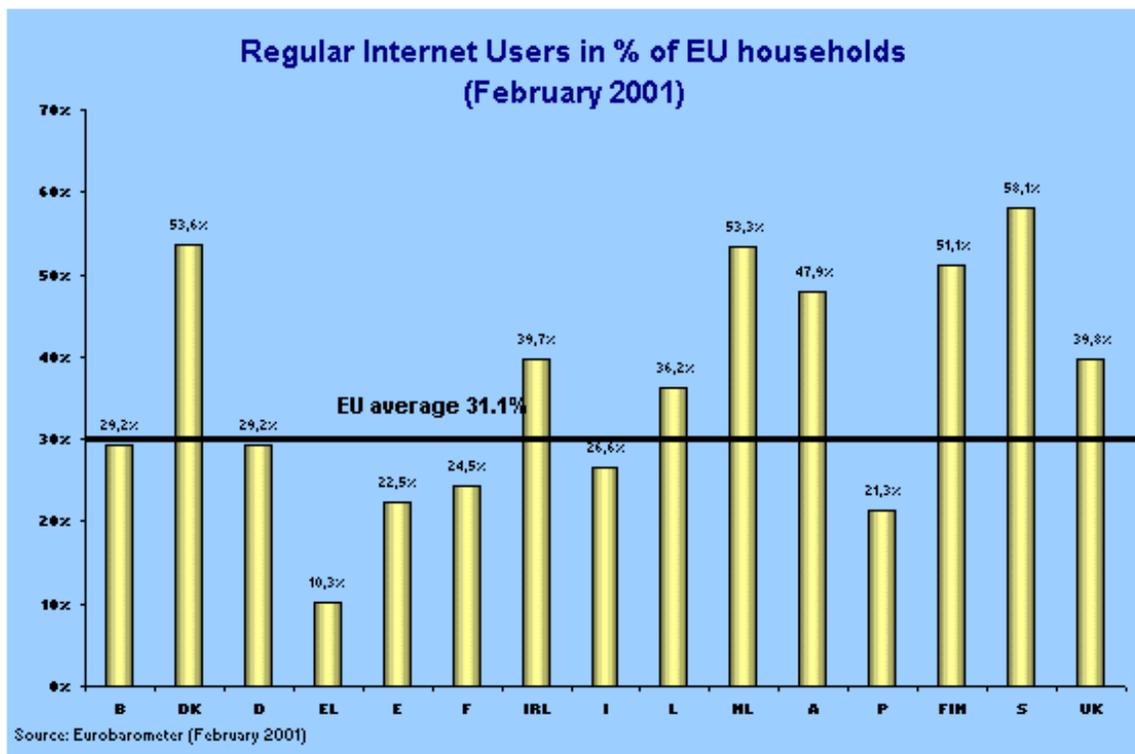


Figure 1. Internet penetration across European Member States as of February 2001

In March 2000, Internet penetration in European homes was at a low 18%. In less than a year, this figure had jumped to 31% (see Figure 1). Although there are continuing differences among Member states, countries where adoption is the lowest are the ones that have witnessed the fastest progression. When taking Internet access from work, school and other non-home environments, Internet penetration can be shown to have already reached 40% of the European population. This fast progression in Internet adoption is closely correlated with reduction in access costs, as advocated in the eEurope action plan.

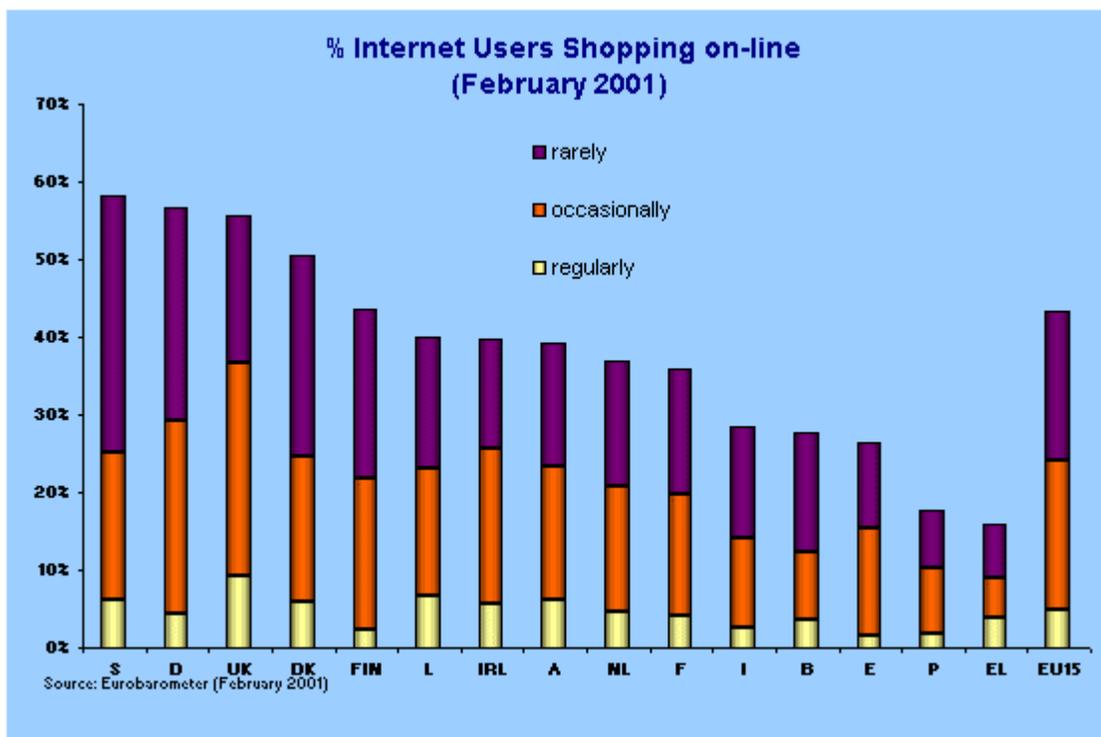
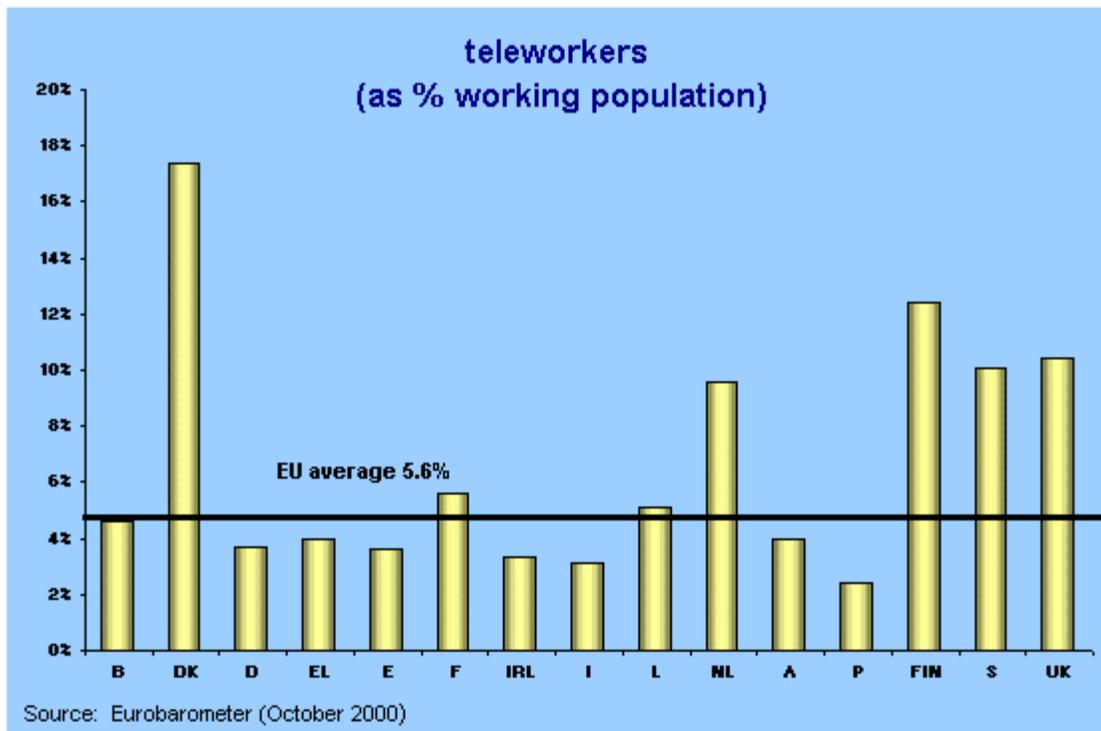


Figure 2. eCommerce adoption levels across European Member States as of February 2001.

At the same time, the percentage of Internet users shopping online and overall adoption of eCommerce practices remains quite low, as illustrated in Figure 2. These low adoption levels continue to reflect concerns of European citizens about fraud as well as the general limitations of today's eCommerce solutions when it comes to ease of use. New solutions for e-work have been slow to gain broad adoption across Europe, as illustrated in Figure 3, suggesting the need for further awareness actions as well as

activities aimed at developing more suitable solutions. The situation in business-to-business electronic commerce is similar, suggesting again that today's solutions still fall short of user expectations.



If anything, these figures show that the emergence of the knowledge-based economy will not happen over night. The recent demise of a number of eCommerce start-ups has demonstrated that many early ebusiness models were simplistic and that adoption of novel IST solutions and practices by businesses and workers is a long and complex process. It is a process that requires further research and development activities in key areas of enterprise collaboration, usability, interoperability, security and dependability, to name just a few, along with well coordinated policy activities aimed at promoting the broader exploitation and adoption of new technologies and practices, as they become available. Below, we review activities launched by Key Action II over the past 3 years that aim at doing just that.

3. The European initiative in eWork and eBusiness

With an overall budget of about 550 Million Euros, the European initiative in eWork and eBusiness supports the research, development and adoption of novel IST technologies and practices aimed at enhancing industrial competitiveness and quality of work life in the emerging knowledge-based economy.

In practical terms, this broad mission translates into several types of activities, as illustrated in Figure 4:

- Support for innovative medium- to long-term/high-risk research projects with high potential payoffs
- Support for take-up and dissemination activities aimed at promoting the broad adoption of novel solutions for eWork and eBusiness across Europe and at supporting other eEurope 2002 objectives
- Socio-economic research aimed at monitoring and assessing the development and impact of novel eWork and eBusiness technologies and practices and at providing guidance to future research and policy activities in this area

3.1. Research Challenges:

A number of medium to long-term research challenges still need to be addressed to develop the tools and practices of tomorrow's knowledge-based society. Key among them are issues relating to **knowledge management**, namely the ability to capture, discover, organise, reuse, share and even trade knowledge both within and across organisations. In a society that suffers from an overabundance of information, knowledge management technologies are required to help people and organisations access and share the right information at the right time. Another set of research challenges at the core of Key Action II relates to the development of novel solutions for eWork and eCommerce that exploit the increasingly pervasive nature of the infrastructure, making it possible for people to remain in contact with one another and to take advantage a plethora of information services "anywhere, anytime". Central to this theme of **Mobile and Ubiquitous eWork and eCommerce** is the notion of context-awareness. The challenge here is to develop technologies and tools that will be capable

of understanding the context within which we are operating such as the activities we are engaged in, the people we are with, and the objectives we are pursuing, and, based on this information, anticipate our needs and provide us with access to relevant services. Developing such solutions goes well beyond the development of smart sensors. It requires the development of intelligent functionality capable of reasoning about the tasks and goals of users, new solutions for interacting with people as well as new standards for representing and exchanging this information and for doing so while respecting people's privacy.

Beyond the above, Key Action II supports focused research efforts in several other strategic areas organised around the following themes:

- **Intelligent Workplaces for All**, which focuses on the research and development of innovative e-work environments that enhance productivity, quality of work life and promote work practices suitable for all.
- **Smart Organisations** is about the transformation of profit and non-profit entities into agile, knowledge-driven organisations, capable of adapting to ever changing market demands in today's *internetworked* economy. Emphasis is on the development of a new generation of distributed and interoperable enterprise applications and services.
- **Dynamic Value Constellations** explore novel IST solutions and value creation models aimed at supporting market-driven value constellations, where suppliers and consumers dynamically come together in response to or in anticipation of new market opportunities.
- **Trust in Information Infrastructures** and **Enhancing Security in Electronic Transactions** are about the development of scalable solutions aimed at ensuring trust and security and at enhancing privacy.

3.2. Take-up and Dissemination Challenges

While larger high tech companies are often prompt to adopt novel IST solutions and practices, many smaller companies find it difficult to understand their benefits and what it takes to successfully deploy them. Key Action II's focus here is on high impact activities aimed at promoting the broad adoption and dissemination of novel and secure solutions

and practices in all areas of e-Work and e-Commerce. These activities, which are closely tied to the objectives of the eEurope initiative, place a particular emphasis on regional and sectoral adoption of novel IST solutions by SMEs and are closely coordinated with a variety of related efforts such as regional and national initiatives and structural funds programmes.

3.3. Socio-Economic Research Activities

The objective of these activities is to better understand the social, economic, industrial, and legal aspects of e-Work & e-Commerce and to develop models and scenarios that can help shape future policy, technology development and deployment strategies.

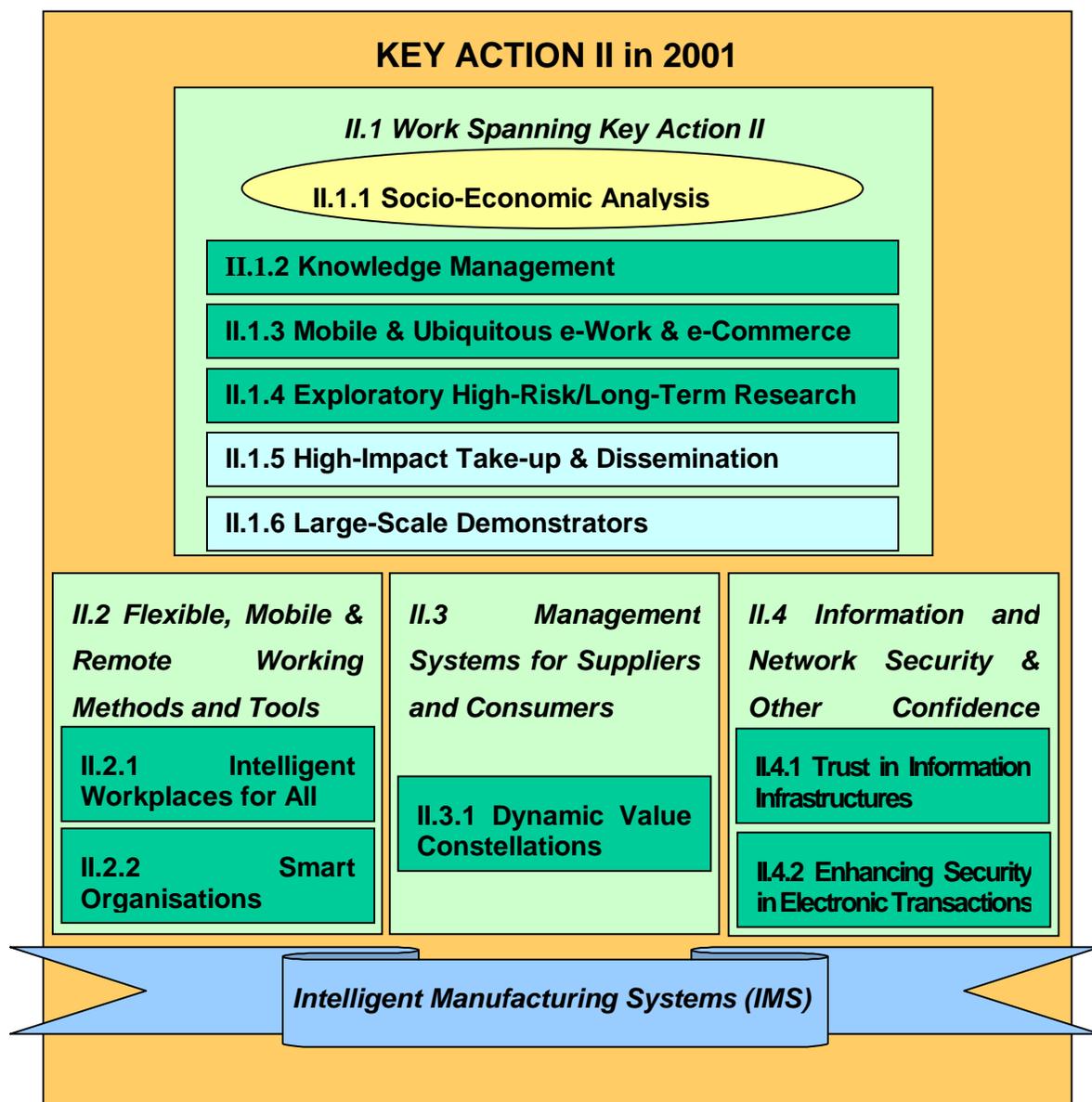




Figure 4. The European initiative in eWork and eBusiness in 2001.

3.4. Other Contributions to the eEurope Initiative in 2001

Beyond the above, Key Action II is contributing to the eEurope initiative in several other specific areas:

- “Go Digital” aims at promoting the adoption of e-work and e-business practices by SMEs through a combination of awareness, training, benchmarking and other take-up actions
- The European Smart Card initiative is expected to lead to the development of standards, systems and rules to promote the widespread interoperability of multi-application smart cards in support of secure anytime, anywhere access to a broad range of applications and services
- The European Dependability Initiative addresses challenges relating to the vulnerability of today’s infrastructures and seeks to develop solutions and promote practices that will support greater levels of dependability
- The e-Work initiative aims at creating more and better jobs in Europe through the development and adoption of novel IST solutions and practices for work suitable for all.

4. Looking Towards 2002 and the Sixth European Framework Programme of Research

Statistics such as the ones we reviewed in Section 2 suggest that, while Europe is making headway in its transformation into a competitive and all-inclusive knowledge

society, our work is far from being over. Adoption of novel technologies and solutions is a long and complex process. But above all, tomorrow's knowledge-based economy will be one driven by innovation. New technologies and practices will continue to emerge, offering new opportunities for greater efficiency, higher quality of work life and inclusion of all. A key challenge for Europe is to build on its early success in areas such as mobile telecommunication, smart cards, digital TV and enterprise systems and create an environment that promotes innovation. As Europe prepares for the launch of its 6th Framework Programme of Research, it should strive to better coordinate its many resources and talents. Initiatives such as GSM or UMTS show that making an impact often requires focusing on key strategic objectives through close coordination of a critical mass of research efforts and policy activities. This observation will likely be reflected in the organisation of the 6th Framework Programme, which will introduce the notion of large "Integrated Projects" that bring together a critical mass of actors around a set of well defined objectives. Work in integrated projects will be coordinated through roadmaps that will be regularly updated to reflect the project's progress as well as other technological and industrial developments.

In 2002, to facilitate the transition towards the 6th Framework Programme and the creation of Integrated Projects, Key Action II will be soliciting proposals from research communities interested in exploring ideas for possible Integrated Projects in the area of e-work, ebusiness and trust & confidence. The Key Action will also continue to encourage bold research ideas with high potential payoffs through its Action Line on "Exploratory High-Risk/Long-Term Research" and will continue to fund activities aimed at supporting eEurope priorities.

5. Concluding Remarks

The development and broad adoption of novel IST technologies for work and business is central to Europe's ambition of becoming the most competitive knowledge-based economy and to create more and better jobs. It is also now clear that the emergence of the knowledge-based society will not happen over night and that many key challenges still remain to be addressed, some of a medium to long-term technological nature others relating more closely to adoption and policy issues. eBusiness and eWork activities started by Key Action II in the context of the 5th European Framework Programme for research have shown that well-coordinated European research activities can make a

difference when it comes to promoting innovation and broad adoption of IST solutions in this area. As we prepare for the launch of our 6th Framework Programme, we need to build on the success of activities initiated over the past 3 years while looking for opportunities to achieve greater impact through well-coordinated, larger-scale efforts that bring together a critical mass of actors.