

EUROPEAN E-SKILLS 2006 CONFERENCE

*Towards a Long Term e-Skills Strategy
5-6 October 2006, Thessaloniki, Greece*

Foreword

The main goal of the European e-Skills Forum is to promote a shared vision and a broad consensus on the challenges facing stakeholders. In 2004, in a context still very much marked by the consequences of the bursting of the dotcom bubble and significant loss of confidence in the potential of ICT, the report of the Forum "e-Skills in Europe: Toward 2010 and Beyond" highlighted the need to start developing more long-term approaches to how we address e-skills issues, including the implementation of actions to help improve the availability of data about the ICT labour market, promote multi-stakeholder partnerships and e-learning, explore the development of a European ICT skills framework, and address the digital divide.

Since then, surveys of the problems encountered by business in implementing ICT increasingly continue to put e-skills shortages at the top of the list of critical factors that are essential for successful innovation and for improving the competitiveness of European enterprises. The demand for e-skills has also increased as a result of the growth of e-business and a number of recent sources point to significant e-skills shortages. It has become even clearer that increased investment in ICT needs an equivalent long-term commitment to the development of e-skills.

The European e-Skills conference ⁽¹⁾ (5-6 October 2006, Thessaloniki) was organised by the Commission and Cedefop

in partnership with stakeholders in order to contribute to the preparation of a long-term e-skills agenda. The 150 delegates, including leading participants from government, ICT industry, trade unions and academia were able to review progress, including a number of well-focused projects, studies and initiatives. The conference underlined that an accurate picture of the supply and demand of e-skills is now available and that the ground has been cleared in particular for the development of foresight scenarios and a European e-Competence Framework. ICT companies launched the European Alliance on Skills for Employability, a partnership to promote e-skills for employability. The ICT Task Force that was set up by the Commission in 2006 also made concrete recommendations on e-skills. To implement them the ICT industry launched in June 2007 in Brussels an e-Skills Industry Leadership Board.

While progress has been achieved, however, we are witnessing a severe decline in the number of young people studying ICT. Skills shortages are once more on the horizon in several Member States at a time when Europe is increasingly challenged by global sourcing and offshoring and is struggling to find home grown talent. There are reports of a new skills' "crisis" and fears that a shortfall in ICT practitioners will lead to a loss of highly paid jobs to the emerging economies of India and China. Against this background, it is widely recognised that it is now a time to act. The



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⁽¹⁾ See: www.e-skills-conference.org

Thessaloniki declaration demonstrates that there is a broad agreement on the main elements of a long-term e-skills agenda and what needs to be done but “we need to move up a gear” and make a transition “from diagnosis to deeds” as we implement the concrete proposals that will make it possible to match e-skills supply and demand and generate the e-competences necessary for strong European competitiveness, growth and jobs creation.

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As a follow-up to the Thessaloniki Declaration and the report of the ICT Task Force, the European Commission adopted a policy Communication (2) on “e-Skills for the 21st Century: Fostering Competitiveness, Growth and Jobs”. Most actions contributing to the implementation of a long term e-skills agenda are within the responsibility of Member States, industry, academia, trade unions, etc.

The Commission encourages them to further develop their policies and initiatives, and facilitates the exchange of good practice, and will focus its own efforts on actions bringing added value at EU level.

The way forward to the widening and deepening of e-skills within the EU is through multi-stakeholder dialogue and partnerships for action. The Commission and Cedefop will organise a major conference in co-operation with stakeholders at the end of 2008 to report on progress, present the results of the actions and discuss the way forward.

This brochure includes the report of the European e-Skills 2006 Conference and the policy Communication of the European Commission on e-skills adopted in September 2007. ■

▶▶ Conference Programme

Thursday: 5 October 2006

09:00 - 09:30

WELCOME AND INTRODUCTION

- Ms Aviana Bulgarelli, Director of Cedefop
- Mr Anastasios Tzikas, President of the Association of IT Companies of Northern Greece
- Mr Günter Verheugen, Vice-President of the European Commission (video)

09:30 - 11:00

TOWARDS A LONG-TERM AGENDA

Chair: Mr Costas Andropoulos, Head of Unit, DG Enterprise and Industry, European Commission

- Mr Soumitra Dutta, Roland Berger Professor of Business and Technology, INSEAD
- Ms Christine Leitner, Head of Center for European Public Administration, Danube-University Krems
- Mr Yvon Le Roux, Vice President Public Sector European Markets, Cisco Systems

11:30 - 13:00

GLOBAL SOURCING, JOB CREATION AND NEW WORKING ENVIRONMENT

Chair: Mr Angelos Ktenas, Policy Co-ordinator, DG Information Society and Media

- Mr Mark Harris, Director Higher Education & Research, Intel
- Mr Luke Georghiou, Associate Dean for Research, Faculty of Humanities and PREST, Manchester Business School

- Mr Veli-Pekka Niitamo, Director of Mobile Work Research, Nokia
- Mr Gerd Rohde, Head of UNI – IBITS/P&MS, UNI-Europa

14:00 - 16:00

PARALLEL SESSIONS

1) European e-Competence Framework

Chair: Mr Burkart Sellin, Principal Administrator, Cedefop

- Mr Stephan Pfisterer, Head of Department Education and Human Resources, BITKOM and AITTS
- Mr Patrick Mathieu, Head of Resource Management, Airbus Information Systems
- Mr Hubert Delafon, Manager SGSI/Q, Michelin and CIGREF
- Ms Clementina Marinoni, Project Manager, Polytechnic Foundation, University of Milan
- Mr Jens Bjornavold, Project Manager, Cedefop
- Mr Malcolm Sillars, Program Manager, BCS and Director, SFIA Foundation

2) e-Skills Certification and Training

Chair: Mr Antonio Herrera, Cisco Systems and President, e-SCC

- Mr Peter Weiß, Senior Researcher, University of Karlsruhe
- Mr Stefan Grunwald, Managing Director, Cert-IT
- Mr Markus Schwertel, Regional Manager Networking Academy Program, Cisco Systems
- Mr Stirling Wood, Consultant
- Mr Friedrich Scheuermann, Managing Director, Institute for Future Studies



3) Employability and Digital Literacy

Chair: Mr Geoff Mc Mullen, President, Cepis

- Mr Joseph Bremer, Project Officer, DG Information Society & Media, European Commission
- Mr Karsten Gareis, Project Manager, empirica
- Mr Damien O'Sullivan, CEO, ECDL Foundation
- Ms Di Millen, Head of Professional Development & Support, NHS Connecting for Health
- Mr Peter Davitt, Chief Executive, Fast Track to IT

16:30 - 17:30

FEEDBACK FROM THE PARALLEL SESSIONS

Chair: Mr André Richier, Principal Administrator, DG Enterprise and Industry, European Commission

- Ms Jutta Breyer, Consultant member of CEN/ISSS group on ICT skills
- Mr Paolo Schgör, ECDL & EUCIP Certifications Manager, AICA
- Mr Michiel van der Voort, Vice President, EXIN International

Friday: 6 October 2006

09:00 - 10:30

e-LEARNING AND LIFELONG ACQUISITION OF SKILLS

Chair: Ms Maruja Gutierrez Diaz, Head of Unit, DG Education and Culture, European Commission

- Mr Simon Tindall, Head of EMEA Business Development, Sun Microsystems and eLIG
- Mr Jouni Kangasniemi, Senior Counsellor, Finnish Ministry of Education
- Mr Tapio Koskinen, Senior Advisor, Helsinki University of Technology
- Ms Lena Nydahl, Vice Director-General, The Swedish Agency for Flexible Learning
- Mr Claudio Dondi, President of Scierter

11:00 - 12:30

MULTI-STAKEHOLDER PARTNERSHIPS

Chair: Mr Ioannis Kaltsas, Senior Economist, European Investment Bank (EIB)

- Mr Hugo Lueders, Secretary General, eSCC and Director Public Policy EMEA, CompTIA
- Mr Terry Hook, IT Skills Development Executive, e-Skills UK
- Mr Michael Ehrke, Senior Adviser, IG Metall
- Ms Elena Bonfiglioli, Director Corporate Citizenship, Microsoft EMEA

12:30 - 13:15

CONFERENCE DECLARATION AND MAIN CONCLUSIONS

Panel discussion chaired by Mr David White, Director Innovation Policy, European Commission

- Ms Aviana Bulgarelli, Director of Cedefop
- Mr Antonio Herrera, Cisco Systems and President of e-SCC
- Mr Michael Ehrke, Senior Adviser, IG Metall
- Ms Christine Leitner, Head of Center for European Public Administration, Danube-University Krems

13:15 - 13:30

CONCLUDING REMARKS

- Mr David White, Director Innovation Policy, European Commission

▶▶ Setting the Context for the 2006 e-Skills Conference

Welcome and Introduction

The context and background to the 2006 conference highlighted both recent progress but also the extent to which improving e-skills levels and putting Europe at the forefront of international competitiveness remains a major challenge.

Why e-skills are important

As Günter Verheugen, Vice-President of the European Commission, informed the conference, **"We all know that effective use of Information and Communication Technologies is one of the most important factors for boosting productivity growth in Europe. But such 'effective use' depends on the availability of e-skills, and supply is still far from meeting demand."**

A Eurostat Community Survey highlighted that 37 % of the European population aged 16 to 74 entirely lack computer skills. It is mainly the older generation (those over 45), people lacking upper secondary education and the unemployed and inactive that lag behind; but there is also a huge difference among the Member States. Other recent studies have shown that, looking ahead to 2008, there may be a shortage of up to half a million people across Europe in advanced networking technology skills. E-Skills mismatches are also a particular issue for certain occupations and certain Member States where there are particularly high levels of unsatisfied demand.

These studies are backed up by the warnings from industry that shortages may emerge in other sectors and occupations, such as security, e-business, system architects and planners. The results from the latest e-Business Watch survey, carried out by the Commission (DG Enterprise and Industry) in 2006, confirmed that a "skills gap" exists in terms of managerial e-business skills, especially for SMEs.

Of major concern is the fact that, as demand for e-skills is growing and the business cycle is improving, supply is declining. The number of students studying computing in Europe declined after the burst of the dotcom bubble. For example, a report by BITKOM showed that the number of students starting informatics studies in Germany decreased from 38,000 in 2000 to 28,600 in 2004 and, for the same period, the Swedish National Agency for Higher Education reported that it went from almost 12,000 to less than 8,000. This will lead to persistent and increasing shortages in the future, as highlighted in November 2006 by Professor Nigel Shadbolt, the President of the British Computer Society. Pointing to new research which shows that in the past four years demand for IT and computer graduates has doubled while at the same time the number of students studying the subject has declined by a third, the new BCS President points to a looming skills "crisis" and suggests that, "If we are not careful, the UK is going to lose its pre-eminent position as a knowledge-based economy."



AVIANA BULGARELLI

Director of Cedefop





YVON LE ROUX

Vice President Public
Sector European
Markets, Cisco Systems

While there are some positive trends — recent statistics also show that the gender gap related to ICT education and training is getting smaller — the fact remains that more than half the European population has never taken a computer course and overall participation in ICT education and training is simply too low.

E-skills are subject to international competition

There have been predictions that the e-skills debate would disappear after the burst of the dotcom bubble. On the contrary, it has become more complex and challenging, particularly as the ICT sector is confronted with major structural changes and global sourcing is no longer confined to manufacturing. There is a growing recognition that an increasing proportion of ICT and white-collar jobs could be “offshored” outside Europe to developing countries like India where a large pool of talented and e-skilled workers exists.

This is matched by an appreciation that the struggle for talent is now world wide, in particular in the field of ICT, where skills are subject to vigorous international competition. We need to understand better the impact of offshoring on e-skills, jobs and occupations so that we can concentrate our efforts on nurturing talent where Europe can best compete.

Demand mainly comes from user industries

The starting point for the development of e-skills must be the needs of user-industries where almost 70% of ICT practitioners are currently working. A priority, therefore, must be investment in business-focused e-skills in all sectors. The development of a European e-Competence Framework, of e-learning solutions and of bridges between formal education and industry training and certification could help here and it was hoped that the 2006 conference could lead to progress in these fields.

Need for long-term and consistent policies

It will take time to build up the necessary supply of e-skills in the workforce and for new university graduates to complete their studies. We therefore have to act early if we are to avoid the risk of an even higher e- skills gap in the coming years and there is a need for both long-term strategic thinking and actions in order to successfully address the e-skills challenges that Europe now faces.

E-skills for inclusion

E-Skills include user skills and digital literacy. Initiatives like the “European Alliance on Skills for Employability” recently launched by leading ICT companies make a welcome contribution to building such skills. But the problem here is widespread — less than one-fifth of workers have received training in ICT at work. Both during the 2006 conference and going forward, we will need to identify new incentives and more efficient training opportunities.

The ICT Task Force

The Commission’s new industrial policy is a clear commitment to building the competitiveness of European industry. It is about improving framework conditions across industrial sectors and launching complementary targeted actions, working with stakeholders via high-level groups and task forces. To address the challenges related to the competitiveness of the Information and Communication Technology sector in Europe and of ICT uptake, an ICT Task Force was established in June 2006. A Working Group of the Task Force is focused on Skills and Employability and several members of the Task Force participated in the conference and helped lead discussions related to an initial set of Task Force recommendations that were provided to conference delegates.

Improving Europe's Competitiveness

At the start of the 2006 conference, it was clear that the key test now is to boost productivity, whilst at the same time generating wealth and jobs for citizens. This is not impossible but it can only be done by building an economy based on skills and knowledge, which is at the heart of the new Lisbon partnership for Growth and Jobs that the Commission re-launched in 2005. A highly skilled and adaptable workforce has to be the foundation on which Europe's competitiveness is built in the 21st century and the promotion and development of e-skills must be considered an important part of this.

▼ What are e-skills

The European e-skills 2006 Conference made clear that creating a long-term agenda for e-skills will require us to take a holistic view of how the knowledge economy is evolving under the impact of globalisation. There is a need to consider, not just the need for advanced e-skills, but also the requirements for e-skills at all levels of society.

This wider scope is necessary for two reasons. First, ICT tools enable acquisition and deployment of the 'real-life' employability skills that employers say they most need – literacy, numeracy, teamwork and collaboration, meeting deadlines, critical and strategic thinking. Second, different types of e-skills enable a wide range of careers and contributions to society.

The term **e-skills** can be thought of as covering mainly three categories:

- **ICT practitioner skills:** The capabilities required for researching, developing and designing, managing, the producing, consulting, marketing and selling, the integrating, installing and administrating, (and) the maintaining, supporting and service of ICT systems;
- **ICT user skills:** the capabilities required for effective application of ICT systems and devices by the individual. ICT users apply

systems as tools in support of their own work, which is, in most cases, not ICT. User skills cover the utilisation of common generic software tools and the use of specialised tools supporting business functions within industries (sectors) other than the ICT industry;

- **e-Business Skills:** the capabilities needed to exploit opportunities provided by ICT, notably the Internet, 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.

e-Business Skills are strategic and related in particular to innovation-management, rather than technology-management, skills – which are part of ICT practitioner skills

Who needs e-skills?

ICT Practitioners

Official statistics confirm that there are more than 4m ICT Practitioners of different kinds employed (or self-employed) within the EU, and their contribution occurs throughout all sectors of the economy. The Computer Services sector alone employs some 2.5m people, adding over €150bn of value to the EU economy, and Member State Computer Services industries win exports of some €60bn a year – the third most exported service*. Between 1995 and 2005 over 1.7m jobs have been created around the EU in this work, and – while employment growth rates have slowed since the 'dot.com bubble burst' - these professionals will continue to make a major contribution to the European economy

ICT Users

There are estimated to be at least 180m ICT Users in Europe, and their contribution to the effective use of ICT in business operations (whether in the public or private sectors) has helped achieve the widespread innovation of business operations in all parts of the economy. This has raised levels of productivity and (in the private sector) competitiveness of European enterprises.



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**ANDRÉ RICHIER**

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Forum, General
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Progress since the 2004 e-Skills Conference

Since the 2004 e-Skills conference, a number of specific projects and studies have been commissioned which have resulted in steady progress being made in a number of areas.

- A CEN Workshop Agreement (CWA) has been released in February 2006 covering a state-of-the-art review of progress in ICT practitioner skills frameworks, explanation of the realities within which such frameworks are developed and recommendations for next steps towards a European Competence Framework taking into account the proposal for a European Qualifications Framework.
- On the statistical front, a module has been developed to include e-skills in the regular Eurostat Enterprise Survey and a report from Rand Europe, delivered in September 2005, analysed the evidence, qualitative and quantitative, on the supply and demand of e-skills in Europe.
- The conference “e-Business: The Way Forward” organised on 5-6 December 2005 in Cambridge confirmed that stakeholders

see the need for a long term EU e-skills agenda to ensure adequate e-skills for the future across both workforce and population.

- A series of projects, were underway in 2006:
 - benchmarking initiative of e-Learning for enterprises
 - foresight study on e-skills in the ICT sector
 - benchmarking of e-skills multi-stakeholder partnerships
 - feasibility study on a European e-skills and career portal

Industry-led skills initiatives include the formation in January 2006 of the European Alliance on Skills for Employability, a partnership between Cisco Systems, CompTIA, EXIN, Microsoft and the European Computer Driving Licence Foundation with Randstad and State Street Corporation. The Alliance aims to help train and provide access to technology for 20 million Europeans by 2010 by investing in and promoting the provision of skills training for employability to: disadvantaged groups; young under- and unemployed workers; older at-risk workers; and people with disabilities.

►► Towards a Long-Term Agenda

This part of the conference programme examined some of the major global trends that need to be taken into account when developing a long-term e-skills agenda and highlighted key issues that are of strategic importance to stakeholders in both the public and private sectors.

Global Trends for Competitiveness and e-Skills

The debate concerning e-skills is increasingly taking place in a world in which there is a perceptible disconnect between a new generation of 'digital natives', who are confident and almost instinctive users of ICT, and an older generation of 'digital immigrants' who grew up in an era when ICT was less ubiquitous and who frequently struggle to keep up with the exponential pace of technological change.

Generally, older ICT users think of themselves as living in a linear world and making linear projections based on what they have experienced in the last four to five years. However, this world view is being disrupted as the exponential curve of ICT development imposes itself more and more on our everyday lives and there is a greater need to be able multitask, deal with discontinuity and assume different roles and identities in a multiplicity of social and online environments.

Developing a long-term e-skills agenda will first require us, not only to acknowledge the gap between digital natives and digital immigrants – "being aware of the gap is a good first step"

– but, as Professor Soumitra Dutta of INSEAD suggested, we will also need to recognise that, **"One of the most important strategic challenges is finding innovative ways to manage this gap between younger ICT users and those who have trouble keeping up with the technology."**

Failure to do so will inevitably impact on European society; there is now an impressive array of data from many respected sources, including the World Economic Forum (the annual Global Information Technology Report), demonstrating a very strong correlation between how countries become more competitive as they make more extensive use of technology and move higher on the 'networked readiness' index.

E-Skills and ICT in general is also critical for innovation. The World Economic Forum recognises three main development stages: the third of which is an 'innovation-driven' stage' where economies increasingly need to develop innovative products using sophisticated production methods. Ten years ago Korea was not considered a leading-edge nation but is now on the threshold of becoming an innovation economy. The development of e-Skills in the workforce has been a key factor there. However, it is also important to recognise that improving e-skills alone is not enough; **leadership and organisational change is also key.**

The most successful innovation-driven economies require accompanying structural changes, particularly related to business



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sophistication and innovation processes. Similarly, with regard to e-learning and e-skills, the focus cannot simply be on providing an adequate number of computers and broadband connectivity. The challenge is getting teachers, faculty members and training professionals to change their ways of working. Long-term, the e-skills agenda must focus not just on developing the right e-skills competences, but must also be concerned with changing the whole context within which learning and training takes place.

Finally, of course, Europe must not just nurture and retain its own ICT talent but must also be able to attract the best talent from around the world if we are going to innovate successfully. To do this, we need to be able to identify good role models at all levels of the workforce and particularly demonstrate that more CEOs and top management in European companies have been drawn from the ranks of ICT professionals.

Public Sector Issues

The need for both improved leadership and systemic organizational change were key issues highlighted by EPAN, the informal network of Directors-General responsible for Public Administrations in the EU Member States, in its analysis of public sector e-skills requirements.

The transformation processes taking place in public administrations, many of which are driven by the availability of enabling ICT technologies, are challenging traditional patterns of government. It is increasingly clear that a specific set of e-skills and other new competences will be required to manage and drive the changes that are taking place. Christine Leitner, from Danube University Krems, suggested that first and foremost, **“A vision is required in order to develop a long-term skills agenda in the public sector which acknowledges the importance of continuity.”** It must be a vision that is realistically connected to existing service delivery in order to ensure

continuity and engage the very diverse range of stakeholders within public sector organizations.

The EPAN work has demonstrated that misconceptions remain widespread among senior public officials concerning what constitutes e-skills. Too much emphasis is still put on the acquisition of basic ICT user skills and there is a lack of common understanding concerning the broader range of competences that will be required. Added to this, the diversity of public administration systems and cultures makes joint action at a European level very difficult. Both outsourcing and (increasingly) offshoring are also presenting new challenges. Finally, it may be that the sector has more of a need for “intelligent purchasers” who are ICT aware rather than ICT experts.

Against this background, EPAN has particularly looked in some depth at the UK approach to developing an e-skills agenda which covers, not only IT professional skills’ development, but also a broader set of skills to help manage organizational change. A comprehensive set of recommendations has been provided concerning how e-skills can be improved, not least of which is the recommendation that e-skills and culture change in the public sector must move higher up on the political agenda.

Private Sector Issues

In the private sector, no less than in public administrations, skills are the bedrock of any e-strategy and both workers and the general public need to understand technology in order to deploy and use it. As in the public sector, more focus in Europe also needs to be given to organizational and employee issues; according to a Momentum Research Group study, taken together, these are by far (49%) the biggest barrier to productivity growth, easily outpacing technology capabilities (7%), technology integration (16%) and business process innovation (20%).

In a 2005 IDC study on networking skills in Europe, one third of organizations had hired within the last twelve months but half reported that it was difficult to find the right people and respondents across the board struggled to find new employees with the right combination of skills. There is also a growing mismatch between the anticipated demand for networking skills and what we can supply; on current evidence a shortfall of 230,000 skilled people in 2005 (6%) will grow to 615,000 (11.8%) by 2008.

In his presentation titled "Diagnosis to Deeds", Yvon Le Roux, VP Public Systems for Cisco cited Kofi Annan's observation at the second World Summit on the information Society. In Tunis in November 2005 the Secretary General of the United Nations suggested that, having articulated a vision of an open and inclusive information society, the task was now **"to move from diagnosis to deeds"** – a call which seemed to resonate with e-skills conference delegates in the later breakout sessions. In response to e-skills shortages, initiatives such as the Cisco Networking Academy certainly demonstrate that we have not been standing still in recent years. Involving 98 public-private partnerships at national, regional and local government levels and the establishment of over 10,000 academies in 160 countries, Cisco can now report over 1 million successful course completions by students as of February 2005!

However, even if it doubled the number of academies, Cisco is aware that it could not

completely fill the anticipated skills gap. New strategies are called for. There is particularly a growing awareness that the private sector and ICT professionals must move from being primarily an "enabler" of an e-skills strategy to also being a "contributor" to the setting a long-term e-skills agenda.

In line with this thinking, leading ICT companies have been key partners in the e-Skills Certifications Consortium and, in January 2006, launched the European Alliance on Skills for Employability, the first of whose pilot projects have already commenced in Germany, Poland, Portugal, the UK and Belgium. Cisco has also accepted the role of coordinating Working Group 5 of the ICT Task Force which is focused on four key issues related to skills and employability:

1. How to create and promote an environment that attracts and retains highly-skilled ICT practitioners;
2. How best to interest future generations in the process of ICT technology innovation and the application of current ICT technologies, specifically taking into account the gender gap;
3. How to foster the employability of the workforce at large, including the lower skilled;
4. How to foster lifelong learning and how to apply ICT to transform the way people learn and work (i.e. how they obtain, manage and share knowledge and transform business processes).



MICHAEL EHRKE

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» Global Sourcing, Job Creation and New Working Environment



MARK HARRIS

Director Higher
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The conference examined how e-Skills development will need to adapt under the impact of the move to global sourcing and new patterns of work and leisure.

Market Globalisation

It is increasingly clear that e-skills must meet the demands of what has been referred to as the 'now economy'. Product creation processes increasingly involve international teams that span across time zones, using a variety of technological platforms, and across diverse organisational and national cultures. This "24-hour global innovation time cycle" impacts differently on research, development, production and sales/marketing but there is little doubt that we are increasingly living in a networked society in which creativity never stops and innovation does not rest. Increasingly, e-skills issues need to be considered in the context of emerging concepts such as such as 'the agile extended enterprise', 'the borderless company', 'real time enterprising', 'battle of partnerships' and 'silent commerce'.

This new stage of internationalization is also characterised by a homogeneous world market, disaggregation of previously integrated value chains and the growth of global sourcing that is leading to an erosion of the corporate knowledge and innovation base and has resulted in staff reductions and social conflicts. In a global knowledge economy we must also think about not just today's issues but also those of the extra 3 billion users who will have access to the Internet by 2010! As Professor

Mark Harris from Intel succinctly put it, "**The Knowledge Economy is global. Business will be global. Everyone needs to think and act global.**"

In such a world, there is growing evidence that Europe is suffering as a result of its fragmented markets and is losing out as large firms globalise their R&D. We are: failing to capitalise on the application of ICT; locked into unmodernised traditional sectors; and under-investing in services R&D – all of this at a time when we are trying to rise to the challenge of major demographic changes. The imperative in a globalized market must be to revamp innovation for economic growth and job creation and to consider how a long-term, e-skills agenda can best rise to a series of emerging new challenges.

Global Sourcing

"**Global sourcing, geo-sourcing and offshore sourcing are here to stay they are not just another management fashion**", according to Gerd Rohde from UNI-Europe. We can see evidence of this by the increasing degree of professionalism in this area (for example, the UK National Outsourcing Association and COPS certified outsourcing professions) and both national and European outsourcing awards. We are now in a phase where, as the OECD has reported, even skilled knowledge workers are being outsourced. Recent suggestions that the offshore boom may be over are simply misguided. According to McKinsey, the global offshore market has tripled since 2001 and, over

the next five years, the market is expected to grow by \$80 billion.

Offshoring in particular though is still a highly controversial issue; public perception is that it results in job destruction and the positive effects are difficult to spot as new jobs emerge elsewhere. In the UK, France and the USA, we have witnessed offshoring being dubbed an “unpatriotic investment” and giving rise to xenophobia and protectionism. Offshore business operations are also risky and there is a high failure rate with analysts reporting the collapse of 40-50% of offshoring projects. Mishandling of human resources, misjudging of intercultural differences and underestimation of communication/coordination costs are some of the reasons cited for offshoring failures. Against such a background, where reliable indicators and data also remain a problem, there are major challenges in determining how a long-term strategy for e-skills can best address global sourcing issues that involve complex social, political and organisational processes all of which require a sophisticated professional response.

The MOOS (Making Offshore Outsourcing Sustainable) pan-European trade union project, however, has made important progress in this area as it has analysed offshoring mechanisms and the transfer of jobs within the professional and knowledge intensive sectors of the economy. For example, the project has demonstrated that job flows happen in both directions and in some countries, such as Denmark and Sweden, more jobs were actually created (7347 and 9317 respectively) than lost (3076 and 5819 respectively) as a result of offshoring developments.

MOOS is also helping to provide more detailed metrics on the types of functions that are offshored/inshored and has developed a set of principles for sustainable offshoring which include a proposal that organisations should reinvest savings in skills’ development. The recommendations to the e-skills conference

were that, building on the work of the project: a feasibility and impact study of global sourcing on e-skills should be launched by the Commission; and that a CEN/ISSS e-Skills Workshop should develop a standard for sustainable outsourcing procedures.

Support for New Skills including Entrepreneurship

Globalisation will require large sections of the workforce to adapt to the new skills requirements of a more dynamic market in which people will increasingly need to be able to work efficiently in dispersed and virtual teams and where multicultural, worldwide collaboration is the norm. High proficiency in English also looks set to be an important skill for these workers. More specific e-skills will also need to be updated as technology develops.

For example, since 1965, Moore’s law has defined the increase of hardware component complexity as well as performance. Now, with multi-core technology, it has been transported into the software domain. The shift to massive computing parallelism in a new generation of commodity devices, is increasingly making it clear that typical, current programming skills will not allow us to take advantage of the resulting performance boosts that will soon be available to everyone. New performance levels will also impact, not only on core ICT professions, but also across disciplines such as Biology and Climatology and new modern fields such as Nanoscience and Fusion. Europe has an opportunity to take a lead in parallel programming by being ahead of the skills demand curve but, to do so, it will need to introduce parallel programming skills at all levels – secondary schooling, vocational education and training, and Higher Education.

It is also essential that we take steps to introduce entrepreneurial thinking and skills at all levels of education, although the quickest return on this sort of investment is most likely to come from initiatives in Higher Education and via the



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promotion of new sort of entrepreneurial 'eco-systems'. Progress here is already being made by the rollout in 2006 of Intel 'Technology Entrepreneurship – Theory to Practice' seminars. These aim to inspire and train academic staff from technology-oriented faculties in how to encourage entrepreneurship, create additional jobs and promote essential support services. More focus on entrepreneurship skills is essential in order to build local innovation capacity and if we are to avoid some of the problems of the dotcom boom when many company failures were a consequence of start-up companies lacking the necessary core business skills.

Developing Lead Markets

Creating innovation-friendly markets needs to be at the core of Europe's proposal for revising the Lisbon agenda. As the Aho group report has highlighted (Creating an Innovative Europe), key to this is the promotion of lead markets. Many elements for lead markets are already in place, including relatively high incomes and a willingness to purchase higher quality goods. However this is not enough.

Further steps are needed to: provide a harmonised regulatory environment favourable to innovation and based on early anticipation of needs; make ambitious use of standards-setting powers to demand high technical performance levels and quickly reach agreements on new standards; use public procurement to drive demand for innovative goods and improve public services; and foster a cultural shift which celebrates innovation. The envisaged development of lead markets in e-Health, Pharmaceuticals, Energy, Environment, Security, Electronic Entertainment and Content, and Transport and Logistics will all have strong ICT e-skills requirements. Luke Georghiou from PREST at the Manchester Business School suggested that there was, "a clear link between e-skills agenda of the Taskforce and lead market agenda of Aho Group strategy for Creating an Innovative Europe" that merits further examination.

Living Labs

A European Network of Living Labs will be launched in 2006 as first step towards a new European Innovation System (EIS) and as a concrete action designed to help the general public to connect with the goals of the Lisbon strategy. The Living Labs concept includes public-private-citizen partnerships where companies, public authorities and people work together to create, prototype, validate and test new technologies and services in real-life contexts, such as cities, regions, rural areas and collaborative virtual networks.

However, this new approach to innovation is a huge challenge for research methodologies, innovation process management, PPP models, IPRs and open source practices. The complexity also increases markedly with the international nature of these initiatives, which is why the European Commission has allocated €40 Million Euros for piloting a network of 12 Living Labs sites in Europe, China, India and Brazil. These projects will identify, prototype, validate and test new ICT services and technologies in process engineering, creative knowledge work and rural and remote areas in Europe.

As Veli-Pekka Niitamo from Nokia observed, "The Living Labs concept, is based on the recognition that users can be creators and developers as well – it is no longer a case of either/or." Living Labs are concerned with moving out of laboratories into real-life contexts and this will entail a major paradigm shift for the whole innovation process and how we need to think about the e-skills requirements of professional researchers at one end of the continuum and the typical end user at the other. For example, if large numbers of users are increasingly seen as active 'co-creators' of new ICT products and services, and less as 'consumers', we may need to change some of our assumptions concerning the types of e-skills required by people in different application sectors.

Living Labs may also provide new opportunities to explore how European companies can create value out of open source modalities. Nokia already suggest that open source communities can carry out work faster than 15,000 of its own engineers and the sort of user-driven innovation environments envisaged for Living Labs have obvious affinities with

open source software development and recent collaborative content development initiatives such as Wikipedia. A long-term e-skills agenda, therefore, may need to consider what sort of new competences will be needed to support emerging open innovation processes and new open development communities in a European Network of Living Labs.



►► Towards a European e-Competence Framework



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This session presented the activities of the leading stakeholders engaged in the development of the e-Competence Framework and examined synergies with the recent proposal of the European Commission to the Council and European Parliament for an inter-professional European Qualifications Framework.

Partners and progress

Since the last e-skills conference, significant progress has been made within the CEN/ISSS Workshop on ICT Skills in Europe that is aiming to create long-term HR qualifications and competence development strategies for the European ICT sector. In 2006, work has been driven by an expert group drawn from several countries (France, Germany, Italy, Netherlands, UK) that includes: framework organisations (CIGREF, SFIA, AITTS); ICT vendor and user businesses (such as Airbus, Michelin, Cap Gemini, Renault); as well as higher education and research institutes (Fondazione Politecnico di Milano, ESMI Grenoble).

This group has elaborated and agreed on a work programme, "Towards a European e-Competence Framework" and, by the end of 2006, it is anticipated that there will be agreement on a common "European language" for competences descriptions. Here the expert group will have to decide how to define and describe competences and, in particular, will be involved in challenging work concerning roles of knowledge (e.g. the level at which technical ICT knowledge will be integrated), context and behaviours (e.g. wider competences),

relationships between competences, performances learning outcomes, and what level of detail should be provided on all these. From early 2007 until autumn 2008, a set of European-level competences will be developed according to the common language agreed in 2006. The intention is that the validated framework will be delivered ready for use by autumn 2008.

There is common agreement that an e-Competence Framework must be developed in line with work being carried out on the broader European Qualifications Framework (EQF). However, while the general principles of linking national frameworks to the EQF now seem to have been largely accepted by Member States, the proposal to encourage sectoral organisations at an international level appears to be more controversial. Against this background, the ongoing work related to an e-Competence Framework within the ICT sector will be of critical importance, particularly if it encourages other sectors to develop sector-specific tools that are aligned with the EQF.

Why do we need an e-Competence Framework?

The session presentations highlighted that the development of an e-Competence Framework is a strategic action that will strengthen European competitiveness. Speakers from Michelin and Airbus commented that their companies, as well as many other European enterprises, are global players that use IT/IS services worldwide. They are currently committing huge resources to

establishing and updating internal company ICT competence manuals for HR planning, training and development. Working together with other European organisations will help to spread the effort involved and is expected to result in significant savings in both time and money.

At the same time, stakeholders involved in national ICT Competence Frameworks, such as CIGREF, AITTS and SFIA, are conscious that several frameworks currently exist in parallel to each other, which makes them difficult to apply in a cross-national environment. Some of them are also mainly profile-oriented which makes them less suitable for competence management. A further problem is that there is no common agreement on how to talk about ICT knowledge, skills and competencies at a European level. This lack of transparency is both inefficient and causes serious problems related to worker mobility and inevitably affects the competitiveness of the European ICT sector.

Synergies and links

In order to ensure broad acceptance and applicability of the e-Competence Framework, it was suggested that intelligent links needed to be established to other frameworks and tools – both at national and international levels. As well as connecting the e-Competence Framework to the EQF and national ICT sectoral frameworks, a link should also be made to a possible future ICT qualifications framework. This could be done, for example, by sharing definitions and information on competence levels. Industry stakeholders underlined the importance of being able to relate and connect the framework to internal, company HR planning and management concepts, such as career paths, job positions and annual performance reviews. In short, the framework needs to be able **“to develop descriptors general enough to be compatible with the EQF but specific enough to reflect an industry’s needs.”**

Part of a long-term e-Skills Strategy

There was consensus that a new e-Competence Framework will both improve Europe’s ability to compete in global markets and provide a key pillar of a long-term e-skills strategy. It will: provide ICT practitioners with clear guidelines for developing e-skills competencies that meet the long-term and evolving needs of their organizations; enable ICT managers to better anticipate and plan their competence needs in line with their specific company policies and business strategies; and finally, higher education, vocational training and certification providers will be able to obtain practical, industry-based support for designing their curricula.

There is also a growing awareness that, taking a long-term perspective, we need a framework that will encompass a wider range of e-skills and other competences that are essential in a Knowledge Economy. As Hubert Delafon, ICT Competence Manager at Michelin, suggested, **“The European e-Competence Framework has to be focused, not on hard skills, but more on competencies that will not go out of fashion and are difficult to acquire.”**

Key Issues

A number of concrete suggestions were made concerning what a European e-Competence Framework must offer as part of a long-term e-skills strategy. In particular it must:

- be based upon a well-defined and shared “European language” for describing ICT competences
- be able to provide a neutral, benchmarking tool for the whole ICT sector that is recognised Europe-wide and which enables those who use it to manage and plan competencies that will be needed over a long-term perspective;
- be an instrument that can be embraced by both vendor and user companies and by large companies as well as SMEs;



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- serve as a common reference point between existing national ICT competence frameworks such as CIGREF, SFIA and AITTS. The European e-Competence Framework can add value to the work of these bodies by adding a new layer of competence definition and will provide a cross-national communication and cooperation tool for the ICT industry, public sector organisations, training bodies, certification institutions and individuals;
- be driven by ICT vendor and user industries, focused on ICT employers' needs and embedded in a European business culture;
- be easy to handle in each European country and directly linked to the European Qualifications Framework (Levels 3-7).

It should be classified according to the major fields of ICT activities and has to be closely linked to the national competence frameworks provided by SFIA, AITTS and CIGREF;

- include both typical ICT competencies, for example those dealing with project and risk management and enterprise architecture, but also wider competencies, including those dealing with broader communication skills and ability to innovate.

With the validated e-Competence Framework on track to be delivered ready for use by autumn 2008, it is clear that this important part of a European e-skills strategy is well on the way to becoming a reality.



▶▶ e-Skills Certification and Training

This session analysed current developments and best practices in the field of e-skills certification and training and discussed possible solutions to further promote e-skills mobility, transparency and recognition in the European Union. Experts representing leading stakeholders reported on their experiences and presented recommendations for actions at EU and national level.

Scale of the challenge

Research carried out by AIFB at the University of Karlsruhe highlights that the number of existing ICT certification schemes is simply huge. It is estimated that over 800 different schemes are currently available, most of which are being continuously updated to keep abreast of market dynamics, and many new certifications are still being regularly introduced. As a consequence, “transparency” is poor and those seeking ICT certifications are confronted with a confusing and expanding number of options, both vendor and non-vendor specific, and from both public and private sector providers.

In addition, during what has been a rather turbulent labour market, few employers appear to lend much weight to applicants’ qualifications, focusing their requirements more on how much direct experience the job applicant has in particular software environments. In order to improve the widespread recognition and transparency of ICT practitioner qualifications and training requirements, it is essential that we put in place: an acceptable framework for clarifying the

meaning and value of individual qualifications from member states; and, ideally, European-wide training and certification schemes.

We are, therefore, still some way from solving the very complex issue of ICT certification and the market perception is that ICT training and certification remains something of a jungle. An unavoidable problem perhaps, is the multiplicity of stakeholders that include certification bodies, developers of certification programs, IT industry, IT user industries, IT professionals, associations of IT professionals, providers of education and other associations and interest groups. As the eSCC highlighted during the June 2006 e-Inclusion Ministerial Conference in Riga, some key barriers to obtaining e-skills are also persistent: lack of consistency between education and certification frameworks; lack of compatibility with industry skills programs at country and international levels; and the socio-economic situation of some individuals can itself be a barrier.

Making progress

Nevertheless, it is important to recognise that significant progress is being made as a result of a number of initiatives, such as CompTIA’s Tech Career Compass, the HARMONISE project that Cepis will complete in 2007, the Embedding Standards project led by Dekra Akademie in Germany, or Cedefop’s report on ICT Skills Certifications in Europe (2005). The Cedefop report, for example, provides an effective way of describing the links between formal education, work experience, definition of required skills,



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specific training, testing and certification. It highlights how the stakeholders involved in the Cedefop survey particularly recognise certificates awarded by the ICT Industry and by the ECDL Foundation, but also suggests that use of independent certification will be required as a basis for a European Framework

In order to achieve widespread acceptance, any certification will need to be broadly recognised by both employers and those seeking a qualification. There is a consensus that both visibility and clarity will be improved by defining and maintaining a map of certification products (and related training) that highlights the scope and features of each certification in order to allow easy comparisons to be made. A key aim in the development of a long-term e-skills strategy must be to develop “a common language” for ICT skills. This goal will be more easily achievable as a result of work being carried out in both the HARMONISE and Embedding Standards projects

Having assembled a comprehensive knowledge base on ICT certification and approaches, taking as a reference the EUCIP model, HARMONISE will elaborate ways of clarifying the feasibility of a widely acceptable European approach to qualification and certification for ICT professionals which builds on the successful experience of the ECDL (European Computer Driving Licence). The Embedding Standards project, like HARMONISE another initiative supported by the Leonardo da Vinci Programme, will collect information on current national and European approaches to identifying and describing ICT/multimedia profiles as well as training and education needs. The project will then develop a grid which facilitates comparison of these approaches and, as part of its work, will include countries where, up to now, not much effort has been made to define the status of national certification processes.

The proposed vision for a way forward must also be based on the formation of effective

partnerships between industry, education and those providing employment services such as careers guidance and cross-sectoral information, several of which were highlighted in this session.

AITTS

A good example of partnerships in action is available in the Advanced IT Training System (AITTS) from Cert-IT, an organization established in 2003 by a diverse group of ICT stakeholders in Germany. AITTS currently offers career profiles covering 29 well-defined job titles, each with coherent descriptions of the tasks and competences involved. The focus is particularly on training in real workplace projects. These include practical work assignments that can be directly utilised by the participant’s organisation and each project is carefully documented and aligned to quality assurance requirements of the certification procedure.

This concept of ‘Work process-Oriented Training’ – APO in German – integrates lifelong learning into the qualification process. Throughout the entire training period, the participant is supported by a coach and technical experts – most often experienced colleagues, employees and other participants – together with complimentary materials and media. The AITTS certification for IT Specialists also complies with the international norm for personnel certification, ISO/IEC 17024.

This sort of personnel certification is a powerful instrument to ensure that workers are able to perform activities associated with their role, as defined in a set of standard processes for the creation and maintenance of ICT systems. It can also encompass informal training methods that are crucial in order to help build soft and behavioural competencies and the concept of proficiency is related to a wide range of knowledge and skills that are independent from vendor-specific standards. Against a background of diverse national educational standards, schemes such as AITTS help

introduce transparent and mutually recognised standards to human resource development in ICT industries. AITTS particularly demonstrates that, when aligned with the concept of 'Work process-Oriented Training', qualification and certification can be innovatively brought together and can powerfully boost the self-learning competency of individual workers.

The Cisco Networking Academy

It is generally understood that there are major differences between "industry certification" and certifications from the traditional educational system. The former is often seen as being focused on a single product, based on an international approach, and sometimes providing "quick and dirty" responses to the labour market. The latter is government controlled and vendor neutral, often based on a broader educational approach, and is more local than international. However, as Markus Schwertel from Cisco Systems observed, **"Modern societies need both approaches."**

Since 1997, the CISCO Networking Academy has provided a good example of how industry certification programmes can be successfully integrated with national educational systems. The current offering includes several curricula, mapping either to Cisco certificates or to other vendor-neutral certificates such as CompTIA, EUCIP and Panduit. The worldwide impact of this program since 1997 is also impressive; over 11,000 academies have been offered in 160 countries, involving in excess of 34,000 instructors and over 2 million students!

A recent practical example of how this Cisco program has been integrated with national initiatives can be seen in Germany. A pilot project, started in autumn 2006, is combining Cisco CCNA/CCNP certification with AITTS certification issued by Cert-IT. Workers participate via a form of blended learning (both on the job and through Cisco Academy sessions) and will be awarded both certificates.

The Qualifications and Curriculum Authority (QCA)

The QCA in the UK provides a further example of inclusion of vendor certificates into a national framework. A political decision to integrate vendor certificates was taken in 2001, in spite of some expressed concerns over the use of public money to further commercial interests (including the creation of monopolies), the alignment of international organizations with government targets and rules, and quality assurance issues. To cope with these concerns, a pragmatic and collaborative approach was adopted. The key goal was to enlarge the skills base by: increasing access to training; introducing publicly funded vocational IT practitioner/professional skills into schools and further education colleges; and increasing the number of vendor IT academies.

As a result, the main IT certifications (by Cisco, CompTIA, ECDL & EUCIP, Microsoft, Oracle etc.) are now offered through a few approved awarding bodies such as the British Computer Society, City & Guilds and OCR. The leading certifications – in terms of volumes – are the basic ones, for example, CompTIA A+ at level 2 (3000 tests, 68% of the total) and the ECDL at level 1, in a unique position with over 1 million candidates thus far. However, several obstacles still need to be overcome, especially in order to increase access to certification and to help counter overseas outsourcing, which may diminish the demand for ICT skills. Moreover, regional frameworks (such as in Scotland where there is different system) need to be made compatible with national and European frameworks.

Both these innovative approaches presented by Cisco and the QCA can serve as models for others. Particularly noteworthy is how they effectively acknowledged and drew on the strength of each accreditation approach and found a way to bridge the outdated perception that industry and national certification schemes must be regarded as mutually distinct and opposing systems.



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Key Issues

As well as recognizing that much still needs to be done to improve the transparency of European certifications, this session highlighted several important issues that will need to be taken into consideration as we move towards the development of a long-term e-skills strategy. In particular, it was suggested that there is a need to:

- recognize the differences between traditional education and ICT certification, and support initiatives that combine (and make the most of) both approaches;
- facilitate the official recognition of IT skills certifications and include them within national frameworks (where applicable);
- define a framework to position certifications, taking into consideration the business processes that they support, and measure the degree of independence from a specific technology platform;
- agree on a Europe-wide standard framework for ICT skills and certifications.



▶▶ Employability and Digital Literacy

This session examined on-going activities and best practices to promote employability and digital literacy and discussed future initiatives and actions to promote e-Inclusion. An opportunity was also provided to discuss the conclusions and the follow-up of the Riga Ministerial conference on e-Inclusion.

Background data

An examination of data from the EUROSTAT 2005 Community Survey on ICT usage in households and by individuals has challenged some commonly held assumptions concerning European e-skills levels. For example, the survey highlights that 37% of European citizens have no computer skills at all, only 22% seem to be familiar with a wide range of computer activities and 4% of European students have never used a computer. Key determining factors relate to age, educational level, employment status and whether individuals live in economically prosperous or relatively poorer regions. The previously reported gender gap in terms of ICT use is less significant and now appears relatively small. What this data also clearly tells us is that the skills gap is not limited to the elderly or individuals with low educational levels. Significantly, the survey shows that 36% of the unemployed in the EU has never used a computer. Given that ICT is an increasingly important aspect of many occupations, this underpins the fact that a large number of individuals still need to acquire e-skills and that their employability may, in fact, depend on this.

E-skills and e-inclusion

While greater use of ICT and improving e-skills levels must be seen as key drivers of the European economy, a long-term e-skills agenda must also be framed within current discussions related to e-inclusion and citizenship, in line with the objectives and actions contained in the declaration from the June 2006 Ministerial conference in Riga and the Commission's i2010 strategy. For example, concrete targets in the Riga declaration are to halve digital literacy gaps for groups at risk of exclusion by 2010. Key elements linked to this target involve training the workforce with regard to e-skills and promoting lifelong learning and digital user rights. Trans-national certification schemes for digital literacy and ICT competences are also proposed, along with actions to ensure that all public websites are easily accessible. In order to achieve these goals, stakeholder involvement and a commitment to e-skills training will be essential if the overall result of a 30% reduction in the category of non-users is to be achieved.

The e-User project and improving perceived e-skills

The e-User project led by Empirica in Germany, is examining how best to put the user at the centre in the design and delivery of e-Government, e-Health and eLearning Services. An EU-wide population survey regarding the needs, experiences and requirements of both current and potential users of online public services was carried out in early 2005. Information has also been collected concerning



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the degree to which the European public sector pays sufficient attention to user-orientation of online services. As well as confirming that there needs to be a greater focus on the e-skills needs of unemployed, disabled and low qualified workers, the study has highlighted that there is frequently a mismatch between the actual e-skills levels of users and their “perceived” e-skills competences. Before the actual skills levels of users can be improved, we may need to find new ways in order to make users more self-aware and able to assess their own e-skills abilities.

User perceptions also colour views of would-be e-Learners, 25% of whom indicate that uncertainty about whether learning online works is a major barrier. This barrier affects, in particular, the unemployed, others not working and people with low income, as well as young (18-24) and older (50-60) persons. Women are also more likely to doubt the effectiveness of learning online than men. On the other hand, persons who have used eLearning courses report very positively about the experience regardless of gender, age or Internet user type. In other words, the study shows that some users are inhibited from using eLearning because of their previous limited experience in using the Internet, their endowment with eSkills, and the importance they attach to the Internet in their private life.

As part of creating a long-term e-skills strategy, therefore, it will be necessary to change how some groups of individuals perceive their existing e-skills levels and their ability to change these. Actions will be needed to motivate and instill confidence in users that e-skills are both valuable and something that they can easily obtain. Failing to do so, may lead to a widening of the e-skills gap as higher qualified workers gain in confidence (as a result of training and work experience) while those with low e-skills levels fall yet father behind.

Ten years of digital literacy certification with ECDL

Since the concept was first developed by CEPIS in 1996, the European Computer Driving Licence has grown to become the leading certification in the field of IT user skills. With over 5.5 million enrolled candidates, the ECDL programme is clearly one of the major instruments that is helping Europe to close the digital divide. During the last ten years we have witnessed a new shared commitment to digital literacy; as Damian O’Sullivan, the CEO of the ECDL Foundation, observed, there is a growing recognition that **“digital literacy is required for living not just for working.”** Use of the Internet has been an important factor here, resulting in a broader definition of what constitutes digital literacy. Digital literacy can no longer be confined to developing the required competences to use a personal computer. ICT users now need to acquire skills that will enable them to: use a wide variety of digital devices; critically analyse and utilise digital information; and communicate successfully using digital networks and platforms.

Looking forward to the next ten years and what is required as part of a long-term e-skills agenda, two key issues are paramount – access and sustainability. Improving access to digital literacy programmes will require us to deliver programmes through varied channels (formal education systems, workplace programmes and community-based initiatives) and by utilising flexible training methods (both classroom-based training and blended e-learning with tutor support). In terms of sustainability, while we realise that digital literacy can be expressed and supported through everyday use of current technologies, we must also facilitate new technology adoption and encourage greater dialogue with the creators of technology.

Addressing the digital divide is not only an issue of training and certification; it also involves new challenges related to man/machine interfaces ongoing development and introduction of new technology and the need to help users develop cognitive and “reasoning” skills as well as the more familiar “hard” skills.

Improving digital literacy in the NHS

With 1.3 million staff, the UK’s National Health System is the largest employer in Europe and includes over 500 organizations and approximately 119,00 doctors, 400,00 nurses and 129,000 scientists and therapists. It requires modern, integrated IT systems and services connecting its staff, some 800,000 of which need some form of training and development in ICT and new systems. The NHS National Education, Training and Development programme highlighted that digital literacy is now as important as more conventional forms of literacy but that even many young professionals are resistant to e-skills training.

However, following a successful pilot of ECDL in eight health organisations in 1999-2000, a major national NHS ECDL scheme was put in place involving 350 accredited learning and test centres and resulting in 175,000 individual registrations. An evaluation of the national scheme shows that it has halved the cost of training delivery and, most impressively, it has demonstrated that ECDL qualified nurses save an average of 30 minutes a day. Given the fact that most hospitals are understaffed, such a change has had a huge impact on the quality of the hospital service. The NHS initiative clearly shows that a successful approach towards closing the digital divide is possible and that e-skills training in organisations can directly boost productivity and result in major cost-benefits.

Promoting employability through e-skills with FIT

The Fast Track to IT (FIT) project from Ireland is an industry-backed initiative for promoting

social inclusion that convincingly shows how it is possible to design successful training programs for disadvantaged job seekers. To date, 5,500 disadvantaged job seekers have participated in FIT Training Initiatives, a further 1,800 people have become digitally literate through FIT community programmes and 800 Youth ‘At Risk’ have been supported and helped to progress into further education and employment opportunities.

The success of the FIT approach stems from developing new market-led courses, combining technical competency with soft skills and ensuring that the initiative has cross-sectoral industry and government support. Employers have actively engaged with FIT as the project has been quick to respond to emerging ICT skill sets and they can relate to its pragmatic vision for corporate social responsibility or “social entrepreneurship” which simultaneously delivers clear benefits to companies while serving the greater social good. Videoed statements from project participants demonstrate that FIT not only helped young disadvantaged people to find a job, but also enabled them to change their life and created long lasting opportunities. With its successful track record, and in collaboration with the Employability Alliance, FIT is currently assessing the potential for an EU-wide ICT digital inclusion initiative that builds on the FIT model.

Key Issues

The session recommended that the following central issues need to be taken into consideration as we move towards the development of a long-term e-skills strategy:

- **Digital literacy must encompass more than computer skills**

Users increasingly need training in how to use a variety of digital devices and there is a growing requirement in modern society for non-technical and soft skills. The overall conclusion is that computer skills will evolve to include all information related skills.



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More effort is also needed to promote multi-stakeholder partnerships that expose individuals and SMEs to entrepreneurial skills.

- **Digital literacy has a positive impact on e-inclusion**

Modern technology makes it easier for companies to contact and support their customers and enables governments to improve services to the public. Statistics clearly show that a significant group of people still have little or no e-skills. In order to strengthen e-inclusion and social cohesion, we particularly need to develop digital literacy actions tailored to the needs of groups at risk of exclusion. We must also consider new forms of attractive part-time and flexible working practices to attract ICT workers including women and mature professionals.

- **Research and statistics are important**

Research is essential. In order to have a better understanding of the problem areas and target groups. Through statistics we are able to monitor progress and show the results of projects and policies. Bringing research, statistics, policy and projects together will stimulate work in the e-skills and employability domain.

- **The way we look at e-skills**

Providing data on whether people make use of a computer or the Internet may not be sufficient. Over the longer term, we will also need to look into the way they use the computer and for what purpose. Large-scale awareness and information campaigns are needed to motivate people to develop e-skills and help build their confidence that they can participate in training schemes.

- **Testing and assessment**

While testing and assessing skills level is necessary, current testing methodologies may be too limited, since they focus too exclusively on technical aspects and hard skills. Future tests will need to include topics such as successfully finding information through the Internet.

- **Best practice actions**

Both the NHS and FIT may be seen as e-skills' best practice actions, clearly show that the issue of the e-skills gap can successfully be addressed and provide useful models for future initiatives. More effort is needed to promote e-learning courses and brokerage mechanisms that support the exchange of online e-skills resources for ICT practitioners and the European workforce and that support the dissemination and wider take-up of best practice actions.

- **Fiscal instruments**

In order to support the development of e-skills, a number of financial approaches is possible: a discount on the price of vendor neutral certification (such as ECDL) for students in formal education; tax reductions for SMEs in order to stimulate training; financial incentives for companies that hire and train unemployed people; financial benefits for unemployed people joining training and job oriented programs; government funded programs to provide schools with computers and training etc. Given existing tax and educational differences between the member states, a best practice in this area is not yet available. Further investigation is needed into how public funding mechanisms can upscale e-skills training and certification initiatives, increase participation and combat social exclusion.

▶▶ e-Learning and Lifelong Acquisition of Skills

As we make the transition to a knowledge-based economy, e-Learning and ICT enables lifelong acquisition of skills including those 'real-life' employability skills that employers say they most need - literacy, numeracy, teamwork and collaboration, meeting deadlines, critical and strategic thinking.

Time to move up a gear

The European eLearning Industry Group (eLIG) is an open consortium of leading ICT companies and content providers that seeks to promote e-Learning in schools, universities, the workplace and the home. It has been at the forefront of organizations emphasizing that, while European industry is dependent on the effective use of ICT for industrial and business processes, the current number of ICT students and trainees is simply not sufficient, especially at degree and higher vocational levels. For example, the yearly number of graduates from Indian and Chinese universities already exceeds that of Europe.

However, attempting to redress this trend through increased use of e-learning in Europe is proving problematic. It is now accepted that existing technology, properly deployed, can provide secure and robust learning platforms and that we are beyond the phase where we need to wait for next generation solutions that can be taken to scale. Nevertheless, although current technology is easily capable of supporting mass deployment of e-learning solutions, it is misguided to think that we can fall back on a principle of "build it and they will come". Breakthrough is only possible

if we recognize that; all mass diffusions of technologies require user-driven adoption approaches and the creation of real user value for both teachers and students. As Simon Tindall from eLIG and Sun Microsystems suggested, **"It is time now for Europe to move up a gear! We particularly need a user-centric not a technology-centric approach to learning."** At Sun, for example, user value is created by demonstrating that training can result in personal competitive advantage, particularly for those taking part in new programmes that provide early experience of emerging technologies.

e-Learning in a Web 2.0 world

As we attempt to accelerate the deployment of e-learning solutions, we also need to recognize that user skills' requirements are changing as interfaces become more transparent and as computing generally moves towards becoming a centralized utility. Moreover, the requirements of older 'digital immigrants' are very different to those of net-savvy 'digital natives' who need little or no formal training as they inhabit and move easily between a multiplicity of new social networks and virtual environments such as MySpace, YouTube and SecondLife. We need to appreciate that we are moving from Internet 1.0 to what is increasingly being called the 'social web' or Web 2.0, characterised by self-made content, self-expression and sharing of information and resources.

The need for a more user-centric approach in a Web 2.0 world will also require us to reflect



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on underlying cultural differences, particularly between Asia and Europe. For example, European attitudes to the lifelong acquisition of skills compare unfavourably with those in the most dynamic Asian economies. As highlighted in several conference sessions, more effort will be needed in order to motivate learners particularly those with low existing e-skills levels or who lack confidence with ICT. As noted in this session by Jouni Kangasniemi from the Finnish Ministry of Education, **“We are now in an era when we need to motivate people; the focus must increasingly be on why they need to learn rather than simply telling them what they need to learn.”** In short, overcoming attitudinal barriers to the use of ICT and acquiring e-skills is now the key challenge.

Innovative strategies for lifelong learning

A number of strategies are proposed concerning how to address the variety of issues Europe is facing in this area. With limited resources at our disposal, we may need to decide whether even greater priority should now be given to the retraining of today’s workers and the older generation of users that are digital immigrants. There may also be a need to concentrate more on the skills needs of ICT developers, the highly skilled ‘few’ who will drive the deployment of new technologies and help develop the new industries and business processes that will make Europe truly competitive.

In Finland, the NOSTE programme has demonstrated an innovative approach to maximising the use of available resources when upgrading the skills levels of poorly trained working adults who have no post-compulsory education. With a budget of approximately €30 million in 2006, this initiative features new types of multi-stakeholder partnerships or ‘training pools’ involving around 600 organisations: vocational adult education centres, vocational institutes, adult education centres, folk high schools, upper

secondary schools, apprenticeship training centres, business centres, associations and job centres. The programme supports people aged 30-59 both in completing their basic education and acquiring basic computer skills and makes extensive use of peer support and training activities that take place within the student’s own working environment. The lessons learned from the NOSTE programme is that large challenges need to be tackled in small stages – “you can’t eat an elephant in one day” – and that relatively small amounts of funding (€100-500 given to a small club or community organisation) can have a major impact. More small-scale funding combined with institutional support and new types of outreach and partnerships can enable the adult education sector to make a contribution to eliminating skill deficits. At its half-way point in June 2006, the NOSTE programme already boasts some 14,000 registered students.

Useful models can also be seen in the ‘Steps for Skills’ initiative from the Swedish Agency for Flexible Learning (CFL). ‘Steps for Skills’ is a national initiative to support municipalities’ long-term skills’ development programmes for staff providing health and social care services to the elderly. Sustainable systems were needed for continuous learning for frontline care staff. This has been achieved by building on short training modules and using a mixture of formal/informal and individual/organisational learning approaches. The strategy also involves: students both working and studying at the workplace; team-based student support from lead trainers, pedagogical facilitators and teachers; setting up ICT-equipped study corners in the workplace; and including colleagues and making them part of the learning environment.

Need for Foresight, Roadmaps and Benchmarking

The session highlighted that innovative, user-centric approaches to skills’ acquisition are gaining ground and there is now considerable

e-learning best practice to draw on. However, there is also a realisation that we still know relatively little about the needs and fears of non-users of ICT and e-Learning and understanding how best to encourage and motivate those with low e-skills levels is likely to be a lengthy process. Foresight studies and benchmarking initiatives will have an important role to play here in helping develop and steer both national and pan-European strategies.

The IST Programme's PROLEARN Network of Excellence, which is focused on technology enhanced professional learning, is already making an important contribution. Based on the experience of previous projects, a comprehensive roadmap is being produced that will integrate business drivers with enabling technologies to provide a coherent framework for coordinating R&D to meet the major challenges of European e-Learning/training. The core vision of the PROLEARN roadmap is, **"To support knowledge workers with technology-enhanced learning by promoting motivation, performance, collaboration, innovation and commitment to lifelong learning."**

Work also started in May 2006 on a one-year study "Benchmarking Policies and Initiatives in support of e-Learning for Enterprises in Europe". Led by the MENON network, this study is currently analysing and benchmarking national and regional policies and stakeholder initiatives that support e-learning for enterprises. The initial analysis of data sources reveals that, according to IDC estimates in 2003, the European e-Learning market is expected to grow substantially at over 30% per year between 2002-2007. However, other studies are not as optimistic and do not expect market growth to exceed 10-20% over the coming years. While the UK growth figures of

+28% per year are broadly in line with the IDC forecasts, a study by ANEE/ASSINFORM in 2005 suggests that the e-learning market in Italy is declining, from +43% in 2003-4 to +17.9% in 2004-5.

While consistency between data sources remains problematic, some general trends are still discernable. For example, there is steady development and stable growth in the corporate e-Learning market due to increased demand for training and 'blended learning' solutions, growing use of the Internet and (slowly) improving access in terms of reduced costs and faster broadband connections. e-Learning is also becoming a more embedded part of work-based learning and, particularly in large companies, is perceived as an enabler to improving competitiveness. The picture in SMEs is less encouraging. Whereas large companies are less concerned with "why to adopt" e-learning and are increasingly focused on "how to integrate e-learning effectively", in SMEs e-learning uptake is still low and is slow to develop. SMEs remain at the "why e-learning?" stage and are unconvinced of its benefits or unaware of its potential.

By April 2007, the final benchmarking report will have identified the most successful strategies for the promotion of good practice and efficient use of e-learning in organizations and will include at least ten best practice examples. However, Claudio Dondi from the MENON Network is already clear that **"If we are to motivate people to use e-Learning, we need to show what it means for the individuals involved."** As earlier speakers in the session made clear, the major challenge is to demonstrate how e-learning and skills acquisition provides real user-value to all European workers and citizens.



CLAUDIO DONDI

President of Scienter



» Multi-stakeholder partnerships



TERRY HOOK

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These conference presentations reported on how multi-stakeholder partnerships (MSPs) between business, government and civil society are a growing feature of both industrial and emerging economies and are a key component in developing a long-term e-skills' strategy.

MSPs are essential not optional

As Hugo Lueders, Secretary General of the e-Skills Certification Consortium (eSCC) informed the conference, **"It is increasingly clear that no one sector in society alone can any longer deliver the complexities of sustainable development and education in the Information Society."** A way forward is via the formation of multi-stakeholder partnerships. These can be thought of as 'Open Coalitions of Cooperation' bringing together, on a voluntary basis, interested companies ready to tackle, amongst others, issues such as education, skills and employability.

MSPs are often a response to real needs caused by market and governance failures. In the e-skills domain, they are particularly essential to any long-term strategy that is attempting to bridge the "parallel universes" that exist between slower-moving, publicly funded education and training provision and industry-based, e-skills training and certifications that respond more quickly to the speed of technological development. MSPs are also increasingly seen a key driver that will help Europe compete effectively in global markets. As Aviana Bulgarelli, Director of Cedefop, suggests, **"Multi-stakeholder**

partnerships between the demand side for e-skills and the supply side – meaning not just the world of education and training but also policy-makers who make it possible to match demand and supply – are of crucial importance in generating the skills and competences necessary for European competitiveness and growth."

In short, MSPs that focus on e-skills development should now be regarded as essential not optional. A solid business case can also be made for MSPs. They can help companies promote their own values principles and policies, while protecting corporate reputation and enhancing the corporate brand. In other cases MSPs are more focused on value creation – leveraging resources and know-how across players and sectors and driving innovation and experimentation.

Partnerships can operate on a number of levels. For example, stakeholders in an industry may come together, like those working on e-Security certifications, in order to jointly develop industry-based curricula, certifications and training material, either vendor-specific or vendor-neutral. As well as cooperation at a product level, there are strategic and alliance-based partnerships, such as the new e-SCC European Alliance on Skills for Employability, involving the whole value chain including R&D, training and/or labour monitoring and placement. Finally, there is a third level that allows whole sections of society to work together on a horizontal set of issues.

Successful MSPs also leverage the strength of each partner. Inclusion of ICT training providers ensures that performance standards and certifications support 'workability' through their alignment with industry requirements. Involvement of academic and educational institutions ensures that public sector curricula and credentials reflect required industry performance standards and then allow the revised curricula to make appropriate use of valid industry-based certification tools. Finally, participation by governments and public institutions ensures a technology-neutral enabling environment that provides individuals with opportunities to attain valued e-skills attuned to market needs.

MSPs in Action

MSPs and SMEs

MSPs are particularly important for Europe's 22 million SMEs. In spite of the fact that they employ 120 million people and account for 57% of European GDP, it is often not easy for SMEs to access available EU funds for innovation, business start-up, employment and training. Addressing this issue is the EU Grants Advisor Program (EUGA), a joint initiative between Intel, HP, Microsoft and other private-public partners. Through this initiative, SMEs and local regional governments can increase their awareness and understanding of funding opportunities for technology infrastructure and training and also obtain support should they wish to apply for funds for which they are eligible. Already the EUGA has helped provide e-skills training for 95,000 individuals and, in the process, has stimulated innovation and helped grow SMEs' businesses and local economies.

European Alliance on Skills for Employability

Industry-led, MSP skills' initiatives include the formation in January 2006 of the European Alliance on Skills for Employability, a partnership between the e-Skills Certification Consortium (eSCC) with Randstad and State

Street Corporation. The Alliance aims to help train and provide access to technology for 20 million Europeans by 2010 with a particular focus on older workers in need of retraining, people with disabilities and the young unemployed. As Elena Bonfiglioli, the Alliance Chair from Microsoft highlighted, "**The European Alliance on Skills for Employability does not want to re-invent the wheel; the aim is to provide synergetic fine tuning of corporate programs across the value chain.**" Each partner in the network adds specific know-how and value at a specific step related to its core competencies and each step of the value chain is connected in an end-to-end approach. Rollout of the initiative is currently taking place in Belgium, Germany, Poland Portugal and the UK. In Portugal, for example, Alliance members have developed a partnership with CITEVE, the training body for the clothing and textile industry, in order to provide IT training centres for the estimated 10% of unemployed former textile workers who have recently lost their jobs as a result of rising competition from non-EU countries.

Profit Alliance in the UK

An innovative MSP in the UK is the Professionalism in IT Alliance (Prof IT) launched in May 2006 by e-Skills UK, the British Computer Society, Intellect and the National Computing Centre. The culmination of three years of development, Profit's aim is to provide focused leadership to professionalise the IT industry and particularly to coordinate activities through a single agreed programme that includes skills competency, good practice, qualifications, continued professional development, ethical integrity, commitment to standards, regard for the public good, and social responsibility. Once again, the strength of this MSP lies in the fact that the alliance's organisations complement each other and include partners that are involved in both technology supply and demand and others where the focus is on both employer and employee focused skills.



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MSPs in Germany

MSPs are well developed in Germany. For example, the KIBNET portal for ICT skills policy has been offered as a common service since 2001 by Bitkom, the German IT industry association and the trade union IG Metall. The CISCO meets APO (Work process-Oriented Training) initiative is also providing a good example of how to bridge “parallel universes” in that, as a result of one course, trainees can now receive two certifications, the APO-IT (sponsored by IG Metall and CERT-IT) and the industry-based CCNA certification (sponsored by Cisco Systems). As Michael Ehrke, Senior Adviser with IG Metall, pointed out in relation to achieving ISO certification for the Advanced IT Training System, **“It is quite possible within the framework of an MSP, to construct a sector-wide infrastructure for a qualification system and for its long-term maintenance.”**

Sustainability of MSPs?

All these initiatives can be seen as examples of best practice that highlight the benefits of cooperation and dialogue between industry and social partners. However, while many MSP programmes are now being scaled up, questions still remain concerning their long-term sustainability.

In this context, a critical issue for current MSPs is the potential of financial support mechanisms for e-skills training. Better allocation of existing public resources is required in order to: fund needed e-skills capacity building; leverage the existing knowledge, experience and energy of the commercial training market; and stimulate private investment to advance public goals. Already there are global discussions taking place on educational and other types of basic income support schemes such as the Basic Income Guarantee and Earned Income Tax Credit Scheme in the US, Renda Basica in Brazil and Grundeinkommen in Germany.

However, we are still at a low point on the learning curve in terms of what makes for sustainable MSPs. It was suggested that we first need to better understand what constitutes best practice in terms of financial support and incentive schemes. As part of a long-term e-skills strategy, decisions then need to be taken on how we can best encourage and persuade EU member states to remove funding barriers that impede schools, universities and commercial trainers from offering industry-based curricula and certifications.



▶▶ Conclusions

ICT has been the greatest driver of competitiveness in recent years and the development of a long-term e-skills' agenda is critical for the success of the revived Lisbon strategy. The key messages from the 2006 European e-Skills Conference, as expressed in the Declaration, were made at a time when there is a general recognition that we need to **"move up a gear"** as our education and training systems, no less than research and business, face the challenges of globalisation. As David White, Director of Innovation Policy, DG Enterprise & Industry, made clear in his concluding address:

"The danger is not a failure to see the issue, or to identify the solution needed, but our incapacity to mobilise our will and energies to implement the solutions in time. Worst of all is to agree what must be done, but to be unable to decide who will do it. Then history will pass us by."

In short, the challenge now is to move swiftly from "diagnosis to deeds" via a series of concrete actions and initiatives that can be taken to scale and sustained as part of a long-term e-skills strategy. However, the conference also confirmed that there is already a very broad agreement on the main elements of what now needs to be done:

- The formation of an Industry Leadership Group by the ICT industry is needed for efficient co-operation and to support the exchange of information and the pooling of resources for initiatives such as the "European Alliance on Skills for

Employability" launched by the eSCC and its partners early in 2006; such a group will help ensure a regular monitoring of the supply and demand of e-skills and a better understanding of the impact of global sourcing;

- The promotion of ICT practitioner education should be undertaken in a long-term perspective and include a balanced integration of industry-based ICT curriculum material and certifications into formal education;
- There is a need for a European e-Competence Framework, new curriculum guidelines and European quality criteria for e-skills training and certifications to facilitate mutual recognition of training, transparency of qualifications and credit transfer between formal, non formal and industry education and training; a European e-Skills and Career portal should be established and maintained in order to help promote transparency, improve mobility, and make ICT career pathways more attractive;
- Public and private sector investment in human resources should be increased together with, where appropriate, financial support and incentives related to ICT training that can be accessed by individuals throughout their career; there is also a need for coherent policies for the granting of immigration visas for e-skills' workers;
- We should increase the promotion of science, maths and ICT, role models, ICT job profiles and career perspectives with a



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special focus on young people; awareness and information campaigns are also necessary to provide parents, teachers and pupils with an accurate understanding of opportunities arising from an ICT education and the pursuit of a career as an ICT professional. In this context, we need to improve teachers' and trainers' professional development and to promote best practice and entrepreneurial skills;

- There is a need to: encourage more user-centric approaches to skills' acquisition and find new ways to motivate those with low e-skills levels; promote e-learning courses and brokerage mechanisms that support the exchange of online e-skills resources and contribute to the development of a more dynamic and competitive market for e-learning products and services; monitor

good practice across Europe for the training of SME employees using e-learning in order to promote the most successful e-learning solutions and business models.

The "Thessaloniki" declaration incorporates not only the recommendations of delegates at the 2006 e-Skills Conference, but also the conclusions of the European eSkills Forum, the results of the most recent projects and analyses and the recommendations of the working group on e-skills of the ICT Task Force. As such, it not only calls for a number of key actions to be included in a long-term e-skills agenda, but also serves as a marker that e-skills must be considered central to policy formation designed to ensure that Europe can boost the employability of its workforce and, as the clock ticks, can respond in time to global competitive challenges.



***COMMUNICATION FROM THE COMMISSION
TO THE COUNCIL, THE EUROPEAN
PARLIAMENT, THE EUROPEAN ECONOMIC
AND SOCIAL COMMITTEE
AND THE COMMITTEE OF THE REGIONS***

***E-SKILLS FOR THE 21ST CENTURY:
FOSTERING COMPETITIVENESS, GROWTH AND JOBS***

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47 Conclusion

▶▶ Introduction

Innovation and the uptake of information and communication technologies (ICT) are two important components of the renewed Lisbon agenda for growth and jobs. The contribution of ICT to the European economy is fundamental for the development of productivity and knowledge-intensive products and services. There is an important need to address ICT-related skills (e-skills) issues in order to respond to the growing demand for highly-skilled ICT practitioners and users, meet the fast-changing requirements of industry, and ensure that every citizen is digitally literate in a lifelong learning context requiring the mobilisation of all stakeholders. These challenges can only be effectively addressed by a real mobilisation of Member States and industry. The European Union (EU) can provide a platform for exchange of best practices and well-focused solutions as identified through dialogue with stakeholders.

At the European level, following the European e-Skills Summit organised in October 2002 in cooperation with the Danish Presidency and Council Conclusions adopted in December 2002, the Commission established the European e-Skills Forum in 2003 to bring together relevant stakeholders. The forum released a report "e-Skills for Europe: Towards 2010 and Beyond" in 2004. Follow-up activities resulted in steady progress being made with a view to prepare a long-term e-skills agenda. An ICT Task Force was launched in 2006 under the Commission's industrial policy aiming to help create a more favourable environment for business in the EU. A number of recommendations were made regarding e-skills. These were incorporated in the Thessaloniki Declaration adopted at the European e-Skills Conference ⁽³⁾ of October 2006.

Three key messages emerged at the end of 2006. Firstly, it is crucial for the EU to rapidly adopt a long-term e-skills agenda to promote competitiveness, employability and workforce development, reduce e-skills gaps and be in a better position to address global competitive challenges. Secondly, strong efforts need to be made to improve cooperation between the public and private sectors on a long-term basis, in order to ensure a seamless framework linking basic e-skills training, vocational and higher education and professional development. Thirdly, industry and policy makers should act more decisively and consistently regarding their strategies to promote the professionalism, the image and attractiveness of ICT jobs and careers and to foster better work, employment conditions and perspectives.

This Communication provides a timely policy response to these important messages.

⁽³⁾
Thessaloniki, Cedefop,
5-6 October 2006, see:
www.e-skills-conference.org



►► Main challenges

E-skills still not seen as a long-term policy issue

The growth of ICT has always been marked by fluctuations of activity and there has been an element of boom and bust. It is estimated that there are 4.2 million ICT practitioners within the EU and that approximately 180 million people are using ICT at work ⁽⁴⁾. A study on the supply and demand of e-skills ⁽⁵⁾ over the period 1998-2004 reported an increase in the estimated number of employed IT practitioners during this period of about 48%. After a peak in 2001 a low point was reached in 2003. There is some evidence of a cycle, and the European e-Skills Forum warned that significant e-skills gaps will again appear and called for the preparation of a long-term e-skills agenda. A 2005 industry report predicted that there would be a shortage in 2008, across Europe, of up to half a million people with advanced networking technology skills ⁽⁶⁾. A sectoral survey on e-business in 2006 reported that enterprises are anticipating skills shortfalls for ICT practitioners, particularly in ICT strategy, security and new business solutions ⁽⁷⁾.

⁽⁴⁾
CEPIS, "Thinking Ahead
on e-Skills for the ICT
Industry in Europe",
February 2007

⁽⁵⁾
Rand Europe, "The
Supply and Demand
of e-Skills in Europe",
September 2005

⁽⁶⁾
IDC White Paper,
"Networking Skills
in Europe"
September 2005

⁽⁷⁾
E-Business Watch Survey
2006

Shortages of ICT practitioner skills have been endemic due to technological innovation and the fast growth of ICT activity in comparison with the relatively low supply and availability of new employees and entrepreneurs with relevant educational qualifications. This was observed in particular with the uptake of the Internet. In response to industry pressure several Member States launched policy initiatives in the late nineties and at EU level a conference on the e-Economy was organised in March 2001. The bursting of the dotcom bubble and the recession of 2001 adversely affected investment in ICT and reduced temporarily the demand for ICT practitioners. Several industry-led initiatives were terminated while political interest and support decreased rapidly. Now e-skills shortages are increasing. The e-skills issue received attention from policy makers in peak times when the ICT sector was booming but suffered a loss of interest in difficult periods. This must alter if Europe is to anticipate and manage change effectively.

Lack of EU-wide approach: fragmented approach prevails

ICT is one of the most global and pervasive technologies. ICT products and services and the corresponding jobs are broadly the same everywhere, and the ICT industry is operating on a world-wide basis. The ICT Task Force complained that Europe is still a patchwork of countries functioning under different regulatory systems. In addition, the adoption of best practice is too slow and an EU-wide approach is still lacking.

The European e-Skills Forum identified solutions bringing added-value at EU level, but these have so far not been implemented. For example, developing and retaining skills required for business success is a necessity to ensure that enterprises have employees with the right skills in the right jobs at the right time. For this purpose, many of them are developing ICT competence

catalogues, processes, tools and strategies. Several countries have already set up ICT competence frameworks ⁽⁸⁾. Many enterprises operating in these countries have developed their competence inventories on them. Efforts to establish and update these proprietary inventories and systems are costly and could be shared for the benefit of enterprises and especially small and medium-sized enterprises (SMEs). Using a European e-competence framework would represent a useful solution in line with the ambitions of the single market.

Image problem and decline of supply of highly-skilled ICT practitioners

The need to maintain and continuously upgrade e-skills stems from technological change and increasingly from Internet-enabled global sourcing. New sources of ICT talent in emerging economies, especially India and China, imply the need for the adaptation of the European workforce. Software programmers face commoditisation of their skills, and some low- and middle-income workers face increasing risks to their jobs. The OECD estimates that around 20% of total employment could potentially be affected by offshoring ⁽⁹⁾. At the lower end of the qualification spectrum, de-skilling of workers often takes place as their know-how becomes codified making it relatively easy to outsource. Higher-level e-skills cannot be so easily encoded, which puts a premium on these skills in a European workforce context. This issue is debated in the media as the emergence of a significant restructuring of the labour market.

Several sources report a deterioration of the image of the ICT sector and ICT work, which is reflected in the decline in the number of students starting ICT courses. Adding to the concerns related to the demographic decline, young people seem less and less interested in studying mathematics, sciences and technology, and the gender issue still remains. There is a need to communicate better with the public, especially young people, parents, teachers and women, and to adopt measures to facilitate the adaptation of the workforce. In its policy plan on legal migration ⁽¹⁰⁾, the Commission underlined the importance of highly-skilled immigrants to contribute to fill gaps in the EU labour market. Member States, however, do not yet have a consistent approach: only twelve Member States offer facilitated procedures and/or attractive conditions for the admission of highly-skilled workers, including ICT practitioners. A common approach could render the EU more attractive, bringing the needed competences.

Rise of “parallel universes” between formal and industry-based education

The continuous development of ICT and changes in the corresponding e-skills requirements provides a complex, moving target for policy-makers. National educational and professional training systems are facing a huge challenge to deliver the skills needed by our economy and society. Despite their efforts, they still find it difficult to cope with the situation, and lifelong learning is still far from being a reality. New forms of partnerships and flexible approaches (such as those based on e-learning) need to be much more actively promoted.

Industry complains about growing gaps and mismatches between the supply and the demand of specific e-skills. The European e-Skills Forum and the ICT Task Force warned against the rise of “parallel universes” between industry-based and government-supported education in ICT. The experience of embedding ICT industry e-skills certifications within the national qualification framework, such as pioneered in the United Kingdom and some new Member States, provides interesting case-studies that should be reviewed and shared between Member States. Qualifications should increasingly be defined in terms of expected learning outcomes to encourage education and

⁽⁸⁾
e.g. CIGREF (Club Informatique des Grandes Entreprises Françaises) in France, SFIA (Skills Framework for the Information Age) in the UK and AITTS (Advanced IT Training System) in Germany

⁽⁹⁾
Offshoring includes both international outsourcing where activities are contracted out to independent third parties abroad and international in sourcing (to foreign affiliates).

⁽¹⁰⁾
COM(2005) 669 of 21.12.2005



training providers to focus on the competence needs of individuals and employers, and not on the duration, location or organisation of the institutions. This approach is in line with the Commission's proposal for a European Qualifications Framework ⁽¹¹⁾, which seeks to facilitate lifelong learning and mobility, and is fundamental to the development of national and sectoral qualifications frameworks.

⁽¹¹⁾
COM(2006) 479 of
5.9.2006

Persistence of digital illiteracy

The traditional notion of literacy needs to embrace the complete set of e-skills and media competences required in a knowledge-based economy and society. Eurostat figures ⁽¹²⁾ indicate that 37% of the EU population has no computer skills whatsoever and that more than 60% of people not educated beyond lower secondary level have no basic e-skills. A lack of e-skills will prevent these people from using e-commerce and e-government applications and participating fully in the information society. Furthermore, the lack of e-skills exacerbates social and educational disadvantages, inhibiting lifelong learning and up-skilling.

⁽¹²⁾
Eurostat, *Statistics in
Focus*, 17/2006

The market on its own cannot close the digital divide. Innovative public measures and multi-stakeholder partnerships are at the heart of both the Recommendation ⁽¹³⁾ of the European Parliament and of the Council on key competences for lifelong learning and also of the Riga Declaration ⁽¹⁴⁾ which was adopted at the Ministerial Conference on e-Inclusion in June 2006.

⁽¹³⁾
2006/962/EC of
18.12.2006

⁽¹⁴⁾
See: http://europa.eu.int/information_society/events/ict_riga_2006/doc/declaration_riga.pdf



▶▶ Long-term e-skills agenda

Most actions contributing to the implementation of a long-term e-skills agenda are clearly the responsibility of the Member States. Some of them have already launched dedicated e-skills initiatives, as reported by the European e-Skills Forum. The Commission will encourage them to further develop their policies in line with a long-term e-skills agenda and encourage others to do the same, in particular by facilitating the exchange of good practices.

To complement their activities, the Commission will concentrate its own efforts on actions bringing added value at EU level, in line with the subsidiarity principle. It is recognised that some actions strongly advocated by stakeholders have a clear EU dimension. These will be promoted by the Commission in close cooperation with Member States and stakeholders.

Key components of the long-term agenda

The European e-Skills Forum, the ICT Task Force and the Thessaloniki Declaration called for a long-term e-skills agenda. They also made detailed proposals for this agenda. These were delivered at a time when there was a general recognition that there is need to move up a gear. The long-term e-skills agenda for Member States and stakeholders includes the following key components:

- **Longer term cooperation:** strengthening cooperation between public authorities and the private sector, academia, unions and associations through the promotion of multi-stakeholder partnerships and joint initiatives including monitoring supply and demand, anticipating change, adapting curricula, attracting foreign students and highly-skilled ICT workers and promoting ICT education on a long-term basis.
- **Human resources investment:** ensuring sufficient public and private investment in human resources and e-skills and appropriate financial support and fiscal incentives, in full respect of State aid rules, as well as developing an e-competence framework and tools facilitating mobility, transparency of qualifications, and promoting recognition and credit transfer between formal, non-formal and industry ICT education and certifications.
- **Attractiveness:** promoting science, maths, ICT, e-skills, job profiles, role models, and career perspectives ⁽¹⁵⁾ with a particular focus on young people, especially girls, and providing parents, teachers and pupils, with an accurate understanding of opportunities arising from an ICT education and an ICT career ⁽¹⁶⁾ to counter the alarming decline in young people's interest for science and technology careers in Europe.
- **Employability and e-inclusion:** developing digital literacy and e-competence actions tailored to the needs of the workforce both in the public and the private sector, with a particular emphasis

⁽¹⁵⁾
These career perspectives should not only cover vertical mobility but also horizontal career paths and suggestions how to combine professional and private life.

⁽¹⁶⁾
"Science Education Now: A Renewed Pedagogy for the Future of Europe". Rocard Report, 12.6.2007



on SMEs and also to the needs of the unemployed, elderly people, people with low education levels, people with disabilities and marginalised young people.

- **Lifelong acquisition of e-skills:** ensuring that workers can regularly update their e-skills and encouraging better and more user-centric ICT-enhanced learning and training approaches (e-learning). Government should promote good practices for the training of employees using e-learning, with a particular emphasis on SMEs, and should publicise successful solutions and business models.

These key components should serve as an inspiration for the development and the implementation by each Member State of a consistent long-term e-skills strategy within the framework of their respective political, legal, budgeting, educational and training systems. It is their responsibility. The Commission will regularly monitor and report on progress.

Action lines at the European level

Taking into account stakeholder recommendations, the Commission proposes five action lines at the EU level. The activities covered by these action lines will be initiated in 2007 and aim at complete implementation by 2010. They will be implemented through EU instruments such as the Lifelong Learning Programme, the Competitiveness and Innovation Framework Programme and the Seventh Framework Programme for Research and Technological Development as well as Structural Funds available for the promotion of Employment and Regional Cohesion and the European Agricultural Fund for Rural Development in the framework of the approved rural development programmes of Member States/Regions for the promotion of ICT, employment and growth in rural areas. Cooperation with the European Centre for the Development of Vocational Training (Cedefop) will be strengthened in order to actively link e-skills activities to vocational education and training and to lifelong learning. They will be monitored on a regular basis to ensure their effectiveness.

Promoting long-term cooperation and monitoring progress

The Commission will promote dialogue and cooperation on e-skills between Member States and stakeholders and ensure a regular monitoring of progress. In this context, the setting up in June 2007 by leading ICT companies of the “e-Skills Industry Leadership Board” is welcomed. The Commission sees also a need for dialogue between social partners and public authorities on finding ways of combining employment flexibility with security for employees in the ICT sector. The following activities will be initiated in 2007:

- Promoting a regular dialogue on e-skills with Member States and stakeholders (industry, associations and trade unions, civil society, academia and training institutions) and maintaining an online virtual community in partnership with Cedefop;
- Monitoring the supply and demand of e-skills in partnership with Eurostat and stakeholders and assessing the impact of global sourcing. An annual report will be released presenting a synthesis of the situation based on existing indicators, focusing mainly on ICT practitioner skills, and on e-business skills surveys.

Developing supporting actions and tools

As recommended by stakeholders, specific actions can be pursued at the EU level to improve the availability of e-skills. They will be launched by the Commission starting in 2007:

- Supporting the development of a European e-Competence Framework based on the requirements of stakeholders and the results of preparatory work within the European Committee for Standardisation ⁽¹⁷⁾ in line with the proposal for a European Qualifications Framework. Results should be available before the end of 2008;
- Further promoting the Europass ⁽¹⁸⁾ initiative in cooperation with Cedefop, including the development of an online e-skills self-assessment tool and undertaking a feasibility study on a European e-skills and career portal. This portal to be launched and maintained by stakeholders should be available by the end of 2008;
- Producing a European handbook on e-skills multi-stakeholder partnerships, including best practices, and recommendations on appropriate legal and financial frameworks. This should be available in 2008 and promoted at workshops in Member States;
- Setting up fast-track and attractive admission schemes for third-country ICT practitioners to the EU. The Commission will put forward in September 2007 a proposal for a Directive on the admission of highly skilled third-country workers to help to respond to skills gaps;
- Encouraging women to choose ICT careers by further promoting the “IT girls shadowing exercise” ⁽¹⁹⁾ in cooperation with ICT companies and launching a best practice study focusing on the retaining factors for women working in ICT.
- Promoting e-training in the field of agriculture and in rural areas ⁽²⁰⁾ in the context of approved rural development programmes for the period 2007-2013.

In addition, the following actions will be launched in 2008:

- Supporting the development of e-competence curriculum guidelines to strengthen the quality and the relevance of ICT education and promote efficient cooperation between industry and academia. The proposal by the ICT Task Force for a new discipline covering services sciences, management and engineering will be explored. The guidelines should be available in 2009;
- Encouraging the development of European quality criteria for existing e-skills industry-based certifications, taking into account the upcoming European Qualifications Framework and industry self-regulation initiatives. These criteria should be available in 2009;
- Investigating appropriate financial and fiscal incentives, in full respect of State aid rules, related to e-skills training, especially for SMEs, and studying the potential of a human capital investment tax credit for individuals. A report will be released in 2009.

Raising awareness

There are two ways in which raising awareness can be facilitated at the EU level, starting in 2007 in particular under the Seventh Framework Programme for Research and Technological Development and the Lifelong Learning Programme in coherence with the Education and Training 2010 open method of coordination:

- Exchanging information and good practices on Member States initiatives for the promotion of science, maths and ICT, role models, job and career profiles and perspectives as well as teacher training in the area of ICT skills and addressing gender issues in the technical and scientific areas;

⁽¹⁷⁾
See: <http://www.cenorm.be/cenorm/businessdomains/businessdomains/iss/businessdomains/iss/activity/wsict-skills.asp>

⁽¹⁸⁾
See: <http://europass.cedefop.europa.eu/>

⁽¹⁹⁾
See: <http://ec.europa.eu/itgirls>

⁽²⁰⁾
The results of a study on best practices in support of take-up and maximising the benefits of ICT in rural areas will be available before the end of 2007.



- Promoting awareness and information campaigns at EU and national level to provide parents, teachers and pupils with an accurate understanding of opportunities arising from an ICT education and the pursuit of a career as an ICT professional in the EU.

Fostering employability and social inclusion

The Commission will launch an initiative on e-Inclusion in 2008. Its characteristics will be defined in a forthcoming Communication. As part of the Riga Declaration commitments, during 2007-2008 the Commission will review Member State policies on the basis of a thorough measurement of digital literacy with a view to identifying the most successful policies, and proposing new initiatives if necessary. The ambition is to halve the digital divide between the groups at risk of exclusion and the average population by 2010. Progress will be measured in the context of i2010. The Eurostat ICT household survey will provide specific data in 2007 on digital literacy.

Significant partners within the ICT industry already launched in 2006 the "European Alliance on Skills for Employability" aiming to make possible the training of 20 million people from disadvantaged groups by 2010. Professional organisations of SMEs would like to develop similar education programmes for user skills, with a specific focus on SME needs. Promising activities and initiatives will be further supported by the Commission, including:

- Promoting corporate social responsibility initiatives and partnerships between providers of e-skills training, civil society, providers of business skills training, and job placement support services in order to help connect trainees to new jobs and to foster digital literacy;
- Investigating, in liaison with ongoing industry initiatives, how public and private funding instruments can efficiently support successful multi-stakeholder initiatives ⁽²¹⁾ in improving the employability of job seekers and low-skilled workers.

Promoting better and greater use of e-learning

Based on the achievements of the e-Learning Programme (2004-2006) and the conclusions of a benchmarking initiative of policies in support of e-learning for enterprises and of the e-Learning conference ⁽²²⁾ organised in October 2007 in Lisbon, the Commission will release a report in 2008 with recommendations for targeted e-learning initiatives and the promotion of successful strategies. In addition, the Commission will support two activities:

- Promoting the development of e-learning courses and exchange mechanisms of e-skills training resources for the workforce. These mechanisms should be available in 2009;
- Supporting the networking of training centres and research ⁽²³⁾ that contributes to a better understanding of future e-skills needs. This network should be operational in 2009.

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In line with the Guidelines for the Employment Policies of Member States (2005/600/EC, 12 July 2005)

⁽²²⁾

See: <http://www.elearninglisboa.com>

⁽²³⁾

e.g. the "Network of Living Labs", see: <http://www.ami-communities.eu/wiki/CORELABS>

►► Conclusion

For the European Union and its Member States to remain successful in a global economy characterised by rapid technological change, more efforts will be needed to raise and widen the level of e-skills of our workforce and our citizens, which is one of the foundations of a knowledge-based society. This will require major, sustained efforts by both Member States and stakeholders applied to a range of policy issues.

The long-term e-skills agenda proposed in this Communication includes key components to serve as an inspiration for the development and implementation by Member States and stakeholders of consistent and long-term e-skills policies and measures. The Commission will support the implementation of five action lines by concentrating on activities bringing added-value at EU level.

The Commission and Cedefop will organise a major conference in co-operation with stakeholders at the end of 2008 to report on progress, present the results of the actions and discuss the way forward. It will also release a report in 2010 based on the results of an independent evaluation and the assessment of the stakeholders.



