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Foreword

This report is the follow-up of the previous annual eWork reports published by the European Commission DG INFSO. It is an appropriate time to refocus and reflect on the new directions now being taken in New Working Environments in its various dimensions. This is also emphasised in the new title of this report.

We all can observe major changes around us in new working environments and work organization. We believe that the core drivers for this change reflect the networking phenomenon enabled by innovation and technology development. The developing environment leads to new, sustainable work opportunities in the knowledge economy, which is also reflected in the wider societal context, as has happened in every earlier "industrial revolution".

We see ourselves as individuals having increasingly simultaneous roles, both privately and professionally, as part of organizations, communities or cybercommunities. Moreover the boundaries between these roles are getting fuzzy. This fuzziness creates opportunities for new drivers based on competence-based empowerment for value creation, while also increasing the quality of working life.

We are at the same time accessing the network services in much more heterogeneous environments, with a multitude of network technologies and also a multitude of different devices, enabling a more diverse range of natural interactions than ever before. This Ambient Intelligence landscape together with its connectivity is the critical innovation enabler that will bring previously atypical work and collaboration forms into the mainstream.

Collaboration @ work focuses on the central issue of sustainable new work paradigms, incorporating traditional eWork, but also empowering us to participate in economic wealth creation in all of our professional roles, whether within organizations, cybercommunities or as individuals. A very broad scope is needed to capture the innovation fully: not only computer supported collaborative work and eWork should be considered. It is the actual collaboration process together with the context-sensitivity which is at the centre.

There will be also a major break from the past drivers in working communities, towards something new which is enabled by enhanced networking, especially grid infrastructures. We can see emergent business communities, we can see emergent work communities, we can see emergent centreless communities, all organizations in which we participate. But we can also see the transformation of the existing ones towards a more collaborative nature.

The challenge for us all is to be able to constructively take the best of the past, the present and drive the future, very much in line with the objectives towards sustainable growth, with high quality of life for us all, in our multiple simultaneous roles. I hope that this report will stimulate new discussions and actions towards better jobs in the sustainable knowledge economy.



Bror Salmelin

Acknowledgements

Thanks for important national contributions are due to :

Name	Organization	e-mail
Joseph Hochgemer	Centre for Social Innovation	hochgemer@zsi.at
Christian Van Asscheek	Belgian Teleworking Association Proactive Consulting	proactive@skynet.be
Jeremy Millard Lars Schmidt	Danish Technological Institute	jeremy.millard@teknologisk.dk lars.schmidt@teknologisk.dk
Juhani Pekkola	European Foundation for the Improvement of Living & Working Conditions	juhani.pekkola@eurofound.eu.int
Tina Hanhike	Ministry of Labour, Finland	tina.hanhike@mml.fi
Jean-Claude Marot Nicole Turbe-Sueters	JC Consultants Distance Expert	marot.jean-claude@wanadoo.fr europe@distance-expert.com
Werner Korte Norbert Kordey Karsten Garers	empinca, Bonn	werner.korte@empinca.de norbert.kordey@empinca.de karsten.garers@empinca.de
Nana Luke	Telework Ireland	beatlaine@beatlaine.ie
Fabrizio Davide Maria Cristina Brugnoli	Telecom Italia	fabrizio.davide@telecomitalia.it UE001864@guest.telecomitalia.it
Kitty de Bruin	Nederlands Telewerkforum	kitty.de.bruin@telewerkforum.nl
Manon van Leeuwen	FLUNDECYT	manon@fundecyt.es
Walter & Hilka Paavonen	Paavonen Consulting	paavonen@algonet.se
Ursula Huws Peter Bates	IES	analytica@dial.pipex.com peter.bates@employment- studies.co.uk
Wendy Spinks	Tokyo University of Science	spinks@ms.kagu.tus.ac.jp
Tonu Lausmaa	Renewable Energy Center TAASEn	tonu.lausmaa@mail.ee
Shin Ahuja Vivek Dalela	Inst. for Integrated Learning in Management	shin11@vsnl.com vdalela@iiml.edu

And for other contributions :

Vidhya Alakeson, Inga Bakane, Anthony Barker, Alexander Beriozko, Marco Boero, Albert Bokma, Maarten Botterman, Maria Grazia Calza, Jonathan Cave, Antonio Collado, Leon Cremonini, Ian Culpin, Nico de Abreu, Anne de Beer, Brian Foley, Francois Giraud-Carrier, Clive Holtham, Alvyds Juocevicius, Peter James, Pete Kercher, Guatam Mitra, Paschal Preston, Monique Ramioul, Michael Ryba, Hans Schedl, Heidi Schmid, Joern Seifert, Tatiana Shulyakovskaya, Tomas Sinevicius, Jeff Stephens, Jose Artur Vale Serrano, Serguei Smaguine, Gerard Valendu, Alain Zarli

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1. INTRODUCTION

As in 2002, this year's report again provides an opportunity to take stock of the changes in working environments as Europe moves closer towards a knowledge economy.

We welcomed in 2002 and 2003 the emergence of the euro, the single European currency, as a stronger reality, and enlargement in the near future will further strengthen the Union. The Lisbon Strategy to put Europe at the top in international competitiveness has still to be vigorously pursued, and the eEurope 2005 action plan is a step in this direction.

In contrast to the recession in parts of the EU, strong productivity growth in the US has continued for a longer period. The US is reaping the benefits of past investments, in particular in Information and Communication Technologies and business innovation. These technologies are transforming business and working life, and at this critical time in European development, the momentum of innovation must be sustained.

Why is this ICT technological revolution so important? The short answer is that it plays a critical role in productivity growth. Productivity growth depends on increasing the value of goods and services we produce and the efficiency with which we use our skills and resources. Both now depend on effective use of ICT.

Despite the inevitable disappointment of unrealistic expectations for revolutionary change in the late 90s, we do need to make the transition to a "new economy" based on knowledge to sustain our prosperity in an increasingly competitive world. This will require the transformation of traditional business models into ones based on networks of collaboration, effective knowledge management, and continuous innovation – all three characteristics dependent on the wide use of ICT.

These technologies lie at the centre of new business models and working practices. However, we are still at the beginning of this transformation of business and working life. We still need to ensure the cost-effective deployment of new infrastructure across the EU and the renewal of our administrative and legislative frameworks to facilitate innovation, productivity and employment growth.

Several targets have largely been met: at the European level, the new European regulatory framework for electronic communications services is in place; the European Social and Regional development funds have been re-oriented to support re-skilling and information society developments at the regional level; Internet use has also grown fast, Internet use in EU households has increased from about 18% in March 2000 to 28% in October 2000, 34% in June 2002, and in October 2002 stood at 40%; in some countries, Internet is used in more than 60% of households – a higher proportion than in the USA.

The challenges of the knowledge economy are addressed at national and European level, and effective synergy between all these efforts must be realised. This report therefore puts together information from all Member States, in the context of common European policies and of new research and technology developments supported at the EU level.

Section 2 summarises and updates the policy framework for e-work development in the context of the Lisbon Strategy for a the transition to a knowledge economy and the EU strategy for sustainable development. It includes the latest statistics from Eurobarometer on the use of ICT in the workplace, and data on the trends in the spread of e-work in Europe.

Section 3 summarises the extent to which e-work has been introduced in Member States, in some of the countries now in Accession negotiations to join the Union, and from India and Japan. These more qualitative reports highlight legislative and fiscal policy changes, as well as new Framework Agreements and major conferences which have helped to broaden participation in new working environments in the last 12 months.

Section 4 includes new research results from some of the current EU research activities now underway in the European 5th Framework Programme.

Section 5 summarises the directions and priorities for future research and technology development (RTD) in the 6th Framework Programme. An updated set of current RTD projects are described in annex 2.

Section 6 is devoted to the wider e-work agenda, with reports of major conferences in 2002 and 2003. Annex 1 spotlights the winners of recent work related European awards.

We hope this report will help individuals, decision makers and organizations to get an updated view of how e-working contributes to a better quality of life, to greater efficiency and to collaboration @ work.

A handwritten signature in black ink, appearing to read 'J. Babot', with a long horizontal flourish extending to the right.

Jacques Babot

A handwritten signature in black ink, appearing to read 'John Nolan', written in a cursive style.

John Nolan

2. EUROPEAN POLICY FRAMEWORK FOR COLLABORATION@WORK

2.1 Introduction

This section has been developed with the active support and exchange of views, data and policy practices within "Employment and Social Dimension of the Information Society" (ESDIS). It also presents data from an Eurobarometer survey on ICT and work, run in October 2002 ; and statistics from the SIBIS project on trends in eworking in Europe, based on surveys in 2002/2003.

The EU policy framework
The Lisbon European Council (March 2000) set the strategic goal for Europe for 2010: to become <i>"the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion"</i> .
The Commission Communication <i>Strategies for jobs in the Information Society</i> ¹ (2000) analysed the impact of the Information Society and presented a set of recommendations in areas such as learning, working, public services, and the enterprise.
Also building on that, the eEurope Initiative was launched, encompassing different objectives and several measures to ensure the European Union fully benefits for generations to come from the changes the Information Society is bringing. Two Action Plans (eEurope 2002 and, from year 2003, eEurope 2005 ²) identify the specific initiatives in detail and monitor their results.
The "European Employment Strategy" <u>enhances human potential via a broad integrated approach in terms of education, professional qualifications, new roles within a changing work organization, equal gender participation in economic activities</u>
The Commission Communication presented at the Gothenburg European Council (June 2001) the European Union Strategy for Sustainable Development.

2.2 European Framework Agreement on Telework - July 2002

An agreement to give some 4.5 million employed teleworkers in the EU more security, whilst maintaining business flexibility, was welcomed by the European Commission. The agreement between European-level representatives of employers and trade unions was signed on 16 July 2002 in Brussels.

Anna Diamantopoulou, Commissioner for Employment and Social Affairs, said: "This is a landmark deal. Not only will this initiative benefit both workers and businesses, but it is the first European agreement to be implemented by the social partners themselves. This shows the coming of age of European social dialogue.

The agreement was signed by the ETUC, UNICE/UEAPME and CEEP³. The agreement defines telework and sets up a general framework at European level for teleworkers' working conditions. It recognises that teleworkers are afforded the general protection granted to workers based on the

¹ COM (2000) 48.

² COM (2002) 263 final.

³ ETUC is European Trade Union Confederation, UNICE is Union of Industrial & Employers Confederation of Europe, UEAPME is European Association of Craft, Small and Medium-sized Enterprises, CEEP is European Centre of Enterprises with Public Participation

employer's premises and highlights seven key areas where the specificities of telework need to be taken into account.

The agreement is to be implemented within three years of the date of signature. The member organizations will report on its implementation. A European report will be prepared on the basis of national reports within four years of the signing of the agreement.

The new agreement contributes directly to the strategy defined at the March 2000 Lisbon European Council. It is also designed to respond to, and to promote, the shift to the knowledge economy and the knowledge society, as set out in Lisbon. It seeks to manage this transition and to reconcile the needs for flexibility and security which both employees and companies need.

The agreement marks a significant step forward in the development of an independent dialogue between social partners, as agreed by the social partners in their contribution to the Laeken European Council of December 2001. The agreement is also fully in line with the Commission policy paper on the social dialogue in which the Commission called upon social partners to step up procedures for monitoring social partner agreements in general and to prepare regular reports on the implementation of these agreements.

The European Union's 10 million teleworkers are made up of:

- home-based employed teleworkers, most of whom work alternately at home and on the employer's premises
- self-employed teleworkers who normally work from home
- mobile workers who spend at least ten hours per week away from home or their main place of work, for example on business trips, travelling or on customers' premises, during which time they use online computer connections
- casual workers who could fall under the first group (home-based), but spend less than ten hours per week teleworking from home.

So far, a number of Member States have taken initiatives relating to telework, notably:

- legislation - Bassanini Law on telework in the civil service (Italy) (16 June 1998)
- codes of conduct - code of conduct drafted by a national advisory committee on telework, set up in 1998 by the ministers for science, technology and trade (Ireland)
- collective agreements - some examples are the framework agreement concerning local authority staff (Denmark); company agreements/models proposed by trade unions: British Gas (United Kingdom), IBM and Deutsche Telekom (Germany), TCO union (Sweden), CONFAPI with CGIL-CISL and UIL agreement on telework (Italy).

The social partners started negotiations on telework following the Commission decision to launch formal consultation of management and labour under Article 138(2) of the Treaty on modernising and improving employment relations. The Commission launched the first stage of this consultation on 27 June 2000 and the second stage on 16 March 2001.

The Commission consultation focused on three aspects:

- putting in place agreed rules and a framework for action designed to modernise and improve employment relations in accordance with the conclusions of the Lisbon European Council
- telework
- economically-dependent workers.

On 20 September 2001, ETUC (and the EUROCADRES/CEC liaison committee), UNICE/UEAPME and CEEP announced that they intended to open negotiations on telework. The negotiations opened on 12 October 2001 and came to an end on 23 May 2002, the date the agreement was concluded.

The agreement can be accessed at

http://europa.eu.int/comm/employment_social/news/2002/jul/telework_en.pdf.

2.3 SEEM - Single European Electronic Market Initiative

The aim of the Single European Electronic Market (SEEM) initiative is to develop an electronic space in which different organizations and participants in the economy can collaborate without technological constraint. Hence, SEEM intends to extend the Single European Market into the network-centric environment, providing workers, companies, public administrations and consumers with the same type of benefits of a single market whatever their particular environments, be that network-centric or otherwise.

The Single European Electronic Market initiative has been launched by the European Commission through a series of workshops held in late 2002 and early 2003⁴. SEEM supports the aims of the eEurope initiative, and although the SEEM vision and high level objectives are being identified, operational models and framework definitions are required to put the SEEM concept into practice in a real industrial and business context.

The objective of SEEM is to achieve a network-centred market environment that is:

- *open*, allowing any entity to come into and leave without barriers, and ensuring the possibility of integrated value chains in which companies, organizations and individuals from different Member States can be linked without expending any access or interoperability problems
- *network-centric*, bringing together available resources and competences scattered throughout Europe so as to allow collaborative value creation relationships
- *without constraints* imposed by IT vendors or any other technological barrier that could hinder collaboration and relationships between entities
- *sustainable*, being aware of the limited available resources and the need to combine them in the most cost-effective way.

The European technological framework for SEEM would ensure the ability: to identify, contact and assess partners, and ensure transactions between them, including collaborative commerce and work; to help partners to conduct business in the common interoperable environment for existing and developing e-services; and to promote collaboration among business Web Services. The framework would cover the entire value chain including fixed as well as mobile operations. Products and services would be based on open, global standards, protocols and interfaces. Applications and platforms would be interoperable, providing seamless geographic and multi-access mode roaming. The architecture, framework and service enablers should be independent of Operating Systems, and the application layers should be domain agnostic. The development of interoperable technological solutions for transactions, contracts, security, signatures, procurement and payments, as well as a framework based on openness are integral parts of this vision.

As a result of the consultative workshops, the SEEM Research Reflection Group⁵ has been established. It is an informal work group aimed at investigating the perspectives, potentialities and challenges of SEEM; and at drawing up guidelines and policies for its development. SEEM RRG includes representatives of SMEs associations (EuroChambers), the European research community (Eurada), standardisation bodies (CEN/Iss), international ebusinesses (Oasis), industry, SMEs, Universities and research institutes.

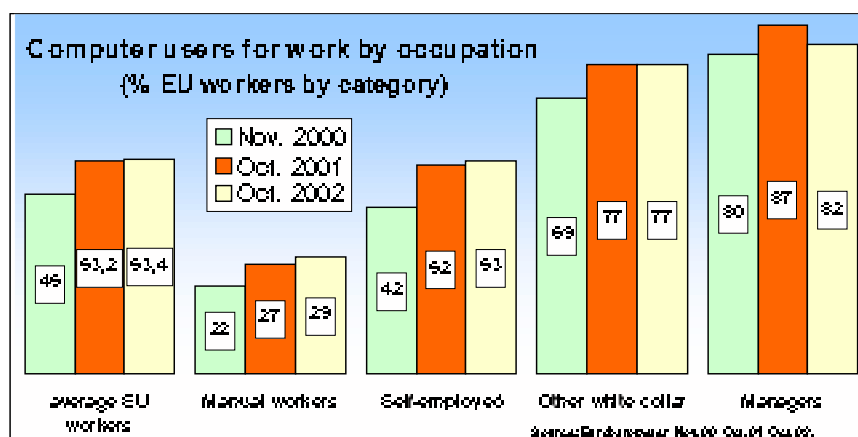
Further activities to support the SEEM initiative are planned under the EU 6th Framework programme.

⁴ Workshop reports at: http://europa.eu.int/information_society/topics/ework/seem_at_work/index_en.htm

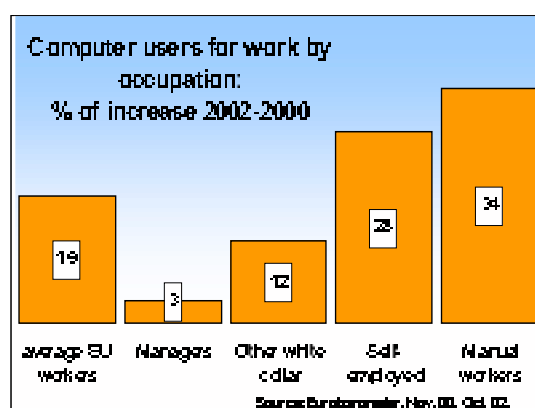
⁵ www.seemrrg.org

2.4 ICT use at the workplace

The latest Eurobarometer⁶ data confirm widespread ICT use in working life. One EU worker out of two uses a computer for work.



Though the average number of EU workers using a computer for work has not substantially increased from last year, the higher penetration among manual workers (increase of 34% in the period 2000-2002) is a further indication of the way work is changing. Company size plays a role, as manual workers in big companies use the computer for work (51%) much more than in micro (22%) and small ones (29%).

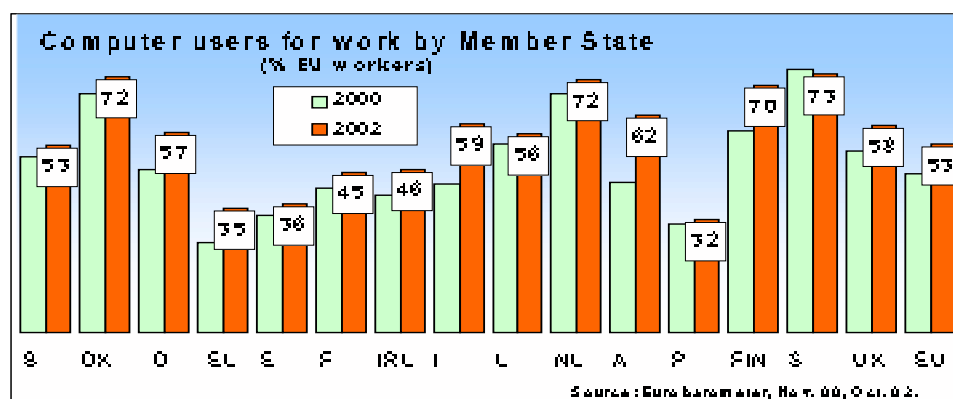


Within the EU workforce, computer use does not vary or varies little according to gender (53% both for men and women) and place of living (58% in large towns, 49% in rural ones).

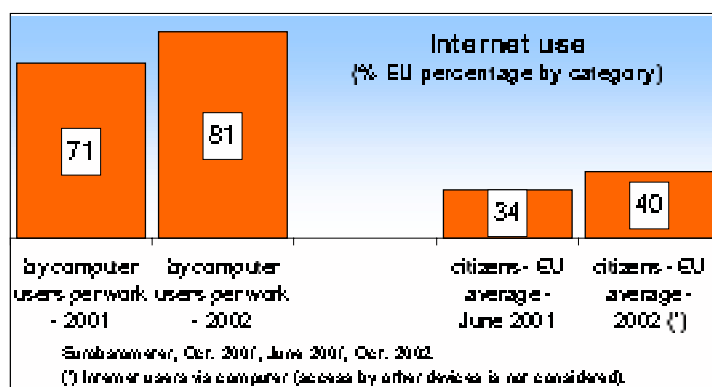
On the other hand, strong differences are related to the level of education (78% for people with high education⁷, 22% for people with low education) and across Member States. However, computer use increased in all EU countries, in some cases at a fast pace.

⁶ Eurobarometer is a EU-wide survey with samples of about 1000 interviews per Member State. Survey results are estimations within confidence-limits of up to 3 % for samples. Because of that, a slight decrease compared to last year may not necessarily imply a decrease in actual numbers. When not otherwise specified, the source of the data mentioned is Eurobarometer.

⁷ The Eurobarometer survey investigates education according to the age at which the educational system was left: up to 15 years old ("low education" in the text above), from 16 to 19, 20 or more years ("high education" above), still studying.



At the same time, four out of five users of computers for work access the Internet, a much higher percentage than for the general population, with more than the half of the EU establishments giving the majority of their staff access to the Internet⁸. Employment remains then one of the main enabling factors for participating in the knowledge society.



2.4.1 ICT and work organization

ICT bring significant changes in the organization of work and, the other way round, the way work is organized constitutes a key element to tap the opportunities of ICT both for innovation and growth and for improved quality of work.

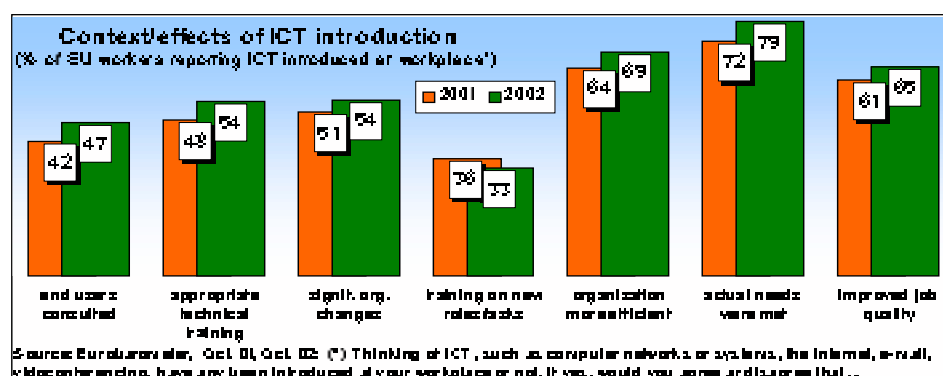
Tele-cooperation, defined as the use of data transfer, email and the Internet for contacts between workplaces at geographically distant locations, already affects more than one third (38%) of the EU workforce⁹, and Eurobarometer data show that the percentage of European workers enworking (regularly or occasionally) has substantially increased (from about 5% in 2001 to about 9% in 2002).

It is important to consider the different conditions and context of ICT introduction, and the final effect on working life and innovation. As for the first aspect, 2002 data show an improvement in the process. A higher percentage of European workers think that the introduction of ICT in their workplaces is accompanied by appropriate technical training, meets actual needs and leads to improved job quality

⁸ Elaboration from SIBIS (empirica) 2002. Available data range from Finland, with about 90% giving their staff access to ICTs, to Germany and Spain (65%), Italy and UK (about 57%) and France and Greece (about 40%).

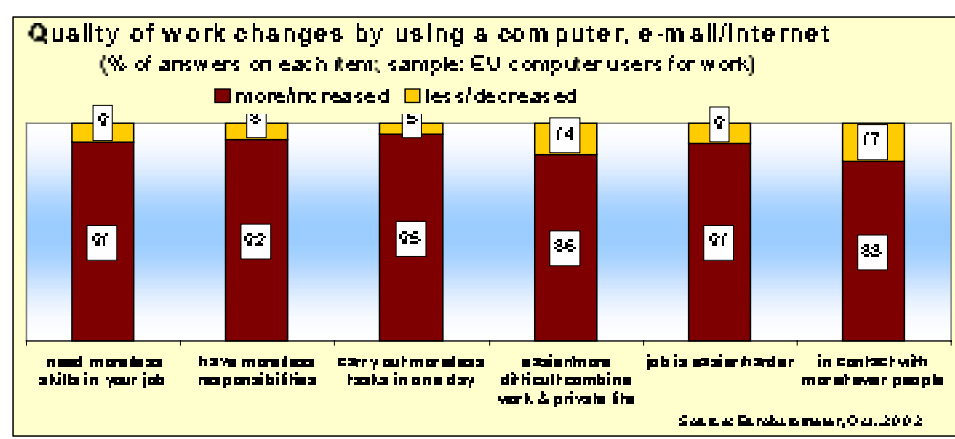
⁹ International comparisons: United States 49%, Switzerland 48%. Source: SIBIS (empirica) 2002.

and a more efficient organization. However, appropriate technical training is still indicated by only one European worker out of two, and prior consultation of end users is limited.

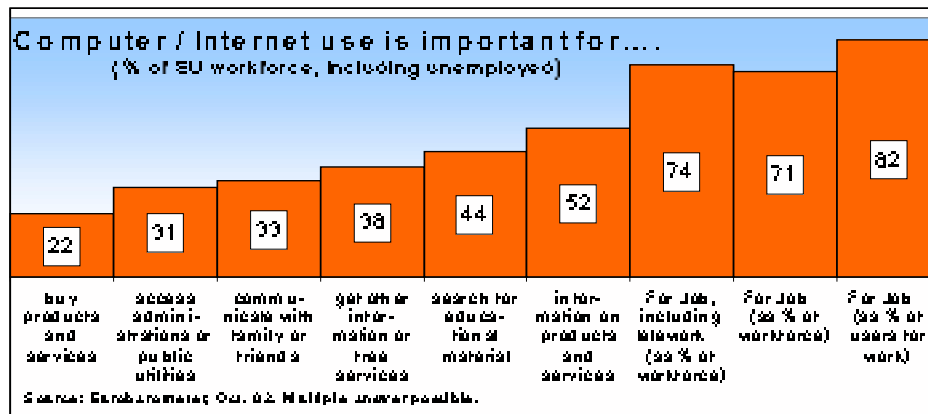


One weak aspect of the introduction of ICT in European organizations is the lack of training for new roles, which was provided only to one worker out of three. This kind of training is key for working in the knowledge society, where "soft skills" are even more important than technical training.

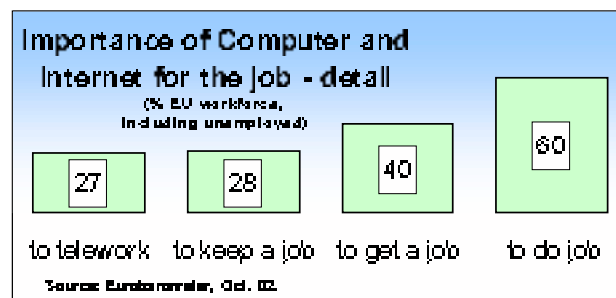
As for the final effect of ICT on working life, the positive aspects are confirmed: one's job is easier for 91% of Europeans (+3% from 2001) and 86% think that it is also easier to combine working and private life. Working in the knowledge society is however more demanding, as people have more responsibilities (95%) and need more skills (91%). It also implies connecting with more people (83%). Human and social capital become then more and more important in the knowledge society.



At the same time, users of computers for work strongly recognise the importance of new technologies for the job (92%), even with a decrease in comparison to last year (92%). The percentage remains high for the overall workforce, and one out of four European workers underlines the role of ICT for e-work, in addition to aspects such as doing, getting or keeping a job.



In particular, 53% of unemployed women and 60% of the people still studying think that ICT are important for getting a job, showing the key role of computer literacy for entering the labour market.



In this respect, the latest data highlight a critical point: the percentage of the working population having received computer training for one's job has decreased (though slightly) in comparison to last year, and practically only about one EU worker out of four has ever received computer training.

eLearning plays a relevant role for work-related training (not only for computer training): more than one worker out of three reporting training for the job in the previous four weeks has used electronic learning material¹⁰ and 12,3% of enterprises in Germany, France, Italy and United Kingdom are using or planning to use eLearning solutions¹¹.

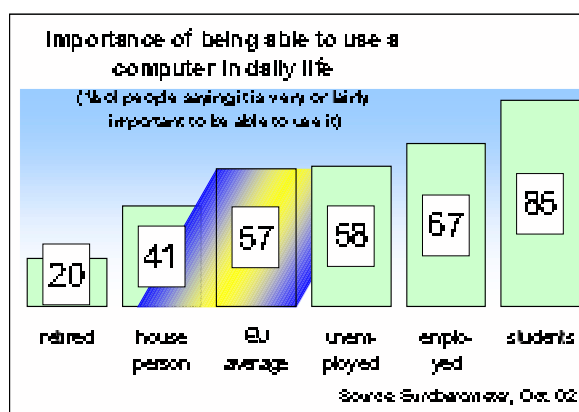
A number of policies are in place in this context, aiming to raise computer literacy for the overall population, to train ICT experts and to tap the potential of eLearning.

¹⁰ Sources: SIBIS (empirica) 2002; Labour Force Survey.

¹¹ Source: e-Business W@tch, 2002.

2.4.2 ICT and daily life

The analysis developed so far has drawn the basic lines of the use of the new technologies in the workplace. Their role is however increasing also in daily life: for instance, digital literacy is considered important not only for work, but for daily life as well, in particular by some categories.



2.4.3 Work organization, ICT and work-life balance

New Forms of work organization

We have mentioned several times so far the significant changes which are taking place in the way work is organized within companies and public sector organizations. "New Forms of Work Organization" are based on new working practices, new participative cultures, new training programmes, new human resources policies and new motivation and reward systems. These practices are based in general on a model of "high trust", "high skill" and extensive employee involvement in operational decision making. The enhanced role of human – and social – capital is therefore central to these changes.

New work practices are introduced in firms hand in hand with new technologies, notably ICT:

- employee involvement schemes are strongly associated with ICT use (the relationship may reflect the fact that ICT facilitate information flows among staff and employee involvement schemes are a way of exploring this possibility);
- the incidence of ICT use is higher in firms that introduce new production systems than in firms that do not introduce such systems (changes in production systems are often associated with the introduction of team working and employee involvement schemes).

The correlation between ICT and new forms of work organization is encouraging, but there is no guarantee that ICT will be used in ways compatible with new forms of work organization. Access to information can be restricted to managers, or it can be made available as a powerful resource to support problem solving and incremental innovation at all levels of the organization.¹² An important

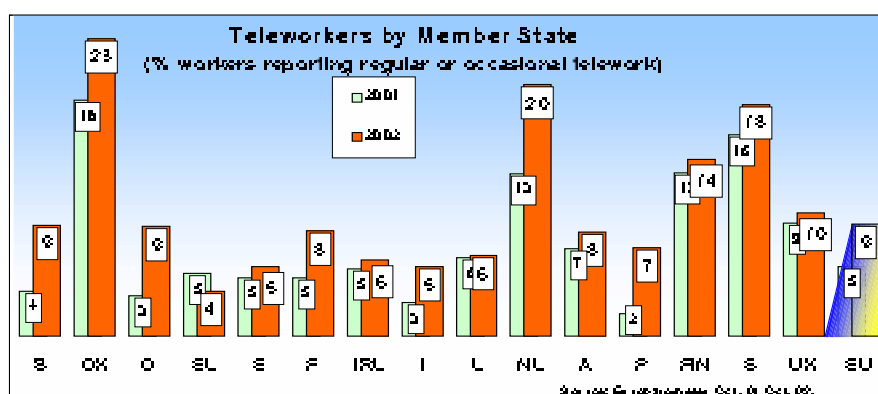
¹² Reference: "Partners at Work ?" A Report to Europe's Policy Makers and Social Partners; P. Totterdill, S Dhondt, S. Milsome; HiRes Project; <http://152.71.22.221/using.php#>

factor for success in workplace re-organization – including introduction and intensive use of ICT – is always represented by workers' involvement, participation and ownership of change.



Telework (as part of eWork) and work-life balance

ICT permits eworking from home or other remote locations as a mechanism to reduce employee commuting and promote family-friendly work practices.



Work-family balance and reconciliation in the context of eworking is critical, from the perspective of developing eworking and for the social and quality of life consequences for eworkers and their families.

Family is considered one of the main sources of "bonding" social capital; families create norms and social ties and provide a social network which benefits its members. Relations within the family can also foster the development of trust and co-operative behaviour outside the immediate family circle (facilitating the creation of "linking" and "bridging" social capital). The family is also a primary source of learning, as well as potential stimulator of success in primary education; it has therefore an impact both on human and social capital building. The potential repercussions of ework practices such as teleworking on family relationships are therefore to be carefully considered from the point of view of their social impact and sustainability.

eWork could enable people to either re-enter or to remain in the labour force; for employers, there is evidence that family-friendly eworking arrangements are useful in helping to retain valued staff.

However, some forms of eworking prove to be very demanding on the eworker and their families, including some forms of shiftworking and on-call working. More in general, some eworking

arrangements are less than optimal in terms of working conditions, hours and levels of psychosocial stress¹³.

Sustainability of work and family life according to job position (in %, EU15)

	Share stating 'often'				
How often you...	Employed professional	Management	Other non-manual employees	Manual worker	All
...find your work successful	40.2	35.6	28.9	31.6	31.9
...come home from work exhausted	37.2	34.5	28.4	33.0	31.6
...find your job prevents you from giving the time you want to your family	27.4	29.2	19.0	21.8	22.3
...you feel tired after work to enjoy the things you like to do at home	25.8	29.0	20.8	25.5	23.8
...find your family gets fed up with the pressure of your job	14.8	12.0	8.2	11.3	10.4

Base : All persons with a contract of employment (N=4,274 by EU15 population)

Source : SIBIS 2002, GPS

2.5 Statistics on Trends in eWorking in Europe

2.5.1 Data sources

For questions surrounding the spread of e-work in EU Member States, Switzerland, the USA, and the ten East and Central European EU candidate countries, the surveys conducted in the context of SIBIS supply a huge wealth of information¹⁴. SIBIS¹⁵ (Statistical Indicators Benchmarking the Information Society) is a project funded by the European Commission via its IST Programme. Major components are two general population surveys of probability samples of the entire population aged 15 and older:

- covering all EU Member States plus Switzerland and the USA (spring 2002; sample size: 11,832).
- covering all 10 Newly Associated States (NAS) from Central and Eastern Europe (early 2003; sample size: 10,379).

2.5.2 The spread of e-work – an international comparison

The share of e-workers in the European Union is considerable lower than in the USA. In the country where the e-work idea was born, every fourth worker has some type of e-workplace (24.6%), while the average in the EU is only 13.0%.

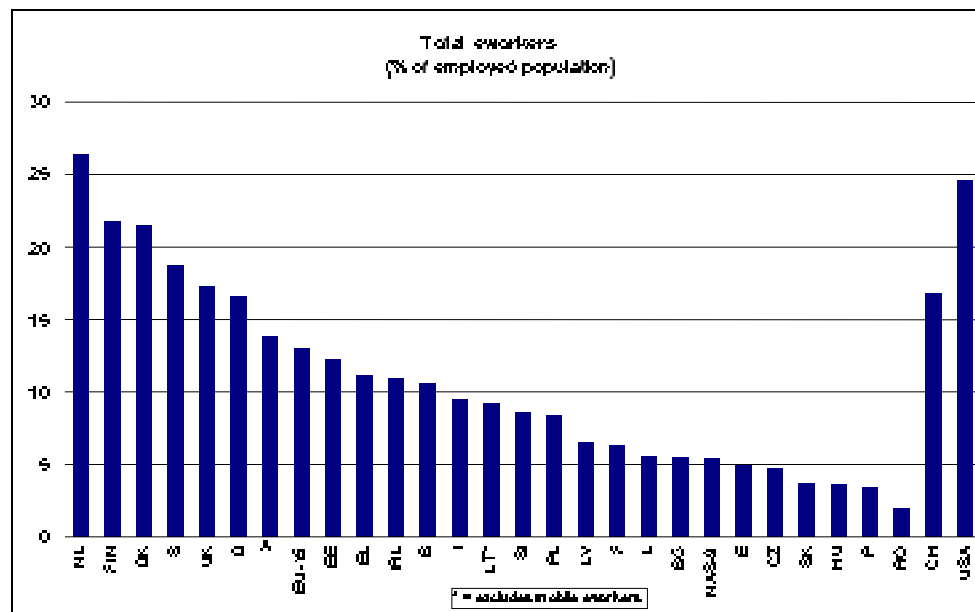
The clear leader in Europe are the Netherlands (28.4%), the only EU country with a higher share of e-workers than the USA. The three Nordic countries Finland (21.8%), Denmark (21.5%) and Sweden (18.7%) are following, in front of the United Kingdom (17.3%) and Germany (16.6%). Below average

¹³ References: "FAMILIES Project - Interactions between family and new work methods in the IS"; R.Wynne; Work Research Centre; Ireland; http://europa.eu.int/comm/employment_social/knowledge_society/conf_en.htm#pan2

¹⁴ This analysis was provided by Karsten GAREIS, Norbert KORDEY & Werner B. KORTE (empirica, Bonn)

¹⁵ for more information about SIBIS visit www.sibis-eu.org

shares of enworkers were found in the countries of Southern Europe, namely Italy (9.5%), France (8.3%) and Spain (4.9%).



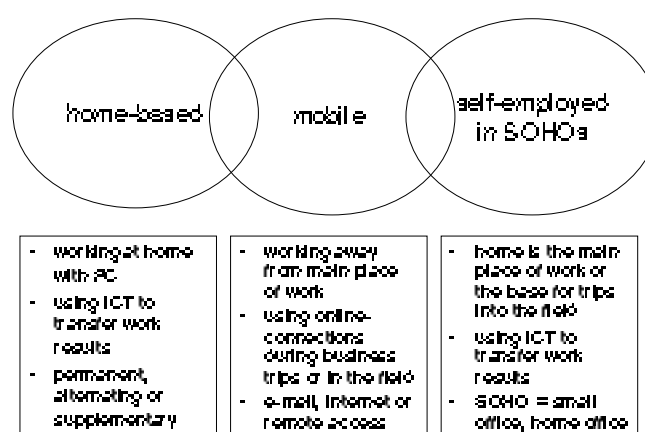
As was to be expected, the countries from Central and Eastern Europe lag behind in e-work penetration (average: 5.5%). However, there are comparatively high numbers in Estonia (12.2%) as well as in Lithuania (9.3%), Slovenia (8.6%) and Poland (8.4%). Romania (2.0%) is at the end of the ranking table.

This pattern is of course partly determined by the economic wealth of each country, as measured in GDP per head. Additionally, considerable differences in the availability of appropriate technological infrastructure can be expected to play an important role, together with organizational practices in companies, political and legal frameworks, housing conditions (space room for home-based e-work), as well as cultural factors such as common attitudes of management and workforce towards technological change.

2.5.3 Different types of eWork

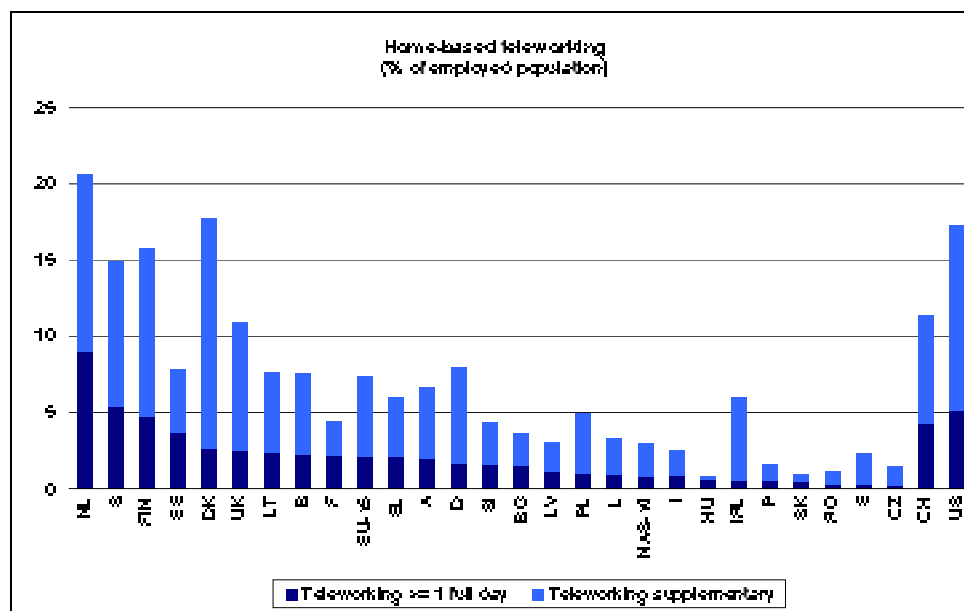
SIBIS research into *ework* distinguishes between home-based *ework*, mobile *ework* and *ework* by self-employed who work from SOHOs, i.e. small offices in their home. These are defined as depicted in the figure below.

eWork: definition and interrelations



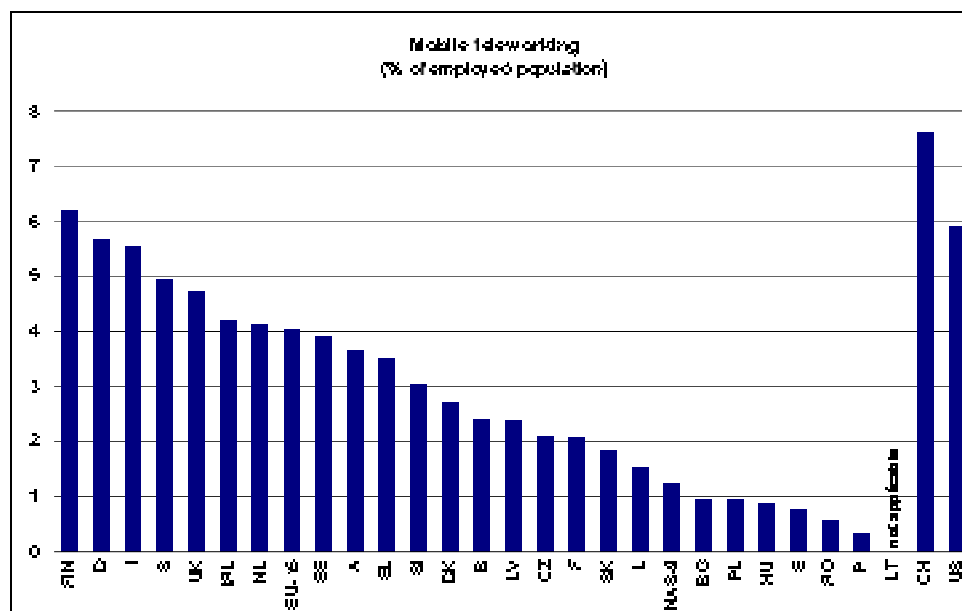
The pattern across Europe with regard to the share of home-based eworkers is by now well established, with the Netherlands and the Nordic countries well ahead of the rest of the EU, and about on par with the USA. Among the big EU Member States, the U.K. is well above average and France, Italy and Spain below, with Germany very much at the average. Portugal has the lowest figure in the EU. Among the candidate countries, Estonia and Lithuania emerge as clear forerunners with a share that is above the EU average.

Only a minority of home-based eworkers spend one full working day per week or more at home. Across Europe, the bigger share work from home only for less than one day per week. These we call supplementary eworkers. The fact that only little over one quarter of all eworkers spend more than one full day working from home seems to confirm recent research findings¹⁶ according to which most eworkers still spend the majority of their working hours at a traditional work location; the home is being used as one additional location for work while still maintaining the central office as the main working environment. Supplementary ework is the most widespread form of home-based ework: In the EU, 2.1% of the working population are either permanent or alternating eworkers, whereas 5.3% can be classified as supplementary eworkers. In the candidate countries the relation is similar, but at a much lower overall level of penetration.



¹⁶ see ECATT (2000), *Benchmarking Progress on New Ways of Working and New Forms of Business Across Europe*. ECATT Final Report. IST Programme, KAll: New Methods of Work and Electronic Commerce. Brussels.

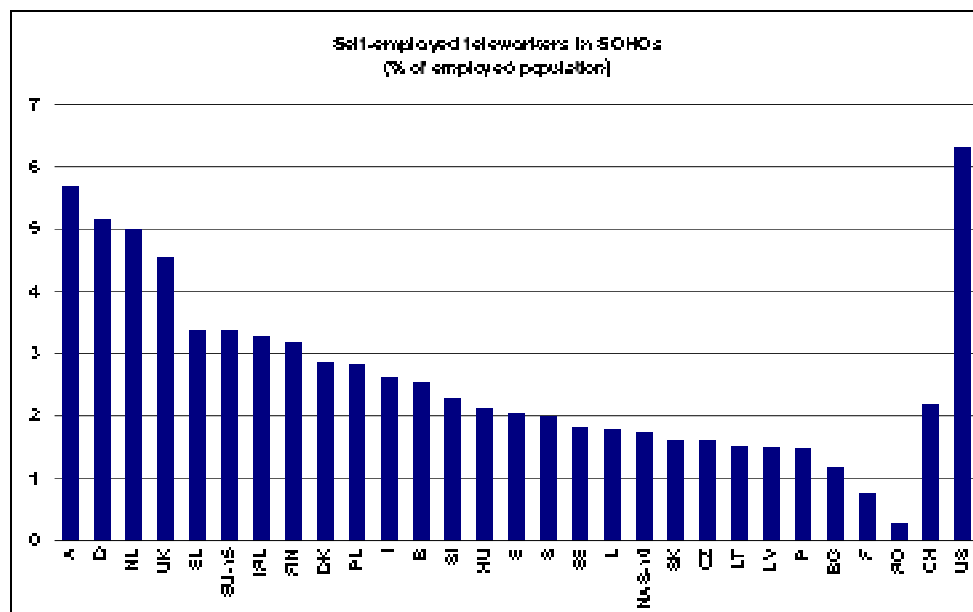
Mobile eworkers are those who spend a considerable share¹⁷ of their working time away from their home and their main place of work, e.g. on business trips, travelling or on customer's premises, and make use of online connections while doing so. According to the survey results 4% of the EU workforce can be described as mobile eworkers. Switzerland is the leader here among the countries in the survey, followed by Finland, the USA, Germany and Italy. The penetration in Eastern and Central Europe is much lower with an average of 1.2%, although Estonia and Slovenia have impressively high figures.¹⁸



Self-employed eworkers in SOHOs are self-employed persons who work from home, on the same grounds as their home or with their home as their base, and use online ICTs for interaction with clients, collaborators and suppliers. The survey showed that 3.4% of EU employment belong to this group which equals 21% of all self-employed. The share of eworkers is therefore considerably higher among the self-employed than among workers with a contract of employment. eWork seems to be on the way to becoming the standard working mode for the majority of the self-employed and among them freelancers (many of whom traditionally work from home), in particular. Austria, Germany, the Netherlands and the UK have the highest share of SOHO-based eworkers in Europe. Greece also has a high score on this indicator which is mainly due to the massive overall share of self-employed in the workforce. The candidate countries (average 1.7%) are somewhat behind the EU, but to a lesser extent than is the case for the other types of ework.

¹⁷ here: 10 hours per week or more.

¹⁸ Data from Lithuania is missing for this indicator.



When comparing these figures with the data gathered through the 1999 ECATT survey, which can be harmonised to allow direct comparison, it becomes obvious that the different types of e-work have developed quite differently in the period 1999 to 2002:

Development of e-work in the EU 1999 - 2002

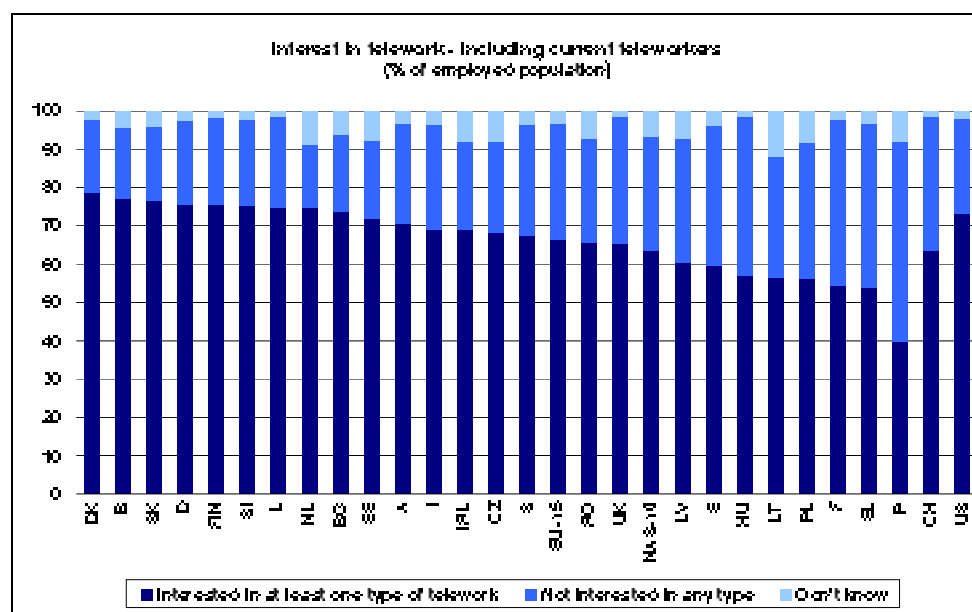
Type	In % of all persons employed		average annual growth (ln %)
	1999	2002	
Alternating and permanent home-based e-work	2.0	2.1	~0
Supplementary home-based e-work	2.0	5.3	~40
Mobile e-work	1.5	4.0	~40
Self-employed e-work in SOHOs	0.9	3.4	~50
All e-work (excluding overlaps)	6.0	13.0	~30

What is most striking is the difference in development between alternating and permanent home-based e-work on the one hand, and supplementary home-based e-work on the other hand. The latter is growing fast, with more than two and a half times the number of supplementary e-workers today than in 1999. The number of e-workers who spend at least one full working day at home, however, has not grown much at all in the last three years. There seems to be a shift of home-based e-workers towards less time spent at home. Obviously, the progress in the availability of cheap and powerful remote access technology has not led to workers spending more and more time working at home, but rather to more and more workers spending only a fraction of their weekly working time at home. This points towards a greater flexibility in the use of individual working locations, but at the possible expense of some of the traditional advantages ascribed to e-work such as savings on commuting.

2.5.4 Potential not exploited yet

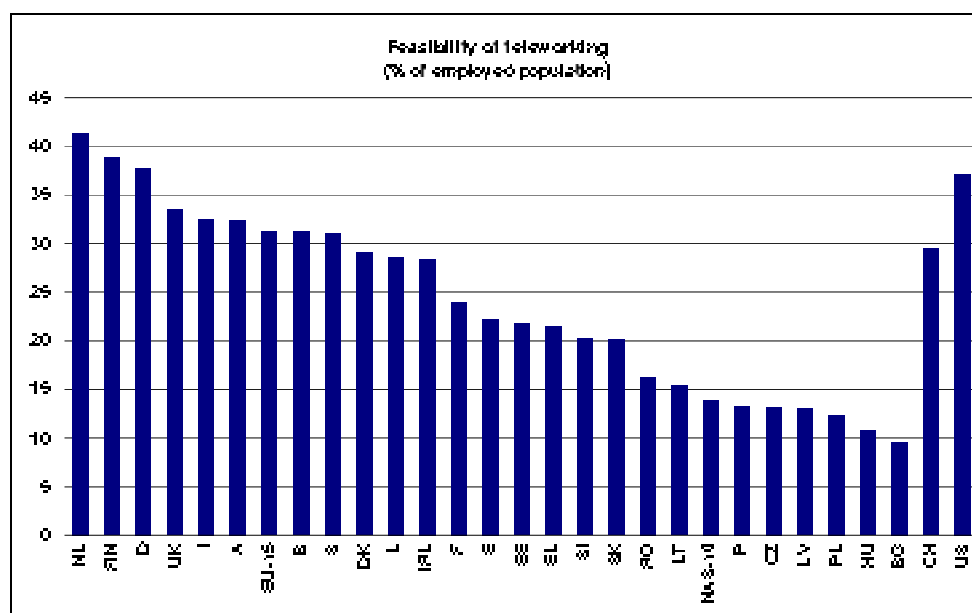
The potential of e-work has not been exploited yet, as can be shown from the SIBIS data on interest in e-work and perceived feasibility of jobs for alternating home-based e-work.

The degree of interest is considerable: 40% of the EU workforce express interest in permanent e-work, 52% in alternating e-work and even 55% in centre-based e-work¹⁹. Two out of three are interested in at least one of these forms of e-work. Taken all three types together, two out of three workers in the EU show an interest in e-work, and only little less in the candidate countries to the east.



As the figure shows there are hardly any differences between countries with regard to levels of interest. Differences are more pronounced when focusing on the perceived feasibility of jobs for e-work: More than three out of ten EU workers (31.2%) regard their current job as feasible for home-based e-work under the condition that they had to spend at least one full working day at home. In the candidate countries the figure is only half that high (13.9%). This could imply that national differences in e-work penetration are at least partly explained by differences in the suitability of jobs for home-based working. However, the causality could also be the other way round, since a high share of e-workers in the working population is also likely to change established attitudes, including the perception about whether other jobs are suitable for e-work or not.

¹⁹ Work in an office provided near your home which would allow to reduce commuting (which refers to centre-based e-work which is also discussed using the terms satellite offices, telecentres, telecottages, e-work-centres).



These results show clearly that neither lack of worker interest nor absence of jobs feasible for e-work can explain the observation that the diffusion of home-based e-work seems to stagnate. The potential for home-based e-work has not been exploited yet.

2.5.5 Implications and summary

A number of conclusions can be drawn from the results of the SIBIS pilot survey. The data clearly show that e-work has many different faces. When looking at e-work without looking in detail at these different forms, IT-based remote working is clearly expanding fast. However, traditional e-workers who spend a significant share of their working time at home represent only one, and maybe not even the most significant, facet in this development.

7% of the EU workforce are practising home-based e-work. It can be estimated that as a result, the share of EU population in employment is between one and two million higher than it would be without the possibility for e-work²⁰. This is an important contribution to the European Employment Policy's goal of increasing the employment rate throughout the EU.

The most important effect of e-work, however, seems to be to make workers more efficient and effective by granting them greater flexibility in how to organize their work. Most e-workers use their home not for working full days (only 2% of all persons employed spend at least one full working day per week at home), but for supplementary e-working. This means that they work only some hours per day at home, but still commute to a more traditional working environment for the brunt of their work. The home becomes a touch-down office, which is equipped for giving online access to company resources whenever needed, but it is in most cases not being used for full working days.

A comparison with data from the 1999 ECATT survey suggest that the share of the EU workforce which practises permanent or alternating e-work with more than one full day per week spent at home is actually stagnating while the number of supplementary e-workers is growing fast. This finding indicates that more and more people make use of the locational flexibility offered by ICTs and spend some working time at home, but only comparatively few stay whole days at home. The number of

²⁰ See empirica (2003): *Benchmarking Work, Employment and Skills in the Information Society in Europe and the US*. SIBIS: Bonn, Brussels. Downloadable from www.sibis-eu.org.

eworkplaces (in the technical sense of a networked workplace installed permanently or temporarily in the home) is increasing at a rapid rate, but the number of persons working at home at any given point in time remains modest. The location of work becomes more footloose, but there is no general shift of work from the office into the home.

The reasons for this are only partly extractable from the data, but the perceived need for face-to-face interaction with colleagues, customers or other persons certainly plays a key role. Still, about one quarter of all jobs are considered feasible for alternating home-based eworking by their holders, more than 10 times the number of actual people eworking in this way. Together with the high degree of interest expressed by the labour force in ework, these figures suggest that the demand for ework is much higher than the supply provided by employing organizations. More and more companies prove willing to give their staff remote access to their computer network, but the acceptability of staff working from home whole days seems to be limited.

This trend is complemented by the strong increase in mobile eworking, i.e. the use of online connections for work purposes during business trips. Here again, the technology is being put in place and increasingly used. The share of mobile eworkers has grown from 1.5% to 4% in the course of only three years. This is likely to benefit employers, as the efficiency of business process increases because of more continuous communication flows.

Self-employed eworkers in SOHOs, many of whom are freelancers, are also becoming much more numerous as tele-mediated communication with clients and work partners opens up new possibilities for improving business performance. While the share of SOHO-based eworkers in the EU was only 1% in 1999, it is more than 3% in 2002 as a result of annual growth averaging more than 50%.

From these observations we can follow that most ework today takes place in flexible settings, with the home acting as only one of a bigger number of options for work locations. Consequently, the number of mobile eworkers is likely to outnumber home-based eworkers soon. These trends should be reason enough to rethink some of the original assumptions about ework and how it will affect society. Ework seems to be part of a general move towards greater variability and flexibility of the way work is organized, and is being implemented in ways that are believed to maximise the effectiveness and efficiency of the work process. With regard to home-based ework, the highest return seems to be believed to come from equipping workers with eworkplaces, but keeping them at the central office location for most of their working time.

It is clear from this that the focus of public debate and policy-making should shift at least partly towards non-traditional forms of ework such as supplementary ework, mobile remote working and SOHO-based entrepreneurial ework. Many of the economic, social and legal questions arising from the current spread of these types of ework still need to be tackled.

3. eWORK - NATIONAL REPORTS

A - EU Member States

3.1 Austria

Background on general economic and employment status

The highest growth rate of the last five years reached a peak of 3.5% of the GDP in 2000, followed by a sharp decline of the growth rate of real GDP to only 0.7% in 2001 and another small growth of slightly less than 1% in 2002. Given the subdued business climate world-wide, current forecasts expect the Austrian economy to do not much better again in the year 2003, with a growth rate likely to remain at a level of about 1.1%.

Thus, for the third year in a row, economic growth will be only at about 1 percent per year. Prospects for 2004 are fraught with great uncertainties regarding geo-political development and the reaction of economic policy. Growth for next year is projected at 1.7 percent. Both in 2003 and 2004, the rate of expansion is likely to be the same as in the euro area. A cyclical recovery in Europe seems feasible only if world-wide uncertainties subside and commodity prices ease markedly.²¹ Even in spite of the high exchange rate of the euro, exports are driving the sluggish recovery, whereas domestic demand expands even less and public procurement and investment are diminished and stagnate.

These factors, cumulating over the last years, lead to increased unemployment up to an expected annual average of 4.2% (according to EUROSTAT measurement) in 2003. At the same time – and contradictory to the development for many years before – absolute numbers of active employment are in decline. The main sectors driving this development are construction, trade, and the public sector. Since the government is planning to continuously lay off civil servants, reducing the public sector as well as the state's economic involvement as such, recovery of both – economic growth and employment – is left to market forces and appropriate developments. Therefore, due to the relative small size of domestic markets, overall European developments will become even more important in future years to come.

Key factors affecting eWork development

Technical prerequisites in terms of availability of mobile communications technologies and internet access have gone beyond critical mass and density. By the end of the year 2002 a total of 58% of the Austrian population aged older than 14 had internet access, real users are 50%, and intensive users (several times a week) are 39%. Among the young population (14-19) 87% are internet users. Approximately 40% of the users access the internet via high speed connections (cable, LAN, DSL, ISDN). Private access from home increased sharply during the last years from 18% (1999), to 33% (2000), 42% (2001) to 47% in 2002. Internet usage from offices (25%), via schools and universities (10%) remain rather stable. Online shopping (B2C) and particularly internet-banking continues to grow at fast pace. Some 30% of internet users regularly use ebanking services.²² Austria now has five mobile telephone providers who serve more than 8.4 million users; this led to a market penetration of almost 75% and positions Austria close to the leading Scandinavian countries with a very high density of mobile communications. Most recent developments have been the introduction of UMTS services in spring 2003 and some changes concerning up until now rather restricted opening hours of shops. Labour laws (particularly time regulations) are under discussion. Because of such trends one may expect higher degrees of availability and rising needs of larger parts of the Austrian work force to embark on new ways of working, i.e. ework.

²¹ Marterbauer Markus, 2003: *Economic Growth Remaining Subdued. Economic Outlook for 2003 and 2004*, WIFO, Vienna.

²² AIM: Austrian Internet Monitor (sample: 18.000 interviews/year; 4.500 quarterly); www.integral.co.at.

In industry, studies provide evidence that eWork is spreading fast according to a local survey in Vienna already 20% of the companies located here employ what they call "teleworker".²³ According to international comparative research Vienna is one of the top 12 regions in terms of ITC-related occupations in Europe. However, the current state and status of technology policy and promotion of innovation shows that spending on research in Austria, while rising during the past five years, has only increased to about EU average (slightly above 1.8% of GDP). Thus total R&D-expenditure still does not reflect the economic capacity of the country. In terms of publications per inhabitants, Austrian researchers rank somewhere in the middle of a European scale. Considerable strength in the medium education segment contrasts with an surprisingly low share of graduates of tertiary education. The economy suffers from structural deficits in its technological performance, the consequence of an above-average share of labour-intensive sectors and a below-average share of technology-based sectors.

Framework agreements

Three general collective agreements concerning eWork have been established at sector levels between industry and their respective trade union :

The first concerned the Oil industry (1997). Among the topical issues of agreed regulations are working time, overtime and working on Sundays and public holidays, shift work, travel compensation, definitions and requirements of remote workplaces, payment, training and career advancement.

The second general agreement for industrial employees was concluded in 1999. It is a general framework for regulations. §19a Telearbeit (eWork) rules that "employer and employee have to make a written contract about teleworking. There must be regulations about work place, working time, working material, expense allowance, regulation of liabilities, about the contact of the teleworker to the enterprise and about the ending of telework. Part of the collective agreement is also a pattern for a contract between employer and employee".

The third collective agreement (2001) is of concern for employees in services of automatic data processing and information technology. From the union's perspective "this collective agreement ... is a milestone for better working conditions in the new economy. It includes ... regulations for eWorking, which is very important, because the IT-sector is one of the sectors with the most eWorkers. Examples for the regulations are : eWorking must be voluntary, the working material must be provided by the employer, also the expenses for the home office. The collective agreement gives also the possibility of flexible working time, but guarantees basic protection norms. The change of the salary scheme brings advantages for younger employees and remunerates experience."²⁴

Beyond these sectorial collective agreements a number of major enterprises (led by IT companies such as Hewlett Packard and IBM, followed by banks and others) have reached specific agreements at company levels.

Examples of key projects on eWork

With a total of 53% of eWorkers of all kinds in companies larger than 50 employees, Austria is positioned slightly above of the European average of 49%. Only minorities of about 1% of employees are working in telecentres, telecottages or other office premises owned by third parties. Moreover, home-based eWorking employees make up only about 1.5% of the respective work force: the stereotypical employee eWorker based solely at home is in fact one of the least popular forms of eWork. This confirms statistical data provided in previous status reports on eWork from Austria, which reported a low percentage of less than 2.5% of the work force performing work according to a strict definition of alternating eWork dis-located from the company's premises²⁵.

²³ Unternehmensberatung Markant, National Report; www.euro-telework.org

²⁴ GPA, National Report; www.euro-telework.org (December 2000).

²⁵ There is broad consensus that in Austria teleworking is understood as alternating teleworking, from 1-2 days a week upwards; cf. Weißbach Hans-Jürgen, Euro-telework: Report on telework regulation and social dialogue; www.euro-telework.org (2000).

There are no further new statistics available, but interesting reports provide evidence of successful implementation of e-work in the public sector: The most advanced e-working schemes in Austrian public administration have been adopted by the provincial government of Upper Austria and in the municipality of Vienna. On the federal level two ministries - *Ministry of Education, Science and Culture* and the *Ministry of Transport, Innovation and Technology* - are running e-work schemes, enabling civil servants to e-work from home or do mobile e-working. Model contracts as well as a "General Framework Agreement" have been adopted.

Reports concerning the e-work implementation programme in the municipality of Vienna address the new and timely issue of "eGovernmentability": In this case e-work has been seen as a "stepping stone towards eGovernment", ... concluding that an e-workable organization "may offer the most necessary organizational and social prerequisites for the first steps towards effective and efficient eGovernment"²⁶

Contact & Information

Josef Hochgerner
Centre for Social Innovation/CSI - Zentrum für Soziale Innovation/ZSI
Koppstrasse 116
A – 1160 Vienna
hochgerner@zsi.at
www.zsi.at

²⁶ Goetzl Ingrid, 2000: *Telework in Public Administration with special emphasis on organizational and social aspects; Final Year Project Thesis, University of Derby*

3.2 Belgium

Introduction

Belgium is a small, densely populated country with extended motorway and railway networks. Combined with the local economic weight of offices concentrated in and around the larger cities, these factors are not pushing towards eWorking. Nonetheless, some authorities are looking at the potential of eWork to help solve problems of road traffic congestion - and regularly visible resultant pollution - in and around Brussels (one million inhabitants and around 330 000 daily commuters) and other major cities.

Socio-economic background²⁷

- The total population of Belgium is about 10 368 000 (March 2003 estimate), an increase of 2.4% over 2002.
- Around 4 044 000 persons have a job (3 307 500 salaried and 677 200 self-employed, plus 59 300 trans-border workers) and 500 000 are unemployed as of March 2003 (i.e. 11% of the total workforce - 14% if one takes into account the 153 700 unemployed over the age of 50).
- The GDP approached an estimated 264 billion euro in 2002, a 3.7 % increase over 2001 (forecast 2003 : + 4.2%), and the inflation rate was 1.5 (forecast 2003 : 1.4). Export of goods and services represented 82.4% of the GDP (forecast 2003 : 84.7%).

Take-up of ICT²⁸

- The number of active Internet connections has reached 1.8 million at the end of the first quarter of 2003, an increase of 20% in one year. Residential connections grew by 15% and business connections by 43%.
- Largely over half of these connections (1 million) have broadband access – 600 000 use ADSL and 400 000 use TV cable. This represents 1/5 of all telephone lines in the country. After having more than tripled in 2001, the number of broadband connections continued to grow significantly and more than doubled in 2002.

How many eWorkers ?²⁹

- The estimate for Belgium is 437 000 eworkers, which corresponds to 10.6% of the employed population (EU average : 13%), based on SIBIS results 2002.

Major eWork development factors

- A new law on Home PC and Internet for Employees ('PC Privé') is in force since January 1, 2003. Employers may now contribute tax-free up to 60% of their employees' private purchase of a full PC configuration with Internet access.
- Following on the huge success of their broadband offerings, major telecom operators and other suppliers (Alcatel, Belgacom, Telenet s.a.) started end 2001 to strongly promote eWork to their business market. See for instance www.alcatel.be/telework.
- A law on Home Working has been in force since March 1997.
- Since 1994 Belgium has a well-established and active national eWork association, the Belgian Teleworking Association - BTA (www.bta.be), with some 50 corporate members out of a total of about 70.

²⁷ Source : Carrefour de l'Economie 2003/1B, published by the federal ministry of economic affairs.

²⁸ Source : www.ispa.be and the online newsletter 6minutes IT & telecom # 84

²⁹ Source : www.empirica.com/aktuelles/index.html

A new study on eworking in Belgium

The STC department of Université Libre de Bruxelles, headed by BTA President Prof. Paul Van Binst, will complete a comprehensive study on ework in Belgian SMEs with less than 50 employees.

The study is financed by DWT/SSTC of the federal government. It will be made in collaboration with HIVA (Hoger Instituut Voor de Arbeid) van KU Leuven, as an extension of EMERGENCE, a large-scale international IST project focusing on ework in SMEs with more than 50 employees, in 18 countries within and outside Europe.

Complementing the EMERGENCE project, this new survey aims to provide an as wide as possible insight in the distribution, characteristics, organizational conditions and implications of ework in the Belgian economy.

Therefore the survey will combine quantitative data collection through structured questionnaires, with qualitative data collection from selected case studies. The quantitative questionnaires will provide data about ework for the entire Belgian economy, while the qualitative case studies will focus on well chosen cases in four economic sectors.

These statistically significant data will be used to guide future policy on ework in the country.

Contact & Information

Christian Van Asbroeck

Proactive Consulting sprl, Brussels

Founder Member and Vice President of the Belgian Teleworking Association (BTA)

proactive@skynet.be

3.3 Denmark

Background on general economic and employment status

Denmark has one of the highest penetrations of e-work and ICT uptake among citizens, families and companies in Europe together with the other Scandinavian countries and the Netherlands. However, the growth rates in regard to further penetration of e-work and ICTs are less significant than that seen in previous years. As we discuss in this report, the main reason for this is that penetration has reached a level making further drastic changes less feasible. On the other hand, other issues related to ICT and e-work have emerged on the political and scientific scene in Denmark.

The Danish economy has maintained a relatively strong and stable position despite the international economic recession. Unemployment rates have gone up, but certainly not as significantly as in other nations. This is not to say that the Danish economy and labour market does not have structural problems, which need to be addressed and this includes discussions of ICT and e-work arrangements. Among the main structural problems is the ageing population, which is expected to result in labour shortages in the near future, which again is closely tied to the even more important problem of how to maintain a public welfare state system, when the number of tax-payers is reduced over time. Related to this discussion, a number of ICT related issues have entered the political agenda. First and foremost, there is a continuous search for ICT initiatives that can improve the efficiency of public organizations (*eGovernment*). The public sector has in Denmark often been among the forerunners for ICT-implementation.

On the other hand, Danish companies are also among the forerunners in Europe, when it comes to implementation of ICT and e-work arrangements. The main driver for implementation of e-work arrangements was a search for flexibility. Companies, as well as public organizations, often use e-work as a strategic human resources tool with the aim of helping employees better balance their work and family life, which in turn often makes them more flexible – it is seen as a win-win situation. However, e-work is rarely mentioned in relation to improving individual productivity (*even though this is often experienced in practice*), reducing space requirements and recruitment and/or retention of employees. We expect that especially the latter will enter the agenda in the near future and be among the main drivers for further penetration of e-work arrangements as this can help senior employees to balance their work and family obligations in a flexible retirement process.

Current ICT and eWork status in Denmark

By late 2002 roughly 70% of Danish families have access to a PC in their home, which is roughly the same figure as the previous year. On the other hand, there has been a slight increase in the number of families with access to the Internet – this has gone up from 54% to 59%. If we include persons with access to the Internet from other locations the number increases to 76% of the population. This represents a rather modest increase from the previous year of 3%. There are still some regional, educational, age and gender based differences related to access to the Internet, but these are often negligible, with the exception of the age dimension. Related to connecting technologies, the most prevalent form for citizens is still a traditional 56 kbps modem (54%), followed by ISDN and ADSL each with 16%, cable connections with 9% and finally other connections (*often advanced solutions such as UMTS, Fixed wireless*) with 4%.

When it comes to ICT penetration, 91% of all Danish companies have access to the Internet, 67% have a company homepage, 59% use a high-speed connection (*ADSL*), 46% use the Internet for procurement and 26% have received orders via the Internet. Related to connection technologies a clear link exists between the number of employees and type of connection – companies with 100+ employees have by far the highest penetration of fast connections. Security is still a significant problem for companies and roughly 66% of Danish companies reported at least one significant security problem within the latest year. This covers problems such as virus attacks (43%) and software problems (33%).

When it comes to ework, Denmark has historically experienced a high, fast and early penetration. This started in the middle of the 1990s, and the main reasons were :

- Establishment of framework conditions for eworking negotiated between the social partners covering more than 1 million employees (of a total of 2.8 million people in the labour market).
- The home-PC agreement making it possible for employers to procure ICT on very favourable conditions (tax-deductible). Resulted in fast penetration of ICT and improvement of general ICT skills (a condition for participating in the programme was a request for participation in training).
- The structure of the labour market with a high share of knowledge-intensive companies (often among the first introducing ework arrangements).

These aspects resulted in a penetration of ework in Denmark on roughly 17% according to statistics Denmark. However, it seems still to be a problem for statistics to accurately measure the penetration, as other sources give an estimate of almost 24%. However, this figure is based on a very broad categorisation of ework (including self-employed persons, students). There is a need for more focused and recent information on exact penetration.

Based on this we assume that the number of eworkers in Denmark is about 17-20% of the labour force. However, it is previously found that even though the penetration in Denmark is quite high compared to internationally, the number of eworkers working full time from home is only 1-2%. The rest are occasional eworkers.

The SUSTEL project – Danish experiences

The Danish Technological Institute is involved in the IST/SUSTEL project. This project is concerned with the sustainability of eworking based on three dimensions

- economic sustainability (for eworkers and organizations)
- environmental sustainability (primarily transportation and CO₂ emission)
- social sustainability (for eworkers and their families).

The project has collected data on these issues among companies and eworkers (during the autumn of 2002). Among the most interesting results from the Danish fieldwork, we found:

- That 100% home-based ework is rarely used by organizations.
- The reason for implementing ework is often a search for flexibility, a strategic HR-tool helping the employees balance work, personal and family requirements as well as securing the flexibility of the organization in peak periods.
- There was evidence that ework improved organizational and individual efficiency, performance, quality and accessibility.

The material from the SUSTEL fieldwork will be used to build a so-called SAT, which stands for Sustainability Assessment Tool. This web-based tool will be used by organization to assess the sustainability of their current eworking arrangements as well as provide guidelines for how to improve. See www.sustel.org.

One issue is existing traditional homebased ework arrangements, but more and more attention is also being placed on mobile forms of eworking not taking place at either a central office or at home. According to statistics Denmark 80% of companies with more than 100 employees have employees working at a distance via ICT, whereas the similar figure is 59% for 50-99 employees, 41% for 20-49 employees and 23% and 21% for respectively 10-19 and 5-9 employees. This type of mobile eworking is most prevalent within business service companies (49%), Industry (33%) and trade (31%).

Legislation and eWork

The home-PC agreement was recently reintroduced in a slightly modified form. However, it is neither expected nor experienced in practice that this will really boost the penetration of either ICT or ework arrangements. According to a survey from Vilstrup research among 200 Danish companies more than 9 out of 10 companies states that this agreement will have no influence on their willingness to offer

ework arrangements. Access to ICT is no longer a driver to ework penetration as most people already have a PC and Internet connection at home.

An EU framework agreement for ework was introduced in 2002 based on a Danish model. It is not expected that this framework agreement will have much impact in Denmark as this is very similar to the legislation, which has already existed in Denmark for some years.

A final piece of legislation that affects eworkers is related to tax. Earlier problems with taxation of employers' reimbursement of eworkers telecommunication costs have been abolished. If employees receive reimbursement of telecommunication costs and they have an on-line connection it is now tax-deductible.

However, taken together it is not likely that these initiatives will drastically change the number of eworkers in Denmark.

Issues on the agenda in Denmark

There is a tendency away from a focus on ework as an independent area to its inclusion into other and broader initiatives.

There is an increasing focus on the uptake of ICT within the public sector. This started out with a democracy debate in the late 1990s, where ICT could be used to enhance accessibility and participation. Almost all public authorities have a homepage and most also offer different kinds of online services (e.g. 93% of Danish municipalities offers downloads of forms).

Recently with the formation of the cross-ministerial *Digital Task Force* more focus is on optimising operating procedures and making these run more effectively using ICT. This is concerned with ICT integration and exploitation, and it is likely that ework arrangements will be considered in this context, as some of the most profound examples of ework are seen within the public administration. A total of DKK 95 millions (*roughly Euro 12.5 million*) has been reserved for these actions between 2002 and 2005.

There is also a trend towards free agents and eLancers. However, there is a need to address the problems that these groups experience.

A survey conducted among 260 freelancers, who are members of the Danish union organising academic labour (*Magisterforeningen*), found that challenges were related to missing opportunities for networking, social and professional isolation, missing access to training and economic uncertainty. There is some evidence that neither traditional unions nor other social partners are ready to support freelancers.

In summary, Denmark is still among the forerunners of ICT implementation and ework arrangements, but penetration is slowing down. There is some evidence that penetration has reached a natural level, where legislative and other initiatives are oriented towards small changes and improvements rather than radical new initiatives. eWork arrangements and ICT are intertwined aspects and there is still much focus on this in Denmark with focus on flexibility, retention of staff, efficiency at both public and private companies. However, ework is not necessarily seen as an independent object, but an integrated part of a reorganization process.

Contact & Information

Lars Bisgaard Schmidt and Jeremy Millard, Competence and IT
The Danish Technological Institute
Teknologiparken, 8000 Aarhus C, Denmark
Tel.: +45 72 20 1419/1417 - Fax: +45 72 20 14 14
lars.schmidt@teknologisk.dk / jeremy.millard@teknologisk.dk
www.danishtechnology.dk/

3.4 Finland

Background and economic trends

ICT development facilitates a major structural change concerning all sectors of our economic, societal and social lives. Digital inclusion, whether economic, social or regional, is one of the major challenges in the information society. ICT markets and related technologies have advanced very fast. Convergence among telecommunications, media and information technology sectors create challenges for adjusting policies and legislative frameworks to the new environment.

So far, the ICT-induced changes have been most prominent in the sectors providing ICT goods and services as well as in digital content provision. But since the most fundamental long-run effects of ICT relate to the way we acquire, generate, store, transmit and exploit information, all sectors will be affected. The Finnish ICT sector is heavily specialized in communication technology production dominated by Nokia, although the sector comprises several thousands firms, including over three hundred first-tier suppliers of Nokia.

Technology diffusion to individuals and households is high: in the summer of 2001 nine out of ten households had at least one mobile phone, nearly all 15 – 19 year-olds and two-thirds of the 60-74 year-olds had their own mobile phone. Every other household had a microcomputer and slightly more than a third of the households had an Internet connection.³⁰

Finland has been ranked high in a couple of international comparisons in terms of its general competitiveness. The country was ranked first in the Networked Readiness Index (NRI), boosted by the best performance in terms of technology usage by its citizens, business and the government in the global information technology report 2002 – 2003 published by the World Economy Forum. In April 2001, IMD ranked Finland third in its World Competitiveness Yearbook 2001. The following five major success factors are often emphasised in different rankings:

- the Finnish liberal communications policy,
- a high level of education in society,
- major R&D investments by companies and the government,
- a well-functioning regulatory and administrative environment in general, and last but not least
- national dialogue and co-operation among the various actors that are involved – the industry, universities, R&D institutes, the Government, Parliament, civil society, etc.

However, there is some indication that, as a user of ICT, Finland may not be as exceptional as it is as a producer. Studies at the macro level show that, while overall effects of ICT are quite large in Finland, they are mostly mediated via ICT provision.³¹ Today the Finnish IT-economy is not booming as it was some years ago. High tech has reached a dominant degree together with the metal and paper industry, but the global problems of telecommunication and domestic miscalculations have decreased the power of that industry. In the global context where the financial market is open, the success of organizations is not only dependent on their own performance. This may lead to serious problems between individuals and public interests. The challenge for the whole of Europe is to take very seriously the discussion on corporate social responsibility and business ethics.

³⁰ On the road to the Finnish Information Society III. Statistics Finland, published in Finnish in October 2001

³¹ Jalava & Pohjola 2002. Economic growth in the New Economy: Evidence from Advanced Economies. *Information Economics and Policy*, 14(2), 189-210.

Human capital and work organization

In all branches of industry future development is dependent on the ability to harness and generate human and network based intellect and performance. In this respect, the way work is organized is of crucial importance. At the moment only ca. 20% of organizations can be regarded flexible in the sense that they have made organizational innovations and truly enhanced the creation as of a learning organization and a high quality of working life.

Labour legislation defines the common boundary conditions for work. In addition to labour legislation, the take up of eWork is affected by labour market agreements, company policy and the professional skills of employees. In Finland there is no special uniform labour legislation for eWork. The motives of eWork are linked to the requirements of work, time management, and efficiency. This can be interpreted as an effort to manage the working process by modifying the working space and interspersing and prioritizing working and personal processes. eWork is part of general flexibility regarding working time. The use of ICT has created a new kind of "being connected all the time" working culture. According to the working life barometer of the year 2002, there is quite some amount of uncompensated overtime work in Finnish working life. This is partly related to the way of carrying work home on a voluntary basis. In September – October 2002, almost 40% (900 000 people) of wage and salary earners were in connection with their workplace by mobile phones or some other instrument during their own leisure.

Finnish Studies on the Impact of eWork

Telework as a bridge to job satisfaction is a project financed by the Finnish Workplace Development Programme, VTT Building and Transport, and the Union of Salaried Employees TU (1st April 2002 – 30th June 2003). The project is concerned with studying the impacts of eWork on job satisfaction in the context of joint interests of personnel policy and environmental policy. The welfare of both the employees and of the environment can be enhanced when trips to work are reduced. It was also studied to what extent other conditions in eWork environment at home were apt to improve the quality of life as well as job motivation of employees. The pilot programme of eWork was carried out among the staff of the Union of Salaried Employees, aided by the eWork expertise at VTT. Based on the positive results from the experiment, eWork was adopted as a regular option in the personnel policy of TU. Experiences of the participants in the pilot project, accumulated as a learning process, were reported in detail. Guiding principles were written for the use of the members of the Union. An exploratory outlook into the future of trends, demands and organising modes of work at large was included in the project.

Eco-Managed Introduction of Telework is a project funded by the Environmental Cluster Programme, several towns (Helsinki, Espoo, Vantaa, Hyvinkää, Kajaani, Kouvola) and regional organizations (Regional Council of Häme and Helsinki Metropolitan Area Council), and carried out at VTT Building and Transport (2001-2003). The project analyses environmental impacts of a New Deal between Housing, Work and Mobility in Urban Form (www.vtt.fi/rte/projects/yki4/etatyoesng.htm). The concept of Eco-Managed Telework is a social innovation to promote the welfare of both humans, communities and of the environment. For the purpose, a framework of EIA (Environmental Impact Assessment) of e-work was constructed and the conceptual model for analysing the impacts of various e-work solutions was further developed (www.mol.fi/est/ennakointi/raportit/telework.pdf). In the Finnish case areas, possibilities were explored for linking residential areas to the eco-managed e-work, when e-work can also be adopted as part of a lifestyle based on sustainable development. The role of e-work centres in reducing passenger car commuting was also analysed, as well as mobile e-work on the train, included in the work hours. Eco-managed e-work can be integrated in environmental strategies of communities, corporations and institutions. A presentation of best practices together with ten recommendations for action to promote eco-managed e-work was made for each actor group: employees, employers, and authorities. Further information: Dr. Sirkka Heinonen, VTT Building and Transport³²

AHJO - Regionally distributed organizations AHJO is a national research project whose scope is to identify how work is organized in regionally distributed organizations. The project is funded by the Ministry of Agriculture and Forestry and carried out by the University of Tampere, Institute for Extension Studies. The main focus of the research is on new ways to organize work, especially e-work in regionally distributed organizations and distributed or virtual teams. How e-work is implemented and what kind of e-work -practices are used. Research themes include also *work management* (how to manage distributed and virtual teams), *project work* (how to evaluate progress of projects), *communication* (how do teams communicate and is it effective) and *training* (what training is needed for the functioning of a distributed organization). The research is carried out in co-operation with department of sociology and social psychology in the University of Tampere.

Further information: Teemu Rauhalu University of Tampere, Institute for Extension Studies, teemu.rauhala@uta.fi

Governments Initiatives related to eWork

The public sector is continuing to widen the use of electronic applications in all areas of services. In the programme of the new government towards the information society, e-work is one element in an organizational and regional respect. The national co-operation group on e-work, established in April 2002 by a government decision in principle for co-operation, will continue its work. It has published statements on premises of e-work and organized two seminars. The co-operation group supports the systematic implementation of e-work and decentralised work. The aim of the group is inter alia to clarify the present situation of e-work taking place via electronic data networks, promote the research of e-work and other innovative forms of work and support the formation of an e-work skill network. All ministries, which consider membership expedient to their activities, are summoned as members of the co-operation body. The co-operation also involves the representatives of labour market organizations, business life, universities and other interested parties. The group has begun co-operation with the ESF during the spring of 2003, when a new ESF coordinating project on e-work started.

³² sirkka.heinonen@vtt.fi; www.vtt.fi/rte/transport/research/commun_information.htm

One Day in a Week – A Future Challenge



Sonera Corporation published a future challenge in the Finnish Parliament at the end of year 2001. The challenge is especially pointed for Finnish companies and labour organizations and it suggests organizations to use 20 % of all working hours as eWork (i.e. flexible work) by the end of year 2010.

Sonera's line of business lies strongly at information communication technology (ICT). As well as the World Summit on Sustainable Development in Johannesburg, Sonera believes ICT has an opportunity to work as a global tool for sustainable development. eWork especially is a tool in the developed countries – a future chance.

There are clear references showing the positive sides of flexible working. Surveys have shown an increase in work efficiency and decrease in absence days. Sonera took part a national Factor X - Entering the Market Eco-efficiently –project in 2001 and the eWork study results pointed out several positive effects (e.g. decrease in transportation emissions). Sonera's own employees have also described their clear willingness to do eWork in an internal company survey (August 2001). About 20 % of employees have eWorked approx. 2,5 days per month and almost 90 % of all employees want to do flexible working.

An important step to implement and encourage Sonera's employees to do eWork was the establishment of an eWork centre in Hyvinkää (2002). ISDN and broadband connections are already available at most areas in Finland and technology has opened the chances for secure flexible working. It is now only up to the organizations to seize the perfect opportunity.

Further details are available at www.sonera.com/about_sonera/environment_and_community_involvement.

Contact & Information

Tiina Hanhike, Senior Officer, Ministry of Labour
tiina.hanhike@mol.fi

Juhani Pekkola, European Foundation for the Improvement of Living and Working Conditions
juhani.pekkola@eurofound.eu.int

3.5 France

The major characteristics of the last year in France is not a spectacular development of e-work practices, but much more a positive jump in equipment figures; DSL connections and legislative decisions related to the digital society. This is why after presenting a few figures, the report will concentrate on some legal considerations and then handle a specific domain where France is probably one of the most advanced countries : telemedicine.

Some ICT figures³³

The technological environment includes several elements belonging to the ICT sector, namely telecommunications, computer equipment, Internet access and use among households and SMEs. France has had a rather strong tradition of excellence in telecommunications during the last 25 years. However, it has been slow to implement some specific applications since the Internet boom.

ICT sector

In 2001, according to the French Prime Ministry office, the ICT sector represented 700 000 employees, with a turnover of 180 billion € and 12 billion € in investments, split as follows:

	employees	Turnover (billion €)	Investment s (billion €)	Source of data
Industry	260 000	70	3	SESSI
Telecommunications (operators)	150 000	33	7	ART
Computer services and wholesale business	275 000	35	2	INSEE

Their share in national R&D reaches 19 % in France, versus 18 % for Europe.

Telecommunications

Fixed phones have reached the volume of nearly 35 million lines, which means 58 telephones per 100 inhabitants. Mobile phones have shown an impressive growth since 1995; the threshold of 50 % has been crossed in 2000. By the end of 2002, the total number of subscribers reached 38.585 millions, an equipment rate of 84 %. Three operators share this market:

- Orange (a France Telecom subsidiary) with 49.3 %
- SFR (a subsidiary of Cegetel) with 34.4%
- Bouygues Telecom with 16.4 %

SMS make up to 5 % of operators' revenues. SMS is an unexpected hit and an unexpected fashion. More than 1.7 million SMS have been sent during last quarter of 2002, according to the ART observatory.

Competition has been the strongest in the field of business services. Operators like Worldcom, Siris, Kaptech or GTS Omnicom have targeted at businesses to which they propose voice, data and Internet services, based on their own long distance networks or local fibre optic loops like Colt Telecom or Completel.

³³ This section was written in cooperation with some members of the French team of the eGAP project : Dr Anne de Beer, Prof Marie-France Kouloumdjian and Mrs Nicole Turbé-Suetens (www.egap-eu.com)

Domestic micro-computers

The French population is catching up; but not at the pace of the most advanced countries in Europe. Household equipment rate for microcomputers raised from 32.3% in the beginning of 2001 to 39% in early 2003 (INSEE survey). Six people out of 10 got their equipment in the last 3 years.

Individual use of the Internet

Different data are known, according to available official statistical sources: number of subscribers, actual users, or connected households. The French Internet Access Providers Association (AFA), for instance, regularly gives the number of subscribers for each of its members, but this data can be misleading: the same individual can subscribe to different ISPs (Internet Service Provider), and the same subscription can be used by several persons. The Department of Industry gives lower and upper ranges for the number of domestic Internet users:

year	minimum	maximum
1998	3.7	4.3
1999	5.4	5.7
2000	6.8	8.5
2001	9.0	12.0
2002	11.9	16.9

Number of domestic Internet users, in million

The %age of connected households rose from 3.9 % in 1998 to 24.3 % by the end of 2002; 8 persons out of 10 got their connection after 1999.

Internet users are rather living in Paris, young and a graduate (76% of managers, but only 13% of working people had already used the Internet). Jupiter MMXI showed in October 2001 that the average French domestic Internet user has slightly changed. A relative decrease of upper socio-professional categories and a slight increase in the proportion of female users.

Access rates

Most French domestic users access Internet through analogue telephone lines. The major providers are Wanadoo (a France Telecom's subsidiary) with a 35% share, Tiscali (18%), AOL-Compuserve (15%); Free (12%) and Club-Internet (10%). Only 4 % of French domestic users had high-speed Internet access by the end of 2001. High speed access is a major challenge in France, which stood behind most of its European partners. During 2001-2002, the number of home Internet users rose by 21% for low rate and 152% for high-speed access. In September 2002, with 24% of Internet users having this type of access, France now ranked third among European nations. France Telecom stated in December 2001 that it intended to cover 81% of territory with ADSL by the end of 2003.

The majority of adults having access to a computer, use it at least once in a week. Daily use concerns nearly 8 people out of 10. The two most frequent uses — e-mail and information search — are equally shared among users. According to Mediametrie Nielsen/NetRatings in November 2002, nearly one French Internet user out of 3 purchases goods or services online.

Computer skills become more widely spread: in 1998, 48% of French people stated they were able to use a computer, 54% in 2001. If the computer remains a work-related tool, the Internet has become less exclusively linked to professional use. A SOFRES survey in May 2002 has shown that 90 % of French people spontaneously consider the Internet as a symbol of " modernity, openness towards the world, communication and exchanges ".

BUSINESS EQUIPMENT

Every large company and SMEs having more than 200 employees have computers and Internet accesses, most frequently at high speed. The following data are related only to SMEs with less than 200 employees, which is one of the official statistical size thresholds used in France. The reason to concentrate on the effort made by SMEs is because 98% of the number of companies are SMEs and that the potential for employment growth is in SMEs.

Computer equipment - Basic computer equipment has reached its full extent, as 99% of all SMEs have, at least, one computer. The number of computers is linked to company size: 5 microcomputers for those between 6 and 9 employees, 48 for those between 100 and 200. Between 1998 and 2001, the average number of computers in SMEs having between 6 and 200 employees rose from 7 to 10. In 2001, there were many differences between activity sectors:

Sector	Average number of computers
Service sector	14
Wholesale trade	13
Industry	10
retail trade	5
Building Industry, transportation	4

Number of computers according to sectors (IDATE 2002)

INTERNET ACCESS - According to various international surveys, France is significantly less equipped than other developed countries. However, over a 5 years period, the %age of French businesses with Internet access increased faster than in other countries, from 40% in 1998 to 82 % by mid-2002.

Plain old telephone remained the major type of Internet connection among SMEs surveyed by IDATE in 2002: 50.7 %, while 30.6 % benefited from ISDN. Broadband connections were ensured by ADSL (10.8 %), leased lines (5.3 %), cable (2.2 %) and wireless loops (0.4 %). ADSL should be the "engine" of Internet access for SMEs (92 % of SMEs by 2006, according to the Ministry of Industry, quoting data provided by IDATE). By the end of 2002, 41 % of SMEs between 6 to 200 employees surveyed by BNP Paribas Lease Group had a high speed access.

ENTERPRISES WITH A WEB SITE - The low "Internet intensity" of French SMEs is also demonstrated by the fact that they are among the fewest to have their own Web sites. Even if their Web presence increased threefold between 1998 and 2000 (from 13% to 40%), this catching-up slowed the following years, reaching only 52% by the end of 2002. E-commerce as the purpose for a company Website concerns only 21% of SMEs, with only 6 % offering online transactions.

SMEs EXPENSES FOR ICT - Investment in ICT makes up 28% of corporate investments, much higher than in Germany (23%), Spain (21%) or Italy (16%). SMEs in the service sector (44%) and the wholesale trade (30%) are the largest relative investors, while transportation and building industry are the smallest with 9 and 8% respectively.

Telecommunications expenses in SMEs between 6 and 200 employees reached 6.35 billion euros in 2000, shared between fixed telephony (87.7%), mobile telephony (12.6%), data transmission (11.7%) and Internet and Web site (8%), according to an IDATE survey conducted in 2002.

Legal considerations

Up to now, no specific legal and/or regulatory framework has been set up in France for e-work. This situation hasn't raised any problems, as statute laws have been able to handle cases as they occurred and some large corporations, such as EDF Gaz de France³⁴ and France Telecom are permanent examples of this possibility. In that manner all existing e-workers are ruled under the general labour code and other existing laws such as the civil code. A consequence of this attitude is that statute law is taking precedent over the law for specific issues related to e-work.

On the other hand, electronic commerce has been stimulated in France and the electronic signature bill, which modifies French law on evidence to take account of ICT and acknowledges the legal force of electronic documents and signatures, was passed by Parliament on March 13, 2000. The application decree implementing the European directive was published on March 31, 2001. The government in place is reinforcing this. As an example the new law for trust in the digital economy is in parliament for final approval.

LABOUR LAW

The fact that the labour code doesn't mention specifically "e-work," as a regular way of organising work has been for many years an inhibitor to the development of e-work in France and is most probably one of the arguments that explains why France is still a laggard in Europe. The fact that any new way of organising the work in a company has to be socially negotiated is also important because all companies with more than 50 employees need to gain a social agreement before they can change the way work is organized.

The major issue in the implementation of e-work is that of working hours because, legally, the working contract is based on a number of hours to be worked by the employee for a given salary. France has a unique specificity, which is the statute of "cadre". The duration of work of those people is easier to manage, as it is not hourly controlled as for employees who clock in and out.

It is an important issue, because one of the main concerns of a manager of an e-worker is to know if he/she is really working when he/she is not in the office and the temptation could exist to control the work electronically. This is impossible without the agreement of the employee and it is one of the major statute law resulting from a decision of the supreme court of appeals in October 2001; the so called "arrêt Nikon". This statute law clearly specifies that an employee has the right to privacy on the work premises and on the ICT tools given by the employer for work purposes. The employer cannot have access to his mail and monitor what he does and with who he is in contact without the formal approval of the employee. This rule applies even if there is an Internet charter in the corporation saying that the ICT tools are only for work purposes.

This statute law has been taken over by two major documents published during the year 2002. The first one is the CNIL³⁵ (www.cnil.fr) report published on February 5, 2002 called "La cybersurveillance sur les lieux de travail" or "e-monitoring on the work premises". It explains in detail what can be done and what cannot be done with respect to the legal framework. The CNIL recommendation is very strong and can be used in court for litigation. For the first time it also specifies the role and responsibility of the information system network manager. This is quite important if this person is called in court and asked for details about employee connections. It is not possible any more.

The second document has been published by the Forum des Droits sur l'Internet³⁶ (www.foruminternet.org) on September 17, 2002 and is called "Work relations and Internet". The main recommendations of the report handle three major topics:

³⁴ EDF GDF, national Utilities Company is still public with a specific statute for its employees. Some employees have also a standard working contract.

³⁵ CNIL: Commission Nationale de l'Informatique et des Libertés.

³⁶ Internet Rights Forum. The report exists in English on the Website.

1) Information technologies and the relationship with work recommends defining precise rules between employers and employees for implementing working from home, and that mobile working (occasional working outside the enterprise) should be controlled by defining genuine, continuous and effective time off.

2) The use of Internet by employees in the work place recommends that employees distinguish personal e-mails and files, and recommends defining fair and proportionate monitoring by the employer of employees' electronic activities. Also recommends creating a special status for network administrators in order to safeguard the confidentiality of all information of a personal nature that they may come across in the course of their work. The law should recognise professional secrecy for network administrators. Finally recommends that the rules of use for Internet are incorporated into an appendix to the internal regulations of enterprises in order to provide greater transparency and effectiveness.

3) The challenge in relation to industrial dialogue recommends staff representatives have access to enterprise intranets and e-mail systems and, that methods of implementing access for staff representatives to Internet and intranet are in the framework of a collective agreement. The Forum is in favour of the principle of electronic voting within enterprises if the technical conditions are able to guarantee the confidentiality and honesty of the ballot.

There is a second statute law which is key for anyone who wants to implement e-work. It is the so-called "arrêté Zurich", also from 2001, from the name of the insurance company. It clearly means that an employer doesn't have the right to ask an employee who has a regular office to work from home without his agreement.

National Level

The Regulation Act for telecommunications implementation on July 28, 1998 shows contrasted results just before the last French presidential and parliamentary elections which took place in May and June 2002. One government had voted this law, but the responsibility for its application devolved to another government, whose members had sharply criticised the introduction of competition and a free market in telecommunications, putting forward that they might threaten public service in this field. It might have been expected that the government would have slowed competition to maintain a good quality public service. The outcome in the beginning of 2003 appears quite different.

The Regulation Act has defined three major objectives: a balanced competition; an enhanced public service; a digital-oriented land planning.

The first objective shows that competition had positive developments. For consumers, communication prices decreased for fixed and mobile phones as well as for Internet access. Subscriber services technologies and uses were diversified. For the French economy it led to growth and competitiveness with important decreases in costs, a stimulated innovation, job creation and investment increase twofold between 1997 and 2000.

Universal service duties, defined by an article in the post and telecommunication code, in accordance with the Regulation Act, define the major principles of public service: equality, service continuity, adaptability. As mobile telephone use became a society phenomenon and the number of mobile telephones outruns the number of fixed telephones, public service should have included mobile communications, with a full coverage of the national territory. However, many rural areas are still not covered. The results of the ART³⁷ survey published in December 2001 show strong differences between cantons and between operators in the same cantons. ART concludes that there is an average coverage of 83% in the country, with discrepancies between 31 and 100%.

³⁷ ART - Autorité de Régulations des Télécommunications

Social aspects of universal service have been implemented with delay. The executive order for the telephone "social" tariff rate for people earning minimum wages was published on March 8, 1999. The debt takeover was implemented in July 2000. Universal directory elaboration, inquiries and the personal number -which should allow anyone to keep the same telephone number his life long - have not been settled more than 8 years after the vote of the law!

Digital land planning, or territorial equality, has not been achieved, although technology spread across the country is a must for competitiveness. Progressive transfer of telecommunication infrastructure expenses to local authorities has been implemented without any legal framework and appropriate financial resources and processes.

Two issues show the gaps in regulation implementation: high speed Internet access and local loop. ADSL Internet access remained under the historic operator's monopoly until January 2002, when regulation about unbundling was put into force. France Telecom keeps a major share in this market, with more than 80% of the subscribers.

ART has launched an experimental phase for the wireless local loop (WLL) between April 1998 and December 1999. This phase led to the allocation of 2 national and 44 regional (2 per region) WLL agreements in July 2000. The first WLL were opened in 2001. As of January 2003, only 34 regional agreements are implemented. For profitability reasons, WLL are concentrated in areas with a strong economic activity and their market target are SMEs. Only one of the 4-surviving operators in early 2002 has developed residential services.

Regional Level

The CIADT³⁸ meeting of December 13, 2002³⁹ has defined operational directions within the digital land-planning scheme. They should provide a full coverage of the territory for mobile telephones and the implementation of high speed Internet access in rural areas. The government proposes to modify the local authorities code, which does not allow local authorities to become telecommunication operators. ART should regulate these new competencies in order to protect competition in telecommunication networks and services.

Social framework

The French social landscape has for many years not been in favour of e-work and there were probably two major reasons justifying this negative attitude. The first one, which is still an inhibiting factor, is the fact that the word telework was considered as synonymous to "working from home". The second reason claimed by many unionist was the fear that e-work would be a way for the employer to loosen the working contract because of the distance and the fact that the employee would not be every day in the office.

However since the end of the nineties most of the unions had understood that e-work could be positive for productivity and employment; and under certain conditions for employees and employers. As an example, in 1999, the CFTC⁴⁰ union published a book⁴¹ giving a lot of practical tips on how to implement e-work in an organization. More or less around the same period of time two other major unions started to show some real interest for the topic: the engineers and management section of the CFDT⁴² and ISERES, the research institute of CGT⁴³.

³⁸ Comité interministériel pour l'Aménagement et le Développement du Territoire, cabinet committee for land-planning and development

³⁹ www.internet.gouv.fr/francais/textesref/ciadt131202am-num-ter.htm

⁴⁰ CFTC: confédération française des travailleurs chrétiens: www.cftc.fr

⁴¹ Télétravail: choisir la bonne voie ! by Isabelle Mouronval & Françoise Mercier, Bureau d'études de la CFTC.

⁴² CFDT: Confédération française démocratique du travail: www.cfdt.fr

⁴³ CGT: Confédération générale du travail: www.cgt.fr

The CFDT Website gives some recent and accurate information using the search engine on the word "télétravail":
www.synomia.fr/sitesearch/consult4/index.php?mid=aabb2b5f8bd14673af80623efa726377&l=fr.

On the other hand, the employer's union, the MEDEF⁴⁴ has not been particularly active on the subject, as the main topic on the agenda was the negotiation and also the fight against the rigidity of the 35 hours law. One of the major projects of the MEDEF is called "La Refondation sociale". The first step of this programme is concluded and the second step, which is open for negotiation with the employees unions, includes e-work as one of the 5 topics on the agenda.

Another step forward was taken in 2000 when UNETEL-RST, which represents the telecom industry, issued a new collective agreement⁴⁵ in which article 4.2.8. is specifically dedicated to homework and e-work. It is the first time that a collective agreement specifies the conditions to be fulfilled by the employer in the case of e-work.

Elsewhere, e-work is gaining ground in France, but mainly as an informal way to organize work or to agree between manager and employee on some flexibility, principally for the mobile workers who are becoming more and more nomadic. Very few company agreements do exist and one can hope that the French unions who signed the European Framework Agreement on Telework from July 16, 2002 will actively continue the job at national level in order to make a French framework agreement available to the parties.

Another aspect that could become an incentive for employers and social partners to look differently at e-work is the new law on economical regulations published on May 15, 2001 in which CSR (corporate social responsibility) becomes a reality to be taken into account. The application decree was published on May 2, 2002. This means that from now on, all Corporations listed on the primary market will have to write in their annual report which are the social and environmental consequences of their activity and what actions are taken to eventually correct the situation and make improvements. One can consider that a properly implemented e-work strategy could have a positive impact on social and environmental conditions and that it could become part of a CSR policy.

TELEMEDICINE CASE STUDY⁴⁶

The pertinent assessment of an innovation depends less on the degree of technological sophistication involved than on the capacity of the basic concept to reproduce and develop itself under different forms. If, in France, there is an area where the concept of e-work has proved its pertinence through its dissemination ability, it is in the telemedicine area.

During the year 2000, the French government led a state of the art and a cartography study on eHealth which brought to the fore more than 1000 telemedicine applications in France of which 42% are dedicated to teleconsultations. It is one of these teleconsultation experiments we are going to describe⁴⁷.

This telemedicine operation carried out during the summers of 2001 and 2002 was a pilot scheme for the treatment of renal failure by haemodialysis. Its aim was to give some preliminary details about the treatment of renal failure. This treatment must be carried out at the rate of three times a week in the case of haemodialysis, and weekly when peritoneal dialysis is involved.

If the patients can be treated at a centre within a radius of thirty kilometres of their home, it is called local dialysis. Dialysis is known as « medicalised » if the treatment is supervised by medical personnel during the session. It does happen unfortunately that medicalised dialysis cannot always be carried

⁴⁴ MEDEF: Mouvement des entreprises en France: www.medef.fr

⁴⁵ the full text of the agreement can be found at: www.unetel.fr/accord01.htm

⁴⁶ by Jean-Claude Marot, JC Consultants, jcmarot@claranet.fr

⁴⁷ see: www.e-work-in-europe.com, www.medcost.fr.

out close to the patient's home. In fact, the development of local dialysis centres is affected by the difficulty of recruiting doctors specialising in nephrology, since this discipline is also suffering from the decline in medical demography.

So, since it is no longer possible to provide a nephrologist in each local hospital centre, telemedicine can provide medical intervention during the haemodialysis session equivalent to that provided by the physical presence of a doctor in the centre. It is thanks to the installation, during the first six months of 2001, of the MEGALIS high speed network between Breton hospitals that it has been possible to set up the teleassistance and video-conference service between the hospitals at Saint-Brieuc and Lannion.

The use of teleconsultation is explained by the realisation that diagnostic medical intervention is essentially based on targeted questioning, as does the analysis of parameters provided by the haemodialysis machine. So, the practices needed for these two medical interventions can be carried out at a distance thanks to the facility of the high-speed network. For each session carried out at Lannion, the nephrologist at Saint-Brieuc carried out a teleconsultation and checked the parameters on the haemodialysis machine by videoconference.

This experiment, carried out during the summer period, which consisted of supervising the Lannion haemodialysis centre from a distance, allowed this centre, which had suspended its services between 1998 and 2001 because of new sets of rules requiring the presence of nephrologist in all centres where haemodialysis was being carried out, to start operating again.

Between 600 and 700 telesupervised haemodialysis sessions were carried out in Lannion during the summers of 2001 and 2002. The study of patient satisfaction showed that they thought the medical action of better quality than when the nephrologist was physically present. Although this may seem paradoxical, it is explained by the fact that the medical personnel were extremely careful in preparing absolutely standard procedures for medical treatment by telesupervision. The study of the care staff satisfaction gave unanimous results, recognising the quality and safety of the care. Finally, from a financial point of view, a saving of 1 600 euros per patient per month was calculated, because of the reduction in transport costs.

Contact & Information

Jean-Claude MAROT & Nicole TURBE-SUETENS
Marot.Jean-Claude@wanadoo.fr

3.6 Germany

eWork in Germany is on the increase – but not quite as expected. Results of the pan-European SIBIS⁴⁸ survey in 2002

In 2002, there were 8 million eworkplaces in Germany. Every sixth employee in Germany practises ework, i.e. works outside the traditional office using IC technology to transfer work results. Recently ework has developed very dynamically: within 3 years the number of eworkers in Germany has increased threefold.

The enormous increase of ework cannot, however, be attributed to the traditional type of home-based ework. Instead, it is primarily mobile ework, ework by self-employed people in small businesses, and the so-called supplementary ework (home-based ework with less than one working day spent at home) which have experienced a strong increase. This, on the one hand, reflects the fast diffusion of new technologies such as email and mobile computer devices with Internet access. However, the change of the working world to flexible working hours, increased proximity to clients and increased job autonomy seem to play an important part, too.

Development of eWork categories in Germany			
Organization form	eworkers as a % of all employees		Average annual increase in %
	1999	2002	
Permanent and alternating ework	1.5	1.6	~0
Supplementary ework	1.6	6.3	~60
Mobile ework	1.5	5.7	~60
eWork in SOHOs	1.5	5.2	~50
eWork in total	6.0	16.6	~40

The comparison of growth rates for the different organization forms (see table) reflects these differences in growth dynamics. Permanent and alternating ework (spending all or at least one working day per week at home, respectively) which so far have been the main focus of public interest as well as regulatory and political measures, have lost some of their relative importance. Other organization forms for which social, ergonomic and other outcomes have so far received only scarce attention seem now to be moving into the foreground.

But while the diffusion of traditional domestic ework is currently stagnating, employee interest in this organization form remains very strong. More than 70% of all employees are interested in working as permanent or alternating eworkers from home or from a ework centre. Those looking for employment express even a slightly greater interest.

Feasibility studies in the individual fields of activity show that the potential for ework is not exhausted by far. More than 20 times as many employees as are currently practising traditional home-based ework describe their job as suitable for ework: less than 2% of all employees in Germany carry out this type of ework while 38% believe that their professional activity is suitable to allow at least one whole day per week at home.

These numbers suggest that although organizations are increasingly opening their computer systems for remote access by employees, they still hesitate to allow them to work whole days from home. Thus, diffusion of technology seems to proceed faster than organizations' management styles are able to adapt. While the number of eworkplaces – in the technological sense of the term – increases with enormous speed, the share of employees who work from home is still modest.

⁴⁸ SIBIS (Statistical Indicators Benchmarking the Information Society), see www.sibis-eu.org.

eWork in German establishments

In the past, balancing employees' interests with those of business has often been the spur for introducing eWork in German companies. The opportunity to practise eWork was offered either to appear as a more attractive employer on the labour market or to retain employees. However, it was expected from management that costs for investments in eWork equipment and maintenance would at least be covered by savings, but calculations were often done in form of rough guesses only.

Apart from these primarily socio-politically motivated eWork projects, there have always been those which have been implemented as a result of particular circumstances. There are examples here of expanding businesses which react to an existing shortage of space by introducing eWork combined with desk sharing. Others were able to continue employing as eWorkers those workers unwilling to move in case of business relocations.

Today, with changed economic conditions, considerations of cost effectiveness are in the foreground when introducing eWork. For example, to reduce costs business locations are given up and, within the framework of these reorganizations, home offices are set up or mobile eWork is introduced. Today, eWork projects must be amortised in the short or medium term. Here they compete with a variety of other organizational investment projects.

Some leading organizations have already achieved such a large diffusion rate that now internal expansion of eWork is stagnating. Others have only recognised the advantages of eWork relatively late and today are expanding rather rapidly. Yet others have satisfied their workforce's basic need for flexible work organization forms with pilot projects. Expansion is however carried out more slowly. Reasons given here are a number of other reorganization measures which are more urgent, often having to do with acquisition and merger activities.

Case study from BMW

In 1995, the BMW group decided to test eWork as an alternative organization form within the TWIST project. The positive experience from this project finally, after completion of the pilot project (1999), lead to a continuous expansion of eWork within the organization.

eWorkers are very satisfied with the new organization form. They are more flexible than before and, at the same time, their (virtual) availability has increased by an average 30%. There are also many advantages for the BMW group. Efficiency increases of up to 16%, increased work and quality, reduced sickness absences and savings of accommodation costs have been reported.

Because of the advantages and potential mentioned, the BMW group is planning to continue investments in eWork. Currently the annual rate for creating new eWorkplaces stands at around 500. It is expected that by the end of 2003 a total of 2500 will have been created. This makes BMW one of the largest practitioners of eWork in Germany.

Decreasing interest in public discussion

More or less independent of its actual diffusion, today eWork is no longer in the limelight of public awareness in Germany as it was in the 1990s. For many businesses the opportunity to work independent of location has become a matter of course which is practised without making a lot of fuss about it. In many places eWork has become a normal organization form which nowadays lacks the special significance which would justify coverage in the press or other media.

In this context it is also fitting that the VTD (Verband Telearbeit Deutschland e.V., Telework Association in Germany) dissolved at the end of 2002 after five years existence. This is explained by the fact that eWork has nowadays found its way into almost all areas of working life and therefore a need to have an issue-specific discussion platform is no longer felt. At the same time the support of the eWork server of the Rhineland-Palatinate has also been discontinued. The extensive information on the Internet has not been updated since the end of February 2003.

Sustainable eWork at Continental

A topic which, although often discussed, remains little researched is that of the sustainability of eWork. Building on the results of surveys and case studies, the EU project SusTel⁴⁹ pursues, amongst other things, the goal of developing eWork in businesses.

In October 2002 a survey of economic, ecological and social effects on eWork was carried out amongst eWorkers from Continental, a medium-sized German insurance company, within the framework of the SusTel project. A questionnaire was sent to all eWorkers there, of which 80% responded. The results of this survey of eWorkers can be summarised as follows, organized into the three aspects of the concept of sustainability:

It can be assumed that economic sustainability of eWork at the company is assured. According to the eWorkers, eWork practised at Continental is linked with:

- increased efficiency
- partially decreased absenteeism
- lower personal costs for the majority of participants.

With regard to ecological sustainability the survey produced the following results:

- most Continental eWorkers record considerable savings in commuting
- the majority of eWorkers do not undertake additional journeys, if so for shopping
- eWork leads to increased paper consumption only in a few cases
- apart from the office equipment, a second desktop (plus peripheral equipment) is used at the home office and so has a negative ecological effect.

Social sustainability of eWork is guaranteed at Continental. Amongst other things Continental eWorkers state that the eWork practised

- is linked with a high quality of life and improved work-life balance
- leaves more time for family and leisure
- leads to stress reduction
- has positive effects on their health
- has positive effects on other family members (mainly young children).

Current technological developments with influence on eWork

DSL access:

The country-wide availability of DSL connections has had a great influence on the technological practicability of eWorkplaces. Currently more than 3 million DSL connections already exist in Germany. However, in some rural areas and in particular in parts of East Germany, DSL technology for fast Internet access is still not available. The root of the problem lies in Deutsche Telekom's decision in the early 1990s to supply the whole of East Germany with a modern glass fibre network, which turned out to be not very suitable for DSL.

Competition in the local exchange area:

By decree of the Regulatory Authority for Telecommunications and Posts (RegTP), the local exchange market has recently been opened up for competition in Germany. Free choice of supplier for local calls was made possible in April/June 2003 (call-by-call and preselection, respectively). Call-by-call customers can choose a phone company for each call via a dialling code, while for the pre-selection process callers must register with a telephone company – their dialling code is then automatically set for each call. For long distance and international calls the monopoly of Deutsche Telekom, the former state-owned operator, was scrapped already in 1998. This has lead to considerable decreases in costs (up to 90%, depending on the contents of the telecommunications services "basket" which is considered).

Authors:

norbert.kordey@empirica.com, karsten.gareis@empirica.com, werner.korte@empirica.com

⁴⁹ SusTel (Sustainable Teleworking), see www.sustel.org.

3.7 Ireland

Economic Background

The latest Quarterly Economic Commentary by ESRI, the Economic and Social Research Institute⁵⁰, shows that growth in the Irish economy varied significantly during 2002, with real GDP having grown by 8.3%, while real GNP grew by just 0.6%. The ESRI at this point forecasts growth rates for real GDP of 2.6% and real GNP of 2.4% in 2003, and of 3.1% and 2.9% respectively in 2004.

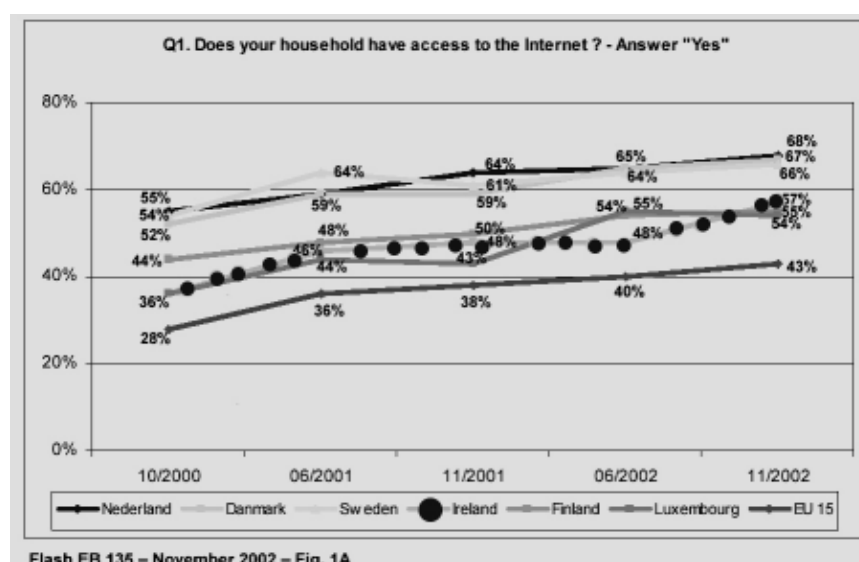
Unemployment in 2002 averaged 4.3%, well below the EU average of 7.7%. As the Irish economy is expected to perform below its potential in the short-term, mainly due to the global economic climate, the ESRI forecasts unemployment rates to exceed 5.0% during 2003. While the outlook for the Irish economy depends to a large extent upon the speed of recovery in the international economies, there are also national issues which need to be addressed.

According to the National Competitiveness Council's 5th Annual Competitiveness Report and Competitiveness Challenge, escalating prices, wage costs and infrastructural deficits must be urgently tackled if the Irish economy is to remain competitive.

The Council was established by the Government to report to and advise the Taoiseach on key competitiveness issues for the Irish economy. It believes that while both the domestic Irish economy and the global economy face difficult times ahead, it is important that steps are taken to position the economy to maximise the benefits and growth potential from any upturn in the global economy. Any decrease in international competitiveness could have adverse effects on employment and income levels in Ireland and would undermine the future health of public finances, all of which would put at risk the benefits of the last ten years of unparalleled growth.

Technical Background

According to the Flash Eurobarometer⁵¹ 135 survey report of November 2002, Ireland has joined the leading group of countries in respect to the number of households connected to the Internet. The number of households has substantially increased since the last survey undertaken in May/June 2002, from 48% to 57%. The EU 15 average has grown from 40% to 43% in the meantime.



⁵⁰ www.esri.ie; Economic and Social Research Institute, Mid-Term Review July 8th 2003

⁵¹ europa.eu.int/comm/public_opinion/EuroBarometer Surveys

While Ireland is well placed in terms of Internet usage and eGovernment development, access to broadband is still extremely poor, especially outside the large centres of population. The following table, extracted from the same Eurobarometer survey, exemplifies the situation at the end of 2002 in terms of connectivity of Irish households to the Internet compared to some of the more advanced EU15 countries. It must be noted that Ireland has the highest number of standard telephone line connections in the EU, and in this survey none of the few existing ADSL connections were picked up, whereas Belgium tops the EU in ADSL Connections.

Country	Standard line %	ISDN %	ADSL %	Cable %	Mobile/Wireless %
Ireland	92.0	6.0	0.0	1.0	1.0
Belgium	51.0	8.0	35.0	18.0	4.0
Germany	56.0	47.0	21.0	13.0	16.0
Denmark	48.0	15.0	22.0	12.0	0.0
Luxembourg	44.0	50.0	6.0	1.0	0.0

Up to the beginning of 2003, ADSL pricing in Ireland was extremely high at €49 wholesale and approximately €85 retail, but these prices were then dropped by the incumbent Telco to €54.45 retail, and its main competitor started offering ADSL access at €49.49 in May 2003.

According to a presentation⁵² made by ComReg, the Commission for Communications Regulation, in June 2003, approximately 50% of all Irish telephone lines are now DSL enabled. These are available in approximately 70 exchanges around Ireland, all of those in cities and larger towns. The uptake of DSL so far has been low, with only 3,200 lines installed.

The issue of broadband roll out to smaller towns and rural areas is one where wireless and satellite access provision offer the most immediate potential. Some of the projects under way to address this provision are co-ordinated by the South West Regional Authority. However, Flat Rate Internet Access via Dial-up lines has finally become available in Ireland, at rates starting from €9.99 for 30 hours access per month to 24.95 for 180 hours per month. While this does not address the need for broadband, it is an important step forward which substantially reduces internet access costs and should boost the amount of time spent using the internet.

There is a high level recognition of the critical importance of broadband infrastructure, commitment and accelerated funding for implementation, as well as discussions and recommendations on management and ownership models.

The Government Action Plan on the Information Society, New Connections:

“Government wants to see the widespread availability of open-access, affordable, always-on broadband infrastructure and services for businesses and citizens throughout the State within three years. We wish to see Ireland within the top decile of OECD countries for broadband connectivity within three years.”

Since the formation of the new Government in June 2003, Broadband development now falls into the remit of the Department of Communications, Marine and Natural Resources⁵³. Phase one of the regional broadband programme initially launched in March 2002 to bring high speed internet access to 127 towns around the country is now under way. Broadband connectivity will be ensured by building carrier neutral, fibre-optic Metropolitan Area Networks (MANs), and this is now under way in the first 19 of the towns. A Managed Services Entity will be set up to manage these MANs on a national basis. In addition, the Department of Community, Rural and Gaeltacht Affairs also has a remit to fast track infrastructural developments in selected highly disadvantaged rural areas.

⁵² www.comreg.ie/_fileupload/publications/ComReg0372.pdf; download this excellent overview here.

⁵³ www.dcmnr.gov.ie/display.asp/pg=865; information on broadband projects supported by the Department of Communications, Marine and Natural Resources

Trends in eWorking – latest survey results

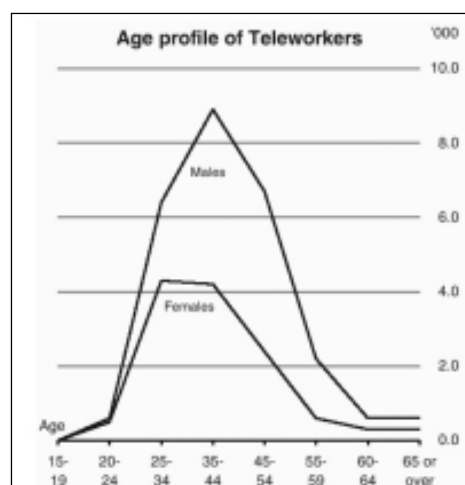
QNHS Module on Teleworking

The QNHS (Quarterly National Household Survey) undertaken by the CSO in the 3rd quarter of 2002 contained a Module on Teleworking⁵⁴. This was achieved in collaboration between the STILE Project⁵⁵, of which the CSO and Cork Teleworking Centre are the Irish partners, and the e-Work Action Forum, the activities of which are described in detail in a later part of this section.

The Telework Module found that there were 38,700 teleworkers working from home to some extent in Ireland, or 2.3% of all those in employment, after workers in the agriculture, forestry and fishing sector were excluded. Out of this total of 38,700 teleworkers, 18,000 or 1.1% of all those in employment indicated that they usually worked from home. It must be noted that mobile eworkers who do not work from home are not covered by this survey.

This survey confirms many of the trends that have been noted in previous research:

- Two thirds of all teleworkers are male
- More than 70% of teleworkers have a third level qualification compared with only just over 40% of the non-agricultural workforce in general.
- Nearly 80% of teleworkers fall into the managerial, professional and technical occupational categories, whereas these workers account for only a third of all non-agricultural workers. 6.7% of the overall workforce in the managerial occupational group telework, as well as 5.5% in the professional and 4.4% in the associate professional and technical group.



- Nearly 40% of all Irish teleworkers reside in the Dublin region. Both Dublin and the Mid-East regions have the highest levels of teleworkers at 2.8% of their working population, whereas the Midland and Mid-West regions have the lowest, at 1.5% and 1.4% respectively.

- Teleworkers are aged between 25 and 54. In the case of female teleworkers, those who are part of a couple with at least one child under 5 years of age are the most likely to be teleworking. (3.2% of the workforce in this category, compared to the average of 1.7% female teleworkers in the overall workforce)

- Over 40% of teleworkers work in the Financial and Other Services Sector. Nearly 10% of all males and 4% of all females in this sector telework to some extent.

- Teleworkers work longer hours. The average working week for teleworkers was 43.5 hours, in contrast to the 37.0 hours average for non-agricultural workers in general.

eWork survey 2002

The eWork survey undertaken by MRBI in October 2002 on behalf Enterprise Ireland's eWork Business Awareness Campaign⁵⁶ was the third annual survey of its kind. The first phase of the survey was conducted in September 2000, and the second phase in October 2001. MRBI used the same definition of eWork and questionnaire in all three surveys, enabling the monitoring of changes in eWork practices and attitudes over time.

Key findings from the 2002 survey are as follows:

- Between 2000 and 2002, the proportion of Irish businesses with one or more employees eworking has been maintained at 10%. Although the 2002 figures show a decline from the high of 12% recorded in

⁵⁴ www.cso.ie/publications/labour/qnhstleworking.pdf; QNHS Module on Teleworking

⁵⁵ www.stile.ie; STILE (Statistics and Indicators on the Labour Market in the e-Economy) project web site

⁵⁶ www.ework.ie; eWork Business Awareness Campaign, downloadable survey results 2000 to 2002

2001, maintaining the 2000 levels can be viewed as a positive development in view of the recent slow down in the Irish economy.

- The number of employees in those companies using eWork increased, from 4.5 employees in 2000 to an average of 5 employees in 2002. This positive development is tempered somewhat by the result of the 2001 survey, recording a high of 6 employees.
- 37% of businesses have increased their number of eWorkers since 2000, 58% have remained at the same level, and only 3% have less.
- 92% of businesses rated their experience with eWorking as "very or fairly" successful.
- However, only 22% of eWorking businesses have a formal eWorking policy, and only 20% of eWork managers and 30% of eWorkers have had training provided. This is relatively unchanged from 2001.
- A "typical" eWorking company is located in Dublin (54%) and has more than 11 employees (67%)
- A typical eWorker is a male full time employee with a third level qualification who eWorks part-time.

Government Initiatives related to eWorking

eWork Action Forum:

The eWork Action Forum (eWAF) was established in late 1999 in response to the 1999 report of the National Advisory Council on Teleworking (NACT) to drive the eWork agenda and monitor and implement the recommendations of the NACT report.

The purpose of the forum was:

"To provide a focal point for the ongoing development of an environment, which will stimulate telework employment opportunities and ensure that this method of working achieves its full potential in contributing to economic growth and an improved quality of life."

In October 2002, having reviewed the achievements of the Forum, Michael Aher, TD, Minister for Trade and Commerce considered that with completion of the Awareness Campaign and the successful launch of the on-line training course, that the Forum had substantially fulfilled the mandate given to it by the National Advisory Council on Teleworking, and should not continue beyond the end of the year.

The Report of the eWork Action Forum 2002⁵⁷ gives an overview of its considerable achievements during its three year term. Actions undertaken related to:

- eWork Business Awareness Campaign
- Code of Practice on eWorking
- Pursuit of eWorking opportunities in Government Departments
- Fiscal Environment
- Training
- Statistics

eWork Business Awareness Campaign

This campaign was focussed on business decision-makers and aimed to increase awareness of the business benefits that eWorking can offer to their firms. It included:

- A national radio and press advertising campaign undertaken between September and early November 2002.
- Repeat of eWork survey in October 2002 to monitor eWork practices and trends in Irish businesses. Results of the survey were presented at the ICT and eWork Conference⁵⁸ held in Kilkenny in November 2002, jointly organized by Telework Ireland, the South East Regional Authority and the Irish Internet Association.

⁵⁷ www.e-work.ie; download the 2002 and previous Annual Reports of the eWork Action Forum here

⁵⁸ www.telework.ie; view and listen to on-line presentation by following the link from the homepage

- Continuation of an eWork helpdesk, reprint and dissemination of eWork literature, and maintenance of the eWork website.

The Code of Practice on eWorking in Ireland

A Code of Practice on Teleworking was produced as part of the final NACT report. It was endorsed by the Government, IBEC and ICTU and launched in May 2000 as "The Code of Practice on e-Working in Ireland". In November 2000 the Code of Practice won an EU eWork award as the "Best Framework Agreement".

eWorking opportunities in Government Departments

The NACT recommended that all Government Departments should be required to introduce eWorking options into their mainstream working and, additionally, that all publicly funded organizations should formulate an eWorking Policy for implementation in 2002. Some examples of eWork projects in Government Departments/Offices are:

- The Health and Safety Authority has introduced a formal eWorking programme into the organization, due to the successful completion of a pilot project during 2002.
- The Department of Enterprise, Trade and Employment is currently reviewing a pilot project and a decision on the introduction of a formal eWorking policy will be made following the evaluation.

Under arrangements established under the Civil Service Conciliation and Arbitration Scheme, the Department of Finance and the staff unions are discussing policy guidelines for Departments which will encourage the introduction of eWorking and set out the main administrative and managerial arrangements that must be addressed in introducing formal eWorking options.

Statement of Practice on tax implications of eWorking

Uncertainty surrounding taxation issues had been identified as a barrier to the uptake of eWorking in Ireland in a report commissioned by the eWork Action Forum in 2000 from KPMG. Following consultations and negotiations, the Revenue Commissioners⁵⁹ agreed to issue a leaflet "eWorking and Taxation" (IT69), which favourably clarifies these aspects of the tax code in relation to employees engaged in eWork arrangements: Benefit in Kind, Home Expenses, Other Expenses, Capital Gains Tax.

A nationally recognised and accredited eWork Training Course

The Forum considered that a special eWork training course would greatly facilitate an increased uptake in eWorking options. Consequently, during 2002, the Forum worked with FÁS⁶⁰ to develop a suitable training course, on the competencies necessary to support successful eWork arrangements. The objective was to develop a nationally recognised and accredited course in eWorking which could be delivered and supported using the internet. FÁS, as the national training and employment authority, operates a wide range of training courses which facilitate the use of ICTs. FÁS also delivers IT education and training courses over the internet through the FÁS Net College.

The course was launched at the end of 2002. It is aimed at those employees who are currently eWorking, those who wish to eWork and their managers. The course covers issues such as communications, technical issues, work space, regulatory background and self management for the e-employee. A separate module, for managers only, deals with managing eWork. The course is delivered on-line. It has recognised accreditation by the Further Education and Training Awards Council (FETAC).

⁵⁹ www.revenue.ie; Irish Revenue Commissioners website. Leaflet IT69 can be downloaded from the publication section of this website as well as from www.e-work.ie

⁶⁰ www.fas.ie; FÁS, the national training and employment authority

eWork Statistics

The lack of national statistics on eWork in Ireland makes it very difficult to monitor, in any comprehensive fashion, the uptake and incidence of eWork.

Following collaboration with the e-Work Action Forum and the STILE researchers, the CSO included some questions on e-working in the Quarterly National Household Survey (QNHS) in Autumn 2002. These questions were adapted and simplified for use within the Irish QNHS structure, from the questions which have been asked each year in the British labour force survey since 1997. An overview of the survey results and relevant links are provided in the "Trends in eWorking" section of this report.

The main reason for including eworking questions in labour force surveys is that information on eworking can then be cross-tabulated with many of the other indicators that are collected at the same time, such as the age, gender, employment status and location of eworkers. In addition, the sample used in the labour force surveys is much larger and more reliable than that used in small-scale academic or commercial surveys.

As part of the activities of the e-Work Action Forum, a survey of 100 small companies was carried out in Ireland, funded by the Department of Enterprise, Trade and Employment, and conducted by the IST Emergence project.

An overview of the results of the surveys from an Irish perspective was provided in the 2002 country report, and a detailed report, "E-Work in Ireland" (IES Report 394) is now available free of charge on the EMERGENCE web site⁶¹.

Other achievements and actions of the eWork Action Forum:

Clarification on Planning Issues

The National Advisory Council recommended that the Department of the Environment and Local Government commences a consultation process with the Local Authorities to establish guidelines on the limits of the use of a home office and the concept of "development" within the planning code. The Department was unable to commit itself to preparing guidelines for planning authorities. However, it provided the following clarification in relation to different categories of teleworkers:

(i) Teleworking/telecommuting from home (either part-time or full-time where all that is involved is a computer terminal).

In relation to teleworking it would be difficult to argue that there is any material change of use involved here and accordingly it would not be an issue from a planning point of view.

(ii) Home as an office with staff and dedicated space for use.

This is quite a different concept and would involve a material change of use and would consequently come within the scope of the planning code. To date the only non-residential activities permitted in a dwelling house are medical and related consultants. Many local authorities are, however, moving toward allowing certain types of home-based economic activity within dwelling-houses, e.g. Dublin Corporation. However, there would be a requirement to go through the normal planning process and be subject to third party objections etc.

⁶¹ www.emergence.nu/pubs/form394.html; EMERGENCE eWork in Ireland (IES Report 394)

Telecommunications

The National Advisory Council on Teleworking (NACT) recommended that the Irish telecommunications environment facilitates the adoption of teleworking as a mainstream method of working.

By its very nature, eWork depends on the ready availability of modern information and communication technologies and in order to significantly progress the development of the e-business agenda, of which eWork is a part, users require access to competitive, low-cost, fixed-rate, always-on broadband services. These are objectives that the Forum has, since its inception, been endeavouring to advance, as it recognises that their availability is vital to the increased penetration of e-working as a work method.

The eWork Action Forum has now ceased its activities, but Enterprise Ireland will continue to provide related information and host the eWork web site.

Future promotion of eWork through government bodies:

eWork is now being promoted as part of Enterprise Ireland's eBusiness Information provision, for example in the book and CD entitled "Practical eBusiness – Competitive Advantage through IT and eBusiness" published in 2002 and available from the eBusiness web site⁶².

In addition, there is an ongoing Government focus on Family Friendly Working Arrangements⁶³, and eWork is highlighted as one of the measures to achieve a better work/life balance.

Information Society Developments

The following is an extract from the first New Connections Progress Report, a detailed document published in February 2003:

In January 1999, the Action Plan for the Implementation of the Information Society was launched by Government and set out the policy agenda for the development of the Information Society in Ireland. *New Connections*⁶⁴, launched in March 2002, updates the policy strategies to achieve the original goals and takes account of developments since 1999. It covers seven policy strands:

Key Infrastructures

- Telecommunication Infrastructure
- Legal & Regulatory
- eGovernment

Support frameworks

- EBusiness
- R&D
- Lifelong Learning
- eInclusion

Appointment of Minister of State with special responsibility for the Information Society.

In May 2002, the Government appointed Mary Hanan, T.D., as Minister of State at the Department of the Taoiseach with special responsibility for the Information Society.

Establishment of a new Cabinet Committee on the Information Society

Following the appointment of the Government in June, the Taoiseach established a new Cabinet Committee on the Information Society with a view to stimulating further progress in areas such as the further development of e-Government and in response to recommendations coming from the Information Society Commission.

⁶² www.enterprise-ireland.com/ebusiness; Enterprise Ireland eBusiness website

⁶³ www.familyfriendly.ie; Family Friendly Working Arrangements website

⁶⁴ www.taoiseach.gov.ie; download from: Policy Areas–Information Society–Publications & Links

The Information Society Commission

The Information Society Commission⁶⁵ has set up a number of working groups to look into issues surrounding the infrastructures and frameworks in the Action Plan. In December 2002, the Minister of State received the first report⁶⁶ from the Information Society Commission. It is based on the content of a new online reporting facility to monitor progress on specific action items. It is intended to develop the online reporting facility further in the coming months and to provide a 'public window' on progress.

Since March 2002, there has been considerable progress under the different policy strands and these are set out in detail in the report. In summary, fourteen projects have been completed, eighty-three are on target, fifty-seven are slowed for the reasons outlined and four are new developments. No information was submitted on two projects.

Existing eGovernment websites include:

www.reach.ie	(Development of Public Services Broker)
www.reachservices.ie	(Gateway to online government services)
www.etenders.gov.ie	(Public Sector procurement opportunities)
www.ros.ie	(On-line Taxation Services)
www.basis.ie	(Public Service information for Business)
www.oasis.gov.ie	(Public Service information for the private citizen)

Telework Ireland, the National Association for eWorking in Ireland

TWI, the National Association for eWorking in Ireland (founded in 1993), is continuing with its activities to promote eWorking in Ireland. It provides an eWork consultancy and mentoring service, an eWork helpline, an ezine for members and a comprehensive website, as well as liaising with Government and organizations with similar interests, such as the Irish Internet Association. Telework Ireland was represented by several members on the eWork Action Forum.

TWI held its 10th National Conference in November 2002, entitled "ICT and eWork @ Work in Ireland". This two day conference was jointly organized by Telework Ireland, the South East Regional Authority and the Irish Internet Association. The very successful event attracted over 100 national and international delegates on both days and highlighted a range of important issues that need to be addressed to unlock the full potential of eWorking for business and regional development. Presentations addressed four main themes – Infrastructure, Regional Development, Corporate eWorking and eWork based business development. Conference presentations in Powerpoint can be downloaded from the Telework Ireland web site⁶⁷ and most presentations are also available with streamed audio from the site.

Contact & Information

Nana Luke, Chairperson, Telework Ireland
www.telework.ie
Director, Bealtaine Ltd.
www.bealtaine.ie
bealtaine@bealtaine.ie

⁶⁵ www.isc.ie; The Information Society Commission website.

⁶⁶ www.isc.ie/downloads/know.pdf; download "Building the Knowledge Society" Report to Government

⁶⁷ www.telework.ie; Telework Ireland, the National Association for eWorking in Ireland

3.8 Italy

3.8.1 Introduction

Since early 2001 there has been increasing awareness that the gap in innovation between Italy and other leading European countries can be reduced only through a combined and well-organized effort by all political, economic and social forces within the country.

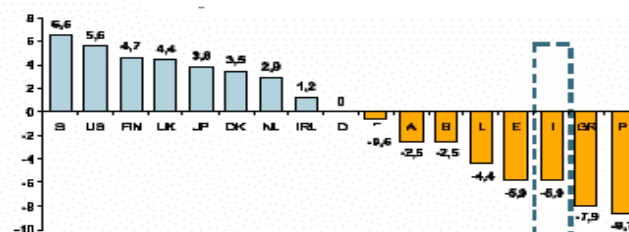
Italy needs a wide-ranging project for digital innovation, involving the participation and contribution of all citizens. Workers and consumers would like to see this project developed by the government in collaboration with the unions and with industry. The project would extend the results obtained in specific sectors of the economy (such as broadband and terrestrial digital communications), to other weaker areas. More specifically these will include small and medium-sized businesses, training, health, schools, transport and the South. This is the only way to ensure that innovation will provide a sufficient technological boost to encourage growth.

It should be stressed that a number of initiatives are already underway. In the following pages we will provide an overview of the Italian economic and social situation, with special reference to new technology and innovation, and summarize the initiatives undertaken by the central government, the public services sector, institutions and local government. Finally, we will discuss a number of recent research documents on eWork.

3.8.2 Overview

The European Commission has recently drawn up an innovation scoreboard, using 17 core indicators of innovation. The scoreboard provides clear evidence of Italy's backward position with respect to other European countries, the USA and Japan. Italy's weak points are: low public investment in Research and Development, poor education, low skills within the population, a lack of high tech patents and weak funding for innovation; its main strong point is the innovative capability of small and medium-sized businesses (Figure 1).

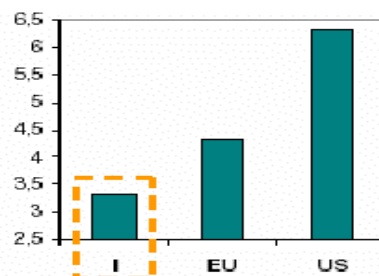
Fig. 1 Innovation Scoreboard



Source: Commission Staff Working Paper, 2001 – Innovation Scoreboard Document SEC (2001).

Italy's backward position is especially marked in applied ICT research. Public and private expenditure in this area is only half the average for Europe as a whole (Figure 2, next page).

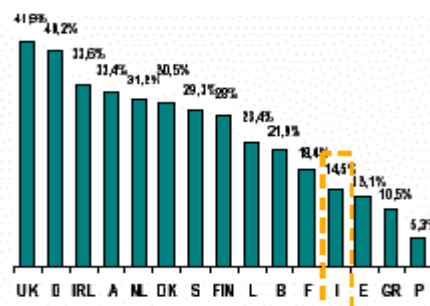
Fig. 2 ICT Expenditure as % GDP - 1990s
- Comparison between Italy - EU - USA



Source: Eurostat data - EITO 2002 Roland Berger Strategy Consultants

Similarly, the number of patents registered with the European Patent Office is extremely low, with Italy registering fewer patents than most other European countries. Italian firms – and SMEs in particular – make little use of new technology, and the Internet; as few as one in ten firms sells its products online, only slightly more use online procurement (Figure 3).

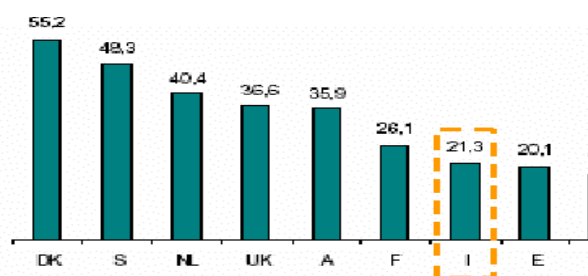
Fig. 3: % Firms purchasing online



Source: Eurobarometer, 2001

This state of affairs is due to a combination of factors. These include weak penetration of the Internet within the population, poor ICT literacy and a limited awareness of Internet's business potential. On-the-job training in new technologies is weak. Only one worker in five has basic ICT skills (Figure 4). The skills shortage problem is even more serious if we consider high level technical skills; it has been calculated that during 2002 in Italy, 60,000 technical jobs remained unfilled (IDC, 2002).

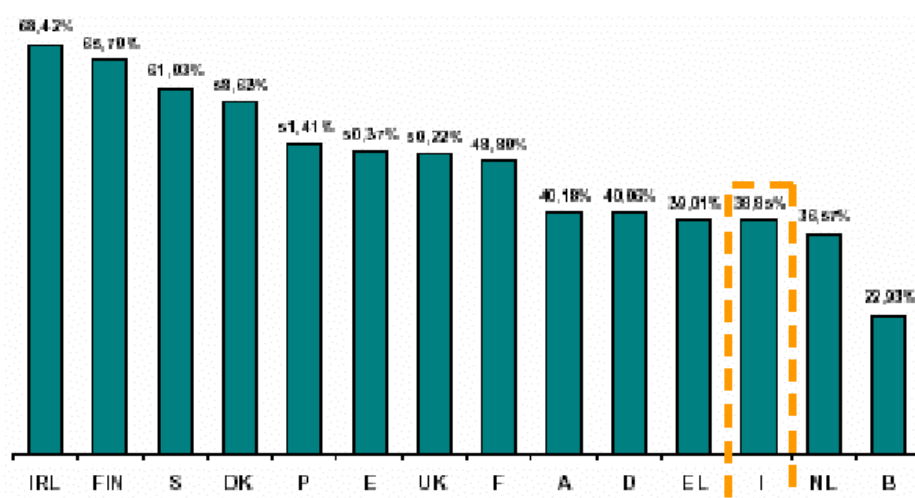
Fig. 4 - % of workforce with ICT literacy



Source: Eurobarometer, 2001

Access to the benefits of the Information Society is still limited. Only one Italian family in four has an Internet connection. Furthermore, use of the Internet is strongly linked to age, gender, and geographical location. Penetration of the Internet is lower in the South (21%) than in the North (28%) and older people, especially women, have no knowledge of how to use it. If we examine the availability of public services online, Italy is not in the top positions.

Fig. 5 Online Availability of Government Services



Source: European Commission, 2001

The leaders in this area are the Northern European countries where the Internet has been used to deliver public services for many years (Figure 5). It should be remembered, however, that the differences among countries are not large and that a number of systems developed in Italy – the tax payment system and the system for online purchases – are among the best in Europe.

3.8.3 Market Developments

The Information and Communication Technology Market

The strong market fluctuations which characterized 2001 led the Information and Communication Technology (ICT) sector to close with a positive result (+8% on 2000). Growth was nonetheless below the level predicted at the start of the year. In 2001, the economic recession and the swift deterioration of the international economy had a surprisingly strong impact. In 2002, the uncertain economic situation and unfavourable market dynamics led to a further downturn, though closing on a positive note (+3.4% with respect to 2001). Today, the main worry for operators and markets is the economy's failure to recover. The persistent lack of market confidence has led to a revision of predicted medium-term growth; 2003 is expected to see stronger growth than 2002, but full recovery is predicted only for 2004. In the period from 2001 to 2002 the two main ICT sectors behaved in different ways:

- Telecommunications growth slowed from 8.5% in 2001 to 2.8% in 2002. This poor performance was due to the maturity of the markets for fixed-line and mobile services. Voice-service – the main component in these markets – is increasingly affected by competition. This has led to a fall in average prices; more innovative services have failed to take off.
- IT: the slowdown in the IT sector is considerable, but less drastic (from 7.2% to 4.4%). The hardware sector produced negative growth (-0.4% in 2002); the strength of the PC market contrasted with poor results for server and IT systems. The positive performance of the e-business, security, and integration segments contributed to the growth of the software (+6.5%) and services (+8.1%) markets (Federcomin, 2002).

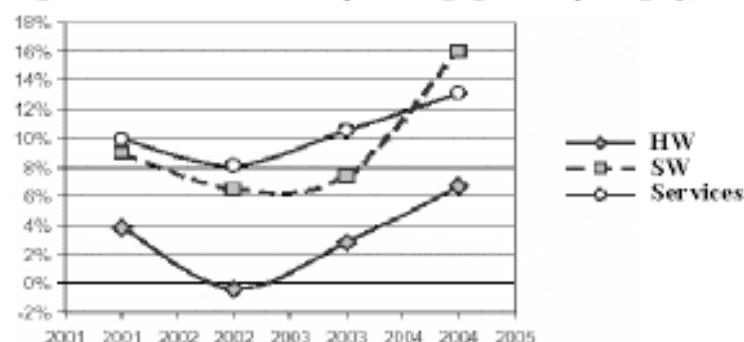
The climate of uncertainty was compounded by the disheartening performance of the economy (in September 2002 the Government again lowered predicted GDP growth) and consumer spending (affected by the danger of inflation). Nevertheless, the effects of fluctuations on international markets and of the collapse of the "new economy", seem to have been overcome. Although the situation as a whole is not encouraging, there is potential for development in the ICT sector, which is now in a stronger situation than was the case a few years ago.

The IT Sector

The IT sector, as mentioned above, has suffered from a general downturn in demand, due mainly to the slowdown of the world and European economies. In 2001 this downturn manifested itself in different ways in different market segments, with services and software (3%) giving the best results (Figure 7).

The hardware sector began to slow down during the first half of 2001; in the second half of the year the situation worsened. But the most recent figures for 2001 confirm the strength of the Italian market, with performance slightly above that predicted. In 2001, the hardware sector generated 3.8% growth, by 2002 the effects of the recession were evident (Federcomin, 2002).

Figure 7 - Italian IT Market: percentage growth by category, 2000-2004



Source: Federcomin, September 2002

Data for the first nine months and forecasts for the end of 2002 suggest estimated negative growth of 0.4%. Systems and servers performed particularly badly, especially when compared to the previous year; the personal computer market, on the other hand, showed some positive signs. As far as other IT sectors are concerned, studies based on the first half of the year confirm a lack of market confidence; it is nonetheless expected that it will be possible to achieve +8.1% growth with respect to 2001, with a growth rate of around 8.5% for the software applications sector.

Mobile telecommunications

In June 2002, the estimated user base for mobile services in Italy reached a total of 49.43 million (Table 1). In Italy, as in other leading European countries, development of the mobile services market, will require a transition from the current situation, in which the market is dominated by voice, towards a more balanced mix, including data and value added services (for example mobile content).

Table 1 - Users of Mobile phone Services (in millions)					
Country	1999	2000	2001	2002	2002
				1 st quarter	2 nd quarter
Italy	30,42	42,10	48,83	49,11	49,43
Western Europe	153,87	243,56	296,76	303,24	310,75
USA	84,63	108,47	123,65	126,81	128,71

Source: Data processed by IDC for Federcomin, September 2002

The situation is in some ways comparable to fixed-line services, with the difference that mobile service providers continue to register a growth in voice market profits, as compared to value added applications (UMTS and Mobile VAS), which are either non-existent or at the experimental stage. The development of GPRS and to a lesser extent UMTS, is a major change. New mobile handset models support advanced applications and functions. For the moment, however, these have only a limited market.

Businesses and ICT Employment

The overall increase in the number of companies, and consequently of jobs, in this sector is basically satisfactory, though somewhat lower than expected. The number of firms in the sector grew throughout the period (+4.4% in 2000, +3.9% in 2001 and +2.6% in 2002) especially in telecommunications: this vitality was the result of strong demand and on the effects of market deregulation, which has encouraged the emergence of new service providers.

The total number of Italian ICT firms grew from 71,000 in 1999 to 79,000 in 2002. Despite the positive performance of telecommunications, software and services maintain a dominant position representing around 72% of total firms, as compared to 11% in hardware and technical assistance, 14% in indirect sales, and 3% in telecommunications services and equipment. Between 2001 and 2002 the development of the economy as a whole was almost zero (0.1%), whilst the ICT sector grew by 2.6%, with TLC services and equipment performing especially well. Employment in this sector increased by 3.4% in 2000, 2.7% in 2001 and 2.7% in 2002. With a total of 598,000 employees, the ICT sector represented 2.9% of the total number of persons in employment in Italy in 2002.

3.8.4 The penetration of new technologies

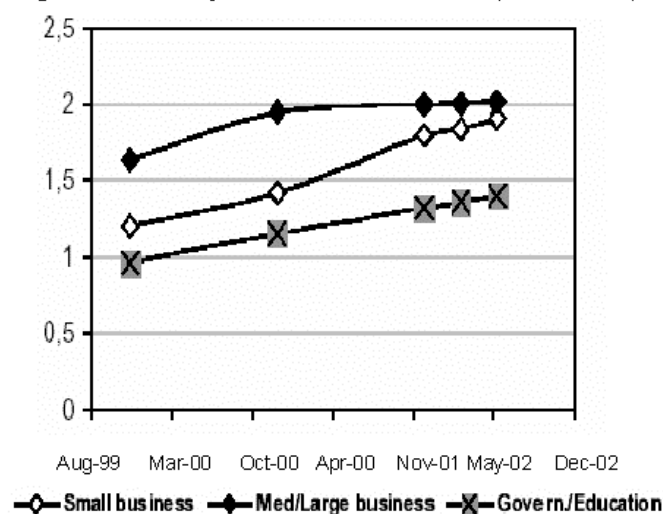
The penetration of technologies continues to increase despite the recession and the absence of support structures. During the second quarter of 2002, in a economic climate still dampened by uncertainties about future prospects, the installed base of personal computers in businesses, public services and schools (Table 2) grew slightly faster than in the first quarter (2.3% as compared to 1.7%).

Table 2 - Italy: Installed Base PCs In Business/Public Services/Education (millions)					
Category	1999	2000	2001	2002	2002
				1 st quarter	2 nd quarter
Small business	1,21	1,42	1,80	1,84	1,91
Med/Large business	1,64	1,95	2,00	2,01	2,02
Govem./Education	0,97	1,16	1,32	1,36	1,40
Total installed base	3,82	4,53	5,12	5,21	5,33

Source: Data processed by IDC for Federcomin, September 2002

Especially important was the slow but steady recovery of the small business sector. In medium and large companies on the other hand, the penetration of personal computers shows signs of saturation (see figure).

Figure 10 – Italy Installed Base PCs (in millions)

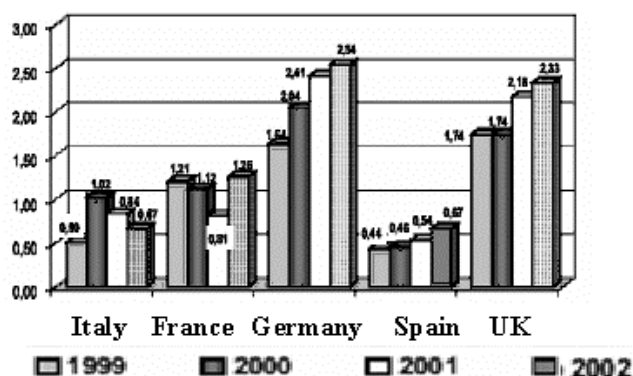


Source: Data processed by IDC for Federcomin, September, 2002

Internet

As for the number of Internet hosts, not all European countries show identical trends. As the number of hosts in Europe grew, Italy concentrated on consolidating its existing position. In July 2002, the total number of hosts was estimated at 670,000 (see figure).

Figure 11 – Europe Internet Host 1999-2002 (in millions)



Surveys of Internet use during the first half of 2002 show a consistently positive trend, and increasing penetration. At the end of June it was estimated that Internet had reached 33% of the population. In the home sector - with around 13.65 million users in June 2003 - Internet is becoming a mass phenomenon. (Table 3).

Table 3 - Number of Internet Users (In millions)						
Country	Category	1999	2000	2001	2002	2002
					1 st quarter	2 nd quarter
Italy	Home	5,02	8,48	12,53	13,09	13,65
	Small business	1,37	2,01	2,68	2,67	2,71
	Med./Large business	1,86	2,66	3,72	3,86	3,92
	Govern./Education	2,57	3,52	4,76	4,90	4,94
	Total (effective)	6,20	13,02	17,95	18,72	19,11
Western Europe	Home	53,73	60,32	109,87	114,38	118,89
	Small business	17,45	24,66	31,15	32,17	33,18
	Med./Large business	16,13	22,33	27,38	28,19	29,00
	Govern./Education	25,38	33,96	43,80	44,94	46,08
	Total (effective)	81,42	117,38	151,28	156,72	162,39
USA	Home	88,79	99,70	119,14	122,78	126,32
	Small business	15,10	18,69	20,95	21,61	22,28
	Med./Large business	18,30	19,76	22,92	23,52	24,11
	Govern./Education	9,62	17,01	20,45	21,98	23,51
	Total (effective)	101,49	127,58	145,23	153,60	159,19

Source: Data processed by IDC for Federcomin, September 2002

The increase in Internet penetration is concentrated mainly in younger age groups. Italy is slowly but steadily catching up with European and US markets in terms of the number of Internet users per PC (Table 4). At the moment, Italy suffers from an insufficient number of PCs. In previous years, this weakness, in conjunction with the boom in Internet access, has increased the value of this indicator. Over the last 12 months surveys have shown a reversal of this trend, due mainly to the rapid increase in the number of PCs connected to the net – particularly in small businesses.

Table 4 - Internet Users on PCs connected to the net (number of users per PC, excluding home category)					
Country	Category	1999	2000	2001	2002
					1 st quarter
Italy					
	Small business	2,5	2,6	2,2	1,9
	Med./Large business	2,3	2,6	2,3	2,1
	Govern./Education	5,5	7,3	5,6	5,1
	Total	2,4	2,7	2,6	2,4
Western Europe					
	Small business	1,8	1,9	1,8	1,8
	Med./Large business	1,7	1,9	1,7	1,6
	Govern./Education	5,1	5,6	5,1	4,6
	Total	1,8	1,9	1,9	1,9
USA					
	Small business	0,6	0,9	0,6	1,9
	Med./Large business	0,4	0,4	0,4	0,6
	Govern./Education	0,6	0,9	1,0	0,4
	Total	0,7	0,8	0,8	1,0

Source: Data processed by IDC for Federcomin, September 2002

Improved access to the Internet is accompanied by an increase in the average number of hours per month spent online. In Italy the greatest boost in this direction comes from the business/education sectors (grouped under the heading 'others' in Table 5), where there is a growing trend towards the integration of Internet in normal work activities ("Internet-related" activities).

Table 5 – Time spent on Internet: Monthly Hours per User						
Country	Segment	1999	2000	2001	2002	2002
					1 st quarter	2 nd quarter
Italy	Home	18,0	19,0	20,0	20,3	20,5
	Other	22,0	24,0	26,0	26,5	27,1
	Total	20,1	21,6	22,9	23,3	23,7
USA	Home	37,0	41,0	43,0	43,5	44,0
	Other	30,0	30,0	30,0	30,0	30,0
	Total	34,7	37,0	37,8	38,0	38,2

Source: Data processed by IDC for Federcomin, September 2002

It has been estimated that in the second quarter of 2002 the estimated number of business and educational users of Internet amounted to 1.1 million, slightly above the number for the first quarter of the year. Online purchases are also growing, though it is clear that Italian culture and patterns of consumption have prevented these from reaching the same level as in other industrialized countries.

The two faces of e-commerce: BtoC and BtoB

The value of BtoC e-commerce in the second quarter of 2002 was around 644 million Euros (Table 6), and is predicted to grow considerably in 2003. This data reflects a market situation characterized by improved supply, an expansion in the number of e-commerce sites and growing acceptance of online payment systems.

Table 6 - Value of BtoC Italian Market (In millions of Euros)						
	1999	2000	2001	2002	2002	2002
				1 st quarter	2 nd quarter	Tot. 1 st Half
Value of BtoC Italian Market	307,5	824,6	1639,4	629,0	644,4	1273,4

Source: Data processed by IDC for Federcomin, September 2002

This is not, however, sufficient to guarantee a boom in demand, which is predicted to occur only in the medium-long term. Overall performance is also affected by the prevailing lack of market confidence, which shows no signs of long-term recovery.

As far as BtoB solutions are concerned, there is an increasing tendency to complementarity – at times convergence – among different Internet-based services. Businesses are increasing their use of these services. There is no dominant "model", firms adapt to a variety of applications, tools, and methodologies (eProcurement, eDistribution, Marketplace, Private Exchange, ...). This has led to a significant increase in the value of BtoB e-commerce (Table 7).

Table 7 - Value of BtoB Italian Market (In millions of Euros)						
	1999	2000	2001	2002	2002	2002
				1 st quarter	2 nd quarter	Tot. 1 st Half
Value of BtoB Italian Market	1584	5434	14429	5115	6082	11197

Source: Data processed by IDC for Federcomin, September 2002

In the second quarter of 2002, this business was estimated to be worth over 6,082 million Euros 78% of the total value for 2001.

3.8.5 Government Policies for national Digitalization

In response to EU directives, the Lisbon strategy, and pressure from citizens and business groups the government has developed a number of policies to stimulate economic and social development through the widespread adoption of new technology. A key goal has been to apply new technology to the complex needs of the labor market. One of the aims is to exploit the immense potential offered by the Internet to coordinate supply and demand for labor, and to encourage job creation. In 2002, the Ministry for Social Policy and the Ministry for Innovation and Technology signed a wide-ranging agreement with precisely these priorities. The initiative will benefit the unemployed, businesses, the disabled and immigrants from outside the EU. The project also involves the development of a series of online employment services aimed at citizens, businesses and public services, and the launch of a computer literacy scheme for civil servants working in the employment sector. Part of this scheme will involve e-learning. Finally, the project aims to simplify administrative procedures in the employment sector by providing online access to administrative procedures to citizens and businesses. A series of special projects will encourage eworking by public employees and by firms and employees in the private sector.

The e-government project

The Italian government is aware that the Italian public and private sectors lag behind other European countries in ICT technology and more generally in the development of the so-called Information Society. It has therefore decided to adopt a series of policies designed to bridge this gap, allowing the country to aspire to a leading, competitive role at the European and international levels.

One priority is the recognition of the importance of a "co-ordinated project for the development of an Information Society involving the co-operation of all local and central government organizations" (Linee Guida del governo per lo sviluppo della società dell'informazione, Ministry for Innovation and Technologies, 2002).

Central to this project is the widespread use of e-government in the public services sector. The project will concentrate on "improving the efficiency and efficacy of public services through technological innovation" (*ibid.*). More specifically, the aim is to bridge the technological gap through the development of a program of selected high impact initiatives aimed at citizens, businesses and the public service sector, developed by local and central government. Innovative techniques will be used to make these services available online, providing a high quality service for citizens and businesses. Key innovations include the introduction of new user identification procedures based on Electronic ID cards, the National Services Card and digital signatures. These are complemented by a series of innovative - mainly online - channels through which users can access services: Internet, call centres, mobile phones, and third-party networks. The back offices of the various public services will be interconnected, simplifying their relationship with users and allowing for greater "transparency". The system as a whole will be based on a new communications infrastructure - the "national connectivity system" - which will link all central and local government offices.

In the case of central government, these projects have been formalized as a series of ten goals for the current legislature, approved on February 13 2002 by the Committee of Ministers for the Information Society. Achieving these goals will lead to a significant increase in internal and external efficiency in the public services sector and improved use of available human resources. Specific objectives include:

Online services for citizens and businesses

1. Online access to all high-priority services
2. Distribution of 30 million Electronic ID cards and National Service Cards
3. 1 million digital signatures distributed by the end of 2003

Internal Efficiency of Public Services

4. 50% of expenditure on goods and services by eProcurement
5. All internal government mail via email
6. All payments to be made online

Optimal Use of Human Resources

7. Certified computer literacy of all public employees
8. 1/3 of training to take place through e-learning

Transparency

9. 2/3 of public services offices to allow citizens online access to administrative procedures

Quality

10. All offices providing services to be equipped with a customer satisfaction system

A key requirement for achieving these goals is basic infrastructure. The project will thus involve:

- launch of the national web-page (*Italia.gov.it*): an easy-to use single access point to all government services
- an integrated electronic payment system, allowing users to carry out transactions with the government using secure and certified systems (debit/credit cards, direct debit from bank or post office accounts)
- a public connectivity system with initiatives designed to improve the existing network both in terms of the number of government offices connected, and of the quality, security and range of services on offer. These will include not only data transfer but also secure email, data bases etc. Broadband will be used to provide more effective services, contents and applications. By the end of the legislature (2006) the proportion of Italy's 85,000 governmental offices with broadband connections will increase from the current 20% to almost 90%
- optimal use of existing information, with initiatives designed to improve the quality of available data, and to define optimal techniques of data delivery (e.g. segmentation of information by user profile)
- definition of an ICT security plan, with initiatives to identify security standards, modes of certification and responsibility.

3.8.6 eWork in Italy: the current situation, projects and forecasts

eWorkers and the Digital Innovation Project

Italy's backwardness in digital innovation and the use of new technologies has had repercussions on the development and spread of ework. eWorkers currently represent around 3.6% of the Italian workforce (Ministry for Innovation and Technologies, 2002) as opposed to a European average of nearly 7%, and ework is almost non-existent in the public services sector. In addition, Italy's job market is one of the most critical in Europe, with unemployment figures almost 2% higher than the European average, and a gap of almost 20 percentage points between North and South.

The government's project intends to increase employment through the introduction of flexible working methods, and the modernization of work organization. eWork represents a response to the need to create new and diverse working opportunities, with benefits not only in terms of employment, but also for workers' quality of life, and for the environment (traffic, transport and pollution).

With this aim in mind the government proposes, to incentivate and accelerate the spread of ework by:

- drawing up a series of regulations for private citizens and businesses
- promoting consultancy centres, specially targeting SMEs
- promoting multi-functional centres to host eworkers
- providing incentives for firms to move into disadvantaged areas
- analyzing those activities that can be easily decentralized (call centres, software development, design, accountancy, etc)
- launching a programme for the public service sector, beginning with pilot projects
- using eworking to improve work opportunities for the disabled.

The Italian eWorker

In 2002 SIT (Società Italiana Teleslavoro) carried out a survey of 507 Italian eworkers. This showed that:

- the average Italian eworker lives in Northern or Central Italy, usually in a small or medium-sized town
- is generally married or cohabiting (54.6% of the sample as opposed to 45.6% of single workers) and is usually female (56% compared to 44% of males)
- is aged between 18 and 34 (54% of eworkers), and has an intermediate level school certificate (64.9%).

This survey also attempted to measure improvements in quality of life as perceived by eworkers: a large proportion of those interviewed (62.9%) claimed that ework lowered stress levels, and 61.3% thought that they had a positive effect on free time. Around 56% said that ework had positive repercussions on family relationships, and on expenses and consumer spending.

Working "at home"

A different survey (carried out by Federcomin in 2002) concentrated on the role (and spread) of "home workplaces" in Italian families. Obviously this survey did not concern eworkers in the strict sense of the word, but it nevertheless provides some indication of the growing tendency within the population to work in places other than the traditional office.

The results of this study show that as many as 38% of Italian families have a designated workplace within the home (Tables 8 and 9). 23% of families use one room exclusively for work or study (this room may be adjoining rather than inside the house), whilst the remaining 15% use only part of a room for work purposes.

Table 8- Household workplaces (2002)			
		Families (%)	Family (thousands)
Use		38,1	7160
	<i>A whole room</i>	20,2	3800
	<i>Part of room</i>	15,3	2670
	<i>A room adjoining the home</i>	2,6	490
Not present		61,9	11640

Source: Federcomin-Anie Report, e-family, 2002

Workplaces inside the home serve a variety of different functions, and are not necessarily equipped with computers. Only 44% of household workplaces have a PC, 33% have a phone line, and 28% an Internet connection.

Table 9- Lack of technology in household workplaces			
		Families (%)	Family (thousands)
Workplaces equipped with:		100,0	7160
	<i>Table/desk</i>	55,7	4700
	<i>PC</i>	44,1	3160
	<i>Telephone</i>	32,7	2340
	<i>Internet connection</i>	28,5	2040

Source: Federcomin-Anie Report, e-family, 2002

The Future of eWork in Italy

The wide-ranging project to digitalize Italian public services, includes the "Telelavoro" project which began in 2001 under the aegis of the Ministry for Infrastructure and Transport. The most significant features of this project are the introduction of new communication technologies, the flexible development of work processes, and the active involvement of employees. The project concentrates on medium and long term goals: the cabling and computerization of managerial offices in the ministry's Department for Human Resources, followed by the re-design of work processes to gain greater flexibility. This organizational change, undertaken in collaboration with employees, also involves the analysis and monitoring of the actions undertaken. Alongside these initiatives, the project includes a study of "The Future of eWork in the Public Sector", which examines the changes taking place within the Ministry for Infrastructure and Transport, and other public services, their development and their likely future impact. This forecast aims to understand short-term prospects for the future of e-Work (up to 2005).

The results of this study stress the fact that in the coming years work organization will change, depending less on workers concentrated in specific places (offices and factories), and more on a series of activities carried out and organized in different places. The number of eworkers will increase; e-work will be increasingly important, but will continue to be ignored on an official level. As such, its potential will remain underdeveloped, and technological and organizational innovations will be mainly concentrated within restricted professional groups.

In the public services sector especially, the main factors in the development of e-work will be the innovation of services and processes. For example, traditional services (ID cards, certification of documents) will be replaced by online services, available through multi-channel technologies, increasing user convenience and creating new opportunities for e-work. The reorganization of back offices and of internal services (such as accountancy and personnel management) will be driving forces in this direction.

The period between now and 2005, will see a significant increase in e-work projects with long-term potential. As administrations increase their experience costs will fall with savings proportional to the rate at which they experiment with new services.

Websites

www.istat.it	www.assinform.it	www.inps.it
www.sitonline.it	www.cisi.unito.it	www.nextonline.it
www.mclink.it	www.innovazione.gov.it	www.s3studium.it
www.tesoro.it	www.pianoegov.it	www.telelavoro.formez.it
www.federcomin.it	www.telelavoro.rassegna.it	

Contact & Information

Maria Cristina Brugnoli
TELECOM ITALIA Learning Services S.p.A.
Business Development
UE001864@guest.telecomitalia.it

Fabrizio Davide
TELECOM ITALIA Learning Services S.p.A.
Director Business Development
fabrizio.davide@telecomitalia.it

3.9 Spain

The Spanish economy

In a more adverse than expected international setting, the Spanish economy closed 2002 with average growth of 2%. Spain's economy kept up a more than one-point growth lead versus the Eurozone average, and has thus moved towards the income levels of Europe's most developed countries. According to European Commission estimates, Spanish per capita income reached 84.7% of the Community average in 2002, compared to 78.2% in 1995.

Concerning employment, indicators all concur that the employment growth trend continued through last year. Labour Force Survey (LFS) estimates put year-on-year growth at a level of 2%. Employment creation was headed by salaried employment (up 2.8%, over one point less than in 2001) and favoured women over men (increases of 3.3% and 0.9% respectively), full-time over part-time work (2% versus 0.9%) and indefinite over fixed-term contracts (leaving the temporary employment rate at 31%, the lowest level of the past twelve years). Indicators coincide in signalling a year-on-year increase in the unemployment rate, but differ about the speed and scale of the change.

Spain and the Information Society

Spain is moving towards a new form of socio-economic organization based on the exchange of information, although not with a sufficiently high rhythm to allow to catch up, on the short term with the most advanced countries. An extra effort is necessary to integrate more citizens and companies, especially SMEs, to the Information Society.

Internet penetration is about 22.7% (study realised by Telefonica), but the numbers change according to different sources (e.g. 14% according to another study due in part to the combination of high access cost). There is a clear tendency towards small and steady growth of the numbers. The majority of the internet users connects from home, but the penetration of PCs in Spanish homes is less than half the EU average, an average of nineteen PCs per 100 inhabitants, or in other words, only 36.1% of Spanish homes has a PC.

When looking at Spanish companies, 85.6% of Spanish companies have PCs showing an increase of 0.5 points with respect to 2001 (in the case of companies with more than 250 employees the rate is 100%). The foresight for 2005 is to reach more than 90%, showing a move towards the European average (92%).

Spain's numerous SMEs have been slower to adapt to the Internet, and although 70% has access to Internet (going up to 80% in 2003), estimations are that fewer than one third have a web presence and only 10% of those offer on-line services. In general the web is viewed more as a marketing tool than one for service delivery.

The size of the company is a relevant factor for the decision to have a web presence, as the majority of the companies that have such a presence are larger enterprises (90% of the large companies), while the companies with less than 50 workers have a web presence of about 20%.

Internet penetration is higher in the companies in the financial services and insurance sector and the ICT sector (100%), as well as in the sectors of business services (94%), while the penetration in commerce and hotel business is the lowest of all sectors.

Spain has a good position in Europe with respect to mobile telephones and the penetration of broadband among internet users: 16.2% of internet users access the internet through a broadband connection, a high number when compared to the EU average. Spanish experts have indicated that broadband is a key factor in the development of the Information Society, placing Spain in a good position for the future.

eWorking in Spain

Despite the advantages that e-working can offer in a number of economic sectors, this way of working remains without a large expansion and acceptance in Spain, the lack of trust and the dependence of a traditional working environment play against the uptake of this form of working. Only 6.5% of the Spanish companies have employees that use e-work to perform their functions.

According to EITO, the average implementation of e-working in European Union countries is 5.6%, where Northern European countries such as Finland, Denmark and The Netherlands have the highest penetration rates, which, in the case of Denmark, amounts to 17 per cent. Spain is among those countries with lowest rates, being situated at 3.6% (this percentage includes those workers that work part of the time outside of their offices). The modality that has gained most followers is the one in which one day a week is spend e-working (4% of Spanish employees). On the other hand, only 2% of the Spanish workers work from home, i.e. use their home as the permanent office, of this group only 0.6% uses Internet and the new technologies to do so.

The Eurobarometer analyses the causes for not using e-working. One of the most frequently mentioned aspects (87%) is related to the impression of the lack of security of the Internet. Business owners are concerned that sensitive information may be passed on to the competition. Of particular interest is the high percentage associated with control difficulties (52%) or lack of trust by management (56%). The latter, which is as high as 75% in Spain, is the one which really explains the problems and mayor barriers to the up-take of e-working in Spain. Companies have great difficulties adapting their production processes and "need" to verify the degree of occupation of their workers through direct observation.

The sectors in Spain that have the highest levels of implementation of e-working, are also those that have very high levels of internet penetration:

Sector	% of eWork Implementation
ICT	47%
Consulting and business services	21%
Communication and journalism	8%
ICT training	3%

Current and Future Developments

Increased Tendency For Flexible Working Time

In its annual review of collective bargaining, published in spring 2003, the Spanish Confederation of Employers' Organizations (CEOE) highlights the increasing tendency for agreements to introduce more flexible working time. This includes measures such as annualisation, daily flexibility and irregular distribution of working time over the year. The CEOE survey finds that 36% of collective agreements include some system allowing for the irregular distribution of working time. This possibility is included in 82% of national sectoral agreements, which tend to refer bargaining on this subject to the company and workplace level. Also a new national intersectoral framework agreement providing guidelines for bargaining in 2003 contains a section committing the social partners to implementing the EU telework agreement.

Implementation of the European Telework Agreement

2002 saw some signs of response in Spain to the agreement on telework signed in July 2002 by the EU-level central social partners, which is to be implemented by the national social partners in the Member States (by July 2005). The social partners have published the text of the agreement on their web pages. The UGT union confederation has expressed a favorable view of its content, and stresses: the guarantee of equal treatment for workers in the company and teleworkers; the possibility of voluntary return to the worker's previous situation; the maintenance of the worker's status; the

regulation of information and consultation rights for workers' representatives, and the employer's obligation to avoid isolation of the worker by facilitating contact with fellow workers and access to company information. There were no legislative initiatives on the issue of teleworking during 2002.

Initiatives and Projects

RED DE TELECENTROS DE ARAGÓN: The regional government of Aragón, in collaboration with a number of municipalities is building what will be the largest network of telecentres in Europe, with about 80 telecentres located in mainly rural areas. The centers will function as a real network, sharing management methods, tools and methodologies.

www.asturiastelecentros.com/index.php?seccion=0

TELEMARA: (IST-2000-28404), Spanish lead IST project that has developed during 2001 and 2002 a telematics tool, based on e-working, which will replace the manual information which flows between the SMEs of the textile industry and the micro-factories that work for them. Includes a software tool and a guide for easy use.

www.aitax.es/frames/proyectos%20IDI/europeos/telemara/index.htm

Main eWork centres in Spain

- Telecentro de Gordexola: the first rural e-work centre that opened its doors in Spain. www.gordexola.net
- Telecentro de Taramundi: e-work centre in a rural area with one of the highest levels of youth employment in Spain. <http://cfmti.net/telecentros/dicit>
- Telecentro Biazipe: One of the most firmly established e-work centres with a clear focus on labour and less on social aspects of e-working. www.biazipe.net
- Centro de Teletrabajo del Parque Tecnológico de Andalucía: E-work centre located in the main technological park of Andalucía. www.pta.es/cat/
- Telecentro Cein: www.cein.es
- Centro de Recursos de Teletrabajo: <http://formentera.net/pobox.htm>
- Centro Telemático Rural en Sierra de Gata: <http://agatur.net>
- Centro Temático del Bierzo: <http://infored.org>

Contact & Information

Manon van Leeuwen

Fundación para el Desarrollo de la Ciencia y Tecnología en Extremadura (FUNDECYT)

Manuel Fdez Mejías s/n, 2ª planta

06002 Badajoz, Spain

manon@fundecyt.es

www.fundecyt.es

3.10 Sweden

General economic and employment status⁶⁸

The weak international and domestic economical development still bothers the Swedish economy a lot and the revival seems to take time. The state of the market continues to be weak. In 2002 the Swedish GNP growth was 1.9 %.

The employment rate in regular jobs was 78.2 in year 2002. During the same year the unemployment rate was 4 %. In addition, 2.7 % of the workforce were in labour market programmes, aiming at re-introducing unemployed into the labour market. The high amount of people on long-term sick leave in all sectors of the labour market is still a great strain on the state budget.

Better environment in offices

The Swedish Confederation of Professional Employees was very early to offer its members advantageous home personal computers. Now when it is time to renew the PCs for the third time, the technology has improved considerably and of course guaranteed to be environmentally and ergonomically approved. The optional PC-packages can be adapted to individual requirements. With 1.2 million union members, the union has managed to negotiate low prices, which benefit the members.

TCO Development – owned by the Swedish Confederation of Professional Employees – continues to improve the working environment for office employees by demanding requirements on ergonomics and on emissions/ecology by environmental labelling⁶⁹ of ICT equipment. TCO has received several global recognitions for its PC-display certifications since 1995. Close to 50 % of all display models manufactured today are TCO labelled. In addition, TCO has also certified desk top computers, lap tops and keyboards. The latest achievement is the introduction of the world's first quality and environmental labelling of mobile phones. The holistic approach of safe and better office work environment includes also quality labelling of furniture and lighting - even specially designed furniture for home-offices.

Agreements between employers and trades unions

The Salaried Employees Union provides to their members advice and recommendations on home based work regarding legislation, agreements, terms of employment and work environment.⁷⁰

The second collective agreement for call centre⁷¹ employees was achieved by the Salaried Employees Union (HTF) in January 2003. It is a great progress especially regarding the timetabling of the work at call centres. The new agreement implies, that the employer has to consult the employee at least 10 days before any change of work hours. The duration of the employment and the weekly working hours should be noted in the employment contract.

After 832 hours of work during a period of 12 months, the employer has to offer regular employment to the employee. The collective agreement also states that a time-limited employment contract must not be used to cover continuous need of labour. The new agreement includes improvements on the compensation for inconvenient working hours.

⁶⁸ Statistics Sweden. www.scb.se

⁶⁹ www.tcodevelopment.com

⁷⁰ www.htf.se

⁷¹ call centres, telemarketing, phone services

The changes in the collective agreement considerably improve the working conditions for call centre workers - approximately 10.000 employees.⁷²

Governmental initiatives

The Swedish government bill 'An Information Society for All' – launched in March 2000 - is still a valid goal. One of the aims is to make information society services available to everyone by introducing high-speed broadband connections in every corner of the country. The number of households connected to broadband has grown fourfold during the last 15 months and in March 2002 about 12 %⁷³ of the households were connected.

The Government has until the end of 2002 subsidized the broadband expansion in 70 % of the 289 municipalities in Sweden. However, the rate of expansion of broadband use is slower than expected especially in many sparsely populated municipalities. In addition to tax reduction to households, house-owners and businesses in stimulating connection to high-speed networks, the government changed the Telecommunication Act in June 2002 in order to support small municipalities. The County administrative boards are now allowed to grant economic support to municipalities for linking to the broadband network.

Technical initiatives

The number of hot spots for wireless systems and local city networks increase in Swedish cities. These facilitate mobile working for increasing numbers of professionals and applications. More than 30 % of the Swedish people have the possibility to connect to a city net, but so far only 7 % are connected. The mobile mode for work requires changes of management styles, which is one of the greatest obstacles for growth. Security considerations related to wireless systems is also slowing down the diffusion of mobile working.

Future demands on wireless technology

The potentials of mobile technology are of great interest for many Swedish municipalities. About 80 % of local governments believe that mobile solutions and other types of

ICT-supported solutions are necessary to meet the requirements of the elderly boom. Elderly care in homes requires new modes of working to keep the societal costs down.

Statistics on eWork

The Internet penetration and the PC-density in Sweden are still one of the highest in the world according to OECD. Annual studies show that about 13-14 % of the workforce work regularly or occasionally from home.⁷⁴ According to ETO corresponding figure for 2000 was 10 %.

⁷² www.htf.se; Salaried Employees Union – HTF. Organising 155.000 members.

⁷³ Post och Telestyrelsen. Computer Sweden 21.8.2002

⁷⁴ CSB Olle Wessberg (Computer Sweden 29.1.2003)

eWork highlights

Members of the Swedish Parliament have for many years practised work from their homes facilitated by ISDN connections. In autumn 2002 all of the 349 members were equipped with gprs phones, wireless connections and lap tops in order to be able to work from anywhere.

Flexibility has always been significant to employees at CapGemini Ernst & Young in Sweden. Provided that the customer permits, the CGE&Y consultants can choose the place where they work. The number of internal agreements on eWork have fallen off more and more at CGE&Y in recent years. On the other hand the geographical assignment areas for the consultants is growing – implying a corresponding need for working while travelling.

In Scania – the most southern county of Sweden – the project Pre Hospital Care⁷⁵ is aimed at saving lives in the ambulance on the way to the hospital. The ambulance nurse communicates with doctors at the hospital and provides real-time-data on the patient from the ambulance. The staff at the hospital uses the information for preparing the admission and on the basis of information from case sheets, they can advise the nurse in the ambulance.

Useful web sites

Facts about ICT in Sweden 2003: www.sika-institute.se

Invest in Sweden Agency: www.isa.se

Contact & Information

Walter Paavonen & Hilikka Paavonen

Paavonen Consulting AB

Granhemsvägen 11

152 41 Södertälje

Sweden

paavonen@algonet.se

⁷⁵ *Computer Sweden 5.4.2003*

3.11 The Netherlands

Summary

The Netherlands has one of the highest penetrations of eWork in Europe, according to several studies and reports. (IDC estimates in 2002 formal tele(home)workers at 300000) other reports mention more than 400000 mobile eworkers, and other reports also include the workers that don't officially eWork, but stay at least one day at home or avoid rush hours and work part time of the day at home. Taking the broad definition of eWork, including informal eWork and the use of ICT's for mobile working, team working, call centre work, self-employed etc., the number goes up to about 1200000 or over 18% of the workforce, probably one of Europe's highest. This means that predicted growth is still on target, but considerable acceleration could still take place if all the relevant policy initiatives were to come together. The major enablers are: pressure from traffic congestion, a flexible labour force, skill shortages and a generally high level of ICT take up.

History

eWork started in Holland during the end of the eighties, computer companies offered their mobile work staff such as service engineers, salespersons and consultants eWork possibilities (Digital, IBM). In 1985 the first remote call centre in Holland was build by Otto Versand in Tilburg. The Ministry of Transport introduced eWork in 1989 to be an example for other companies. The first focus at that time for companies was the improvement of productivity and better customer service. Productivity improvement was in those years-average 15%. In 2002 the focus on productivity is very low. A recent study stated that in the Netherlands the managers don't see productivity differences between eworkers and office workers, but the employees think that eworkers are more productive, as a survey in 2002 by Sustel showed. Later in the nineties, eWork was used to attract and keep highly educated employees. Since the beginning of 2000 eWork is used to provide a better balance between work and life.

The main enablers of eWork :

- The educational level of the workforce is the highest in Europe (23% of the workforce is medium and highly educated)
- The Netherlands has the most flexible workforce of Europe. Figures from statistics Netherlands: in the year 2000, 7 293 000 workers, 4 128 000 male and 3 165 000 female. The amount of fulltime functions in that year is 4 208 000 and the amount of part-time functions is 3 085 000. The workforce is very "flexible" in terms of contracts (part-timers, temporary agencies, sabbatical months, years) and the relation between manager and employees is often based on trust, mutual understanding or is even non existant in new companies such as the Vision web.
- There is still an excessive demand for highly educated and trained people and companies are giving secondary labour conditions to keep and attract employees. In November 2002, CBS reported an amount of 150 000 vacancies. eWork is often seen as a fringe benefit.
- Netherlands has Europe's densest road network relative to size of country. As well as the social and economic costs of road congestion, there is wide and growing popular concern about aspects of environmental damage. Big companies such as Shell now have a traffic co-ordination manager.
- The positive pressure for eWork generated by road traffic congestion is balanced by the Netherlands' excellent public transport infrastructure, which is being enhanced by innovative use of ICT's optimised information and journey planning for citizens.

- The slowdown in Dutch economic activity is mainly caused by lower growth of exports, which are suffering from lower international trade volumes, loss of competitiveness and the foot-and-mouth crisis. Despite the slowdown of economic activity, employment in the Netherlands continued (slightly) to grow. (0.5% in November 2002) The unemployment rate was in November 2002, 2.5% (figures CBS).
- More than 1 million persons are in the WAO (law for work disabled persons) and this is a major problem, where *ework* could be one of the solutions.
- ICT usage is high, 81% of Dutch Internet users are using email one or more days a week (Nipo June 2001), 20% are using internet telephone, videoconference and chat.

Political attention:

- Following some years of effort by individuals and the Netherlands Telewerk Forum, there is now political as well as commercial attention on *ework*.
- The Ministry of Transport has defined several major programs together with the Telewerk Forum to stimulate *ework*, but did not take any decisions to start this. One reason is the failure of the new cabinet in 2002.
- The Government is also investing in high speed connectivity, together with private companies, a total investment of about 100 million Euro's. The program knowledge- neighbourhood will offer in Eindhoven a high-speed network for 80000 citizens with services such as teleshopping and *ework*.

Stimulation programs:

The Website of the Telewerkforum had more than 1.5 million hits in 2002, and 1 in 5 companies have *ework* projects. More than 1000 articles were written in 2002 about *ework*. The Unions have information on their Websites, published (CFO and FNV) Collective labour agreements have *ework* as a part of their content. KPN was the first large private company with *ework* in their CLA. The government has now also *ework* as part of their labour conditions. The annual Telewerk Award was organized in November 2002 for the ninth time.

The Ministry of Social affairs and Employment started a stimulation program (80 million Euro, three years ago) for a better balance between work and life.

The PC private project what gives companies the possibility to provide their workers a PC for use at home stimulated *ework* also. Most governmental *ework* projects are based on this, but private companies tend to lend a laptop or computer to control standards to make it easier for the helpdesk and software distribution.

A tax-free compensation of 363 Euro per year or one time in five years 1 815 Euro can be given to employees as compensation for light and furniture. The rules to get this compensation are: a minimum one-day *ework* per week and a written *ework*- contract.

The Dutch Government sees itself as a "launch customer" for Information Society applications and further positive actions could bring rapid take off.

Some major constraints:

Low use of ICT's among small firms and managerial resistance to new management approaches. Continuing promotion, information provision and policy development is needed to capitalise on the excellent opportunities.

The high overall level of ICT investment conceals a very variable pattern, with relatively lower ICT use in Government and in small firms.

Legislation and regulation is dated and largely based on traditional home working and are, in some aspects, inappropriate for modern eworkers. As everywhere, management resistance and concerns are based on old-style "management by presence", with insufficient adoption of management by objectives and measurement of results.

Issues include a relatively low level of ICT deployment in schools and among smaller firms. There are skill shortages, especially in high-technology jobs.

Contact & Information

Kitty De Bruin
kitty.de.bruin@telewerkforum.nl
Nederlands TelewerkForum
www.telewerkforum.nl
info@telewerkforum.nl

3.12 United Kingdom

It is increasingly recognised that reliable statistics on eWork can make an important contribution to policy development and monitoring across a range of government functions including employment, training, transport, planning, the environment and social inclusion.

Thanks in part to the work of the STILE project, more and more European Governments are now collecting such information. The UK Office of National Statistics was something of a pioneer in this field having been collecting information on eWork in the UK through its Labour Force Survey since 1997. Several other national statistical offices, including Austria, Finland, Luxembourg and Slovenia have also used Labour Force Surveys to try to ascertain the uptake of these new forms of work. In 2002-3, in collaboration with the STILE project, Ireland and Hungary joined them.

The basic approach adopted in the UK survey, and also that recommended by STILE is to use a *derived definition* of eWork. By collecting information separately on where people work, the hours they spend there and the technology they use, and combining this with other information such as their gender, age, occupation, qualifications or sector, it becomes possible to produce a highly differentiated picture of the eWorking population.

In this analysis of the latest UK data by the Institute for Employment Studies, several different categories of eWorker have been identified. These are:

- Telehomeworkers – people who spend most of their time working at home and who require a telecommunications link to deliver work to their employer or client
- Multilocational eWorkers – people mainly working from their homes as base and who require a telecommunications link to deliver work to their employer or client
- Occasional eWorkers – people who worked remotely at some time during the week of the labour force survey and who require a telecommunications link to deliver work to their employer or client
- These first three categories are grouped together as 'all eWorkers'
- In addition, there are some workers who work remotely using information and telecommunications technologies but who say that they do not require these technologies in order to work remotely. These have been designated 'eEnabled remote workers'
- Finally, for comparison purposes, the tables also show those workers who do not eWork, and the total profile of the UK labour force.

Table 1: eWork In the UK In 2002 by gender							
	<i>Telehome workers</i>	<i>Mobile EWorkers</i>	<i>Occasional eWorkers</i>	<i>All eWorkers</i>	<i>eEnabled remote Workers</i>	<i>Other workers</i>	<i>All</i>
Male	186700	650196	366948	1203844	216803	14088724	15509371
Female	207965	173576	194637	576178	138580	11983006	12697764
Total	394665	823772	561585	1780022	355383	26071730	28207135
% of workforce	1.4	2.92	1.99	6.31	1.26	92.43	100

Source: Office of National Statistics, Labour Force Survey, Spring, 2002, analysis by the Institute for Employment Studies

As can be seen from Table 1, 1.78 million workers, nearly 6.5% of all people in employment in the UK, can be described as eworkers in the strictest sense, a proportion which rises to 7.5% if eEnabled remote workers are included. The most popular form, accounting for nearly 3% of the workforce, is mobile eWork – using the home as a base whilst working from multiple locations. Breaking this down by gender we see a striking contrast. Whilst well over half of telehomeworkers are women, amongst mobile eWorkers nearly eight out of ten are men. Men also outnumber women in all other categories of eWork. Women are more likely to use ICTs to stay put in their homes, whilst men are much more likely to use them to rove.

Employment Act Supports eWork

The subject of eWorking acquired a new topicality in the UK in 2003, when, On 8th April, the Government introduced an important new legal duty on employers to consider applications for flexible working from parents of young or disabled children. The right of workers to ask to be allowed to eWork forms an important part of the provisions of the 'work and family provisions' of the Employment Act, 2002. But to what extent does eWorking bring about greater flexibility for parents of young children?

To complement the information on gender, IES carried out an analysis of eWork and parenthood, shown in Table 2. The evidence seems to confirm the association of gender patterns of eWork with the traditional patterns whereby women take primary responsibility for childcare.

Whilst 12% of all women in employment have children under five, this rises to 23 % among women who are telehomeworkers. But surely telehomeworking also opens up the opportunity for men to become househusbands and share in the childcare? The evidence suggests that this is very much the exception. Whilst 15% of all men in the workforce have children under five, this is the case for only 10% of male telehomeworkers. So you could say that – at least up to 2002 - there is some evidence of men with young children actually avoiding working at home. It will remain to be seen whether the new legislation will bring about a change in the balance of responsibility between mothers and fathers or whether the new right to telework will simply entrench the view that a woman's place is in the home.

Table 2: eWork In the UK In 2002 by whether parents of young children (%)							
	<i>Telehome-workers</i>	<i>Mobile eWorkers</i>	<i>Occasional eWorkers</i>	<i>All eWorkers</i>	<i>eEnabled Workers</i>	<i>Other workers</i>	<i>All</i>
Male							
no children under 5	89.6	84.3	81.2	84.2	84.9	85.2	85.1
children under 5	10.4	15.7	18.8	15.8	15.1	14.8	14.9
Total	186700	650196	366948	1203844	216803	14088724	15509371
Female							
no children under 5	77.4	86.8	89.1	84.2	86.5	88.1	87.9
children under 5	22.6	13.2	10.9	15.8	13.5	11.9	12.1
Total	207965	173576	194637	576178	138580	11983006	12697764

Source: Office of National Statistics, Labour Force Survey, Spring, 2002, analysis by the Institute for Employment Studies

Profiles of eWorkers in the UK

Turning to the age breakdown of eWorkers, shown in Table 3, we see a strong clustering in the mid-career age-groups (between 36 and 55). This is not surprising: these are the ages in which people are most likely to have acquired their skills and be mature enough to be trusted by their managers to work independently. They are also the ages when they are most likely to have young children in the home, and therefore a strong motivation to eWork in order to spend more time with them. It might be expected that in the older age-groups, two factors would contribute to lower levels of eWork. One is the fact that this generation is less likely to have the skills to use ICTs and to be in the occupations which make intensive use of them. The other reason can be described as the 'empty nest syndrome'. With dependent children having left the home, parents may be glad of a change of scene for the final phase of their careers. In view of this it is surprising to find that around seven percent of 56-65-year-olds are eWorkers, only fractionally lower than the 7-8 per cent eWorking in the two lower age-bands. The lower numbers in this age group reflect the much higher levels of economic inactivity or unemployment among those over the age of 55 in the UK. There are also higher levels of self-employment amongst more mature workers which may also provide part of the explanation.

Table 3: eWork In the UK In 2002 by age							
	Telehome-workers	Mobile eWorkers	Occasional eWorkers	All eWorkers	eEnabled Workers	Other workers	All
16 - 25	9812	21191	20776	51779	11365	4382136	4445280
26 - 35	72086	166892	156261	395239	74330	6555843	7025412
36 - 45	115756	278889	190443	585088	116592	6687451	7389131
46 - 55	114744	228167	151436	494347	104946	5514214	6113507
56 - 65	65320	114004	40120	219444	39470	2603599	2862513
66 +	16947	14629	2549	34125	8680	328487	371292

Source: Office of National Statistics, Labour Force Survey, Spring, 2002, analysis by the Institute for Employment Studies

Looking at the breakdown by working hours also produces striking contrasts, as can be seen in Table 4. Whereas overall around a quarter of people in employment within the UK work part time, this rises to 44% amongst telehomeworkers and drops to only 16% amongst mobile eWorkers and an even smaller ten per cent amongst occasional eWorkers. This is in line with the gender pattern, whereby telehomeworking is more likely to involve women and other forms of eWork are male-dominated. But it cautions us against assuming that all eWorkers have similar work-styles.

Table 4: eWork In the UK In 2002 by working hours							
	Telehome-workers	Mobile eWorkers	Occasional eWorkers	All eWorkers	eEnabled Workers	Other workers	All
Full-time	219250	688724	505776	1413750	279400	19496723	21189873
Part-time	174595	134614	55809	365018	75983	6568563	7009564
Total	393845	823338	561585	1778768	355383	26065286	28199437
P/t as % of total	44.33	16.35	9.94	20.52	21.38	25.2	24.86

Source: Office of National Statistics, Labour Force Survey, Spring, 2002, analysis by the Institute for Employment Studies

Table 5 shows a breakdown of the figures by employment status. Here, it is clear that there is a very strong correlation between being an eWorker and being self-employed, which applies across all forms of remote work with the partial exception of the occasional eWorkers. Nearly six out of ten telehomeworkers are self-employed as are well over half of all mobile eWorkers. This compares with just 11% self-employment in the workforce as a whole.

Table 5: eWork In the UK In 2002 by employment status							
	Telehome-workers	Mobile eWorkers	Occasional eWorkers	All eWorkers	eEnabled Workers	Other workers	All
Employee	163024	375117	472133	1010274	178991	23785974	24975239
Self-employed	231641	448655	89452	769748	176392	2285756	3231896
total	394665	823772	561585	1780022	355383	26071730	28207135
Self as % of total	58.69	54.46	15.93	43.24	49.63	8.77	11.46

Source: Office of National Statistics, Labour Force Survey, Spring, 2002, analysis by the Institute for Employment Studies

Turning to the occupational breakdown, shown in Table 6, we see that the majority of eWorkers are in managerial, professional or technical occupations. Once again, however, the telehomeworkers stand out as having a distinctive profile compared with other eWorkers, with a much larger number of administrative and secretarial workers.

Table 6: eWork In the UK In 2002 by occupation							
	Telehome-workers	Mobile eWorkers	Occasional eWorkers	All eWorkers	eEnabled Workers	Other workers	All
Managers	92484	188992	200604	482080	56588	3489647	4028315
Professionals	63718	140215	204764	408697	105834	2768569	3283100
Technical & assoc, prof.	108429	209315	92919	410663	51318	3439345	3901326
Admin and Secretarial	94200	23239	21381	138820	19486	3498976	3657282
Skilled Trades	12396	181311	21309	215016	71767	3050418	3337201
Personal Service	12223	10371	7960	30554	17975	1951084	1999613
Sales/ customer Service	7277	27370	4723	39370	9222	2148989	2197581
Process plant & Machine	1235	28299	5081	34615	15049	2307308	2356972
Elementary Occupations	2703	14660	2844	20207	8144	3409209	3437560
Total	394665	823772	561585	1780022	355383	26063545	28198950

Source: Office of National Statistics, Labour Force Survey, Spring, 2002, analysis by the Institute for Employment Studies

Table 7: eWork In the UK In 2002 by highest qualification							
	Telehome-workers	Mobile eWorkers	Occasional eWorkers	All eWorkers	eEnabled Workers	Other workers	All
Degree or equivalent	147056	226701	298443	672200	139889	4433463	5245552
Higher education	43281	97952	76881	218114	34602	2366604	2619320
GCE A Level or equiv	77332	270647	97692	445671	91795	6594950	7132416
GCSE grades A-C or equiv	73777	131046	56918	261741	43360	5918213	6223314
Other qualifications	36101	58513	21452	116066	24358	3509514	3649938
No qualification	15082	36100	8229	59411	20809	3065384	3145604
Don't know	2036	2813	1970	6819	570	180630	188019
Total	394665	823772	561585	1780022	355383	26068758	28204163
Graduates as % of total	37.26	27.52	53.14	37.76	39.36	17.01	18.6

Source: Office of National Statistics, Labour Force Survey, Spring, 2002, analysis by the Institute for Employment Studies

An analysis of the qualifications of eWorkers (shown in Table 7) bears out this picture of eWork as a form of work which is practiced by more senior and highly-qualified professionals and managers. Whilst only nineteen per cent of the British workforce have a university degree or equivalent, this proportion doubles to 38% amongst eWorkers, rising even higher to over half of occasional eWorkers. Surprisingly the telehomeworkers are considerably more likely (at 37 per cent) to be graduates than the mobile eWorkers (at 28 %). Looking back at Table 5 we can see an explanation: 271 thousand of

the 823 thousand mobile eWorkers are in technical or associate professional jobs and a further 181 thousand are in skilled trades. These workers, whilst having reasonably high skill levels, are more likely to have technical qualifications than a university degree.

Table 8 shows the breakdown by industrial sector. As might be expected, the largest numbers of eWorkers are to be found in the business and financial services sector. This applies across all types of eWork except for occasional eWork, where the largest numbers are to be found in public administration, education and health. Together with the large number of eEnabled workers in this category, this reflects the practices of allowing informal occasional home-based working common in many local and national government organizations in the UK, as well as the long tradition of working from home amongst teachers and academic researchers for course preparation, report-writing and other activities requiring freedom from distraction.

There are also significant numbers of eWorkers, mainly mobile eWorkers, in the manufacturing and construction sectors. This is consistent with the masculine bias and the bias towards technical and skilled trades occupations in this group of eWorkers.

Table 8: eWork In the UK In 2002 by sector							
	<i>Telehome-workers</i>	<i>Mobile eWorkers</i>	<i>Occasional eWorkers</i>	<i>All eWorkers</i>	<i>eEnabled Workers</i>	<i>Other workers</i>	<i>All</i>
Agriculture & fishing	3744	20230	4200	28174	10584	334492	373250
Energy & water	3901	8289	7683	19873	1448	305567	326888
Manufacturing	39077	106419	71788	217284	18915	4177509	4413708
Construction	27150	145484	24492	197126	64714	1788708	2050548
Distribution, hotels, restaurants	50026	92707	49148	191881	37744	5279671	5509296
Transport & communication	17485	46572	28099	92156	15226	1901544	2008926
Banking, finance & insurance etc	160726	253774	152464	566964	48834	3918553	4534351
Public admin, education, health	44730	65975	201328	312033	125673	6892884	7330990
Other services	47008	84322	22383	153713	32245	1450354	1636312
Workplace outside UK	412			412		5911	6323
total	394259	823772	561585	1779616	355383	26055193	8190192

Source: Office of National Statistics, Labour Force Survey, Spring, 2002, analysis by the Institute for Employment Studies

Our final table looks at disability and eWork. Being able to work from home is often seen as making a positive contribution to opening up labour market participation for disabled people and these statistics provide a useful way of monitoring progress towards the goal of integration. In the UK, there are two ways of defining disability in the Labour Force Survey. The first refers to people who fall within the definition of disability laid down by the Disability Discrimination Act (DDA) whilst the second refers to people who have a condition which limits their ability to work, referred to as a 'work-limiting disability'. In Table 9, people who fall under both of these categories are shown in the first row, whilst people who are considered disabled under only one of the two definitions are listed separately in the second and third rows.

As can be seen, disabled people form approximately one in eight (just under 12 and a half per cent) of all those in employment in the UK. The proportion of disabled people amongst eWorkers, at thirteen

and a half per cent, is indeed slightly higher, but not dramatically so. What is perhaps most surprising is that the highest levels of disability are not found amongst the telehomeworkers, as one might expect, but amongst the mobile eWorkers, where it reaches a peak of fourteen per cent.

Table 9: eWork In the UK In 2002 by disability

	<i>Telehome- workers</i>	<i>Mobile eWorkers</i>	<i>Occasional eWorkers</i>	<i>All eWorkers</i>	<i>eEnabled Workers</i>	<i>Other workers</i>	<i>All</i>
D/DA disabled & worklim. disabled	25773	48591	26428	100792	18251	1250567	1369610
D/DA disabled only	15322	31110	23898	70330	17235	1169783	1257348
Worklimiting disabled only	10140	36202	23318	69660	13000	792171	874831
Not disabled	343430	707869	487941	1539240	306897	22859209	24705346
Total	394665	823772	561585	1780022	355383	26071730	28207135
Disabled as % of total	12.98	14.07	13.11	13.53	13.64	12.32	12.41

Source: Office of National Statistics, Labour Force Survey, Spring, 2002, analysis by the Institute for Employment Studies

This brief snapshot illustrates some of the extra analysis which is made possible by the addition of a couple of short questions to a standard labour force survey. It is of course also possible to correlate these results with other variables of interest to policy-makers, such as weekend or evening working, ethnicity or the nature of the journey to work. Labour force surveys reflect national interests and priorities and not all these variables are available in all EU countries.

Nevertheless, thanks in part to the work of the STILE project, they illustrate a potential which, hopefully, will soon be available to policymakers right across the EU

Note

This section was written by Ursula Huws with the assistance of Peter Bates. Both are based at the Institute for Employment Studies (IES) where Huws is an Associate Fellow and Bates is a Research Fellow.

Contact & Information

*Ursula Huws
Analytica
Tel: +44 20 72 26 84 11
Analytica@dia1.pipex.com*

*IES: www.employment-studies.co.uk
STILE project: www.stile.be*

B - Other Countries

3.1 Estonia

Background

Attitudes favouring innovative thinking and entrepreneurship have helped Estonia in a short time to catch up with developed countries in the use of ICT in society. These factors combined with general economic growth and macroeconomic stability have created a favourable basis for further progress in this field. An important role in this progress has been played by the free market conditions as the telecommunications sector has been completely liberalised in Estonia since January 2001, when the special monopoly rights of the Estonian Telephone Company ended.

Internet

In April 2003, there were already 48 000 ADSL Internet connections in Estonia (3.5 lines per 100 people) which is twice as much as a year ago. In addition to ADSL, wireless connections such as WDSL or RDSL are available to rural districts, and mobile phone users have GPRS Internet access throughout most of the country. Internet banking has become a common trend in Estonia with almost half of Estonians doing their everyday banking via Internet. Access to various information and bank services through mobile phones using Wireless Application Protocol is in use as well. There are already about 500 Public Internet Access Points in Estonia which means a rise of more than two times compared with the previous year, and incomes can be declared to the Tax Board via Internet.

Telecottages

In Estonian rural life telecottages are one of the key factors on the road to the sustainable information society. Telecottages in Estonia are affiliated to the Estonian Association of Rural Telecottages, including more than 50 telecottages. This grassroots organization, working among small communities and regions, links the most remote villages and towns to provide local information. Most rural telecottages belong to local citizens and societies and offer Internet access at a speed of about 10 Kbps. Regarding sustainable development issues, rural telecottages provide access to territorial planning information and to basic data for environmental impact assessment. Some 20% of Estonian telecottages host local area networks and are used for training and data exchange purposes with up to 30% of them equipped with multimedia terminals.

E-Government and E-Society

An Internet portal *Estonian State Web Centre* has been established, containing links to all government institutions' websites, and every citizen has access to the majority of official documents there.

The current Election Law has been complemented with an e-voting option for the year 2005 municipal election and the following ones, provided that all crucial technical issues would be solved by that time.

Since January 2002, the Citizenship and Migration Board has been issuing a new primary domestic ID card. In addition to many advanced security features, the card has a machine-readable code and a microchip containing the visual data on the card and two security certificates, to verify the individual and supply digital signatures.

Information Policy

With its policies and innovative initiatives the Estonian Government is helping companies make the information technology sector one of the most progressive in the country. The Principles of Estonian Information Policy, approved by the Parliament in May 1998, serve as a basis for an action plan for developing Estonia into an information society. The information policy priorities for 2003 are:

- the development of services for citizens, the business sector and public administration, and especially the elaboration of ID-card applications;
- better provision of schools with computers to achieve the ultimate goal of one computer shared by 20 students;
- the Tiger University programme to support the development of ICT infrastructure for the academic staff and post-graduate training.

The main ICT target programmes and joint projects financed from the latest State budgets:

- *EEBone* - the trunk network for public institutions, launched in 1998, has reached its planned volume and is growing with the number of connected government institutions more than 850. All the connected institutions enjoy at least 2 Mbps connections with ministries and other bigger governmental institutions linked at 100Mbps.
- *Estonian language technology target programme* – a national project for electronic dictionaries, thesauruses, speller programs, intermediate products for final products, such as morphological analyser, disambiguator, synthesiser, syntax analyser, etc.
- *eCitizen* - a nation-wide project for developing the co-operation between Estonian citizens and the public sector through the Internet, targeted for establishing that all state and local government agencies should provide services through the Internet by 2004.

Contact & Information

Tõnu Lausmaa
Re-En Center TAASEN
Tel/Fax : +3726 726 690
tonu.lausmaa@mail.ee

Estonian relevant websites:

www.riik.ee/en/ - the Estonian State Web Centre with all the official information about Estonia
www.ciesin.ee/ESTONIA/ - Estonia-Wide Web portal, providing an access to all relevant Estonian websites.

3.2 India

Overview of Indian Economy

India is the seventh largest and second most populous country (Population - 1 027 015 247 according to 2001 census) in the world. According to the 2001 census, the literacy rate has gone up from 51.63% in 1991 to 65.38% in 2001, with 75.96% males and 54.28% females being literate. After an economic slowdown due to world events in 2001-2002, the Indian economy recovered again in the year under review. The growth performance of industrial as well as services sector showed significant improvement from 3.3 per cent to 6.1 per cent, and from 6.8 per cent to 7.1 per cent, respectively, between 2001-02 and 2002-03. The growth recovery was accompanied by continued macroeconomic stability in terms of low inflation (2.6 % in January 2003), orderly currency market conditions and comfortable reserves. India is moving towards macro-economic stability through the pursuit of a suitable combination of fiscal and monetary policies. The fiscal deficit, as a proportion of GDP, has gone up from 9.5 per cent in 1999-2000 to 10.0 per cent in 2001-02 for the general government.

Organized sector employment has witnessed some positive trend in the private sector, which, in the current state of buoyancy of the industrial sector, should further accelerate if some of the rigidities in the labour laws are removed. The Industrial Disputes Act, 1947, Contract Labour Act, 1970, and Payment of Wages Act, 1936, are some of the legislative instruments that the government is considering for amendment.⁷⁶

Key factors affecting eWork in India

eWork in India has spread over the last few years in the form of outsourced business processes coming to the country. Recognising India's potential to act as a destination for work outsourced from the developed countries, the Indian government has kept information technology as one of its top five priorities.

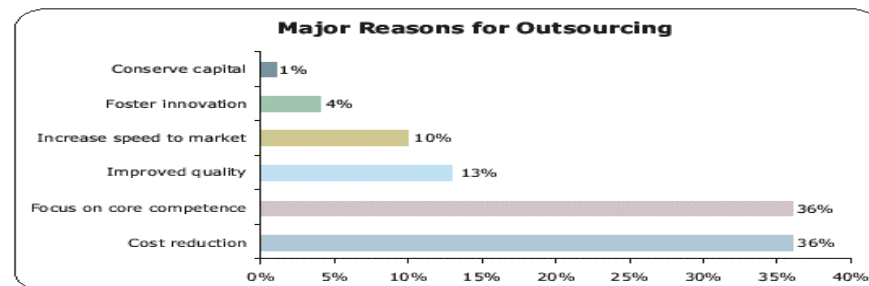
Quality attracts outsourced business

Two major factors that are India's strengths in attracting outsourced business processes include linguistic skills (English-language) and lower costs. India continues to be the lowest-price source, with its person-hour rates being far lower than those commanded by countries producing quality work. Moreover, more Indian companies have a CMM-SEI 5 rating (for the highest quality software) than any country including the US.⁷⁷ As a result of quality output over the last few years, Indians are now beginning to get more value-added jobs requiring more specialised skills. For instance, accountants at Ernst and Young's India office now case US tax returns for the firms' American clients. Indians process claims for major US insurance companies, radiologists interpret CT scans for Massachusetts General Hospital and molecular biologists conduct research for pharmaceuticals.

Technology and the right infrastructure has driven this growth in the last year. The IT revolution, and the vibrant IT industry in the country, have been critical factors in making information available about state of the art technology and in bridging the technological divide in some sectors. With quantitative restrictions on imports a thing of the past, customs duties progressively coming down, and foreign investment - both direct and portfolio - liberalized, integration of India into the global economy is also fast progressing. Buoyant export performance, a surplus in the current account, and the strong balance of payments position demonstrate the success of the country in this integration process.

⁷⁶ *Economic Survey, 2003, Ministry of Finance, Government of India.*

⁷⁷ *The Sunday Times, Special Report, July 8, 2003.*



Source: www.nasscom.org/newsline/lites_update.asp

The Indian government is aware that benchmarking to the best international practices will need an enabling environment and will need to be facilitated by three factors: appropriate social and physical infrastructure, a suitable regulatory framework and an efficient tax system, and macro-economic stability. The Government of India and various state governments have started taking the ITeS (IT Enabled Services) industry very seriously. National Association of Software and Services Companies (NASSCOM) has been working with the government to formulate new policies which are in favor of the ITeS industry. To promote India as a major destination for the ITeS sector, the government is also considering a proposal to set up an "India Brand Marketing" fund. The fund will be utilised to de-commodity the industry and promote the country as a preferred destination for the ITeS sector. The government is also planning to create infrastructure for the ITeS sector in various parts of the country. Efforts are also being made to delimit the growth of ITeS from big cities. At the same time, rapid growth of mobile telephony is rapidly raising teledensity. The number of phone lines per 100 person has improved rapidly from 3.6 in March 2001 to 4.9 in December 2002.⁷⁸ Price competition between two technologies, namely Global System for Mobile (GSM) and Code Division Multiple Access (CDMA), has yielded price benefits to the ITeS.

A major boost to e-Work has come through recent policy amendments by the Government of India. Under a recent arrangement, ITeS companies have been permitted to share bandwidth on a time-sharing mode. This new provision will enable firms to use the same bandwidth to cater to the requirements of Indian and international customers—a facility which wasn't allowed earlier.

Development of eWork

The ITeS industry in India came into its own in the mid-90s with various global majors locating their back-office processing centers here. In order to continue to compete effectively in the global market, the Indian ITeS industry is now re-assessing and re-positioning itself as a high-end service provider. Though the organizational environment has not yet matured enough to introduce telecommuting as a work form in India, e-work is expanding in volumes as well as quality in the form of IT-enabled services. The key outsourcing trend until recently had been focused around on-site delivery. However the off-shore model of doing business is gaining popularity. This development is due to the improved telecom infrastructure, the expansion of the Internet and the gradual emergence of off-shore destinations such as India in the Asia Pacific region. Emergence of BPO players as process specialists—such as HR vendors— or as industry specialists (those offering solutions for a set of industries such as financial services, healthcare etc.), is another significant trend in e-Work development in India.

Growth in India's software and services exports dipped to 26.3 per cent in 2002-03, against 29 per cent the year before. A very large part of these exports is attributed to the fledgling IT Enabled Services (ITeS) sector, which is commonly called Business Process Outsourcing (BPO). The number of employees in ITeS grew from 106.5 thousand in 2001-02 to 171.1 thousand in 2002-03. The revenue increased from \$1475 million in 2001-02 to \$2375 million in 2002-03.⁷⁹ The US and the UK contribute 59 percent and 22 percent respectively to India's ITeS-BPO exports. India has around

⁷⁸ Economic Survey, 2003, Ministry of Finance, Government of India.

⁷⁹ National Association of Software and Services Companies (NASSCOM) is the driving force behind promotion of eWork in India

10,000 call centers and expects 100,000 higher end jobs in the coming years. A study done by Global Management Consulting firm AT Kearney ranked India as the best country overall for offshore business processing, followed by Canada, Brazil, Mexico, the Philippines, Hungary etc. The destinations had been chosen on the basis of political and economic stability, infrastructure availability and people availability.

eWork Legislative Development

The background to legislative development in e-work was set up in the Long-Term National IT Policy prepared in the year 2000, which discussed the strategic policies for the IT industry, IT Research, Design and Development, IT Human Resource Development, Citizen-IT Interface, Content Creation and Content Industry, Micro Electronics, Mission mode creation of Fibre-optic infrastructure, financing the IT sector and organizational structure.⁸⁰. The policy focused on delicensing and deregulating the IT industry while emphasising ISCO-9000/SEI Level 5 or equivalent standards for Indian software services and products exports. In the subsequent years, various Indian states, mainly Karnataka, Andhra Pradesh, Tamil Nadu and Kerala have released their regulatory frameworks to ensure growth of the IT enabled Services (ITeS) in these states.

The Government of India has forged a partnership with Confederation of Indian Industry (CII) and National Association of Software and Services Companies (NASSCOM), Federation of Indian Chambers of Commerce and Industry (FICCI) for creating a conducive regulatory environment. In the process they are actively facilitating improvements in critical infrastructure such as telecom, power, property and banking services.

The President of NASSCOM Kiran Kamik feels that e-governance could well be the panacea for India's sluggish domestic ICT sector. Once the government begins building IT infrastructure to implement e - governance initiatives that empower its citizens, the domestic ICT industry is likely to receive a major impetus. There are many reasons why the e-governance market is expected to become a hot bed of activity for the ICT industry in the future. The key among them is the fact that the Government and its agencies continue to be the largest service providers in the country. As the need to make its services more cost competitive and efficient intensifies, the Government is likely to turn to IT for its day-to-day solutions.

E-governance, which was once a subset of the IT Task Force's list of activities, accounting for a near 5-6 of a total of 108 recommendations, has moved on to become the primary agenda. Approximately 19 Indian states (including Andhra Pradesh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra and Tamil Nadu), and Government agencies have created e-governance blueprints and begun implementing projects that aim to delight their customers. Most state governments have established separate departments of Information Technology and announced Information Technology policies.

Contact & Information

*Shiri Ahuja, Vivek Dalela
Assistant Professors
Institute for Integrated Learning in Management
Lodhi Institutional Area, Lodhi Road,
New Delhi, India 110003*

*Phone: + 91 11 24647820/21
shiri1@vsnl.com, vdalela@iilm.edu
www.iilm.edu*

⁸⁰ it-taskforce.nic.in/vsit-taskforce/actplan3/

3.3 Japan

The general economic climate remains grim in Japan although last year saw a small improvement in company profitability as well as plant and investment. Unemployment, however, remains at a high level. Accordingly, the Ministry of Health, Labour and Welfare (MHLW) has made the promotion of flexible work styles and skill development two of its top policy priorities. Elsewhere on the policy front, a worrying issue which emerged last year was that of unpaid overtime work. Several major companies, as well as public bodies, were fined for overtime pay infringements. While not directly linked to e-work, a raised awareness of work hours and the financial costs involved may add impetus to the promotion of telework and other flexible work arrangements.

According to Wendy Spinks⁸¹, a major new set of populations statistics were published in March 2003 based on November 2002 survey data. Led by the Ministry of Land, Infrastructure and Transport, four ministries have been involved in major research on e-work in Japan, the population survey being a major component thereof. Not only do the results show a considerable level of e-work in Japan, for the first time ever the self-employed e-work sector has been captured making a valuable contribution to current e-work knowledge. Nevertheless, it is quite clear that the incidence of regular e-work is relatively low vis-à-vis many EC countries.

Major results of the survey are

- A total of 4.08 million Japanese workers e-work at least 8 hours per week (6.1% of the total workforce), while a further 6.34 million workers e-work less than 8 hours per week (9.5% of the total workforce)
- 3.11 million salaried workers e-work at least 8 hours per week (5.7% of the salaried workforce), while 4.43 million salaried workers e-work less than 8 hours per week (8.0% of the salaried workforce)
- 0.97 million self-employed e-work at least 8 hours per week (8.2% of the self-employed workforce), while 1.91 million self-employed e-work less than 8 hours per week (8.2% of the self-employed workforce)
- On a regional basis, the three large urban areas of Greater Tokyo, Greater Osaka and Greater Nagoya show almost twice the level of e-work as regional cities
- Male e-workers outnumber female teleworkers in a ratio of 7:3
- Only less than 30% of salaried e-workers say their employer has a formal e-work program

Main developments in Japanese e-working over the last year include:

- The Japan SOHO Association (www.j-soho.or.jp/ (in Japanese)) continues to act as an important lobby for SOHO interests. Recent plans/activities include the establishment of a "Skills Bank" and joining forces with Diet members in a campaign against misleading outsourcing practices.
- The Japan Telework Society (www.telework-gakkai.jp/) continues to play a key role in disseminating academic research, publishing a second volume of its journal in March 2003. Its fifth research conference will be held in early July with some 30 papers to be presented.
- While very little momentum has been witnessed in the field of corporate e-work programs, developments related to independent SOHO operators maintain a steady flow. In addition to Shizuoka and Fukuoka Prefectures, which remain at the forefront of sustained public SOHO support, Hiroshima City set up a SOHO facility in April, as did neighbouring Yamaguchi Prefecture and Shiga Prefecture, which borders on Kyoto. Elsewhere, Saitama Prefecture ran a 10-part seminar on starting up SOHO businesses, while Tokushima Prefecture on the island of Shikoku introduced a subsidy program for SOHO businesses relocating to the prefecture.
- In the private sector, Hokuriku SOHO operators have set up their own job directory site and office-equipment leaser, Koushin, has started offering a free web page design service for SMEs and SOHOs. NEC has added a SOHO corner to its online shop "121@store" that offers leasing arrangements as well as a COD settlement service.

Contact & Information

Wendy Spinks
Dept. of Management Science,

Tokyo University of Science
spinks@ms.kagu.tus.ac.jp

⁸¹ Tokyo University of Science, Chair, Japan Telework Society. spinks@ms.kagu.tus.ac.jp

4. NEW RESEARCH RESULTS

4.1 INTRODUCTION

"New working environments" embraces high level IST RTD and contributes to policy developments in new working environments designs and organization of work in the networked knowledge-based economy, incorporating innovative ICT. The aim is to facilitate creativity and collaboration, and to foster resource-use efficiency, value-creation and extended work opportunities for all in various settings.

The focus is on the areas of: eProfessions and individually driven working, new workplace designs, knowledge management in media-rich working environments, including mobility and multimodality, collaborative work and organizations, ambient organizations and new organization of work. Technical directions include the use of grid technologies in new work environments and organizations, targeting towards integrated applications and platforms.

The major domains of research and development within New Working Environments are described as:

eProfessions and eindividual in work

- Research focuses on the new ICT supported roles of e-workers (such as skilled and unskilled workers, managers, technicians, engineers), e-professionals and knowledge workers, aiming at wide participation of all to the e-economy

Collaborative eWork and work organization

- Research focuses on organising and managing collaborative working environments, supporting knowledge work and decisions making. The work covers organizational change management, competencies and capacity sharing and new technology introduction to work environments leading to new organization of work, including issues such as distance management, use of common virtual workspaces etc. Communities of practice, centerless work organization, disappearing organizations (e.g. peer-to-peer) in GRID environment and dynamics of cybercommunities are also dealt with in this area.

Knowledge and capability management

- The research focuses on acquisition, sharing and retaining of knowledge and capabilities in multimodal and media rich mobile working (e.g. engineering) environments, and networking of competencies to enhance the value of collaborative workspaces and multidisciplinary work.

New work spaces

- The research focuses on continuous, extended and mobile work environments for individuals and groups in dynamic networked environments, incorporating innovative technologies, such as natural multimodal interfaces, simulation, visualisation, virtual reality and wearable computing to open, interoperable application platforms and protocols enabling end-to-end seamless mobility. This area covers also research in trust and security when sharing the workspace and protection of privacy in working environments.

New organization and methods of work in sectorial and regional settings

- The research work focuses on development, integration and demonstration of individually driven work environments, work organization and methods in an integrated and innovative way, structured around either sectorial or multiregional clusters. The work develops and verifies new work concepts in given settings. Examples of this work could be found in organization of the work around extended products and services covering their entire life cycle.

Sustainable development and corporate social responsibility

- The work focuses on the changing roles of work communities in society, the socio-economic and legal aspects of the change and also supports policy work in the area. Intangible investments in ICT, human capital, employees and workplace and the organization of work is part of the research under this priority area. The work has a strong policy component.

The remainder of this section highlights results emerging from current IST FP 5 projects working in these domains.

4.2 PROJECT RESULTS – ePROFESSIONS & eINDIVIDUAL IN WORK

4.2.1 The impact of ICTs on work – lessons learnt from current good practices (Best eEurope Practices - Beep)

Current practices have much to teach us on the evolution and prospects of work and skills in the Information Society. The Beep project, which was completed in June 2003, developed an on-line knowledgebase where interested stakeholders can view current good practices and use them as an inspiration to optimise their work. Though the impact of ICTs (*Information Communication Technologies*) on work is extremely varied in its nature, four core themes emerge with particular vigour, i.e. the effect of ICTs on information exchange and knowledge management within the organization, the need for a new kind of skills ('digital skills'), the use of ICTs to improve skills other than digital ones, and the new horizons of flexibility. This paper highlights key lessons on eWork learnt from these good practices.

Knowledge Management

An interesting development of today's organizations is the implementation and development of a corporate Intranet, which is regarded as a common feature in knowledge management initiatives. Current debates focus on best practices in dealing with information and the pros and cons of sharing it with others. For a variety of reasons, ranging from time constraints to uncertainty on how provided information might be used, not all employees are willing to share their knowledge, although benefits clearly do arise by doing so. The Texas Instrument Office of Best Practices, for example, saved over € 1 billion thanks to knowledge exchange implemented through a network of 140 best practices sharing facilitators worldwide⁸². Moreover, the effectiveness of knowledge exchange involves organizational changes. In fact, knowledge management is an organizational approach that is not easily implemented. On the one hand, knowledge-sharing activities depend on the voluntary participation of employees. Therefore, management should be sensitive to the knowledge activities that are already prevalent within the company and seek means to support them. On the other hand, management needs to implement some organizational change in order to change the corporate culture. Employees can have all sorts of reasons for not co-operating and employers who see benefit in Knowledge Management have a hard time changing the corporate culture accordingly. Some of the workers' objections are practical, relating for example to an imminent deadline. Other objections may be consequence of employees' will to keep their own knowledge from potential competitors. A knowledge sharing culture can only find fertile ground if top-management supports it, showing benefits and rewards to those who do. Despite all positive evidence, cases also reveal the risk of repeating flaws. Knowledge has the inherent characteristic of changing constantly as new experiences refute old ideas. But not every good new idea will work everywhere. Corporate surveys, such as those performed by KPMG, British Telecom, Shell and Philips are a good way to estimate the benefits. Knowledge management cannot be just another project on the side; it requires structural changes in the policy of the company.

Information Society Skills

Clearly, if the potentialities of new technologies are to be exploited, the workforce needs to be properly equipped to work with them. That is, skill development is a key ingredient in the achievement of greater productivity and workforce employability. Digital skills encompass a broad domain of competencies, ranging from technical to social and from coping with information flows to organising work. Naturally, any definition of digital skills depends on the context of use and becomes obsolete in time, since the effect of ICTs in the workplace will change. 'Information Society skills' can be defined on a five-level scale⁸³ and, thanks to the empirical support provided by the knowledgebase, Beep

⁸² see Beep D. 8.1, domain 'Work and Skills', Chapter on Knowledge Management.

⁸³ These are (1) getting access: one cannot get digital skills without having access to a computer or the Internet; (2) basic digital literacy: practical knowledge on how to operate a computer and use the Internet, i.e. knowing which buttons to push; (3) information skills: using ICT in a way that one is enabled to cope with large quantities of information, process it, create useful

suggests the preferable ways to reach each level. For example: 'PC-for-free projects' are a good way to give employees access to ICT; learning by doing seems to be the most effective method to attain basic digital literacy and information skills, while communication skills- more social by definition- are not easily taught and perhaps also require a kind of personality: the 'networker'; instead, formal training is a feasible approach towards learning how to perform specific job-related tasks through ICTs.

E-learning employees

Once digital skills are acquired, it is possible to gain new skills and competencies through the use of ICTs and far from the traditional classroom (e-Learning). Here, too, much can be learnt from good practice. Although e-Learning has a positive impact on cost reduction (for example by decreasing travelling and teaching costs) this ought not to be its primary goal; rather, projects show all sorts of unanticipated tasks, which overburden the teachers, as well as the programme organizers. Second, e-Learning really has pedagogical advantages if technological abilities for interaction are sufficiently exploited. Group communication (as implemented at Siemens) and on-line role-playing (such as in the cases 'First Union' and 'Genuity') are powerful means to appeal to workers with customised learning trajectories that both supply a more realistic context as well as engaging activities. Third, network performance is critical to the success of an e-Learning program. Logically, multi media interaction requires high bandwidth, but large numbers of users too. Also, accessibility of the network can obstruct effective learning, as websites could be all too well protected, urging new users to by-pass valuable applications. Finally, a training program can't be entirely on-line: in any case, human contact is vital. Depending on the kind of skills or knowledge that needs to be acquired, a good mix needs to be found - if it were only to explain the program or build trust in its abilities.

The flexible office

The introduction of ICTs in offices, and the development of the proper skills enabling workers to use them, increases the possibility for flexible working arrangements, such as tele- or mobile work. Empirical findings and relevant literature suggest common advantages in terms of job satisfaction and productivity - a win-win situation where both employers and employees are satisfied. Yet, the question remains as to what the optimal conditions for the creation of a flexible organization are; to what extent we can grasp these conditions and can manage them to our advantage; and where the boundaries of flexibility should lie. There clearly seem to be three sets of conditions, which can be found amongst the cases available on the Beep knowledgebase, and can be defined as cultural, physical and economic.

Cultural aspects involve mentality changes by the three key players: first, the management, who should offer flexibility as an opportunity and should move to an approach where motivation and accomplishments as opposed to time are the crucial elements in assessing his/her employees; second, workers, who should share a common belief in the value of flexible work arrangements and should, consequently, avoid suspicions on the amount of work actually completed by e-working colleagues; finally, the political environment, which ought to be supportive if the flexible organization is to function.

Physical aspects entail the presence of ICTs as well as the actual working space. It is generally recognised that, for the sake of effective flexible work, the location where tasks are performed (home, telecentre or a flexible office) needs to be properly equipped with the necessary ICTs and connections. Ideally, the distant worker should not notice the difference from office-based activities and the employer should expect an output at least equal to that of traditional work. Only in this case both parties involved can deem flexibility an added value, rather than a burden. Hence, training and technology support is key to an efficient use of ICTs; issues on security and deployment of ICT tools also need to be addressed to avoid possible misuse (or even abuse) by the employee. In some cases

work-related knowledge and store it. For example, finding work related info on the Internet or developing a database; (4) communication skills: building networks through sharing knowledge and information with colleagues and clients. This means knowing when a multi media presentation is appropriate or just e-mail will do, or how online communities can be nurtured; (5) ICT employability: mastering ICT in a way one can employ the tools to carry out tasks specific for ones job. At this level, one should know what kinds of digital skills are needed to perform a certain job and how these should be acquired.

the appropriateness of the workers' physical environment was assured through an income-based selection of prospective emigrants, in other cases the organization itself provided a telecentre with the necessary amenities (for example child care facilities).

Last, flexibility must lead to *economic performance improvements*. The greater the profitability of new ways of working, the stronger the incentive is to adopt them. A number of examples confirm that wherever flexible arrangements were successful, the company gained from it economically. However, there is no sustainable productivity gain unless it goes hand in hand with increased job satisfaction. A cost-benefit assessment is a first step when introducing increased flexibility.

Contact & Information

Leon Cremonini
RAND Europe
Newtonweg 1
2333 CP Leiden (NL)
Tel. +31 71 524 5151
Fax. +31 71 524 5191
leon@rand.org
www.randeurope.org
www.beep-eu.org

4.2.2 Social impacts of home based eWork - DEESD project



Our workplaces have become one of the most important sources of social capital. It's a place for mutual support, membership and meaning. At the same time pressure, stress and long hours are taking time and energy away from our social and family lives. In other words the workplace plays a twofold social capital role – nurturing it in some ways, draining it in others.

Working from home can be used to alleviate the draining side of work and nurture its rewarding aspects. But homebased eWork⁸⁴ is by no means a magic wand that can be waved over overworked knowledge workers to make them work harder or call centre employees to save office space.

With more women working full time and more households having two working parents, balancing family and work commitments is a growing challenge for employees and employers alike. A better work/family balance is one of the most important reasons for choosing to ework. Working from home at least part of the week enables parents to fit work around family commitments, such as taking children to school or being at home when children return from school. This does not necessarily mean that eworkers spend more time with their families, rather they enjoy greater flexibility to choose when to spend time with their families.

Spending more time at home seems to allow eworkers to be more active not only in family life but also in their wider social networks and local community. A consultant eworking two days a week reports that working from home allows him to plan his evenings better, and that he is more inclined to do something social when he hasn't been stuck in traffic for one or two hours.

This increased involvement in the local community can substitute for limited face-to-face interaction when working from home. However the implications for community involvement do not seem to be that significant yet. Individual and family dilemmas seem to be more pressing for most people than their lack of community involvement, and it is the personal and family level that benefits most from more hours at home.

This is hardly surprising because changes in the structure of local communities happen over time. The role and structure of communities have changed throughout history and gone through different phases closely connected to trends in working life, family structures, residential patterns and public institutions (urbanisation, suburbanisation, the welfare state, extended families, single or double income families and single or double parent families). These structural changes have been incremental. If we are at the beginning of a rebirth of local community brought about by new working patterns, the full extent of this change will only emerge over time.

Working from home

On average, people working from home tend to work longer hours than their colleagues in the office, but interestingly enough they generally report improvements in their quality of life, despite working longer hours. This seems paradoxical, as working long hours is usually associated with stress, domestic tension and other factors that reduce quality of life. Some explanations for this are saving time and eliminating the stress of commuting, the possibility of fitting domestic tasks into lunch breaks, greater autonomy and control over time, and being more productive at work. The last factor seems particularly relevant since people who chose to sometimes work from home are in general highly motivated and keen to improve their productivity. It is a chicken-and-egg question of whether eworking improves performance or whether high achievers are more likely to want (and get permission) to work from home. But there is definitely a correlation between the two.

⁸⁴ Home-based eWork is defined as people working from home at least one day a week facilitated by ICT

Paradoxically, even though it has been shown that e-work on average has a positive influence on employees' performance, fear of less productive workers is still one of the biggest barriers for managers. The "Out of sight - out of mind"- thinking seems to be very difficult to shake off - for managers and employees. A mental shift to focus on outcomes and not hours in the office is needed. One employee we interviewed said: "I still get embarrassed if I take a work phone call while shopping in the supermarket, and I maybe try to hide where I am. But why should I be embarrassed if I don't reach my targets. I'm still learning this."

Corporate social capital and e-work

There is growing awareness that informal social interaction is not only important for individual well being, but also key to corporate success. Many of the most successful ideas are not the outcomes of scheduled meetings, but brainwaves over a coffee or an after-work drink. Much of the knowledge held within a company cannot be written down and transferred as zeros and ones. It is tacit knowledge in the heads of company employees, passed on through daily contact. Remote working therefore poses a challenge to corporate social capital, as it can be difficult to maintain with less face to face contact.

Corporate social capital is a complex organic system that is constantly redefined and refined through small daily encounters with group members and the outside world. Regular face to face contact is key to maintaining corporate social capital. It appears that working at home one or two days a week does not seem to weaken social relationships between home based e-workers and colleagues. In fact, e-work can increase employee loyalty, as it is perceived as a sign of trust on the part of colleagues and managers.

Remote e-working is not an isolated phenomenon. The challenges faced by homeworkers, their colleagues and managers are broader challenges associated with work in the digital economy. The blurring of work and home of which homeworkers complain is increasingly a challenge for knowledge workers in general. Mobile technologies mean that we are always within reach, not only bringing work into the home but also into commuting time. No time is dead time anymore. We are moving away from nine to five, five days a week towards the 24/7 society. The challenge of building social capital in these changed realities of the knowledge economy is real.

Home based e-work is still in its infancy, particularly in Europe compared with the US. Homeworkers are still in the minority and many organizations are stuck in the industrial age model of an office-based workforce. As more people and organizations become familiar with e-work, norms of communication will develop and managerial resistance will decrease. Remote workers themselves find their own rhythm and balance between work and private life after some time. That can be a nine to five day with just work, a working day broken up to make time for childcare, the weekly working hours dispersed on four or some other arrangement. But if we want to maximise the social benefits of e-work for individuals, companies and communities, technological innovation needs to be accompanied by organizational innovation and a change in mind set that support the more flexible, mobile working patterns of the knowledge economy.

Further information

This section draws on a case study into the environmental and social impacts of e-work conducted by Forum for the Future and the Wuppertal Institute with the Global eSustainability Initiative. The case study was conducted as part of the Digital Europe project (DEESD).

Contact & Information

*Britt Jorgensen
Forum for the Future
19-23 Ironmonger Row
London EC1V 3QN
b.jorgensen@forumforthefuture.org.uk
For the full case study report, visit www.digital-eu.org*

4.2.3 Strategies of Inclusion: Gender & the Information Society: SIGIS project



There has been a long-standing concern that women have been excluded from the design, production and use of technology --and, by extension, from the information society. The SIGIS project starts from the premise that there may be important changes going on. Some recent theorists suggest that new ICTs offer new possibilities for women's inclusion, not least because of the potential flexibilities and communicational functions that they support. Moreover, the transformation of computers to multimedia and communication machines seems to make them more attractive to girls and women. Besides, there have been many public as well as private initiatives in the EU member states to include women more actively in the Information Society.

The SIGIS project addresses such inclusion initiatives and related processes. It seeks to examine the strategic features, to learn from relative successes, and to provide a knowledge base to support the development of new inclusion efforts. This is needed to support the development of 'Europe's way' to an information society for all. But it is also an important prerequisite for commercial success of many new ICT projects. Indeed, one of the SIGIS case studies found a significant concern, among top managers in some of the leading ICT corporations, that it is now increasingly difficult to develop/promote designs that only involve or attract "one half of the population".

SIGIS research has addressed issues directly related to eWork (broadly defined to include gender aspects of new 'flexible' modes of working, changing workplace/home relationships) associated with the production and use of new ICTs. But, clearly, the hesitant relationship between women and technology extends beyond eWork. Studies of design, intermediate and final use also help inform our understanding of the gender patterns that are being recreated in these new work practices and forms. Overall, the SIGIS project is conducting 48 case studies of initiatives in public, private and voluntary sector settings and user studies (based in 5 countries). In combination with reviews of prior literature and statistical data, SIGIS examines the range of initiatives impacting on gender imbalances in both the production and use of new ICTs.

Some Initial SIGIS Findings

The case studies stage of the SIGIS project is now nearing completion. While analysis is still ongoing here we indicate some of the emerging findings related to working practices, especially those related to the cluster of Private Sector cases. The SIGIS research on the changing patterns of work in the ICT production sector, and women's changing roles and status reveals a number of familiar as well as some interesting new developments:

- The findings from an online survey of Women in Technology International (WITI) suggest that women ICT workers continue to regard gender discrimination as stronger in the ICT sector than in other sectors. The many ways in which this was expressed showed that women are lacking a sense of difference at a number of levels. These include: identity (e.g. lacking ability to self promote); symbolic (e.g. perception of women's lack of commitment) and structural (e.g. inflexible working hours). However, while the latter structural factors were identified most forcibly as a source of discrimination, solutions were identified more at the symbolic and identity levels. In other words, while the women surveyed tended to highlight the impact of structural factors, they could not articulate a response at this level.
- In conceptualising solutions they tended to identify the changes they needed to make to fit in to a man's world. However, the online survey showed that many believed it was important to develop personal characteristics such as competitiveness, aggressiveness, and skills at politicking, in order to succeed in the sector. The women see the appropriation of skills traditionally defined as 'male' as a means of responding to their work environment. Lobbying for improvements in the work environment emerged as an important role for the women members of WITI, but overall there was an emphasis on women looking to themselves rather than external agents as the source of change.

- A study of Unfold, a UK based voluntary group that offers female digital designers a platform to showcase their work and share experiences of working in the field. Again, the persistence of old structures of gender inequality in the new media industries was revealed by this study. But so too was a fear that gender specific initiatives might ghettoise women. The ground-up, self help approach of Unfold was seen as key to promoting gender inclusion without creating gender essentialism.
- The number of formal and explicit gender inclusion strategies undertaken by the private sector in the five countries studied was relatively small, but the researchers identified a wide range of informal or implicit initiatives. Web-based applications seem to play an important role in terms of informal learning initiatives which facilitate women's use and engagement with new ICTs. For example, Web-based initiatives, such as online women's magazines, have played a role in familiarising and socialising increasing numbers of women into online activity. Some of our case studies have looked at formal e-magazine initiatives such as the Libelle abc computer forum, others have pointed to the more informal role played by chat rooms and discussion boards as a means of providing a 'safe' space where women can begin to experience electronic networking and interaction.

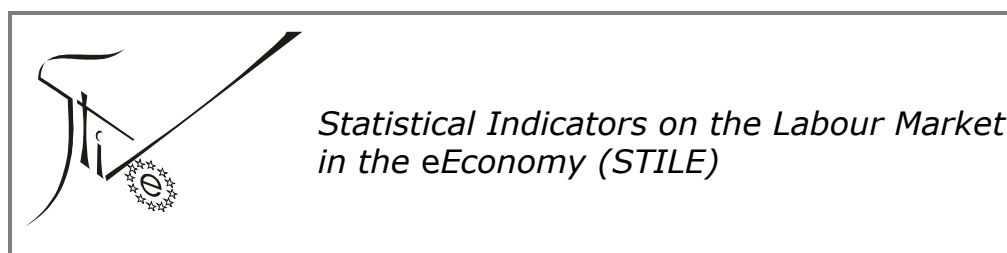
A number of these SIGIS case studies explore gender aspects of the design of new ICT-based artefacts such as mobiles and digital games. Some of the most relevant preliminary findings emerging from these cases for the present publication, include:

- Heightened awareness of economic rationale for greater gender inclusion both as a potential market and potential skills base. Indeed this may be linked to a more widespread and increasing shift towards arguments based on efficiency grounds (rather than equity considerations) related to gender inclusion.
- Awareness at key stage in production – many strategies entail redefining the product/action when producing for women rather than merely changing the marketing campaign
- One specific challenge and difficulty in high cost production sector – need to work with essentialist views of 'femaleness'
- One case study provides (tentative) indications of the positive potential of women-managed firms to significantly improve the employment status/role of female workers in the ICT services sector (Italian case)
- There is now a very widespread awareness of gender factors compared to findings reported in the past. For example, designers of ICT-based products now seem very familiar with gender discourse and concerns compared to the past. Yet, some cases indicate a persistence of 'Hviethodology' approach as the key design strategy, especially in smaller firms or project lacking significant funding
- Tentative indications of potential of smaller scale production facilities to design for a more differentiated audience.

Contact & Information

*Paschal Preston
 Director, COMTEC
 Professor, School of Communications
 Dublin City University
 Glasnevin, Dublin 9, IRELAND
 Tel: +353-1-700-5478
 Fax: + 353-1-700-7734
 Paschal.Preston@dcu.ie
 www.rcss.ed.ac.uk/sigis/*

4.2.4 STILE develops methods to measure eWork



1. Introduction

The STILE project⁸⁵, aims at contributing to the innovation of the statistical tools and indicators to monitor new working practices. The project is mainly targeting statistical bodies and research institutes involved in the production of labour market statistics and study via the organization of surveys. The project approach chosen is not one of developing new instruments or setting up new surveys. Rather, the consortium assesses the existing survey practices, in order to improve them by offering flexible and effective modules that can easily be 'piggybacked' onto the surveys. These modules concern both organization and employee surveys. This work is carried out with strong attention for and involvement of the target audiences at the national and European level in order to safeguard the effectiveness of the project's work.

In the first two project years, STILE developed indicators and pilot tested a new questionnaire module for measuring different forms of ICT-mediated distance work at employee level. Secondly, an interactive digital 'toolkit' has been developed, enabling researchers and statisticians to select the right indicators and questions for organization surveys, feasible to investigate the impact of ICT on organizations. In this article, we focus on the module developed to measure individual forms of eWork in existing Labour Force and General Population Surveys. For more information on the digital toolkit and the module developed for organization surveys, please visit the project's website www.stile.be.

Efficient and flexible tools

The survey module to measure eWork needs to meet different criteria. The first is the reconciliation of continuity and 'innovation' related to the changed reality in companies and at the work floor. The second criterion is efficiency: a module should offer ready-to-use solutions for existing surveys, still enabling to generate a considerable amount of new and relevant information by cross-tabulating generic data with new module-related data. The third criterion is flexibility: the use of indicators and questions should allow giving answers to various policy and/or research issues and questions. In addition, the European regional variety, for instance in the diffusion and use of ICT, needs to be monitored without hampering comparative analysis opportunities at an aggregated level.

Core indicators based on a 'derived' approach of eWork

A common approach is to ask a specific question along the lines of 'are you a teleworker?' This approach is problematic because respondents have to know what is meant by the term teleworker or eWorker and have to correctly identify themselves as one. A more effective way of measuring is defining eWorkers on the basis of the combination of three objective criteria. Careful analysis of the eWork literature shows that there are three dimensions to the phenomenon: work at a distance from the conventional workplace; use of information and communication technologies, and the intensity of

⁸⁵ *Statistics and Indicators on the Labour Market in the eEconomy*, approved as Accompanying Measure under FP5, IST and Eurostat.

the work carried out at a distance. All subsequent definitions involve different combinations of these three dimensions.

This method is very flexible. Each indicator can be translated into one or more core and additional questions, according to the level of detail one wants to obtain. Equally, 'nested' questions for one specific indicator can be added, allowing more detailed information without limiting comparative power at a more aggregate level. For example, the 'use of ICT' can be operationalised very basically or yield a huge variety of questions relating to different technical tools that distant workers use. This way, regional and/or longitudinal comparisons of the incidence of eWork can easily be obtained and at the same time specific detailed information at a more decentralized level remains possible.

The module is published in the project's report entitled *Working at a distance. How to know about it?*, and in the special edition of the *STILE Newsletter*, available on request

Filtering issues, additional indicators and impact measurement

A particular issue that the pilot test of the module revealed, is the best sequence of the questions in order to filter eWorkers. The most difficult filtering issue concerns the order of the ICT and location questions. One approach starts by identifying those who work at distance and then seeks to discover whether they use ICTs. The other approach identifies those who use ICTs and then asks whether they work using ICTs from locations other than their employer's main premises. The order of the questions will depend on the context of the questionnaire (other questions asked, target group, research question, etc.) to which the module is attached. The most suitable sequence of questions and the routing employed depends on the main purpose of the analysis. The pros and cons of the various routing options are covered in more detail in the STILE report, entitled *Recommendations for the introduction of an ad hoc module on telework in the Labour Force Survey*.

The project also prepared lists of additional indicators in order to construct a coherent module including all relevant aspects of eWork, such as: motivation and expectations to telework, tasks performed at a distance, formal arrangements and reversibility, impact on the quality of work and life, etc. Finally, the module gives an initial impetus to fill the gap in research on the impact of eWork on the workforce involved, because different impact indicators are tested, such as quality of work, work environment, health and safety issues etc.

Piggybacking on carrier surveys

The module is designed to be easily added onto a range of different questionnaires, in response to a variety of different research questions. Almost any employment-related GPS survey could be used to carry the model questions. Information and suggestions on carrier surveys are given in the report entitled *Recommendations for the introduction of an ad hoc module on telework in the Labour Force Survey*.

The module is conceived as a 'library' or 'toolkit' of dimensions and related indicators that can be used for customised combinations in a module that is suited to answer a specific research question and to be adapted to the specific carrier questionnaire. For instance, if a questionnaire on Internet usage is the carrier, then the indicator on ICT usage can be easily confined to Internet questions. The specific question wordings can easily be fine-tuned to the carrier questionnaire. The routing of the questions can be adapted to the routing of the basic questionnaire and to the filtering power the various indicators need to have.

This 'piggybacking strategy' is a flexible and powerful tool to obtain new data by cross-tabulating the answers with the generic data from the survey. In the STILE project, the Community Labour Force Surveys served as the most appropriate vehicle to test the module. This test, carried out in five countries, showed that the cross-tabulations with a huge variety of characteristics on the labour force obtained in this survey, allowed the generation of new information on eWork and the investigation of

the characteristics, similarities and differences of different types of eWorkers. To cite some examples: gender, age, educational level, professional status, and occupation, working time, atypical work. The results of the pilot tests are published in the STILE report entitled eWork module. Report on the national pilot tests.

As the STILE project has developed expertise in working with the module, interested parties are welcome to request a customised translation of the module for their own carrier survey.

Contact & Information

Monique Ramioul
Monique.Ramioul@hiva.kuleuven.ac.be
Higher Institute for Labour Studies (HIVA)
Catholic University of Leuven, Belgium &
Atrechtcollege, Naamsestraat 63,
B-3000 Leuven, Belgium
www.stile.be

4.2.5 The integration of handicap workers into knowledge society extends to Baltic States



THINK - Towards Handicap Integration Negotiating Knowledge - is a project that professionally integrated 300 disabled people, as eworkers, in five European countries, up to July 2002. Professional integration implies transfer of skills in different areas so that they become productive, lucrative and self-sufficient using information and communication technologies for ework. The THINK project is already a technological, organizational and social model, recognised in Europe as an innovative solution for disabled people.

The success achieved by the previous PORCIDE project with the integration of 20 disabled people from all over the country into services such as Help Desk, Programming, Webdesign, Creation of Templates and Audio Transcription, has given rise to further developments in THINK of an innovative socio-economic model and its take-up in another eight countries. There are 60 vacancies in Portugal, 60 in Spain, 60 in Italy, 40 in Greece, 20 in Scotland, 20 in Latvia, 20 in Lithuania and 20 in Estonia.

In a European perspective, the project intends to demonstrate and develop a model of social, organizational and technological dimensions that enables people with disabilities to work as a team across different countries.

The project aims to improve the quality of life of a population which has been discriminated against in the labour market. And since the future of Europe "in terms of innovation, growth, competitiveness and employment depends human resources development and information and communication technology",⁸⁶ THINK is a truly helping hand in a very competitive world, giving primacy to people with disabilities in a new area: ework, which becomes the instrument of socio-economic cohesion.

The project nurtures a virtual community, where eworkers and all project participants can exchange opinions and thoughts in a virtual space emerging from common experience. This infrastructure enables exchange and learning about individual and group experiences, and makes it possible to support both intra-company as well as inter-organizational working. THINK is a unique concept, which will help the disabled to be autonomous and self-sufficient, while contributing to better employment conditions and social inclusiveness. It is also an example of the power behind civil partnerships, how private companies can collaborate to help solve a public problem and profit from it. But in the end society as a whole will benefit.

THINK and THINK BALTIC are different. The earlier project focused on training unemployed or disabled in performing teleservices, not guaranteeing employment opportunities. However, THINK BALTIC has employment potential, linking the usage of the features of the Information Society with the social-professional integration of citizens suffering from a handicap. The ultimate expected result is to give disabled people real control over their lives and consequently the autonomy and independence to participate actively in society.

The main goal of THINK in the Baltic States is the integration in each country of 20 people with mobility handicap in the labour market using new working methods. This model is based on ework. Professional integration implies transfer of skills in different areas so that people become productive, lucrative and self-sufficient using.

⁸⁶ www.eun.org, Report of 26 June 1999.

The *THINK Baltic Extension* is a technological, organizational and social model with 5 stages:

- Selection of eworkers
- Interview process
- Training process
- Apprenticeship phase
- eWorker launching in labour market



At first a special on-line application form was created where people with handicaps can apply. In a short period and due to the effective project promotion, more than 170 application forms were registered in a data base of potential eworkers.

For the selection of eworkers, application forms, CV and motivation letters of people were analysed and all persons who applied were interviewed.

The interview process for each person had 4 main parts:

- discussion with potential eworker
- examination of their computer skills
- psychological testing
- examination of their language skills.

From the interview process, potential eworkers were selected to start training with behavioural training, computer training, eworker coordination trainings.



The main goal to be achieved during the apprenticeship period is that eworker's personal and professional competences are checked and special technical conditions needed for his/her future working place are determined. It is also important to determine whether the eworker will be able to perform the tasks foreseen for him/her, as well as to provide the eworker with knowledge needed for that particular task.

The methodology used for apprenticeship period is not the same in all three Baltic States and it can vary, since it is actually set out separately, while considering special features of every State, special needs of potential employers in every State and skills needed of potential employees.

Think Baltic Extension – www.think.lv - <http://think.w3.lt>

Contact & Information details

Project Manager in Latvia
Inga Bakane
Inga@openlatvia.lv
Phone: 371-7200133

Coordinators in Lithuania
Alvydas Juocevicius,
alvydas.juocvicius@think.w3.lt

Tomas Sinevicius
tomas.sinevicius@think.w3.lt
Phone: 370-5-2365170

4.2.6 WWW-ICT: bridging the gender gap in ICT professions

In Europe, there is a deep gender imbalance in ICT professions (which are only about 15% female) and, simultaneously, an unsatisfied demand for ICT professionals. This is an obstacle to the development of the knowledge economy and the achievement of social cohesion. Various factors can explain the gender imbalance in ICT professions: education and training, working and employment conditions, culture. The IST project WWW-ICT (Widening Women's Work in Information and Communication Technology, May 2002 – April 2004) uses two types of methodological tools to investigate these factors of imbalance: biographical interviews on women's professional and personal trajectories in ICT, and case studies of work organization in ICT-intensive firms. The research consortium includes Austrian, Belgian, British, French, Irish, Italian and Portuguese teams.

Imbalances in education and training

Although gendered statistical data are not always good enough to allow for European cross-country comparisons, some statements can be drawn up. Women are under-represented among ICT students and graduates. Imbalance worsened during last years, despite a diversification of options and diplomas. A similar imbalance is observed in vocational training and lifelong learning.

The challenge is to understand why computer science and the related disciplines remain so unattractive for women, despite the large diffusion of ICT in the whole society, and why the same statements are repeated for so many years. Our interviews confirm that the image of ICT professions among students is still made of stereotypes rather than based on a better knowledge of the professions. The fact that, nowadays, the computer and the Internet belong to the common environment of young boys and girls does not give them more desire for making a trade of it.

Our biographical interviews consider the influence of a series of factors which, taken separately, would undoubtedly not constitute a sufficient explanation, but which, together, produce convergent effects.

Informatics is still assimilated to technology, mathematics and physics, rather than management and communication. Effects of social reproduction, based on the occupations and professional choices of the parents or brothers and sisters, remain important. The technological domestic environment and the leisure uses of the computer and Internet interfere with the construction of a curriculum choice or a professional project. The image of ICT in the teenagers media (press and audio-visual), and in the way ICT-related characters are introduced as positive or negative heroes in the eyes of girls or boys, reflect too many stereotypes. Finally, there is an ongoing gender bias in marketing or advertising campaigns for products and services of the information society.

Working conditions that disadvantage women

The intensive rhythms of work, the overloaded schedules and frequent overlaps between professional life and private life, which often characterise the working conditions of ICT professionals, do not correspond to professional aspirations of most women and are not really compatible with the domestic and family loads that they still assume mainly.

In ICT occupations, working time and human means are complex to schedule and often unpredictable or underestimated, to the detriment of quality of work. Long working hours and self-intensification of work, associated with unpredictability of the working time, are discriminating factors towards women. Voluntary agreements of flexible e-work are too rare. On the labour market, one might suppose that ICT professionals have significant individual bargaining power, taking into account their expertise and the staff shortage. This is not the case for women. As long as there are so few women with children in ICT departments, there will be no pressure to change the organization of work and to make working time more flexible.

Professional careers favouring men

Careers of ICT professionals have differentiated effects on men and women. ICT companies want employees who are highly devoted to work, but simultaneously they weaken job security. As a consequence, the workers must manage by themselves their employability and career. The expressions "nomadic career" or "boundaryless career" illustrate these new forms of professional trajectory, in which work relation is based on the development of employability as a counterpart of performance and flexibility, whereas the traditional work relation exchanges job security against loyalty.

Are women favoured or disadvantaged by the extension of such nomadic careers? In some cases, nomadic careers present opportunities for women. Women could be more efficient than men to develop trust in work relations, and they have greater experience with discontinuity in work. On the other hand, a series of factors disadvantage women: geographical mobility; disruptions of career, which keep women far from the professional networks and erode their competences; time investment, which is necessary to assume self-training and to develop professional networks. Besides nomadic careers, women in classical professional trajectories are also concerned by the "glass ceiling", an expression often used to characterise the obstacles faced by women when they reach a certain level in their career.

Cultural factors that reinforce the male image of ICT

For a long time ICT has been associated with a male image, made of power, fighting strategies, capacity of control and domination, potential of destruction. This image is still alive, but nowadays, the stories about the Internet pioneers give space to another image: the "non conventional" ICT specialist, a mix of Einstein, Woodstock and Wall Street, out of generally accepted ideas, but always male. Both traditional and new images are largely unfamiliar to women. Images of ICT jobs are too caricatured and contribute to produce an ideology in which young, dynamic and connected men are the kings. These images should be seriously re-considered because they contribute to excluding all those who do not belong to these very restricted profiles.

Concluding comments on equal opportunities

Some recent tendencies can be favourable to an improvement of equal opportunities in ICT professions, but these opportunities must still be seized. New professions, related to web design, databases, digital graphic design, network management and e-commerce, appear less gendered than the traditional ICT professions. Consequently, it is important to implement work practices that make it possible to open these professions to more women.

Fighting the gender gap in ICT professions requires a serious effort in organizational patterns, particularly as regards working time management and availability and compatibility between private life and professional life is a key point (flexible agreements, alternate telework, etc.). Awareness of employers is important in order to break the vicious circle: skills shortage, but professional profiles generating exclusion.

Contact & Information

*Project coordinator: Fondation Travail-Université (Namur, Belgium)
Work & Technology Research Centre – Patricia Vendramin and Gérard Valenduc
pvendramin@compuserve.com
gvalenduc@compuserve.com
www.ftu-namur.org/www-ict (in English and French)*

4.3 PROJECT RESULTS - COLLABORATIVE eWORK & WORK ORGANIZATION

4.3.1 "Statistical Indicators for the Information Society – Forms, Content, Strategy and Impacts of B2B e-Commerce" - B2B METRICS



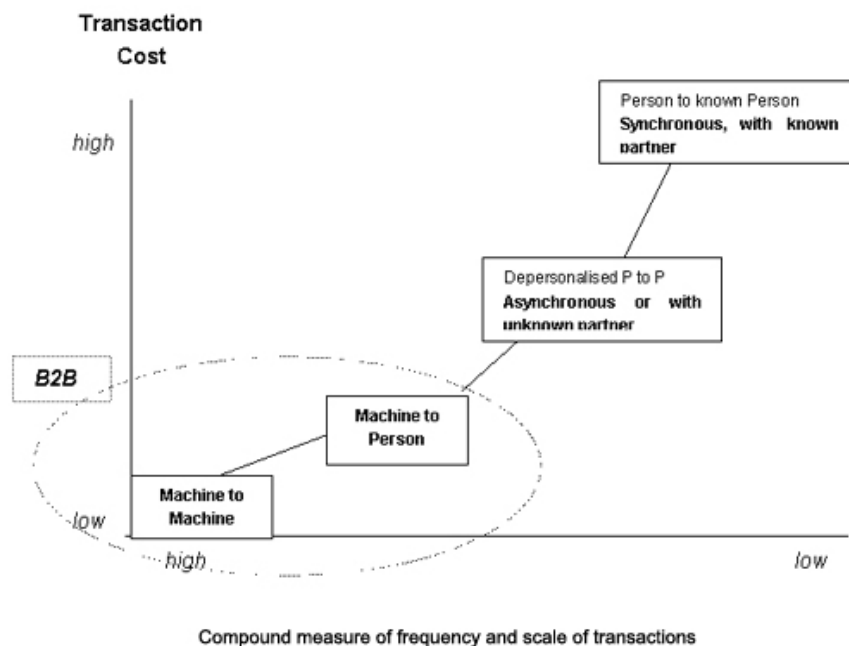
Aims

The primary aim of the project is to develop ways of measuring the diffusion and impacts of B2B e-commerce. This involves new concepts and new indicators. Special attention is paid to the development and application of B2B in small and medium sized firms and understanding the potentially inhibiting factors to development.

Oral and written pilot surveys in selected segments are used to build the base for an operational instrument for surveys of national and European statistical offices. Another important aim is to balance the informational needs of companies, policy and statistical offices.

Methodology

The study differs in several ways from previous studies: we analyse value chains covering several sectors instead of following a nomenclature oriented approach. B2B is currently perceived as the use of automated, network oriented applications – person to machine and machine to machine transactions (as shown in the graph below) – in procurement, supply chain management, business-customer relationship management, collaborative, networked e-development and the use of exchanges. However, as technologies advance their applications in B2B, relationships evolve and extend and the nature of this evolution needs to be recognised. The study will help in this respect.



Our theoretical background-model calls for the integration of complementary innovation. Data collection implies interviews and survey techniques with relevant partners in the companies of pilot value chains: automotive, banking, distribution, digital media and pharmaceuticals. Surveys are conducted in France, Finland, Germany, Japan and the U.K.

Focal points

Focal points of the study are the

- necessary complementary innovation, especially standardisation and integration of processes, the actual use of B2B e-business applications in purchasing, production planning sales, development, collaboration, research, design and the use of exchanges
- estimation of impacts on tangibles (e.g. cost) and intangibles (e.g. process speed, quality, knowledge).

Thus, the questionnaire tries not only to identify e-transactions (e.g. search, description..) or processes (e.g. SCM, CRM..) and their quantitative and qualitative impacts but also enablers like available IT infrastructure, training and management or potentially limiting factors like market structure, distribution system or cost. This will lead to new indicators which can be used for benchmarking purposes of companies in comparison to groups of similar firms as well as indicators at a higher level of aggregation such as for national or supranational policy implications.

First results

Detailed interviews conducted in the selected value chains seem to indicate different developmental pathways according to the firm's role in the value chain and its size and the existence or otherwise of entrepreneurial interventions. Depending on the industry sector access to B2B for many small firms could well be limited to access via a mediating exchange but it is possible that groups of SMEs could collaborate in the development and introduction of a collective system or they may in the future be able to install a standard proprietary system that is simply customised to user requirements. Collaborative exchanges could be the solution for medium sized firms not integrated into supply chain processes. A third type could be the firm integrated into the processes of a core firm in the supply chain, a fourth the core firm model, integrating important upstream and downstream collaborators and offering a portal kind of exchange to smaller co-operating firms. The interviews also indicated the important role of legacy systems (e.g. EDI, SWIFT) for the development of B2B.

Contact & Information

Hans Schedl
Ifo Institute for Economic Research
Tel. +49-89-9224 1366
schedl@ifo.de
www.ifo.de/b2b

4.3.2 Development of a System of Indicators on Competitiveness and Fiscal Impact on Enterprises Performance



The DIECOFIS project charts and explores problems, issues and methodologies for the development of a system of indicators on competitiveness and fiscal impact on enterprise performance. It is centred around three major themes which are as follows: i) *Issues in the creation of a multi-source integrated and systematised data base of enterprises data;* ii) *Issues in the development of ad hoc business data bases, suitable for the construction of microfounded indicators derived from microsimulation models of the effects of public policies on enterprises;* iii) *Issues in the construction of indicators, microsimulation and tax modelling.*

The Project work plan starts with a very preliminary phase: a "framework search phase", that is a reference against which the descriptive capacity of indicators can be measured. This frame is that of the New Economy which, by its very nature, requires a flexible, innovative and highly focused approach in order to be able to distinguish:

- the New Economy, that is "what is changing and pushing change, the speed at which change is occurring and where it is happening";
- the Economy, that is what is "structured", is changing slowly and is being pulled by ICT driven change occurring elsewhere.

The other steps are as follows:

1. Integration of cross-section and longitudinal microdata from surveys and/or administrative registers-statistical issues;
2. Development of concept of IT framework, issues and development of software requirements for the creation of a multi-source data base;
3. Implementation of software for the measurement of statistical quality, and for comparing the robustness of alternative multi-source, integrated databases.

These first three steps deal with the systematisation of single data sources into an integrated database and the issues and problems associated with it. A multi-source databases requires the record-linkage and integration of micro data from different sources (surveys or registers), collected in the same year or in successive years, which otherwise would be partially or not immediately available. As a result, multi-source integrated data sets greatly expand analytical capacity and open up new research opportunities. To exploit efficiently and in a cost-effective manner these opportunities, however, appropriate statistical and IT tools must be developed.

Further steps are:

4. Database development for tax indicators building purposes;
5. Tax indicators, construction and development: step 1- Conceptual framework and development of the national tax bases modules, corporate enterprises, country IT (new) and UK (extended);

6. Tax indicators construction and development: step 2 – Tax schedules rules modules for corporate enterprises, country IT;
7. Cross-country simulation of tax burden: development of country UK corporation tax model to simulate the tax system of country IT and other selected EU countries;
8. Development of a "core corporate tax model" demonstrator for EU countries to simulate the essentials of their tax systems on an EU corporate data base (see also Theme 2 above).
9. Tax compliance by firms and analysis of responses to tax-rates and enforcement activities

Each of these steps or themes is linked to the others. Thus, activities have been tailored to the appropriate timing and sequencing, concentrating on:

1) Statistical and methodological issues and IT tools developments where main results are:

- The development of the logical and physical model of the databases; with the indication of future implementation of simulating tools by means of specific tax modules.
- A critical assessment of different data integration methods which deals with application requirements, statistical characteristics such as error rates, robustness in different contexts, availability of software, computational requirements as well as a summary of empirical results reported in the statistical literature. An empirical section describes how the integration techniques are applied.
- The development of the software containing matching techniques of different sources of data and re-weighting units of firms' samples. The description of the code for the management of the database. The management consists of the loading of administrative (Business Register, Accounts data) and survey (SCI and FIMI) sources, the integration of them and the extraction of specific datasets for microsimulation purposes. It describes the syntax and the physical organization of the database.
- The development of the "Code for user interface" and the "Sotter user manual" which includes the manual of the User Interface to be applied for: the loading, the integration and data matrix creation for microsimulation activity. It follows all the process in the building of the multisource and integrated database.
- With reference to data validation, a first test on reconstruction of missing information is made. With single and multiple imputation techniques alternative estimation is obtained. Software will be developed to compute data quality indicators and test hypotheses regarding distortion problems due to non sampling errors in alternative databases. Innovative uncertainty and sensitivity analysis methodologies already tested for the analysis of indicator robustness will be employed.

2) Indicators and micro-simulation issues, where work has been carried out to develop modules for the Italian tax legislation IRPEG (Corporate tax) and IRAP (Regional Tax) and for the Social Contribution, and Tax Compliance. Main Results are:

- IRAP and SC modules have been built and first results validated. As regards IRAP model, the response in terms of government revenue is very satisfactory: the model underestimates Irap revenue of 1.3 per cent. For Social Contribution, the model's fit can be considered very satisfactory in terms of total contribution receipts.
- The computational routines necessary to simulate fiscal rules have been completed and included in the corporate tax (IRPEG). Currently the model simulates specific allowances resulting in a reduced rate and/or a different definition of taxable income, tax credits to be subtracted from the gross tax, tax abatements to be deducted from the net tax in order to obtain the tax due. Using the available data-set, the model gets some preliminary results, which have been validated on the basis of aggregate corporate tax returns data.
- A model synthesising the standard approaches to tax compliance in the personal sector has been evaluated and the empirical validity of this type of model has been investigated on the basis of secondary sources. The model has been adapted and extended for application in the corporate sector. The resulting basic corporate-tax compliance model has incorporated a number of developments in the academic literature on tax compliance by firms and is flexible enough to incorporate a variety of assumptions about market structure.

- These developments and first results can extend the benefits of the project beyond the consortium. The experience gained in the construction of the multi-source, integrated and systematised databases can be passed on to others through transfer of best practices. Similarly, the experience gained with the development of microsimulation models can be applied to replicate the exercise in other countries, and can be transferred at the Community level to establish a sort of "think tank" on tax issues that can serve to transfer best practice and provide a co-ordinated approach to the dissemination and exploitation of emerging statistical analysis and modelling techniques, with the support of the Community.
- On the basis of the above results, the research team at ISTAT is working to the construction of a system of micro-founded indicators to assist in improving our knowledge of how the competitive process change and is affected by public policies in the global IT economy. Use of micro data will make it possible to break down indicators by selected characteristics (including technology intensity and other IST attributes).

Contact & Information

Maria Grazia Calza
Calza@istat.it
 ISTAT – Economic Research
 Via Magenta, 2
 000185 Roma
www.istat.it/diecofis

4.3.3 MOTION: Mobile Teamwork Infrastructure for Organization Networks



Nowadays enterprises are increasingly characterised by geographically distributed product development activities and business processes. Products are built up of components developed by units located in different cities and countries, often in different time zones. This is the case of many products of today's mass market, from electronics to cars, household appliances, textiles, etc. Distributed production means distributed knowledge and expertise, which in turn means a need for new and innovative ways to support distant collaboration, communication, group coordination and distributed business management. MOTION addressed this strategic area of the European knowledge-based economy and piloted innovative solutions supporting *knowledge access and sharing, teamwork and distributed working methods* for cooperative product development and business management in largely distributed, knowledge-based enterprises.

The developed solutions have been validated in two manufacturing environments: mobile phones at Nokia and household appliances at Electrolux Zanussi. The key results from the project can be summarised as follows.

Collaboration within a Virtual Business Community

Enterprises are evolving into organizations of knowledge workers. The main view pursued in MOTION is supporting this change by facilitating knowledge sharing and collaboration within largely distributed *Virtual Business Communities*. Virtual communities may group geographically dispersed teams within large or extended enterprises, involved in different business processes related, for instance, to specific products, families of products, projects or technological areas. These types of virtual organizations are flexible and dynamic in their nature, and require suitable tools to cope with evolution and dynamic (re)organization.

MOTION has developed and validated a distributed multi-service infrastructure for communication and collaboration within geographically distributed virtual teams. Each MOTION node has a number of facilities and services which the members in a MOTION virtual community can access to improve the way they interact and work together. Validation of MOTION in two industrial use cases has shown the most relevant features include:

- *Shared workspaces*, i.e. globally accessible, distributed repositories of business artefacts (documents, contents, meta-data, resources, etc.) contributed by each individual (node) participating in the virtual community. The global, shared workspace is dynamically built by transient sharing of the accessible individuals' workspaces, and the physical distribution of resources during access is masked by the adopted sharing policies.
- *Archiving, searching and retrieving* information and knowledge within the shared workspaces. Besides reflecting real-life organizations, virtual community organizations and services provide the basis for access control policies to the shared information (e.g. user profiles, ...). This enables reducing the scope of knowledge search and retrieval, thereby leading to implementation of efficient knowledge sharing.
- *Searching, contacting and finding people*. Not only documents and passive contents belong to the virtual community shared workspace, but also (meta-)information about participating users and individuals. This allows implementing efficient communication among participants and higher-level knowledge management facilities such as search and location of experts and corporate expertise.
- *Ubiquitous access to services and mobile working*. Anywhere, anytime access to virtual community resources are important requirements for team interaction and collaboration within the extended and dynamic enterprise. MOTION provides support to both models via the internet and through integration of hand-held devices. MOTION users can access groupware services via fixed nodes, from their office or from any other locations providing internet accessibility. Through improved wireless capacity – GPRS and UMTS – access to MOTION services is also possible on the move through mobile devices such as PDAs or smart phones. MOTION users may also work in disconnected mode; for instance,

when connection facilities are temporarily unavailable. The system itself takes care of synchronisation of the work by notifying all changes and relevant events as soon as the node is connected again to the relevant community. Finally, the setting up of temporary, ad hoc virtual communities, based on short-range wireless networks (WLAN) is also possible to support, for instance, co-located meetings, documents sharing, etc.



Peer-to-peer vs. centralised approaches

In order to support operations of dynamic, open business virtual communities, different architectural solutions may be considered. MOTION has designed and validated a *peer-to-peer* oriented approach, investigating the advantages of this type of organization against more traditional client-server solutions. The overall architecture is organized around many functionally equivalent peers (the *MOTION peers*) and a backbone of a few permanent nodes (*Community Cabinets*). The former, feature the virtual community support services previously introduced and allow implementing the dynamic virtual community of peers. The latter, allow permanent storage of the minimal persistent information required for the management of the dynamic network of nodes.

This approach has shown a number of competitive advantages, including:

- easy customisation, deployment and configuration
- easy integration in the company environment
- focus on specific business process requirements
- support for mobility
- support of off-line work and ad-hoc networking
- complete control of each user over their own data

Business Process Re-engineering potentials

Organizations are evolving to virtual models. The workplace has evolved from centralised, tethered and synchronous interactions to multiple forms of decentralised work modes characterised by:

- A radically decentralised workplace, often with thousands of individual, shifting locations
- Mobile, remote and untethered workers
- Asynchronous, 24x7 work processes
- Enhanced 24x7 collaboration across lines of business and enterprises, i.e., business-to-business (B2B) and Business-to-Employees (B2E)
- Increasing needs for speed and agility within the workforce and workplace

The infrastructure to support this workplace has not evolved as rapidly as organizations and work styles. Experimentation with the MOTION system has shown that introduction of suitable infrastructures and tools for operation of virtual communities addresses this gap and has a large potential to support reengineering and improvement of business processes within the extended enterprise. On the one hand, this type of system provides a natural way to capture, formalise and support the operating principles for "how we work" as an enterprise. On the other hand, they allow the introduction of significant improvements and new, more flexible methods of working.

The test case at Nokia, demonstrated the capability of the MOTION platform to support critical business processes related to distributed design of software components of cellular phones. Benefits have been shown, for instance, in supporting relevant process phases such as distant software review meetings, where participants are geographically distributed and take part in the process workflow in different phases and at different times. At Electrolux Zanussi, the MOTION platform has been validated to support advanced knowledge sharing, expert search and location and solution finding in the design of key mechanical components of household appliances. This demonstrated the significant potential of the approach to improve the present corporate knowledge management capabilities.

Contact & Information

Marco Boero
Head of Research and Innovation
Softeco Sismat SpA
Via De Marini, 1 – WTC Tower
16149 Genoa, Italy
Phone: +39 010 6026329
Fax: +39 010 6026 350
marco.boero@softeco.it
www.motion.softeco.it

4.3.4 OSP: the Evolution of Web-Based Optimisation from ASP to eServices



OSP: Optimisation Service Provider

Optimisation models are widely adopted in a number of industrial sectors including finance, supply chain planning, agriculture, and energy distribution. Optimisation is used as an analytical engine for competitive advantage in these and other sectors. Furthermore, there is growing interest in the use of optimisation techniques as inference engines within Decision Support Systems (DSS).

The OSP project embraces the concept of Application Service Provision (ASP) to offer remote access to software tools for optimisation and optimisation-based DSS via the Internet. The OSP platform also includes specialist training material, a valuable resource for the acceptance and use of optimisation by a wide user-base, which may not have the key expertise and/or resources to adopt optimisation for competitive advantage. In this respect, the OSP consortium has achieved important results, by implementing a platform which provides several commercial modelling systems and optimisers, as well as two vertical applications, namely a system for optimal portfolio allocation, and a supply chain management prototype.

Optimisation and the xSP model

The original ASP model has been recently extended and replaced by the xSP concept, that is, the provision of "any" Service. For instance, an MSP is a Management Service Provider, whereas an ISP is an Internet Service Provider. In this framework, OSP can be characterised as follows:

Target Audience	Decision Support Analysts, Consultants, Decision Makers
Scope	Business-to-business, Business-to-analyst, Business-to-consumer
Domain	Finance, Supply chain management, Agriculture, Environmental management, Utilities
Value added Services	Modular use, customisation, training
Service Provision Venture	Small to medium enterprise consortium

E-Services: new directions

In the 1990s, SUN concluded that "the network is the computer". Since early 2000, the emphasis has changed and it is now generally accepted that "the browser and the network are the information appliance and dynamic platform for knowledge exchange". Traditional e-commerce is giving way to the new "e-service" paradigm. The philosophy of e-service is the focus on users and customers (meeting their needs precisely and providing them control over the service). The enabling technology is based on the concept of web-services.

OSP is aiming to adopt the e-service model by building web-services which can be seamlessly used to create optimisation-based distributed applications and to outsource computational resources from the user's desk to a remote server. The technology, however is not an end in itself. The provision and sharing of domain knowledge via training and user documentation is envisaged as the overarching infrastructure of OSP as a true e-service.

As a pilot scheme, the OSP platform has been deployed in academic institutions such as the CARISMA Centre of Brunel University, UK to create OptiLab: an optimisation laboratory where the OSP tools and applications are used for teaching purposes. The OSP service has also been used for teaching purposes in the University of Milano Bicocca, Italy, in Jadavpur University in Calcutta, India, IIT Bombay, India, and Vienna University, Austria.

Conclusions

Component-based decision support systems are important and are gaining acceptance. Organizations deploy IS with a clear requirement to improve their business performance. To respond effectively to global as well as regional competition, successful companies have started to formalise and improve their Business Process Management (BPM) procedures. In many application domains the optimisation, decision analysis, or other analytic models are often embedded as a decision engine within the respective business processes. Thus IS enabled business processes bring many benefits to organizations which are conscious of their performance. As prototype DSS applications succeed the adoption of these within full blown BPM and their deployment into a competitive working environment becomes all the more important to the business. The use of distributed components will allow businesses to deploy DSS applications effectively.

OSP has set out to be one of the leading providers of optimisation tools and optimisation based decision support systems. The contribution of OSP to the e-work and e-Europe vision is represented by the provision of a complete e-service which enables users and business alike to outsource their computation needs. The web-enabled applications are also supported by extensive optimisation knowledge resources, which can facilitate the use of optimisation techniques and therefore expanding the market for these applications. The knowledge based also contributes to the education sector via initiatives such as OptiLab.

Contact & Information

Guatam Mitra
UNICOM R&D HOUSE
1, Oxford Road
UXBRIDGE UB9 4DA
UNITED KINGDOM
Tel: +44 1895 256484
Fax: +44 1895 813095
www.unicom.co.uk
www.osp-craft.com

4.3.5 PROTELEUSES: European eWork and eBusiness Showcase for SME's



PROTELEUSES is a Best Practice project whose major goal is to increase the competitiveness of European Small and Medium size Enterprises belonging to the services sector, as well as to improve the working conditions of its staff members, by fostering the introduction of eWorking tools in its working activity. This will be approached aiming at promoting and fostering the introduction and use of the newest information technologies, by introducing such technology in 10 final users' activities. The information technology tools to be promoted are those related to the communication and information exchange, used to enable the incorporation of eworking activities, in the daily activities of the firms.

Implementation

- The individual business of the company is defined, structured and optimised including business processes and organizational structure.
- Type and Scope of the support by an eworking solution is defined in form of an eworking project portfolio. The analysis includes Technical aspects, Social/legal aspects, Organizational aspects and Knowledge aspects.
- An individual validation of the different eworking projects (that means ranking the importance of different eworking projects) is made.
- A selection of possible eworking platforms for the company has been made and is part of the company-wide IT strategy.
- Implementation and Training.
- Testing the trial.

Success Factors

- Good knowledge of eworking background.
- New eworking implementation methodology for services SMEs.
- Mainly organizational and social focus instead of Technology-exclusive approach.
- Personal training.
- Supporting computer-based tools.
- Good post-analysis method measuring very interesting aspects.

Bad Practice: Bad public support in Legal aspects. Needs improvement at administration level.

Tangible Outputs

PROTELEUSES defined a methodology to implement eworking platforms in SMEs. In addition, the project has produced up to now 11 complementary dissemination brochures (1 informing on Proteleuses project and its commonalities with IWOP project, and 10 more flyers detailing each implementation project). We are preparing a new one (Exploitation Flyer) aiming at presenting the methodology and the services to be provided. The website is another dissemination and exploitation tool.

With respect to the documents supporting the dissemination of eworking among SMEs, Proteleuses has produced 5 main reports, 4 of them devoted to the analysis of eworking platforms applied to different segments (media monitoring, software development, insurances and project planning). The fifth report is a Transversal study evaluating and comparing all implementations from the organizational, economic, technological, social & legal and knowledge viewpoints. Such dissemination material is of interest to all European SMEs belonging to the services sector and interested in implementing eworking.

Socio-Economic Impact Analysis

We want to highlight that all 10 eworking cases we worked with have achieved a doubly successful impact in social and economic terms. ROIs depend on the segment and obviously on the specific SME but they vary from 0.55 to 2.9 years (average: 1.9). Concerning the social impact in the company we have realized that all eworkers, office workers, managers and the managing director, positively assessed the use of eworking platforms. Such assessment is fundamentally based on the increase in free time, productivity, quality of work and competitiveness, as well as in the decrease of commuting costs and time, absenteeism or staff turnover.

Follow Up

The project has already demonstrated that regardless of the different countries, cultures and even branches of "services" the companies come from, each of them was able to use eworking in order to increase their competitiveness and the quality of work of their employees. Our experience can now help other European SMEs in their way to ework.

Opinion Of General Managers

Jesús de la Maza is the general manager of **CARSA** (business case 1): "In our company we have experienced for the first time the sensation of not being dependent of the traditional office. It is great knowing that you can make use of all knowledge generated in CARSA when you are not in the office".

Enrique Fàrez is the president of **ICC** (business case 2): "eWork has become a critical issue in our company. I want to stress that thanks to ework we can provide new services to our clients offered from new locations (making use of local eworkers), or exploit our daily work in new markets. In this respect we have run two new projects that we could not even think about, one and a half years ago. Quality of life in general for all employees has been increased. I am one of the ICC's eworkers."

Jordi Valls is the General Manager at **KRM** (business case 3): "What a couple of years ago was recognized as a dream for us, today is a reality. Market expectations and magnitude of our customers have drastically changed in just one year. All these modifications in our business have to do with the successful implementation of ework. In addition, and probably the best experiences of all, our eworkers are delighted with the solutions implemented."

Francesc Palacin is the General Manager of **ASURBROK** (business case 4): "On account of our experience in Proteluses, results have even exceeded our expectations, namely: upgrading the working environment, improving our service, reducing costs, increasing productivity,... Now, it is time to extend the project to other business areas in our firm. In addition, we have been contacted to transfer our know-how to other companies in our own environment"

Frank Zimmermann is the General Manager of **JOSEF LEISMANN AG & Co.** (business case 5): "The increase in automation helped to reduce standard work processes, which in turn resulted in more time for a qualified support of the brokers, meaning an additional improvement of service. The reduction of costs, which can be attributed to ework will come into effect with an increase in the number of brokers i.e. brokers, who use the system to the full extent"

Jörg Scherer is the General Manager of **EURICE** (business case 6): "An entrepreneur going into ework has to trust his employees working from home. Our experience has shown us: The motivation is high, the results are very good. However communication and information exchange is crucial – eworkers must be fully integrated in the team."

Klaus Netter is the General Manager of **XTRAMIND** (business case 7): "My company is working on the front line of a new economy and the level of technological innovations we are implementing in the company is a key element of success on the market. eWorking is not only helping us to reduce our

expenses, it enables us to provide better services to our customers, to compete efficiently, to extend our markets..."

Roumen Nikolov is responsible for the project for the UNIVERSITY OF SOFIA (business case 8): "The eworking project implemented at DIT lead to the following achievements: Coordination and communication processes were significantly optimised. Working environment at DIT was improved and made more efficiently used. Co-operation between DIT's branches, employees, intercessors, brokers, project partners and customers was improved. Project management and implementation was optimised, leading to about two times more incomes from projects and other consultancy activities".

Vesselin Spiridonov is the General Manager of VIRTECH (business case 9): "The results of the implementation of ework in Virtech include: Reduced number of offices and office costs. Increased productivity of the workers by 20 %. Improved positions mentioned as weak points".

Yuri Atanasov is the General Manager of ISIS (business case 10): "There are two main characteristics of ISIS working process – dispersed participants and multiple iterations. Such two characteristics are the basic reason for company bottlenecks existing before project implementation. Even very clear for us as IT professionals, the opportunities offered by eworking led to some unexpected results after the project trial. We succeeded not only to automate the numerous communication sessions as part of our working process, but also to transform some of the processes by sharing our information sources and dividing the responsibility for updating sources among the participants as well as by opening appropriate parts of the sources for tele-use by different participants. In such a way significant reduction of iterations has been achieved and therefore overall company efficiency and productivity has been increased".

Contact & Information

Antonio Collado
CARSA
acollado@carsa.es
www.carsa.es

4.3.6 TEAMwork Project - eWork in a distributed, multi-cultural environment

The TEAMwork project set out to trial an innovative e-working solution for use in a distributed, multi-cultural environment. The project, an eighteen month take-up action was funded under the EU's Fifth Framework (IST) Programme with project partners drawn from seven EU and Accession States. The project trialed the solution in a diverse range of distributed working environments in three user domains:- public-service organizations, research networks and software engineering companies.

The TEAMwork solution itself comprises three integrated components – methodology, technology and social dimension. The starting point in the project was to apply the methodology and technology in the user group. Users in each domain analysed a number of relevant e-working scenarios using the Bestregit teamworking methodology. This analysis yielded a set of roles, responsibilities, work flows, document flows and document templates for each scenario which in turn were used to configure the NQA 'virtual office' technology with a series of tailored bespoke e-working solutions. The methodology was regarded as a valuable tool by users in explicitly defining activity flows, roles and responsibilities and facilitated teams to think in a structured and logical way about a work process.

The technology component (NQA) is a virtual office with strong document management capabilities. Users found the ability to work on documents in a shared environment critical to the perceived usefulness of the system with strong security and integrity features addressing users sensitivities about sharing information in a virtual environment. The configured technology was tested in each user domain through a series of trials conducted over a four-month period involving users in Ireland, UK, Spain, Austria and Slovenia. Feedback from users was captured using questionnaire (HTML form), interview and open feedback. Feedback focused on evaluation of the technology, methodology together with a set of questions designed to assess the social and cultural dimension of working in a distributed virtual environment. User feedback confirmed that the TEAMwork solution could effectively support collaboration in a diverse range of e-working scenarios.

While user feedback to the NQA was positive, a number of improvements and refinements were made to the system in response to specific user feedback. The principal refinement was the addition of an e-working application wizard to enable non-technical users to generate their own e-working environments. The wizard includes

- A Configurator, an interface developed with PHP, SQL database and Apache server which supports the creation of project types, e-working spaces and document flows.
- A Generator – a tool which builds NQA containing all regenerated user interface templates and scripts so that NQA can be tailored automatically.

A new Graphical User Interface was also added to improve the user-friendliness of the interface. This included a number of simplifications, the addition of a discussion forum and a menu style format. These improvements in the user interface and system functionality significantly improve the usability of the system and position the TEAMwork solution as an advanced state-of-the-art solution.

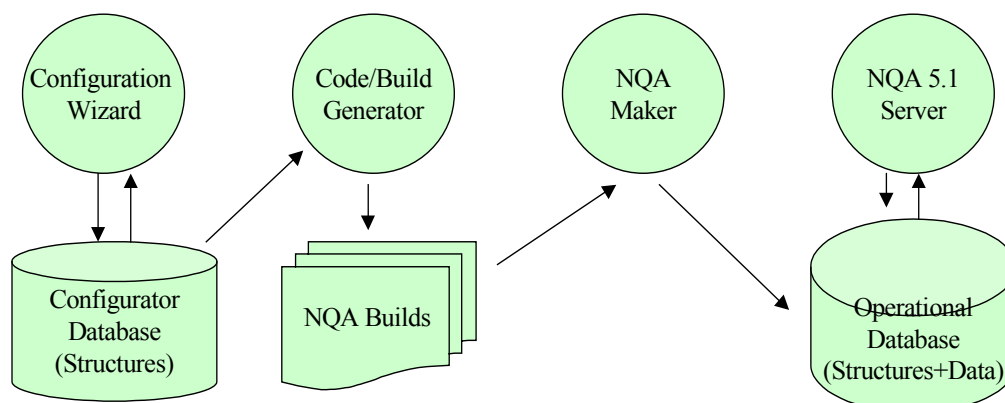


Figure 1: The New Tool Chain

The social dimension of the project was an acknowledgement that the development of more innovative e-working solutions is also leading to the design of new social spaces. These require sophisticated communication and inter-personal skills to ensure that the technologically-mediated spaces are socially functional and organizationally effective. The social impact of these systems is high because they are changing the working reality for many people in a dramatic way. The challenge in TEAMwork was to bring to light issues associated with working in these kinds of spaces, and to understand both the role and the limitations of the technologies and methodologies associated with these spaces.

It was interesting that all users were found to have had a positive experience of using the system which was somewhat surprising as it had been assumed that the document centric approach of TEAMwork and the formalised definition of roles and methods of communication would have rebutted at least some of the participants. National and cultural differences were also found to be only of minor importance in users interaction with the system. The participants used the technology in a very similar manner and described their experiences with the same words and concepts. Given the extent to which the literature highlights the importance of cultural factors in this kind of system these findings are important. Further research is needed to understand the extent to which cultural homogeneity is emerging within the EU as a result of, or in parallel with, technology development.

Systems and technology must not overly-formalise human behaviour – forcing humans to act as appendages to the technology. Technology, as demonstrated in the project, is at its most effective when people are encouraged to engage with each other, rather than with the technology per se. This perhaps explains some of the difficulties reportedly associated with many advanced supply-chain integration systems which adopt a very formal model of organizational behaviour and then force people to work according to that model.

Contact & Information

*Project coordinator
brian.foley@tecnnet.ie
www.euteamwork.net*

4.4 PROJECT RESULTS - KNOWLEDGE & CAPABILITY MANAGEMENT

4.4.1 AUDIOTAIN – Games-based eLearning and Knowledge Management

AUDIOTAIN tackles aspects of eLearning and Knowledge Management by developing an innovative technological platform capable of combining text, audio and video content, integrating these with gaming concepts, in order to make learning and knowledge sharing between remotely located people more attractive.

The active partners currently are: Rundfunk in Berlin-Brandenburg (RBB), Berlin; Dalet a.n.n., Paris; exozet.com, Berlin; plus support from PIXELearning, Coventry, Universal Music Group, Berlin.

The term Knowledge Management in AUDIOTAIN is to be understood as providing an environment that supports users in typical processes of Knowledge Management (KM) such as:

- Identification : find the needed and relevant information
- Acquisition : absorb/integrate this information
- Generation : help users to generate new knowledge
- Distribution/sharing : help users to easily disseminate and share information

The motivation of users to accept and use these tools, has always been a topic that most of the developers left as a job for HR departments, or teachers (in the case of eLearning). The success of a tool is dependent on manifold aspects, such as e.g. interface design, response times etc. According to Prensky (2000) the motivation of users through fun is also a very important aspect, which is often underestimated or even neglected in eLearning and Knowledge Management systems development.

The Audiotain system was designed to enable Knowledge Providers to easily create innovative interactive applications through which multimedia information can be delivered.

Users can interact with the multimedia information in several ways:

- absorb information
- integrate pieces of information by associating them with each other
- test/prove their new knowledge
- contact other users to disseminate the relevant information

AUDIOTAIN – Technological Platform

Audiotain offers an end-to-end solution for content providers to create and administrate applications in which end users can interact with the providers' multimedia content.

The system consists of the following building blocks which can be used separately or in combination:

- the daletPlus Content Management System, to manage and define the media content of the application's Tasks
- the Audiotain Application Flow Editor, to define the Levels and the relations between individual Tasks
- the aX Application and User Administration tools, to manage application and user data
- the Audiotain Task Principles and Front End Applications, the actual User Interfaces through which users interact with the media information

Beyond the creation of applications the system allows the use of marketing tools like interactive Newsletters and e-commerce tools like TAN (users could win Codes which allowed them to buy songs online).

AUDIOTAIN – First Results

Since December 2002 there have been five applications of three different kinds:

- **Music Entertainment**
Universal Music Group has published two Games closely related to recently published compilations (FutureTrance, April 03; BravoHits May 03). In these games users were to explore the world behind those compilations.
- **eLearning**
UK eLearning company PIXELearning developed an application for the Museum of British Road Transport (MBRT) in which 7-11 year-old children can learn about the Land Speed Record Car Thrust SSC, including physical and technical backgrounds (Supersonic engines, etc.) and the history of Land Speed records.
- **Infotainment**
RBB has created a series of infotainment games in which users have to solve tasks by interacting with recent information.

The flexibility of the AUDIOTAIN product allows its integration and application in many different contexts related to either eLearning or Knowledge Management. Thinkable scenarios for KM could be:

- Interactively presenting and describing company processes (e.g. because new employees need to find their way through the company processes, identify their colleagues and contact persons; new processes need to be presented to employees (e.g. after business reengineering processes); customers want to understand the sales or after-sales/service process and would like to identify the right persons for their specific problem)
- Producing an interactive instruction manual for products (e.g. because customers would like to buy a certain product, but beforehand they would like to look at all the details; new employees would like to have a look at the products the new employer produces, in order to be able to better advise customers.)

Contact & Information

Nico de Abreu
Rundfunk Berlin-Brandenburg (RBB)
EU-Project AUDIOTAIN
+79 30 3031 3276
nico.deabreu@rbb-online.de
www.audiotain.com

4.4.2 Issues in Personal and Shared Information and Knowledge Management from Nopik



As the amount of information workers are faced with on a day-to-day basis is growing at an alarming rate there is an urgent need to develop strategies to manage complexity. Individuals need to be able to cope with this situation while maintaining their ability to effectively communicate and share information and knowledge that is generated in everyday activity. A considerable proportion of this information is in document format and which we are concerned with primarily in the NOPIK Project.

While there are a number of widely available technologies and techniques that would on the face of it appear to support these needs, such as shared file-systems, filing hierarchies, document management tools and search engines, these nonetheless suffer from a number of problems, especially when the collections are becoming substantial in size. Thus while files can be shared on shared file-systems they are not easily available when individual workers are not connected to the network and even when they are connected it may be difficult to find the document in question in a myriad of folders where the file hierarchy maybe unfamiliar and the document name unknown. While document management systems and search engines can help in the task of finding relevant documents even when their filename and location is unknown the success in finding the relevant document is often dependent on the skill of the user and the specificity of search terms to be able to quickly identify relevant documents.

Another aspect that appears missing from this, and that is important to the speed with which the individual worker can carry out tasks and solve problems, is that on one hand the individual engaging with historic collections of documents and creating new ones develops a lot of knowledge about the documents, how they relate to each other and which ones are valuable and which ones are not. While the individual worker develops such an understanding over time he is limited by his ability to remember, which becomes more faint as time passes; he is not able to do this easily with collections of documents that are growing at such an alarming rate, nor is he able to share this understanding with others unless this is recorded somehow. Problem solving, especially where it is done collaboratively therefore requires effective access to information and knowledge to be efficient and in addition would benefit from better exploiting past experience in terms of past problem cases and their solutions than is typically the case.

Project Objectives

The NOPIK Project is investigating the requirements for an integrated information and knowledge management environment to support personal information and knowledge management needs and enable the effective sharing of information and knowledge in the enterprise and for distributed teams at inter-organizational level. The solutions in terms of the tools developed are listed in the following section. They comprise, amongst other aspects, an ontology and case-based approach for information and knowledge management that support a personal information and knowledge organizer for the individual worker and which connect to an enterprise cognitive network to support shared resources. This solution will support thematic access to information collections and the knowledge that is built around them and cater for eworkers and flexible teams.

The objectives can therefore be summarised as the development of a comprehensive and usable approach to information and knowledge management in the organization:

- that overcomes the limitations of currently available solutions (too process oriented, not intuitive, not supporting the individual worker)
- that uses extensible ontologies as an organising principle for classification, storage and retrieval of collections of information (documents etc.) and associated knowledge
- that allows thematic and context sensitive browsing
- that supports problem solving through the use of case based reasoning.

Support of the individual workers in their personal information and knowledge management needs as well as the sharing between team members and communities of practice is a key criterion in the solution concept and is reflected in the networked system architecture. Thus the development of a modular system comprising personal information and knowledge organizers (PIKO), and that interfaces to a central shared information and knowledge network server (IKON) is foreseen as well as the generation of a Best Practice Guide for the development and deployment of the tools. Finally the interface developed will be intuitive and graphical, and allow graphical point-and-click navigation of the said collections of information and associated knowledge in terms of concepts and categories.

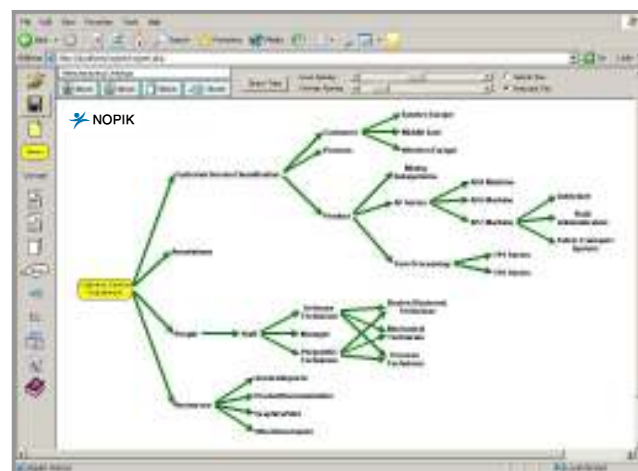
Expected Results

An interim version of the toolset has been developed and is currently being evaluated. This comprises a set of tools to cover:

- graphical navigator of information and knowledge resources
- case-based problem solving decision support tool
- problem process manager to support ad hoc process composition and execution
- messaging and searching facilities

The tools that currently work on a centralised architecture will be refined and extended to function in a distributed architecture, comprising a network server (IKON) and autonomous clients (PIKOs). Other topics addressed are:

- Exploring issues relating to user-level development and use of ontologies for classification purposes
- Exploring sense-making, intuitiveness and navigability and capabilities of ontologies to support this
- Exploring information and knowledge sharing capabilities of ontologies and their graphical representation
- The benefits of case based reasoning for problem solving activities to complement navigation and browsing



Above a sample screen is shown that reflects the current state of the tool in question. The users can create the graphs shown on the screen interactively and subsequently use them to attach documents of different types and annotations to comment on documents and their relationships. The graphs can be imported in RDFS format or created and modified in the tool and automatic graph layout functions are available to allow easy formatting of the graphs for easier viewing. At the moment a fixed set of resource types can be used to distinguish different types of documents and export facilities are still needed and an automated classification of imported documents is under development amongst other features.

What is significant about this approach and which is a key component of the innovation of the project, is the use of graphical representations of ontologies at the user-level to assist users and groups of users to structure collections of documents and the associated knowledge records according to their domain. The tool supports the use of several ontologies in the same tool to also allow users apart from shared ontologies, for corporate and collaboration purposes, to use private ontologies alongside for

personal information and knowledge management needs. The ontologies in question are light ontologies although the deeper use of ontologies is also being investigated, as are issues associated with user-driven ontology evolution. While it is acknowledged that the tool and its proposed use can involve considerable set-up effort when the domain is complicated and one has to start from scratch, there may be potential for ontology reuse and adaptation to reduce this effort. The approach deliberately opts for user-driven domain models to ensure that the resulting tools do have a good fit with the organization and teams of users using it (as opposed to completely automated solutions from prominent portal vendors which are not always entirely intuitive to the user) to enable them to effectively find information, to manage to maintain a good understanding of the document collections and navigate/browse these collections, and record and share their understanding and knowledge about them in a collaborative scenario. While automated solutions have their benefits they are usually based on a search and retrieve basis (or push approaches following automated search and retrieval) which does not enable users to manage resources and associated knowledge themselves and for this reason the present research fills an important gap in the current field.

Contact & Information

Francesco Molinari
Consorzio per la Zona Industriale Apuana
Ente Pubblico Economico
Via Sforza n. 5
I - 54100 MASSA (MS)
francesco.molinari@zia.ms.it

www.nopik.com

Albert Bokma
Senior Research Fellow
Centre for Electronic Commerce
University of Sunderland
Sunderland, SR6 0DD
United Kingdom
albert.bokma@sunderland.ac.uk
Tel.: +44 191 515 3233

4.4.3 New Working Environments and the PRISM Project – Reporting and Measuring Intangibles



Summary

PRISM has been a dissemination project with embedded research in relation to the measurement and reporting of intangibles. The initiative set out to address three global objectives:

- To materially advance the knowledge frontier regarding the economics and measurement of intangibles.
- To propose specific policy recommendations to accelerate the diffusion and take up of methods and practices to foster the growth of a competitive European economy.
- To provide an infrastructure for disseminating the results of research of direct relevance.

These objectives have been achieved through a focused cluster of leading-edge research projects supported by original case studies, and dissemination of results to interest groups Europe-wide. The public side of the project web site has proved to be a significant resource for the European intangibles community: www.euintangibles.net

New Working Environments

Although the focus of much of the research work was into the economics and reporting methods for intangibles, the fifteen case studies took in a wide range of sectors and themes, and somewhat unexpectedly, these turned out to provide some valuable material in respect to new working environments.

In analysing the cases after completion, we were able to group them across the following main headings:

- Intellectual Capital of Regions
- Intellectual Capital of Nations
- Knowledge and Intellectual Capital of Networks
- Knowledge and Intellectual Capital of the Firm
- Knowledge of Teams
- Knowledge of Individuals

It can be seen from this list that there is a strong link between the working environment due to geography or communities of interest, both within and across public and private sector organizations.

We draw attention here to the case studies which have some particular relationship to new working environments.

KTH (Royal Institute of Technology, Stockholm) worked on cases relating to the tangible/intangible dynamic

- Aftonbladen, Expressen, Svenska Dagbladet. "Newspapers on the web – are they giving it all away? The dynamics and relationships between digital and printed products at three Swedish newspaper companies." This case addresses a core issue of the relationship between the much-lauded wholly digital information environment, and the much more complex scenarios actually found in the interplay between the tangible and intangible.
- Distance learning projects at Stockholm University and at KTH Stockholm. The development of and support for the intellectual capital of individuals and regions. The two case studies cover relationships a) between university students in a capital city and at a learning centre in a provincial town, and b) a course originating in one country (Sweden) and being received at a university in another (Norway). This is a particularly valuable case examining the impact of changed knowledge work processes mediated by advanced use of technology (telepresence).

TSM (TSM Business School, Enschede) produced cases on entrepreneurship

- Transuniverseel. Creating and justifying intellectual capital value: Entrepreneurial networking for business development on the WAP protocol. This related to the contribution made by universities to their surrounding business environment.
- TeleCats and Rabobank. Banking and Entrepreneurship: assessing and fostering the value of intangibles. This highlighted the significance of the intellectual capital of regions

IESE (University of Navarra, Barcelona) produced cases on Knowledge Management

- Cap Gemini Ernst & Young. The merger of two knowledge-intensive firms – one European-based, one US-based – requires choices and trade-offs to develop a new knowledge working environment for the merged company.
- Unión Fenosa. Corporate University: Top management sponsorship of a mutual 'teach and learn' initiative upholds corporate values and beliefs during the successful transition from state utility company to multinational energy business. This relates to both the symbolic and practical importance of a new working environment – the corporate university.

In addition to the bottom-up work within PRISM that related to new working environments, the project held seven workshops and conferences, including active inputs from a very lively advisory council. These proved to be a tremendous opportunity to identify emerging issues not formally on the PRISM agenda but capable of subsequent study. As a result of the input from Leif Edvinsson formerly of Skandia and now the University of Lund, it was identified that the issue of physical space had a very significant impact on the creation and sharing of knowledge. This was supported from the research findings emerging from the Cass Business School, which had commissioned research into new environments for learning as a result of the construction of a wholly new business school, opened in 2003. This research highlighted that dramatic differences in knowledge creation and sharing were possible if physical space was redesigned.

Contact & Information

*Professor Clive Holtham,
Cass Business School,
City of London: Lead Partner
c.w.holtham@city.ac.uk
www.staff.city.ac.uk/c.w.holtham/kspace.htm*

4.5 PROJECT RESULTS - NEW WORK SPACES

4.5.1 AVATAR-Conference - Avatar-based Conferencing in Virtual Worlds for Business



Purposes

Communication is getting more and more essential for our global oriented economy. Partners and teams from all over the world have a strong need for flexible and intuitive communication which can be started mostly independent from equipment and location.

AVATAR-Conference is an innovative toolkit for the set-up and administration of virtual online conferences in which users are represented by avatars, i.e. as animated 3D figures. The system is designed as a scalable, modular application, offering a large number of supportive functions and the integration of e-business applications into the conference environment. It offers enterprises and business partners a considerable and cost effective alternative to real meetings. They have the possibility to have multi-media meetings, conferences and presentations via the internet with no additional equipment than their PC.

By using the avatar technology, users from all over the world can simply access or start a conference by using the Internet still having the feeling of a real conference. Low bandwidth requirements and stability are just one of the numerous advantages of the AVATAR-Conference system. Different additional components like desktop sharing, whiteboard, translation services, e-business integration etc. enable the user not only to use AVATAR-Conference as a communication but rather as a teamwork instrument.

Since AVATAR-Conference will not be a proprietary system, it is a suitable option for research centres and large enterprises with branches in different parts of the world (e.g. the automobile industry) moreover, its low costs make it attractive for small and medium enterprises, especially for companies in the service sector, e.g. advertising agencies.

Within the project there are three different pilot scenarios tested:

- a product presentation scenario (linear communication, useful for 3-50 participants)
- a management meeting scenario (spontaneous communication, interactive, useful for 3-10 participants)
- and an integrated teamwork scenario for technical meetings (interactive, useful for 3-10 participants)

The AVATAR-Conference prototype can be exploited as a whole, complete product, providing interested customers with an easy-to-use, innovative solution for web meetings or as a modular system.

The benefits of the project are linked not only to the prototype. The partners have also been able to improve their knowledge within the field of research within the project. By integrating the components into the partner's product range, the outcome of the project will be wider.

Contact & Information

Project Co-ordinator
Heidi Schmid
Fraunhofer IAO
Nobelstr. 12
70569 Stuttgart
Heidi.Schmid@iao.fhg.de
+49 711 9 70 23 18

Technical Co-ordinator
Andrea Memminger
e-pro Solutions GmbH
Waldburgstr. 21
70563 Stuttgart
Andrea.Memminger@e-pro.de
+49 711 68 70 42 25
www.avatar-conference.com/
www.exodus.gr/Avatar_Conference/

4.5.2 Humantec: Design for the Humanisation of Technology



The Approach

As the project's name states, the focus is on using design as a tool for the humanisation of technology. As a consequence, it does not propose 'simply' to research and develop new technologies as a response in themselves to all evils, but to use design methodology as a tool for devising novel ways in which ICTs can be given a more human face and a more instinctive interface, as well as be communicated to the ICT-resistant public as tools and aids for improving the quality of life and work in the knowledge workplace.

Humantec set itself four objectives:

- to contribute to the comfort and humanity of the workplace in the global information society in terms of safety, ergonomics, environmental sustainability and the overall quality of work and working life, as well as in terms of the aesthetics of objects for daily use
- to involve universities, design centres, technology producers and furniture manufacturers in a dialogue and exchange of ideas tailored to obtain a panorama of possible scenarios for humanising workplace technologies
- to plan a series of dissemination initiatives and activities, with the co-operation of each partner, so as to reach those designers and manufacturers who share the project's principles of sustainable design and
- to involve office furniture industry SMEs in venturing the concrete feasibility of designs for a sustainable workplace.

Obviously, this kind of task is by its very nature open-ended and does not generate a single applicable or marketable result, but a method with a range of first-tier results (the scenarios and design ideas) and an unlimited potential for subsequent developments. In addition, as the Humantec project was originally designed to create a new community of actors, mostly within the design community itself, with a critical mass of awareness about the rôle that design can and indeed must play in the development of suitable ICT applications, interfaces and tools in future, the best format for the project was that of a Thematic Network.

The method chosen by the Humantec consortium, whose members are drawn prevalently from the design community – university faculties, schools of design and design promotion centres – and assisted by technology experts, was to identify several scenarios of knowledge workplaces in the current world or the near future and to analyse a selection of parameters in each of them, based on the tasks that people need to undertake and how they can go about doing so. As the partners were chosen because they use different techniques of problem analysis and solution identification in their design processes, these scenarios together depict a fascinating and complete picture – not of the potential situations encountered in the knowledge workplace of the near future, but of the various different design methods that are habitually applied to problem solving in different countries and cultures in Europe (the partners come from Finland, Poland, Germany, Austria, Spain, France, Italy and Turkey).

Each scenario was then used as the basis for the development of a set of design ideas, whose purpose was to offer tangible examples of how the European office furniture and technology development industries could start interfacing and working together in future. This is certainly not an easy task at present, as the useful life of an item of office furniture is currently many times longer than that of the IT equipment that is often used in partnership with it: indeed, the turnover of IT hardware is so rapid that any attempt to incorporate existing technology into furnishings is usually outdated by

intervening hardware obsolescence before the furniture has completed the process of development to market.

For this reason, the development of scenarios and design ideas in the Humantec project tended to 'leapfrog' the stage of cable connections and desks as vehicles for more or less conventional computers, tending first instinctively, then as a consequence of the advice of the technology expert partner, to favour the principles of ambient intelligence and focusing the design input more on the significance of humanisation of the workplace as a whole.

Results

The Humantec project achieved results of two kinds: material results and non-material results.

Material Results: Working Scenarios

The most evident material results are the working scenarios, each accompanied and illustrated by several design ideas. The members of the consortium partnered with representative firms from their national office furniture industries to test the feasibility of the ideas, in many cases producing scale or 1:1 models as part of the design and feasibility testing process.

Scenario
Individualisation of Office Space
Free Office Work
The Communication's Bank
Home Office
Working at Home
Medium: Working in Downtown Munich
The Fixed Space "At Home"
The Flexible Space "On the Way"
Intelligent Office Stand
Factory Office
General Office
Ground Office
Prosthesis
Temporary Work Agency
Editorial Office
Tourist Office
Breaking up the Bank
Living in the Office
Large: Working in the periphery of Munich
Relieve Spaces
Thinking Everywhere
The Environment as Interface: Sensitive Environments and Relational Workspaces
The Diffused Office: Continuity of the Workspace, Media Integration and Fluid Interfaces
The Virtual Bank
Workplace & Hospitality
Temporary Office
Small: Nomadic Office
Technologies Affecting the Workplace

Non-material results: Macroscenarios

These working scenarios have been collected together in three large families, which have been described as macroscenarios. Unlike the working scenarios, which illustrate and expound on potential identifiable situations, these macroscenarios do not answer questions, but point the way for future thinking and forecasting.

There are three macroscenarios: *Here*, *There* and *Anywhere*. Each is exemplified by an iterative model of four descriptive statements, whose changes from one macroscenario to the next reflect the changes and thus also the similarities between them. Similarly, a list of keywords focuses attention for the future development of each macroscenario.

Here

These scenarios photograph situations that are close to the individual in both time and space. They focus on people's needs today in places of intimacy that can double as workplaces and in workplaces that can link to or double as places of intimacy.

For many individuals, the first step towards humanising technology consists of a more personal, domestic approach to the existing individual workplace.

Information Technology is an essential raw material for the design process involved in creating the intimate workplace of the future.

Keywords: Immediate - intimate - personal - home - proximity

There

These scenarios offer a description of situations in which individuals may find themselves when they venture out of the sphere of immediate personal intimacy. They focus on people's needs in the tangibly near future in locations of social intercourse that double as workplaces and in workplaces identifiable with current models that double as places of social intercourse.

For many individuals, an essential step towards humanising technology consists of a more user-centred, caring, sentient approach to the way public and social workplaces are designed and used.

Information Technology is an essential raw material for the design process involved in creating the social workplace of the future.

Keywords: Soon - public - social - intercourse - office - proxemics

Anywhere

These scenarios suggest situations in which many individuals will be doing knowledge work while on the move in the foreseeable future - and some already are now. They focus on people's needs to be able to access and use their knowledge sources at times when they are not situated in any currently defined working location, when the surroundings doubles as the workplace and the workplace blends seamlessly into the surroundings.

For the many individuals who now work on the move, technology can and must be humanised by relegating it to its function as an unobtrusive facilitator whose applications are instinctive and putting the design focus squarely on the user.

Information Technology is an essential raw material for the design process involved in creating the mobile workplace of the future.

Keywords: Any time - all the time - anywhere - everywhere - communications - mobile

Non-material results: Future developments

One of the major achievements of the Humantec project has been to lay solid foundations for a continuing community of ICT-aware designers, design educators and design promoters, teamed with – so far – one ICT centre of excellence as an advisor. As a thematic network, Humantec now continues to exist through this community, bringing its results and potential to the attention of other actors in the fields of design and ICTs and acting as one potential bridge across the gap between them.

Humantec now offers an open door to all other researchers and practitioners in the fields of design and ICTs who wish to draw on the Humantec experience and/or make use of the innovative input from the design community in future ICT/IST project developments.

Humantec has made a strong statement about the importance of the paradigm shift away from the old model of development of technology, which often forces "feature-rich rubbish into [the] already overcrowded lives" of unwilling users, i.e. developing new technology because it is developable as a further evolution of existing technology, not because somebody has actually asked for it and towards the user-centred focus of identifying what people need (maybe without being consciously aware of it) before embarking on developing new technologies.

Humantec has also established a further new paradigm, drawn from the rich experience accumulated by processes of creative design through the modern age. This is the principle that information technology is essentially a raw material for the design process, in the same way as state-of-the-art metal alloys and plastics. What this means, in very simple terms, is that, just as the metallurgists who develop new composite alloys and the chemical engineers who develop new plastic materials have grown accustomed to working in mature partnerships with cutting edge architects and designers, creating raw materials for specific design and production processes and requirements that are customised to suit them, so the specialists of ICT development must learn to interface with the vanguard of architecture and design to ensure that the products they develop are not only relevant, but custom-designed for specific purposes. This new Humantec paradigm is a *sine qua non* for the development of ambient intelligence through embedded, disappearing and ubiquitous computing.

Contact & Information

*Pete Kercher
Centro Legno Arredo Cantù
Piazza Garibaldi 5
22063 Cantù (Co) - Italy
Tel. +39-031-713114
Fax +39-031-713118
pkercher@libero.it*

4.6 PROJECT RESULTS - NEW METHODS of WORK in SECTORIAL SETTINGS

4.6.1 Results of CARUSO – an eCRM project

Introduction

CARUSO (Customer Care and Relationship Support Office) provides a framework for low cost customized eCRM applications, including software components, such as systems and business objects, modelling, development and administration tools, as well as interfaces to IT and to telecommunication infrastructures. CARUSO facilitates the building of eCRM program solutions for SMEs of any industry and easily adapts to changing customer requirements.

eWorks in Customer Relationship Front Offices

Front offices are focal points of customer communication. Their objective is to provide intelligent services for customer care, marketing & sales programs and activities, as well as to care for general and for technical requests. User desks are to be supported by multi-channel communication technology, intelligent call and message distribution and call/message conversion features. This technology has to be smoothly integrated with software functions that serve various requirements of passive customer care and management centres, as well as of active and passive marketing objectives. In order to avoid integration cost, the whole range of functionality shall be supplied on a single server.

For more information on eCRM functionality see www.datacall.biz or contact info@datacall.biz.

General Risks and Customer Experience

In contrast to eCRM success stories, a Gartner Group study made in 2002 reports that approximately 55 % of all CRM projects failed to meet the company's expectations. Tabor Triffin Communications indicated "six mistakes that will sink CRM customer projects" (28.03.02): vendor hype and unrealistic expectations; no customer strategy; poor preparation for change; absence of executive leadership; neglecting metrics; Forgetting that 'C' stands for 'Customer'.

These reports point out the necessity of top management involvement in strategic guidelines and decisions, and the requirement for detailed project management and for participation of organizations concerned in the definition and implementation procedures.

In order to avoid risks, Caruso recommends nine rules for project management

- Definition of the customer's strategy, requirements and new business processes.
- Adaptation of Caruso software modules to the customer needs.
- Definition and implementation of PBX interface, host interface, data base applications, and session management.
- Provision of easy to handle user interfaces.
- Provision of powerful monitoring & reporting tools for the management.
- Implementation of Caruso in steps with intermediate tests to match the requirements.
- Training of agents on their business processes and their data.
- Configuration of the system together with the supervisor/administrator.
- Introduction of the supervisor/administrator into the change procedures.

After a number of eCRM projects with Caruso technology, we summarize experience reports given by SME customers and by developers:

- The design of applications, of business objects and of data modelling with the Caruso components and tools made the developers' life much easier than it was in former times.
- Caruso technology proved that changes could be made with reduced effort.
- The implementation, with limited effort, of Caruso by steps of functional packages was successfully managed due to the component structure of Caruso.
- Due to the simplicity of Caruso screens, agents rapidly got used to the new look and feel, and to their handling.
- Supervisors easily adopted new configuration procedures as well as their support by configuration screens.
- Status monitoring and statistics reporting tools put supervisors in the position of providing optimal service quality. Customer requirements for individual management reports have been easily implemented.
- Customers also report productivity increase of agents by a factor of 2 to 5 due to new Caruso functionality, user interfaces and communication procedures!
- With new services, additional sources of revenue could be implemented.
- Customers say that they expect to achieve their ROI within 6 to 18 months.
- With the day-by-day experience customers have rapidly realized, that with Caruso technology, they could easily implement new helpful procedures, which had not been planned before.

Apart from additional revenue, productivity gain and cost reduction of SMEs, their clients benefit from new or improved customer services and in two cases from reduction of service fees.

Contact & Information

*Jörn Seifert,
Managing Director,
DataCall Systeme GmbH,
München,
Germany
blahr@lycosmail.com*

4.6.2 Knowledge Management for the construction industry: the e-COGNOS project



Introduction

The overall aim of the e-COGNOS project is to specify, develop, and deploy an innovative open model-based infrastructure and a set of tools that promote effective and consistent KM (including capturing, organising, mining and disseminating) within collaborative construction environments.

The objectives of the project are to identify and develop methodologies and software tools that are necessary to effectively and consistently manage knowledge in the construction domain, in order to: (i) facilitate the capacity to collect the experience gained in a construction project, so as to be able to reuse it elsewhere; (ii) organize access to general information (domain level), to internal know-how (company level) and to the documents that are specific to a given operation (project level) appropriate to the role and needs of the user; (iii) facilitate document consistency between these three knowledge layers (domain, company and project); (iv) have access to Internet-based searching tools that are adapted to the construction sector.

The e-COGNOS consortium included major construction companies from four European countries and two leading research centres.

Approach

The e-Cognos consortium has adopted an iterative and incremental approach to address the objectives of the project. The work is being carried out across two iterations spanning a 27-month period.

Requirements for the proposed system were provided by an analysis of the current business processes and information management practices within the end-user organizations. The process analyses led initially to the development of models using IDEF0 functional modelling describing the basic KM practices in the participating companies. By abstracting from these models, the Generic Knowledge Management Process Model (GKMPPM) was designed to determine the high-level KM process activities.

At a lower level the Unified Modelling Language was employed to detail via use cases the ways in which the e-Cognos system can be used at a business level, and to derive the required functionality of the system. From the use cases, the e-Cognos project used an object-oriented approach to design and implement the e-CKMI.

The following results have been delivered:

(a) The e-COGNOS knowledge management infrastructure (e-CKMI)

The eCKMI, a construction-oriented middleware, is an ontology-enabled infrastructure delivering knowledge management services. It uses collaboration and profiling to mimic social behaviours with respect to knowledge creation, capture, searching, sharing and dissemination.

A component based architecture using the concept of 'services' has been adopted. This allows the system to use the 'Web Services Model' to provide the unifying infrastructure, which enables the sharing and use of services and applications by the e-CKMI. The e-Cognos manager and e-Cognos portal represent the human interfaces to the e-CKMI, which provides a set of KM services supporting the main functionalities identified in the classical KM Life cycle, (e.g. *acquisition, indexing, searching, and dissemination*). These services operate supported by an ontology-centred service which is managed by the e-COGNOS Ontology Server.

(b) The e-COGNOS ontology

The consortium defines an ontology as a shared understanding of a particular domain, represented by means of concepts that are related in a rich manner. An ontology of the construction sector can be used for advanced information management. For example, it can provide advanced search mechanisms such as, e.g., assisting the user in their searches by expanding or narrowing the search, or categorizing the results of a search when too many items are returned. It can also help manage knowledge in context, the context being specified through the ontology.

The consortium developed a methodology for ontology creation and enrichment based on recent standards. At the highest level, the ontology inherits the structure of the IFC model. At lower levels, existing taxonomies and thesauri are continually incorporated. With more than 13,000 concepts to date, this work in progress is a valuable contribution to the research community.

(c) The ontology server

The e-COSer is a Web-based application that plays two complementary roles: ontological support to the other KM core services of the e-CKMI and ontology management. The former, which is indeed the primary function of e-COSer, consists in taking a list of meaningful keywords (a query) and produces the respective ranked list of ontological concepts that best match that list of keywords. The latter supports the management of the ontology providing services like inclusion/suppression of ontological entities (concepts, attributes and relations), graphical functionalities to browse the ontology, the importing of bcXML-compliant taxonomies, and so on.

End-user pilots

In each country represented in the consortium, the e-COGNOS ideas and solutions were applied and tested against selected business scenarios.

In Germany, Hochtief concentrate on user issues such as service quality, interface layout, language support, integration with user applications, etc. One interesting feature of the prototype is the ability to manage knowledge embedded in drawings through indexing of text and other named entities of CAD documents.

In Finland, YIT make use of its best practices library to provide information to its employees on how to best perform a particular task. The approach being investigated concentrates on the use of product models (IFC models) as an interface to best practice management in construction. Integration of an IFC model server within the eCKMI was achieved and tested.

In the UK, Taylor Woodrow focused on benchmarking the eCKMI against other state-of-the-art solutions to deliver a comparative analysis together with business recommendations for achieving the benefits of the e-COGNOS solutions.

In France, OTH/Derbi concentrate on evaluating how the system can be used to effectively and consistently manage knowledge across different sites, in a secure, integrated environment, for example in the case of OTH between 2 or more non co-located subsidiaries. The eCKMI provides a framework for the integration of OTH in-house knowledge sources and the delivery of value-added KM services over a nationwide VPN.

Contact & Information

*François Giraud-Carrier
Derbi (OTH group)
18, boulevard de la Bastille
75012 Paris, France
f.giraud-carrier@derbi.fr
www.e-cognos.org*

4.6.3 EConstruct project – results and follow up



The eConstruct results, including the bcXML language, the "bcBuildingDefinition" taxonomy, and the bcXML Prototype were presented in January 2002 at a workshop in Delft. It demonstrated how the bcXML language could support the Building and Construction industry in the procurement of products, components, and services. The prototype used real catalogues provided by Taylor Woodrow Construction, the British end user in eConstruct. These catalogues were created using spreadsheets and converted into bcXML compliant catalogues, that were registered into two different Supplier Catalogue Servers managed by the Resource Database Server. The Taxonomy Server supported the creation of the appropriate bcXML queries and various client applications that were able to search and find products in the referred catalogues as shown in Figure 1 below.

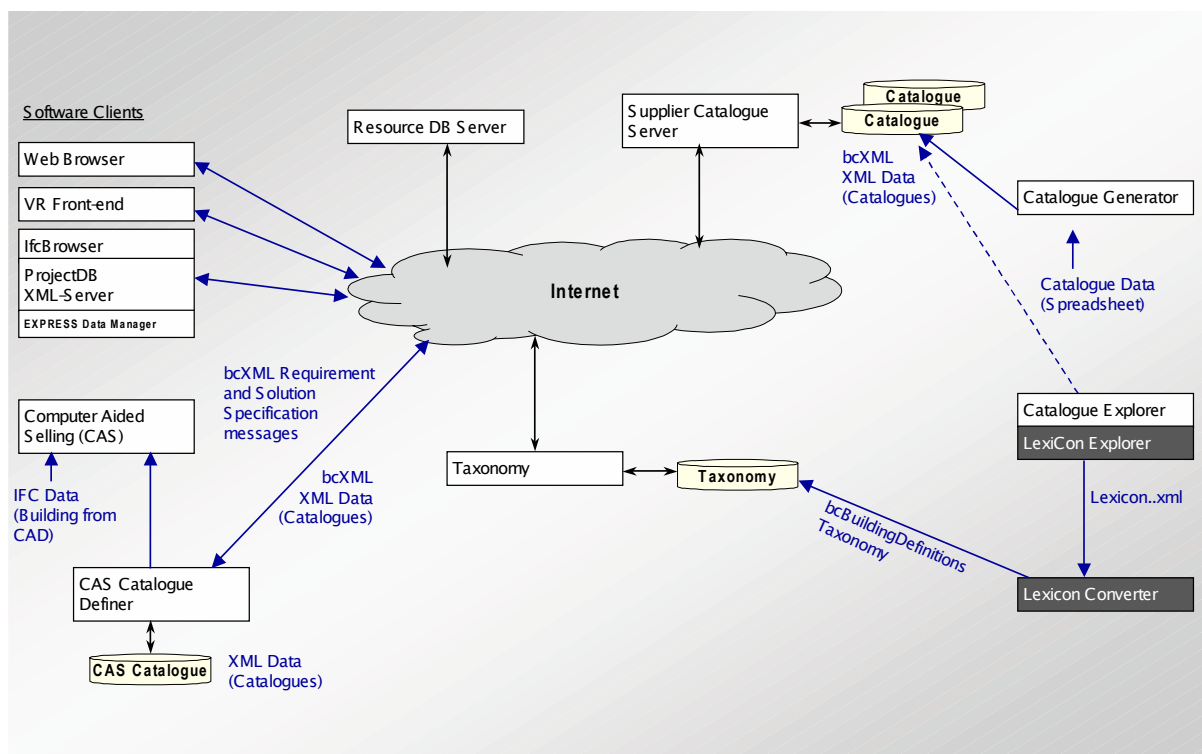


Figure 2 – bcXML components

Since the completion of the eConstruct project work has continued in 2 areas: within the CEN/ISSS Workshop called eConstruction and the IST e-Cognos Project:

CEN/ISSS Workshop - eConstruction

In progressing the introduction of electronic commerce (eCommerce) and electronic collaboration (eBusiness) in Construction ("eConstruction") there is a need to draw together the many efforts, initiatives, projects, organizations, companies and people that are currently active in research, development, dissemination, take-up, deployment, exploitation and standardisation to deliver "consensus specifications for an integrated suite of construction e-standards". This consensus is seen as a critical success factor to hasten the "e-evolution" in the European construction sector.

eConstruction: embraces potentially all ICT related topics in the Construction industry but with a primary emphasis on the Internet and Next Generation Internet (XML-based) as basic communication

infrastructure. Two main sub-scopes are recognised: eCommerce and eBusiness. eCommerce targets the supply-chains ("trading") whereas eBusiness targets the Goods & Services development life-cycles ("collaboration").

The Workshop for eConstruction is one of the mechanisms to facilitate this end. In this it aims to be the European platform for harmonisation of eConstruction, embracing all semantic electronic communication & information integration in the construction life cycles and business supply-chains of the European Construction Industry.

The Workshop is committed to improving competitiveness, productivity and client satisfaction by preparing an agenda for future research programmes and shaping the ICT solutions for the next decades to transform the ways the industry works. It will propose migration routes from the current ways of working to the vision where ICT is exploited to the full by providing measures to increase their penetration into the industry. It will take advantage of the emerging technology taking into account the opportunities offered by the Internet.

The Workshop will align with the recently commenced IST ICCI European cluster project that is tasked both to harvest and harmonise results from running and recently completed RTD projects and to identify directions in which new work might evolve to best suit industrial exploitation. The establishment of this Workshop is regarded as one of the organizational end-results of the combined efforts of the recently completed IST eConstruct project and the current IST ICCI project.

Contributions in the form of ideas, specifications, software etc. will also come from other projects including OSMOS, e-Cognos, ISTforCE and eLegal; from existing CEN/ISSS Workshops (such as those on eCommerce in general, eBES dealing with ebXML in Europe and Web Services) and from ISO STEP, IAI and ISO Construction Classification working groups such as ISO TC59/SC13/WG6. The roadmap project ROADCON is seen as a prime contributor as well as early 6th FP integrated projects in the area of eConstruction.

Finally the setting-up of this Workshop has been fully supported by the IST C-ECOM cluster project.

bcXML in e-Cognos

BcXML has been adopted as the format to import taxonomies into a construction-oriented ontology that is being developed by the e-Cognos project. Such an ontology has been built to achieve one single goal: to support the consistent knowledge representation of knowledge items in construction. Two concepts are fundamental: Knowledge Items (KI) and Knowledge Representations (KR). The former are the real pieces of knowledge (documents, experts, projects, organizations, etc.) and the latter are the respective representation of KIs within the e-Cognos Knowledge Management Infrastructure (e-CKMI) that the project is developing.

The e-CKMI is composed of a set of Knowledge Management (KM) Core Services representing its vital functionalities. The KM core services were designed to cover the "classical" functionalities of the KM cycle, such as acquisition, indexing, searching, and dissemination. In this context, the Ontological Service (e-COSer) that includes the e-Cognos Ontology, provides the ontology-related functionalities that support the operation of a number of the core services.

A taxonomy is the backbone within the e-Cognos ontology and the taxonomy was initially created taking the International Alliance for Interoperability (IAI) Industry Foundation Classes (IFC) objects as core concepts. Subsequently the taxonomy was enriched with concepts coming from different sources (glossaries of terms and classification systems, etc.). However, in nine months of work the ontology had only 800 concepts and one of the fundamental questions to be answered was raised: how to grow the ontology? BcXML was found to be the answer and the e-COSer offers a mechanism to import bcXML-compliant taxonomies, which has meant that the e-Cognos ontology has quickly grown from 800 to 13000 concepts.

The goal of e-COGNOS is to extend the ontology by importing further well-known taxonomies. However, the effort now required to build a bcXML taxonomy is not significant and other specific taxonomies (for example used by one single company) can be imported within the ontology very

quickly. This provides a very effective means to customise the ontology in the sense that there is always an open door supporting the aggregation of very local "dialects".

This mechanism is also being exploited in a transcontinental cooperation involving CSTB and the University of Toronto, where the e-COGNOS ontology will be enriched with the appropriate knowledge about highways and the financial-related aspects of construction projects.

Contact & Information

*Jeff Stephens
Taylor Woodrow Technology Centre
Stanbridge Road
Leighton Buzzard
Bedfordshire
UK - LU7 4QH
Tel: +44 1525 859067
jeff.stephens@uk.taylorwoodrow.com
<http://taylorwoodrow.com>*

Websites

- The eConstruct homepage: www.bcxml.org
- The eConstruct project results can also be accessed on line at: www.bcxml.org/6-Public/bcXML_CD/index.html
- The eConstruct project has created a CDROM that contains the project results and all the software that is needed to install the prototype demonstration that was presented at the final review workshop. Copies of the bcXML Prototype Demonstration CDROM are available at: www.bcxml.org/6-Public/bcXML_CD/orderform.html
- The CEN/ISSS Workshop eConstruction homepage: www.nen.nl/wseconstruction/
- The e-Cognos Project homepage: www.e-cognos.org/

4.6.4 The ICCI project: providing a consolidated view on RTD results in Construction ICT

Introduction

The ICCI⁸⁷ cluster project (<http://icci.vtt.fi>), undertaken in the IST⁸⁸ programme, is dealing with harmonisation and integration of outcomes from major research projects funded under the EC Fifth Framework Programme (FP5). ICCI covers many issues relevant to construction actors appraising the future use of ICT⁸⁹ in their daily work and business activities. The main objectives of ICCI are:

- to encourage and assist cooperation of projects in the ICCI cluster
- to identify the synergies in work and results in different projects
- to promote the deployment and efficient use of ICT in the automation, integration and communication in the European Construction industry – paving the way towards new knowledge intensive construction processes
- to strengthen relationships with standardisation bodies to ensure coherence of technology deployment in Europe.

Approach and results

The ICCI project provides an umbrella for improved co-ordination and broader dissemination of results of the following six projects: OSMOS, eConstruct, Diversity, ISTforCE, eLEGAL, GLOBEMEN. It also has relationships with other EU projects and initiatives, e.g. e-COGNOS or the prodAEC thematic network and results in ICCI also rely on analysis and synthesis of the research undertaken in IAI⁹⁰ projects and some national projects as well. Table 1 presents a summary of the objectives, outcomes, and perceived impacts of the 6 ICCI member projects. In a nutshell, OSMOS and ISTforCE provide models and tools for supporting construction virtual enterprises, eConstruct provides a taxonomy and a building construction vocabulary (bcXML), Diversity provides 3D and 4D tools for construction simulation and visualization, eLEGAL explores contractual implications of ICT work, and GLOBEMEN, through an appraisal of different industrial sectors involved in one-of-a-kind production, provides a virtual enterprise reference architecture and methodology.

The basic approach used in ICCI has been the review of information from the document archives of the analysed projects, supplemented with targeted interviews and workshops conducted at national levels for validation and to seek further view points. Results have been classified under the main headings of:

- Industrial requirements (primarily for eBusiness and eWork)
- ICT infrastructures supporting industry needs and collaborative working
- Human and organizational aspects for ICT in construction
- Legal and contractual aspects of networked co-operation in the construction industry

Major results and their target audience are listed in Table 2.

⁸⁷ IST-2001-33022; *Innovation co-ordination, transfer and deployment through networked Co-operation in the Construction Industry.*

⁸⁸ *Information Society Technologies funded by the European Commission.*

⁸⁹ *Information and Communication Technologies.*

⁹⁰ *International Alliance for Interoperability; www.iai-international.org/*

Table 1: Summary of main objectives, main outcomes, and perceived impacts of analysed projects

OSMOS	
Main Objective	Specify, set up and promote flexible Internet-based services that support teamwork in the dynamic networks of the European construction industry
Main Outcomes	Generic VE process model Application service integration and management OSMOS prototype demonstrators Migration path to the approach
Impacts	Increased competitiveness Improved team working
EConstruct	
Main Objective	To develop, implement and disseminate the "Building and Construction eXtensible Mark-up Language: bcXML"
Main Outcomes	bcXML Specification bcXML Use Case Scenarios
Impacts	With bcXML, a cheap but powerful Internet technology has been developed for eCommerce in Building & Construction
Diversity	
Main Objective	Research and Develop Distributed Virtual Workspaces (WS) that Support Continuous Design between different technical domains Support a Visual representation and Collaboration between geographically distant sites
Main Outcomes	Prototypes for Client Briefing WS, Design Review WS and Construction Planning WS
Impacts	Improved communication between different phases of the process through a Model Driven approach Ability to study the impact of various technical choices in early design phases
IST for CE	
Main Objective	Introduce methods of the new economy to construction by: (1) Developing new ways of collaboration for the design and planning in civil and structural engineering, and (2) Developing new business models for providers of software and online services
Main Outcomes	Personalized, human-centered Concurrent Engineering Services Platform (CESSP) for multi-project participation Open collaboration environment where service providers can meet managers, architects and engineers Infrastructure for on-line eBusiness Prototype Internet workspace for engineers
Impacts	Solid approach for next generation collaboration platforms development Opening new ways of working to engineers, software vendors and information providers
ELEGAL	
Main Objective	Definition of a framework for legal conditions and contracts regarding the use of ICT in project business and implementation of legal support tools
Main Outcomes	Definition of the legal basis for contracts on ICT use in the VE Contract negotiation & authoring tools
Impacts	Improved business relationships in VEs More trust and confidence between parties Reduced number of disputes
GLOBEMEN	
Main Objective	Definition and harmonization of ICT support requirements in various one-of-a-kind industries operating in various cultural environments.
Main Outcomes	Generic reference architecture for virtual manufacturing enterprises. Specification of required methods & tools. Guidelines and handbooks for virtual manufacturing enterprises. A demonstration of system features. Industrial prototype implementations.
Impacts	Improved collaboration between different ICT applications Framework for the configuration and instantiation of VEs Deployment by ICT vendors

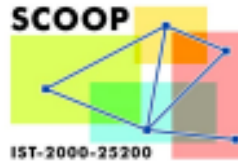
Table 2: Main ICCI results and target audience

Title of Result	Audience		
	Industry	Research	IT Mngt.s
Collected end users scenarios	X	X	X
Collected end users requirements and common structure	X	X	X
End User Requirements: Common Structure and Gap Analysis		X	X
Assessment and continuous updates of end users requirements	X	X	X
ICT common glossary	X	X	X
ICT ontological framework and classification		X	X
State-of-the-art in ICT standards & standardisation efforts		X	X
Market watch	X	X	X
RTD advances and migration risks		X	X
Synthesis of projects ICT infrastructures		X	X
Guide for tools/services delivery			X
ICCI Best practice guide	X	X	
ICCI Action Plan on training in construction	X	X	
State-of-the-art review report on legal and contractual issues of ICT in construction	X	X	
Potential legal gaps and problems within the cluster projects	X	X	
ICCI vision for integration of contractual and legal aspects of ICT into networked co-operation in construction	X	X	
Extended Collaborative Engineering: Concepts, Applications and Potentials	X	X	X
Future needs, RTD and plans for IT in Construction	X	X	X

Contact & Information

Alain Zarli
alain.zarli@cstb.fr
CSTB,
290 Route des Lucioles B.P. 209,
06904 Sophia Antipolis cedex,
France

4.6.5 Sophisticated Co-operation in Dynamic SME Networks based on Co-operative Planning and Control



Introduction

Small and Medium-sized Enterprises (SMEs) form a dynamic and heterogeneous community, which is confronted by many challenges. These include increased competition resulting from the completion of the European internal market and the general trend for market globalisation, the constant threat of larger companies willing to outperform and/or buy them and the growing customer influence on production processes. More and more SMEs tackle these challenges by forming enterprise networks and strategic alliances.

The SCOOP project addresses the problem of managing co-operation in dynamic SME networks using an innovative and advanced solution based on co-operative planning and control. The textile/garment and printing industries have been chosen as ideal representatives of highly dynamic business scenarios.

Background

The SMEs acting in the European printing and textile/garment industries still have substantial competitive advantages in technical areas. However, international competitors are starting to expand their influence in Europe. To stay competitive in a global, highly dynamic market requires the optimisation of co-operation between SME to react in a flexible way to market demands.

Therefore production has to be optimised along the entire supply chain, which requires close co-operation between the participating companies. In addition to the vertical co-operation along the supply chain there is an increasing need for horizontal co-operation especially in the European print industry. In order to provide full service to their customers, companies accept orders although they do not have the capacity for processing these orders or they cannot produce at optimal cost due to a lack of specialised equipment. Therefore these orders are outsourced to co-operating companies, which have free capacities or the equipment to produce at optimum cost.

Planning and controlling production processes in dynamic networks of co-operating companies is currently hindered by several problems:

- Especially small companies do not use IT systems for local production planning and control due to high investment costs and the inability of existing PPC systems to deal with highly dynamic changes of the production plan imposed by customer requests.
- Production planning across an entire network of co-operating companies is only possible if all companies use the same system for local planning and control and are willing to pass information about local planning and control to their partners.
- Vertical and horizontal co-operation requires negotiation, which is time-consuming and error-prone.
- Finding possible partners is not supported sufficiently by electronic marketplaces.

There have been attempts to use standard PPC systems (SAP, BAAN, etc.) in the past. However, generating production plans using these systems is far too time consuming to fulfil the high demands for short feedback loops. Therefore production planning in most cases still relies on magnetic whiteboards, i.e. all production planning including adjustments caused by changes of priority or external influences is performed manually.

Requirements

The requirements analysis performed with the end users involved in the SCOOP project made evident that the SCOOP software toolset should provide four main functionalities:

- Local rough planning
- Co-operative rough planning across a network of co-operating companies
- Decision support at order intake
- Broker service for establishing new partnerships

Since detailed shop floor planning at an early stage of order processing does not make sense in highly dynamic end user scenarios, a fast capacity based rough planning, which only takes the capacity of organizational units and critical resources into account is required. In order to make proactive and reactive subcontracting and/or outsourcing easier, the local rough planning systems have to be extended by mechanisms for exchanging planning data and thus automatic negotiation of order shifting.

To support make-or-buy decisions at order intake mechanisms are required, which analyse the economic suitability of an order based on the technical specification of the requested product. In order to find new co-operation partners a broker service is required, which allows companies to register with a profile describing the services they offer. Thus potential co-operation partners can be searched by matching requested services with the stored profiles.

Results

Based on these requirements a methodology for co-operative rough planning and a set of software tools supporting this methodology have been developed in the SCOOP project.

The core component of the SCOOP toolkit is an extremely fast simulation-based rough-planning system, which allows online-planning at order intake. To support planning across a network of co-operating companies, the planning engine can communicate with the planning engines of partner companies on a peer-to-peer basis to negotiate production capacities. Incoming electronic inquiries are automatically analysed according to their economic suitability, i.e. a ranking factor is computed, which is used to decide whether to offer capacity for the inquiry or not.

In addition to the peer-to-peer communication model a broker system is provided. Companies can register at this broker with a description of the services they offer. Other companies requesting a specific service can query the broker for possible co-operation partners. However, the broker system does not only serve as a yellow page service, but also accepts electronic inquiries by the planning engines, which are forwarded to companies able to serve them. In this way shifting orders in large networks is simplified substantially.

The SCOOP solution provides a powerful and easy to use set of applications, in line with the current component-based virtual enterprise market trends for applications. At an affordable price it responds to the dynamic production planning needs and requirements of the SMEs in the printing and textile/garment industries. The enhanced dynamic planning process provided by SCOOP will lead to a considerable reduction of production costs as well as a reduction of lead times.

Pilots installed at the consortium end-users, have provided a solid test bed for the SCOOP products development and extensive market knowledge in the target industries. Dissemination activities have spread the SCOOP solutions among relevant European players and provide a starting point for SCOOP commercialisation.

Contact & Information

Michael Matthieseen
Institute of Parallel and Distributed Systems
(IPVS)
Universitätsstraße 38
D-70569 Stuttgart
Germany

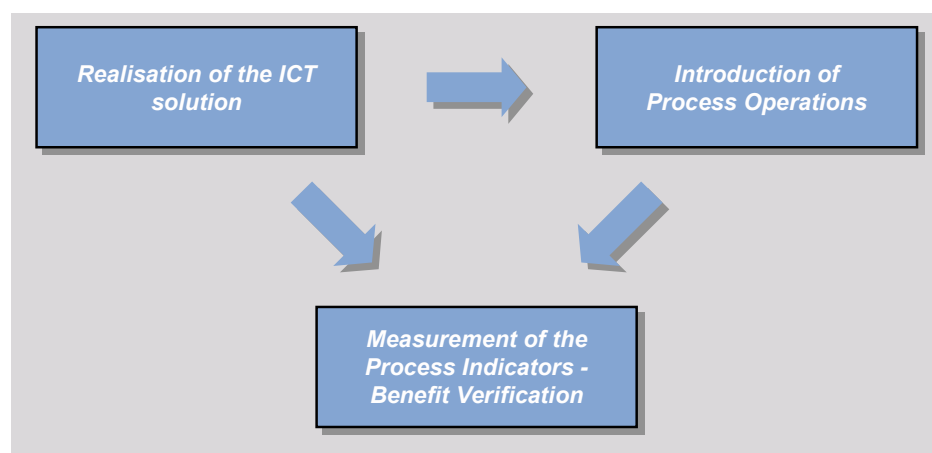
Phone: +49 711 7816 414
Fax: +49 711 7816 248
Michael.Matthiesen@informatik.uni-
stuttgart.de
<http://scoop.informatik.uni-stuttgart.de/>

4.6.6 Best Hospital Practice through Teamwork - TEAM-HOS Project

The TEAM-HOS (Best Teamwork in Hospitals) Project gave birth to an innovative methodology, called BHP (Best Hospital Practice), associated with a set of tools for the analysis of an hospital's requirements, in order to optimize and re-define new teamwork process organizations, together with the specification, design, selection and implementation of adequate ICT solutions to support these re-designed organizational processes.

The project developed in five Hospitals, constituting five Case Studies: two hospitals in Germany, two in Portugal and one in Austria. The project dealt with the definition of concepts for the BHP-Methodology and tested these at the five Hospital Case Studies. This consisted of an analysis of requirements from a treatment point-of-view, fully based on Participatory Design with the clinicians, and centred on the patient.

This work lasted for the first two years of the project and a detailed set of specifications of the solutions for the hospitals was obtained, clarifying the new organizational procedures and finally selecting the particular ICT solution for each hospital. At the end of the TEAM-HOS project, the consortium was able to produce a complete first release of the BHP-Methodology together with a handbook. All Hospital partners selected the particular ICT solution and a provider. At the end successful implementations were achieved in the five hospitals, allowing already for indicator's measurements that lead to results surpassing the initial benefits estimations.



BHP – Work steps for implementing an ICT solution at a Hospital

Actions already taken regarding dissemination and exploitation of results include several papers in Scientific Meetings and Conferences and an European Level Workshop at IST'2002.

Contact & Information

José Artur Vale Serrano
IEETA - University of Aveiro
Campus Universitário
3810-193 Aveiro - Portugal
serrano@ieeta.pt
Fax: +351 234 370545
Phone +351 234 370521
www.team-hos.net/teamhos/home.nsf

4.7 PROJECT RESULTS - NEW METHODS of WORK in REGIONAL SETTINGS



4.7.1 Esociety Gap assessment project (eGap)

Background

To maintain or to improve their competitiveness in the knowledge economy, SMEs face the challenge to adopt new working methods, review their work processes and adapt existing skills to a growing use of ICTs. eWork which combines new work organization, new information and communication technologies and new values and behaviours among managers and staff, gives rise to hope, hesitation and resistance.

The ECaTT 98 telework survey pointed out the strong and weak parts of this process, and the discrepancies among different European countries. eWork 2001 Status Report has underlined the leading role of large corporations in generating awareness about the Information Society. Nevertheless SMEs and their paid workers are more numerous within European countries. As in many cases they are highly dependent on large corporations as sub-contractors, their adaptation capacity will become a major factor for their survival as well as for sustainable development as a whole. Thus growth prospects in eWork seem more promising than in very large corporations.

Objectives

The eGAP project intends to observe and compare five significant EU countries — Finland, France, Hungary, Italy and the United Kingdom — and Japan, at a regional level, in order to bring out the reasons why and the ways how, within specific professional environments, eWork and teleactivities in SMEs meet difficulties in implementation or give out positive outcomes for cooperation.

The regions involved include Tampere the 'model region' of the new economy in Finland; Rhône-Alpes one of the fast growing areas in France; Emilia-Romagna well known for its industrial districts for a long time; Székesfehérvár, the capital of Central Transdanubia, ranked among the top ten fast developing areas of the world in the late 1990s; and the Greater West London Wedge, part of the very developed London region.

The eGAP research concentrates its effort on a comparative study amongst them in order to provide practical recommendations to national and local actors, and other stakeholders. The results of the eGAP research should become a major contributor in the understanding of 'how' and 'why' SMEs adapt better and/or faster than others and evaluate the results of this adaptation process in economical terms.

The study is both qualitative and quantitative, using data collection and classification, a quantitative survey and interviews. A cross-analysis will enhance 'best cases' and underline the essentials, for an adequate, positive and sustainable implementation of eWork within SMEs.

Main results of the survey

The survey was undertaken via telephone interviews between November 2002 and January 2003. The number of questionnaires collected reached 1 714 entrepreneurs in the five European regions.

(a) Companies and Technology

Basic technology level is very high in all regions of the study, especially about Internet and e-mail diffusion. However, indispensable technologies for e-work development seem to be still not very widespread, such as web sites and collaborative tools.

Among preconditions of introducing e-work, the general level of firms' ICT equipment is just as important as the possibility for all, or part of the staff, to gain access to corporate information services. Figures allow a certain degree of optimism in particular for France where for more than half of the companies, everybody can use ICT equipment remotely. In the United Kingdom and Hungary, this possibility is granted to a lower percentage of employees. The risk of company information security constitutes a significant problem for the use of Internet everywhere.

A synthetic indicator of the level of corporate technological equipment has been built. This index has been split into three categories; *low*, *medium* and *high*. The resulting figures are not surprising: in Finland and the United Kingdom, more than half of the companies have a *high* level of technologies, while in Hungary the percentage of companies with a *low* level of technology is still relatively high. Figures show a *high* level of technology in France and Italy, though in France it coexists with a significant number of obsolete firms.

(b) Organization and Innovation

From an organizational point of view, inclination towards innovation seems low: project work is not widespread yet; management seems still very hierarchical and the only widespread forms of flexibility are related to new kinds of contract. Moreover, the most common management model is direct supervision and visual control of work: that is why working site-off is not yet a common practice and is used mainly by managers and sales force.

Entrepreneurs state that the main problems in introducing new technologies, are the lack of time for training, the resistance to changes and the generational gap. These answers indicate a low level of propensity towards innovation, in spite of high levels of technological equipment.

(c) e-work perception

The main agreement among the managers is that working at home is only suitable for trustworthy and close employees of the company. The most significant findings, common to all countries, is that the most widespread type of off-site working is at customer's premises and that work at home is generally only confined to management. Home worker's efficiency is considered higher because they can organize themselves autonomously. EWork's greatest advantage is perceived to be 'greater flexibility in working hours' followed by 'less time wasted through commuting', almost everywhere.

Managers consider e-work to be more beneficial to employees than to the environment or to employers, almost everywhere. They give very little importance to corporate benefits such as 'increasing productivity' and 'saving office space'. The greatest disadvantages reported by managers are the 'lack of employee supervision' and 'organizational difficulties'.

These figures have been aggregated in a synthetic index of 'inclination towards working at home'. According to this index, Hungarian firms seem to be more favourable to work at home, while more than half of French and English entrepreneurs shows some hesitation towards it.

(d) Inclination to e-work: a Typology

Despite the fact that most of the sample companies have a very high level of technological growth and a remarkable knowledge of e-work, very low percentage of them actually use it for some of their employees. If we admit that technological equipment is no longer an impediment to e-work implementation in European companies, what are the elements that prevent it from spreading?

In order to find out interesting connections between technological equipment and the organizational attitude towards remote working, we put together the figures obtained through the two indexes (*technological level* and *inclination to work at home*). Thus, we obtain a model of 'propensity to e-work'.

Model of propensity to e-work In the five European regions of eGap study

Technological level	Low	Medium	High
Inclination to work at home			
no aptitude for e-work	No interest (28,1%)		Resistant (19,1%)
inclined/favourable	Interested (32,6%)		
neutral	Indifferent (20,1%)		

According to this classification, Italian firms are more interested in e-work (above 40%), followed by the English (35%) and the Hungarian ones (above 30%). Italy has a low percentage of firms indifferent to e-work (15%). The number of firms not interested in e-work is very high in Hungary and France (above 35%). Finland has a high percentage of firms classified as indifferent (above 30%).

This classification is related to familiarity with e-work everywhere but in France. There is a strong relation between inclination to e-work and the chance to work in a project mode; and also a strong relation between inclination for e-work and the chance of employees to organize their own workingtime.

(e) Conclusion

Although the majority of interviewees – especially in the service sector – know the meaning of the term *e-work*, among entrepreneurs prevails a stereotyped vision of this kind of work, according to which employees are the main beneficiaries. Economical benefits, well known in the literature, are considered almost insignificant. Our survey has confirmed our first hypothesis: technology is not sufficient for e-work diffusion, because the reason for this low diffusion must be researched in organizational cultures more than in technical problems. In other words, inclination towards e-work doesn't change in spite of changes in technological equipment.

Local environment, Regulatory Framework and e-work

The regulatory framework is meant to include the legislative as well as the social framework. To better understand this interpretation – which is the methodological basis of our evaluation of empirical data – it is necessary to briefly review the most relevant forms of the regulatory mechanisms shaping economic behaviour. In this respect, we intend to stress the following: ICT in itself is not a *key driver*, only a *key enabler* factor in the diffusion of e-work. The influence of ICT is mediated by the various types of regulators functioning at national, regional and workplace levels.

A legislative process

eWork – in a historical perspective – is a rather new phenomenon of the new or digital economy. No EU country, – including the associated State of Hungary – has better than partial statistical data and 'anecdotal' qualitative evidence on the economic and social-organizational 'filters' which shape the diffusion and maintenance of e-work (EMERGENCE, 2002). Under these circumstances, it is important to call attention to the so-called 'absorption' capacity of this new form of work and employment of various institutions and actors, partly shaped by the legislative context and by the regulatory framework taken in a broad sense.

In the report we are focusing on the legislative and social-cultural (institutional) regulations of e-work. In this perspective, it is worth stressing that the various forms of legislation are interconnected and embedded in other types of regulations, and they together condition the actions of both the individuals and the collective actors in the societies (regions) surveyed.

The legislative processes relating to e-work are similar in all the countries participating in the project. Perhaps the most important point is that at present there are no effective provisions or laws regulating this form of employment. True, there have been several initiatives and there are preparations for submitting bills in the near future in most of the countries examined.

Having dealt with the 'ework centred' legislative framework, now we turn our attention to the 'indirect' forms of legal and social regulations of ework that can create a (un)favourable environment for it. In this respect, we may distinguish the following categories of countries in our project: (1) where the *national level, or the so-called 'top-down' approach* is dominant, with rather weak regional initiatives (France, Finland and Hungary) and (2) countries where the national and regional level initiatives are developing (at least in the case of the most developed regions) in a *more balanced way* (Italy and the UK).

In the French case, 'The Regulation Act'(1996) aimed to stimulate the implementation of telecommunications in respect of both the market and the quality of the public service with key objectives such as 'balanced competition', 'enhanced public service' and 'digital-oriented land planning'. The dominance of the national approach does not completely exclude localism, because it supports the progressive transfer of telecommunication expenses to local authorities.

It is interesting to note the new and unprecedented role of the Framework Agreement on Telework (16th July 2002) which will lead to agreements concluded between the social partners instead of directives, as the starting point for regulating working conditions. This 'social contract' or 'social contract'-type approach inherent in the Framework Agreement on Telework not only respects the social-cultural context of this emerging new working and employment practice but it also recognises the important role of the social actors. The four EU member States will have to ratify it within three years, whereas Hungary is also taking it into account in its related new law which is to be passed in 2003.

Among the *regional* initiatives, it is worth mentioning the first Italian test-project on safe communication by means of telematics, which was launched by the 'Municipal Administration of Modena' in 1997. Another experience worth mentioning, carried out in Emilia-Romagna at the regional level, was the development of a realtime online observatory of the regional public works.

Conclusions

The major key lesson of the transnational comparison appears to be that the frameworks of both *reglementation* and *regulation* show visible differences and are changing with unequal speed, similarly to the technological environment.

The legal systems of the countries involved in the project are rather centralised – with the only exception of Italy where 'regional thinking' and the importance of the 'community of firms' are rather strong. The other common characteristic of the legislative framework is the dominant role of 'written law', with the exception of the UK. In the case of English law, the concept of 'reasonableness' is widely used.

In spite of these differences among the countries participating in the project, there is a tendency of growing 'e-awareness' among the key social actors which is reflected in supporting the practice of ework by developing the legislative framework and/or using social-cultural, often informal, regulation. The expected efficiency of ework depends on the 'joint optimisation' of the technological and the social systems. We would like to stress that this 'joint optimisation' process does not solely depend on *reglementation* and legislative tools but also on the dominant — formal and/or informal— regulations at the workplace level.

Contact & Information

Corinne Roels
Project Co-ordinator
management@futuribles.com
Tel. 33 01 53 63 37 71
Fax. 33 01 42 22 65 54
www.egap-eu.com

Futuribles
55, rue de Varenne
75007 Paris
France

4.7.2 E3WORK project – Sharing EU eWork experience with NAS countries

For the first time a methodology for eWork implementation coming from an EU country has been applied in parallel in five NAS countries and five pilot sites organized on the same model. The five pilot teams of teleworkers have been set up in the frame of the E3WORK project⁹¹ in the two Baltic states of Latvia and Lithuania, in Hungary, in Poland and in Romania. The main results of this research published in April 2003, are summarised hereunder for 3 countries.

The project has prepared e-learning modules to be used to promote and disseminate the practice of eWork. A focused market survey is underway in the five countries. This project has used, probably for the first time on a large scale, a virtual community as management and dissemination tool (www.e3work.com) based on Lotus QuickPlace developed by Mayetic.

Hungary

The host company is the largest Hungarian telecommunication firm granted for concessions international and inland calls within the geographical area of Hungary. 'Hungatel' provides a wide range of services (from low value added to high value added ones) in telephony, data transmission and, via its subsidiaries internet services and mobile telecommunications.

We have had a series of discussions with a pilot group in the frame of the e3Work project. This pilot group consisted of selected eworkers working for Hungatel. The teleworkers' "pilot group" experience at Hungatel started at the end of April (30th April 2002) and finished at the beginning of July (8th July 2002). During the six pilot group meetings, the average participation rate was 8.2, the highest rate was 7 and the lowest 5.

On the basis of the experiences of the e3Work project, we may say that there are three main preconditions of eWork: the state of the art of technology, the willingness of the employees to become eworkers and the positive attitude of employers and managers towards eWork. With regard to technology we may stress the importance of broadband infrastructure and the cost of Internet use which serve as a basis for eWork diffusion. In Hungary, there are serious barriers impeding eWork penetration. The motivation of the employees to become teleworkers seems less problematic than the availability of the appropriate ICT infrastructure in Hungary. The attitudes of employers and managers towards telework is of crucial importance, because eWork – as a new form of working arrangement, affecting work organization, technology, individual and organizational learning, labour and employment relations, Corporate Social Responsibility (CRS), society and culture alike – requires a cultural shift in management methods and practices.

Latvia

The company Open Latvia is a firm believer in innovation, creativity and flexible working methods and developed knowledge and useful new skills in managing projects dedicated to eWork. The pilot for E3WORK was run in the company Baltijas Suvenirī. Here are some of the major findings :

(a) Social assessment

For better adaptation of new IT solutions for distance working it is necessary to consider the psychological suitability of potential eworkers, which can be also developed by previous work experience and self-management abilities, e.g., time planning, accountability, responsibility and ability to plan a balanced compromise proportion the intermediate work at PC, family and personal activities. Professional management assistance and regular meeting on work practice in the initial phase is also necessary for better involvement in distance working.

⁹¹ The coordinator of the E3WORK project is Distance Expert from France. The consortium is composed of Open-Latvia from Latvia, LWS and Advera from Lithuania, SSU from Hungary, CAW from Poland, Western-IQ from Romania

(b) Legal aspects

There were no legal problems caused by eWork during the pilot implementation. Computer hardware and communication tools were agreed by each eworker separately without any conflict.

(c) Organizational changes

The introduction of eworking, has changed some working processes in the company:

- working style with the clients - on-line connection to the system and work place together with the client at their premises;
- implementation of a better security system

(d) Quotes from eworkers :

"...for me individual teleworking is a possibility to work in conditions I like and to socialise, during the most of my working time, with those people whom I prefer. It is a chance to combine work with childcare and have an intensive social life whenever I want to"

"...of routine daily "press-to-press" actions I can get bored the same as in my office"

"...sometimes the employer trusts more those workers, who have daily visual contact and informal talks, so it is necessary to have visits to the office"

Romania

The pilot was run in INSCC (National Communications Research Institute - www.cnscc.ro) which has 60 employees (full-time workers = 87%, graduated = 47%, under 35 years old = 15 and 28 are women). The ICT status of the company was : 40 PCs (average computers age 5 years) and internet through a rented line with an acceptable speed.

The main activity of the researchers is :

- Software development for communications
- Access to the Internet for documentation and correspondence
- Text and image processing

There were 9 people in the pilot, working one day a week from home with a weekly monitoring meeting and a bimonthly evaluation meeting. The pilot was developed in two phases, each of 3 months length according to the methodology and here is the SWOT analysis at the end of the second period :

The SWOT analysis at the end of 2nd phase:

Strengths :

- support of INSCC management in venturing e-work potential
- good employee's perception concerning e-work scheme

Weaknesses:

- difficulties concerning adoption of legal rules
- communication problems

Opportunities :

- participation in international projects

Threats :

- delay of the necessary legislation adoption by Romanian Parliament and Governmental bodies

Inhibiting factors

- Low level of Romanian ICT infrastructure
- Weak experience of work at home (lack of trust both on the part of employers and employees)
- Lack of legal eWork support (no possible eWork cost deduction)
- High cost of power and communications - near the European level, comparative with the salaries - ten times smaller than European wages.
- Lack of information concerning the legal framework for eWork in other countries (success examples).

Advantages

From the manager point of view:

- Less stress
- Improved quality of work
- eWork experience
- Better operability
- Better productivity
- Improved management
- Flexible work program
- Costs reduction

From the eWorker's perception

- Time savings
- Less fatigue
- Improved quality of life
- Better operability
- Less stress
- Better productivity
- Improved quality of works
- Better work conditions

Some conclusions for Western IQ :

- new consulting activities especially dedicated to the most dynamic SME's segment, which are ICT Companies, Service Providers and Research Companies
- WIO speed up actions for the adoption of the Telework Law, by promoting to representatives of Public Administrations the successful results of the E3WORK project
- The labour employer – employee relation has become more flexible now due to:
 - Bringing into operation of the New Labour Code at 1st of March 2003*
 - Break of ROMTELECOM monopoly on fixed telephony from 1st of January 2003*
 - Finalisation of accession negotiation to EU in the next 2 years*
- The general agreement in introducing telework (Trade Unions, Parliament and Government) as well as at company level (national evaluation) generates optimism for eWork maturation in Romania.

Further the E3WORK team develops an eLearning module which is a general introduction to eWork which will be made available in the 6 languages of the project next September. A general presentation of the pilots is also available on the E3WORK website as well as all the dissemination activities.

Find more on the ICT national situation of each of the 5 NAS partners at www.e3work.com

Contact & Information

Nicole Turbe-Suebens
Distance Expert, France
Europe@distance-expert.com

4.7.3 TELEBALT – Teleworking as a Tool for Information Society Technologies Programme Promotion to Baltic States



TELEBALT main objectives are to:

- Promote the IST Programme to the three Baltic countries (Latvia, Lithuania and Estonia) by implementing fast dissemination and awareness actions targeted on the Baltic countries, as EC newly associated states.
- Introduce new methods of team work (eworking, virtual collaborative teams, etc.) into the three participating Baltic countries to launch new educational, research, telemedicine and business projects.
- Develop a system of Information Demonstration Centres (IDCs) in the three Baltic countries. Based on IDCs, to organize a Telebalt kick-off planning meeting and major project conference in Vilnius, Lithuania, a workshop in Riga, Latvia, and an outlook demonstration based workshop in Tallinn, Estonia, devoted to IST Programme products and opportunities for the Baltic countries. Provide in-depth demonstrations of relevant EU telematics products in order to demonstrate potential and the results of IST Programme to the Baltic states telematics community with emphasis on user-friendliness.
- Adapt, demonstrate and implement in the three Baltic states selected IST telematics tools, such as Virtual Presence System (VPS), developed by a consortium led by University of Ulm, Germany (SHOPEAWARE and WISTCIS projects).
- Provide training measures (through Telebalt Web-sites and face-to-face) to increase knowledge in the Baltic states about the European Union, Fifth and Sixth Framework Programmes, former, present and future programmes, with special attention to the IST Programme.

Telebalt issues

Telebalt project materials were disseminated through Telebalt Newsletters Vol. 2 in English (1500 hardcopies) and electronically, via Telebalt Web-sites at EDNES, France (www.ednes.org/telebalt), INFOBALT, Lithuania (www.infobalt.lt/telebalt), "Open Latvia", Latvia (www.telebalt.lv), and Inforing AS, Estonia (www.telebalt.ee).

The proceedings of TELEBALT Workshop "Information Technology, Tourism and Social Integration", Riga, Latvia, April 3-6, 2002, have been published and widely disseminated among the participants and interested bodies via Telebalt Web-sites.

Telebalt Web-sites were developed based on the conception of information and knowledge portal. They are hosted at servers of all project partners: main at INFOBALT, Lithuania (www.infobalt.lt/telebalt), at "Open Latvia", Latvia (www.telebalt.lv), EDNES, France (www.ednes.org/telebalt/), and Inforing AS, Estonia (www.telebalt.ee). The content of the Web-sites encompass: regularly updated information on the project, Fifth and Sixth Framework Programmes and IST; links to Web-sites of other participating countries; calls for applications and reports of Telebalt gatherings, Newsletters, training courses.

Telebalt focuses on development of a community in the Baltic countries able to operate efficiently in the modern information society. An important component of such development is selection and evaluation of IST products and telematic tools eligible for EU-Baltic states eworking. Telebalt Web-sites promote new methods of work, such as "EU-CIS Teleworking 2001" (JC Consultants, France), CoBrow and Virtual Presence System (VPS) toolkits (University of Ulm, Germany), European Knowledge Platform (EKP) (GRI, Germany), etc.

VPS demonstration Web-site was developed by EDNES telematic specialists, installed on a high-speed Internet connection server at EDNES (www.ednes.org/telebalt), and successfully used for numerous virtual working meetings of Telebalt project participants.

Information Dissemination Centres (IDCs) deployed at INFOBALT association in Vilnius, "Open Latvia" association in Riga and Inforing AS in Tallinn disseminated information on opportunities that IST opens for Baltic countries concerning new methods of work. IDC at INFOBALT (28/17-18, Vokieciu LT-2001 Vilnius Lithuania) entitled "Teleworking for Business and Partnership Promotion" focuses on business. IDC at "Open Latvia" (3, Zukusalas krastmala LV-1509 Riga Latvia) entitled "Telematics for Tourism and Social Integration" focuses on tourism. IDC at Inforing AS (10508 Tallinn P.B. 3457 Estonia) is entitled "Telematics challenge to employment opportunities". Each IDC web-site is clearly target-oriented. Latvian IDC web-site deals with information technologies and tourism.

The IDC's web-site in INFOBALT, Lithuania, is devoted to telematics for business and research information dissemination and exploitation. The Estonian IDC web-site focuses on employment opportunities. The project "Register-searching system: registration of persons, interested in jobs searching, registration of companies looking for labour (CV-Online)" in the Baltic States has been installed on Internet (www.cv.ee, www.cv.lv, www.cvonline.lt).

The Telebalt Conference "Teleworking for Business, Education, Research and e-Commerce" was organized in Vilnius, Lithuania, on October 21-22, 2002. The following IST projects were presented at the workshop: CAPERS, doc@HOME, E3Work, eDRUL, EKP, Flex@Work, ICONS, IDEAL-IST, Smart-IS, TEAMwork, TelemediCare, TELESOL, THINK-EXT, SHOPEAWARE, WISTCIS, WISE.

The Telebalt Workshop "IST Sixth Framework Programme - New Challenge for Baltic States", was held in Riga, Latvia, on April 2-3, 2003, linked with Baltic IT&T 2003 Forum. In total 60 different project presentations from member states of the EU, CIS, the Baltic, the EU candidate states and French Polynesia were made.

A Training course on the IST Priority of the FP6 has been developed by telematics experts of EDNES, including four lectures: "What is FP6"; "IST Overview"; "IST Activities"; "Participate in IST". The training courses were installed at TELEBALT websites.

Contact & Information

Alexander BERIOZKO
Telebalt Project Coordinator
Ber@wdcb.ru
www.telebalt.lv

4.7.4 TELESOL - eWork solutions for promotion of EU cooperation in business and research with the Commonwealth of Independent States



Introduction

The process of gaining knowledge in the telematic methods of work is taking place in the CIS (former USSR) countries. At the same time, these countries often lack the systematic knowledge and gaining from the experience of others. So the emerging everyday problems are not properly addressed, and the results of telematic work are far from optimal.

Traditional argument in favor of eWork is the difference in wages and office rent level in different countries or regions, which makes eWork between these locations economically interesting. But eWork, including eWork within one location and even within one organization, can have other advantages as well. eWork helps better combine work responsibilities and family issues (like child care or getting another education). eWork involves disabled in work processes and improves work conditions for all, diminishing commuting time. eWork assists regional development by inviting qualified personnel to remotely situated organization. Finally, use of eWork helps to overcome such calamity issues as epidemics.

Project TELESOL: goals and objectives

The coordinators of the project are UNIDO – United Nations Industrial Development Organization, and association EDNES (Earth Data Network for Science and Educational Exchange), France.

The main objectives of the project are to:

- create telework awareness in the local business and research communities
- make use of experience and best practices of other IST projects and EU companies to address telework issues in CIS countries
- collect information in the participating CIS countries, concerning their technological and other readiness for the telematic methods of work
- identify local eWork problems
- widely disseminate the relevant information by project events, publications and through Internet
- develop interactive training materials on the telematic methods of work.

The goals and objectives of the project defined a choice of the participants. The IST projects, EU companies and organizations, were chosen for having knowledge and experience in the telematic methods of work, including cross-border eWork with CIS or East European countries. At this moment organizations, which were active in the project activities so far, represent Austria, Germany, France, Denmark, the Netherlands, Ireland, Switzerland, Poland, and the list is open.

We were able to identify in the participating CIS countries the business and research organizations, involved and/or experienced in the telematic methods of work, thus contributing to the project. These organizations are considered to be the focal points of the project in each of the participating CIS countries. The participants of the project represent the following countries of CIS: Central Asian (Kazakhstan, Kyrgyzstan, Uzbekistan), Caucasian (Armenia, Azerbaijan, Georgia), Slavic (Russia, Ukraine).

Project TELESOL: events and actions in 2002-2003

Project TELESOL is achieving its goals and objectives using the following means:

- The regular meetings of the representatives of IST projects, EU telework experts, other project participants and of the telematic community in the participating CIS countries. Up to this moment, the following events were conducted:
Kick-off workshop in the Bishkek (Kyrgyzstan), 8-9 June 2002
Regional workshop "Technical aspects of the telework" in Yerevan (Armenia), 19-20 November 2002
Regional workshop "Telework in research, medicine and business" in Kiev (Ukraine), 24-25 April 2003
- The following events are planned for future period:
Regional workshop "eWork in education and training" in Baku (Azerbaijan), January 2004
Central Asian eWork conference in Almaty (Kazakhstan), September-October 2004
- The creation of the Telework Competence Centers in the participating CIS countries. It is envisaged that TCCs will be the focal points of the knowledge, experience and best practices of the telematic methods of work in each participating country
- In 2002-2003, the interactive web-based training materials on eWork for a Russian-speaking audience were developed. The expert persons and organizations from France, Germany, Ireland, Poland, Russia took part in this activity. The pilot use of these materials was made at the Kiev workshop. Part of the work was realized as an eWorking project between Ireland (project FLExWORK), Russia and Armenia.

Publications and web-sites

In 2002, the first volume of TELESOL newsletter was published in 1000 copies in English and Russian. The newsletter was widely disseminated by direct mailing to eWork experts and at TELESOL events. The second volume of TELESOL newsletter is in print and will be available in autumn 2003.

TELESOL team considers Internet as the most important tool for dissemination of eWork methodology and experience information. For this purpose, the TELESOL main web-site was developed, which contains all information about the project and a lot of useful eWork information and resources. TELESOL web-sites were also developed in all participating CIS countries; these sites contain country-specific eWork information. The address of the main site is: www.ednes.org/telesol; one can find there links to local web-sites.

Contact & Information

Serguei Smaguine
EDNES
sma@ednes.org

4.7.5 WISTCIS –New methods of working for Information Society Technologies Programme promotion to Commonwealth of Independent States



The main goals of the project are:

- to demonstrate IST objectives, opportunities and telematics products to the CIS community;
- to do working technology studies in European Union and the CIS countries.
- to develop a community in European CIS countries capable to operate efficiently in the modern information society
- to demonstrate IST results to the CIS telematics community
- to select and adapt telematics tools to the participating CIS countries produced by IST
- to encourage submission of new project proposals to IST Programme with collaboration between EU member states and CIS countries and to contribute in this way to development of huge CIS potential market for EU IST products.

Results achieved during the project implementation

The project disseminates results of working technology studies through WISTCIS Newsletters, Web-sites, conferences and workshops.

The main WISTCIS Web-site (www.ednes.org/wistcis) as well as project web-sites in Ukraine, Moldova, Azerbaijan, Belarus, Georgia, Azerbaijan were launched.

Training courses as the main tool of encouraging submission of new proposals concerning working to the EC were prepared by PriceWaterhouseCoopers (principal contractor) and introduced at the conference and two workshops. The lectures of these courses are available in English and Russian on WISTCIS Web-site: www.ednes.org/wistcis/main_e.htm

The manual "New Methods of Work for EU-CIS Telematics" has been prepared, presented and evaluated at the WISTCIS conference and workshops. The manual is available on the Web-site.

The toolkit developed by projects CoBrow (RE 1003), CoBrow/D (RE 4003) and IST project SHOPAWARE was adapted for EU-CIS team working. Another toolkit developed by project Presence Awareness was also adapted for EU-CIS teamwork.

WISTCIS Kick-off Conference "Telematics in Research, Medicine and Business", Kiev, Ukraine, was held on 19-21 April 2001. The Kick-off Conference was designed with the objective of encouraging maximum interaction and activity among Ukrainian and other CIS participants. Active discussions during all the plenary sessions, workshops and seminars of the kick-off conference have shown that such meetings play an extremely important role in coordinating efforts of the CIS countries to develop the information society.

WISTCIS Workshop "Telematics and Network Support in Environmental and Natural Hazard Research and Monitoring", Kishinev, Moldova was held on 21-22 June 2001. The Workshop had shown for a wide audience recent results of telematics products application in the sphere of environmental monitoring and protection against natural hazards, which is very important for many CIS, Western and Eastern European countries; as well the spread of information and knowledge about new

telematics products and technologies worked out in the EU and the CIS countries, and IST Programme possibilities.

WISTCIS Workshop "E-working, Distant Training and Environmental Monitoring: New Opportunities", Baku, Azerbaijan took place on 13-14 December 2001. The major audience represented educational and research communities of Azerbaijan including teachers, postgraduate and graduate students of universities.

WISTCIS Workshop "New Methods of Work for Business and Research" took place on 21-22 November 2002. The regional caucasian workshop "New methods of work for business and research" was aimed at strengthening commercial, scientific and technological co-operation between the European Union and Armenia (TransCaucasian CIS countries in general) in the field of IT application to new methods of work. An emphasis was on EU Armenia business and scientific communities' cooperation.

The conference and the workshops promoted the following IST projects: SHOPAWARE, TELESOL, TELEBALT, TeleinVIVO, TEAMwork, THINK, StarMate, UNITE, EKP, E3Work, EXTERNAL, EMERGENCE, UsabilityNet, FlexWork, AEGIS. In addition the gatherings promoted the following EU telematics products: Louis Dreifus, EUR-OPA Telematics System for Natural Disaster Consequences, French telematics systems for earthquake and volcanic observations.

The first, the second and the third volumes of WISTCIS Newsletter have been published and presented at the Web-site.

Contact & Information

Tatiana Shulyakovskaya
WISTCIS Project Manager
Shu@wdcb.ru
www.ednes.org/wistics

4.8 PROJECT RESULTS - SUSTAINABLE DEVELOPMENT & CSR

4.8.1 Work in the Information Society: major trends and impacts – view from the JANUS project

The accelerating pace of change in the world economy during the latter half of the 20th century is ongoing. The past decade has seen a sequence of rapid, widespread and potentially profound changes that appear to challenge conventional understanding of the economy and its relations to other domains (including the environment, society and culture). In order to be able to act in this time of high uncertainty it is important that the best knowledge is gathered to improve the understanding of the nature and direction of the change and of the mechanisms that determine the direction and impact of policy actions.

As we are now in the final stage of the Fifth Framework Programme (5FP), many significant results have already emerged from IST socio-economic research, and an effort of consolidation of existing work will allow to make these lessons and the lessons that could not have been drawn from all individual projects in themselves, alone, widely available to people who need to know. In this spirit, JANUS organized its workshop at the e2002 conference in Prague, with a session that focused on how the Information Society has affected work in its nature and in the way it is organized. The session brought together the results of some leading IST projects (EMERGENCE, TOSCA, STAR and FAMILIES).

Ursula Huws, project leader of EMERGENCE and researcher with a long standing reputation in the field, explained that the introduction of new information and communications technologies has been accompanied by major shifts in the location of employment both within and between European regions and globally. These developments were poorly mapped and documented. In particular, no evidence has been collected on the types of information processing activities that are likely to be outsourced or relocated, the extent of such relocation or the criteria used in the selection of remote locations. In her view such information will be of critical importance to policy-makers in predicting future employment trends, ensuring the competitiveness of European industries, combating unemployment and developing policies for a socially inclusive European Information Society. Work shows that most of the popular thinking about transnational eOutsourcing and remote eWork location is highly over-simplified, if not caricatured. The zero-sum-game model of a job 'lost' at one location and 'gained' at another is rarely an accurate reflection of reality. Although it is sometimes the case that a spatial reorganization is part of a broader organizational restructuring process which involves downsizing, it is equally likely that it may be part of an expansionary process.

New forms of labour, not or hardly existing before, include call centres and "eLancing". Call centres represent one of the fastest growing forms of employment in Europe. It is predicted that about 1.3% of the European labour force (or nearly two million people) will work in call centres in the year 2002. DataMonitor estimate that as long ago as 1998, 3% of the US labour force was working in call centres. European call volume and employment numbers are continuing to increase, and if US trends are repeated here, will continue to do so, although perhaps at a less dramatic rate of growth than in recent years. Frost and Sullivan estimate that there were 12,750 call centres in Europe in 1999 and that this would grow to 28,289 by 2006[2] - a slightly lower forecast.

"eLance" is of form of work in which freelancers get in touch with clients via the Internet, work as eworkers, and transfer work results via ICT networks. e-Lancers are seen as the logical answer to the flexibility requirements of today's companies: According to this view, companies, which are affected by an increasing need to adapt as fast as they can to ever more volatile market conditions, must have access to a more flexible workforce to be able to shift labour at short notice to where and when it can be used most productively. In reality, however, there seems to be only limited evidence that 'regular employment relationships' are gradually being replaced by atypical ways of working like eLancing concluded Karsten Gareis based on the research done on this in the project STAR.

In several projects emphasis was on the apparent importance of the human factor. Where e-work relocation has become normal, and global, as EMERGENCE findings underlined, the researcher concluded that a surprising amount of human mobility and face-to-face communication is involved in making these remote working relationships successful if work of any complexity is involved. The call centre work is typified by a high industry staff turnover rate which must call into question whether this type of work is intrinsically temporary, or whether in fact there are ways in which employers can provide better career paths and reduced stress. Although TOSCA found surprising few temporary contracts, it does appear that in fact because staff choose to resign for various reasons, including stress, after quite short periods, their employment contracts are in practice temporary. This aspect of call centre work requires further examination. eLancers are in general well qualified professionals, who see that their markets expand, as they now have become able to offer their services to a wider number of companies. The provision of a social safety net is not obvious in this.

All together the session concluded that e-work is on the raise throughout the European Union and is representing new ways of work that now start to become a "normal" way of working amongst others. Technology is now pretty mature, organizations (either by choice or by fact) learn how to deal with a geographically dispersed workforce and different kind of relationships with suppliers and customers. However, as also highlighted in the findings of the project FAMILIES this is only the start to e-working, and we must address the social consequences for the e-worker and his family context. Lars Schmidt explained that only by building up a detailed understanding of how e-work arrangements are used in practice and the social and work-related consequences for the e-worker, partner and children will it be possible to discuss further political initiatives that can support adaptation of new e-working arrangements and hence make them sustainable.

Contact & Information

*Maarten Botterman
RAND Europe
maarten@rand.org
www.janus-eu.org*

4.8.2 SEAMATE – Socio-Economic Analysis and Macro-modelling of Adapting to information Technologies in Europe

Project overview

The objective of SEAMATE is to analyse the overall economic impact of IST within the context of the EU and national policies. Research focuses on two systems: the European social system and the European business system. Acting on these systems are technological changes in IST and many other changes in the world. Scenarios representing changes in technology and other external factors are produced based on an exploration of these contextual factors. These outline scenarios and an assessment of fundamental prerequisites and drivers of growth are provided as inputs to parallel analysis that refines the analysis of the impacts of IST, respectively on the business system and society at large. Microeconomic analysis provides additional insights about the effects of selected technologies on the business system. Based on the above, a set of assumptions on the IST impacts and plausible effects of related macro and sectoral policies are used to model the outcomes from combinations of social and business scenarios. Implications for policy changes will be identified as will the need for new statistical classifications and data to be collected to track IST changes and their impacts.

Work to date has focused on providing the necessary information to underpin the macroeconomic modelling, for which a summary of the key issues is provided below. Work is ongoing to implement the macroeconomic scenarios and to draw out the implications for policy.

IST Scenarios and Conceptual Framework for the Analysis of Technological and Policy Changes

Research to date has included a systematic overview of the complex dynamics of the digital economy, identifying and analysing feedback loops between the economy and IST and identifying state-of-the-art in statistical indicators relating to e-commerce and its impacts.

Preliminary findings include:

A number of risks to the continued growth in IST use and development are identified, including systemic operational risks (congestion, downgrading, gridlock), untimely exploitation of available resources, and cascading failures. Strong doubts are also voiced about the adoption of third generation UMTS cellular phones.

In the majority of EU countries unemployment is on average lower for the high-skilled workers than for skilled workers, though there are some notable exceptions (Italy and Greece). There is seemingly a cause and effect link between investment in IST-related R&D and education and growth in GDP. Further analysis indicated that the quality and level of education is a decisive policy factor in determining the strength of the virtuous feedback loop that operates between economic growth, investment and innovation. This suggests that investing in the ICT sector and adoption of its modern tools are not per se adequate prerequisites to obtain positive socio-economic impacts. A nation's shift towards ICT requires in turn increased investment in R&D and in education - which can be done if adequate resources are available.

Reliable data with which to measure the separate elements of IST processes are generally lacking. This makes it difficult to understand the path of recent development even before thinking of future developments.

Improving the modelling of network effects and understanding better the dynamics of diffusion of IT is feasible based on new concepts of scale-free networks. Different industrial structures and market regimes should be studied to understand the underlying network dynamics. In some cases the evolution towards oligopolies or a monopoly situation can result from the operation of scale-free network dynamics and the preferential attachment process.

Business Impacts of IST

Research to date has included formulating a theoretical framework for the analysis of knowledge production in the economy, identifying changes in the business structure from the new 'technological environment and examining the impact IST is having on European businesses through in-depth qualitative interviews.

Preliminary findings include:

Product characteristics are seen as the main reason for e-commerce development by businesses although competitive pressures are cited as the most important driver influencing general ICT take up.

Exploiting the opportunities provided by IST will affect the relative importance of sources of competitive advantage that include collaboration among firms, placing greater premiums on higher-level skills, decentralisation of control, more outsourcing, greater importance on customer relationship management, greater importance of brands.

IST has facilitated the development of new business models. These include B2B, B2C e-commerce sales, e-procurement, e-customer relations and marketing and e-management.

Key implications of business-level impacts for the economy as a whole include lower search costs and hence greater competition and greater geographical distance between suppliers and customers, increase demand for IST-related skills, the greater importance on intangibles in overall investment, the redefinition of non-core activities which can be outsourced.

The complex structure of e-business related innovations mean that it is particularly difficult to distinguish e-business impacts from other impacts that might be going on at the same time

The behaviour of firms within the market show that companies reduce their vertical range of manufacture by at the same time outsourcing of non core activities. This trend will be supported by the cooperation tendencies of SMEs companies in virtual networks. The bigger enterprises show well organized networking structures within their own company and have therefore not such a big need to be attached to enterprise networks.

While it is hard to generalise from the limited number of industries surveyed, there is evidence to suggest that an important impact of IST on business is that organizations more and more concentrate on core competences and focus on problem solving capabilities. The ongoing trend of the reduction of company functions means that enterprises need the network in order to co-operate in a complementary manner.

The survey identified that companies face difficulties in estimating or assessing the exact impact of IST on their performance. They typically use insufficient management or development indicators in order to make the effects more sizeable, concrete and transparent.

A major challenge to achieving the impact that IST allows is the need for the investment to be accompanied by organizational and cultural change. Staff training is also seen to be a major element if the impacts on competitiveness are to be achieved.

Large firms are more likely to participate in advanced IT implementation than their SME counterparts. In the case of large companies, a major drive of e-business is to improve internal processes. In the case of SMEs it is often more about improving and enhancing interfaces to partners.

Social Impacts of IST

Research to date has include formulating a theoretical framework of the interactions between the economy and society, identifying late adopters and other deficient groups and analysing their specific adoption problems, fears and needs.

Preliminary findings include:

Changes in many aspects of social life are made possible, or are driven by, changes in IST including work life, partnerships, divisions of labour and family life; income disparities; participation and governance and other aspects of social life.

In particular IST opens up the possibility of new ways of working and demands new skills and competencies. It affects the work-home boundary, places demands on the availability of appropriate resources in the home and may affect career prospects. It accelerates the shift in demand towards skilled labour with the associated income consequences and it affords opportunities through e-government. It also impacts on the opportunities for social interaction and the associated consequences on well-being and health.

Six groups are identified within the population as likely to be late adopters, or IST-deficient, namely older workers, the elderly, women, foreign migrants, inhabitants of remote areas and the disabled. The analysis of IST disparities among the potentially deficient groups shows that the digital divide according to age and income or social class is much stronger than are disparities by gender or place of residence in almost all EU member states.

A review of past experience of ex-ante judgements shows great discrepancies with the later realities, mostly due to a substantial overestimation of the rates of adoption and the speed by which diffusion will occur.

Exploratory Microeconomic Analysis

Research to date has developed a generic framework within which to model the characteristics of different IST technologies and concluded some preliminary work to simulate the potential implications of competition between two alternative technologies 'wired' and 'wireless' and the application of internet banking.

Preliminary findings include:

The attributes of innovation help explain the adoption of technologies. In particular relative advantage, comparability, complexity, triability and observability can together explain more than half of the variance in adoption. In addition communication channels, social systems and time are also important.

A model has been developed to simulate the impact of different ICT. The model uses the concept of utility functions. It is based on diffusion theory, taking into account network effects. Although the model is based on a business-to-consumer perspective replacing the utility function with a profit function makes the model applicable to modelling business-to-business relationships.

The analysis identifies three possible macroeconomic consequences of competition between wired and wireless technologies: there will be a surge in investment in electronic infrastructure implied by different outcomes of this competition; productivity differentials between nations may vary depending on which technologies are favoured; productivity enhancements in sectors such as transport, communications and retailing, may increase more in some countries if mobile technologies become dominant over wired technologies.

Preliminary analysis of the application of e-banking shows that it is clearly the case that internet banking reduces costs in the banking sector. Further, internet banking may reduce the size of the banking sector as the profits from the banking sector are transferred to sectors with stable value chains.

Macroeconomic Analysis

Research to date has identified and implemented the structural changes necessary to the existing macroeconomic model (E3ME) that is to be used so that the it may better represent the key IST effects identified elsewhere in the project.

Preliminary findings include:

Particular innovations to be made to the existing macroeconomic model, E3ME, include using investment by asset to identify the specific contribution of IST to long-term growth, differentiating the contribution of non-human technology separately from human technology and using a quality-adjusted estimate of export prices to isolate the effect of technology on a country's exports.

It will not be possible to enable all the key IST effects to be represented within macroeconomic modelling. This is particularly so for the changes that could occur in social life. However, any omissions from the quantitative scenario analysis is in no way a reflection of their relative importance. It is vital that these less quantifiable impacts are brought out in the contextual analysis of the eventual scenarios. It may well be the case that they have important implications for policy.

Contact & Information

Project Co-ordinator:
Anthony Barker
Cambridge Econometrics
Covent Garden
CB1 2HS Cambridge
Tel: +44 (0)1223 460760
Fax: +44 (0)1223 464378
ab@camecon.com
www.seamate.net

4.8.3 Is Teleworking Sustainable ? – Results from the SUSTEL Project

Previous research has shown that eworking can make a substantial contribution to sustainable development by:

- Assisting economic development, for example, through increasing staff productivity and enabling better utilisation of office space.
- Assisting the social objectives of sustainable development by, for example, balancing work with family life, or by providing work opportunities to those who might otherwise be excluded, such as the disabled or people looking after children or elderly relatives.

Reducing ecological impacts, for example, by reducing commuting to and from work.

The SUSTEL project was set up to undertake a comprehensive assessment of the relationship between eworking and sustainable development, making use of previous research where it existed, and undertaking new research in areas where it didn't, or which were under-explored (see www.sustel.org for further details). It involves a collaboration of 7 partners – Avanzi (Italy), BT (UK), Danish Technological Institute (DTI), Empirica (Germany), Telewerk Forum (Netherlands), University of Bradford (UK) and the project co-ordinator, the SustainIT unit of the UK Centre for Environment and Economic Development.

One of SUSTEL's first outputs was the creation of a sustainability assessment framework for eworking which had 15 main elements. Having established this framework, the project used it to set 27 key research questions about the economic, environmental and social benefits of e-work in general and ework in particular. Answers to many of these questions have been obtained from 30 detailed case studies and 8 surveys conducted in 5 countries (Denmark, Germany, Italy, Netherlands and the UK) during 2002-early 2003.

This research has increased the amount of hard data on the economic benefits of eworking. The surveys and many of the cases provide solid evidence of improved work performance. The surveys shows that this is not primarily because of longer working hours (as is sometimes suggested), which – although prevalent (see below) – is just one of a number of influencing factors, and not the most important. In one case the project was able to make specific comparisons of the performance of eworkers with a closely matched control group of non-eworkers (which has seldom been done in the past). It found that not only was productivity was higher, but also that absenteeism and error rates were lower.

Two other areas where SUSTEL has added to the knowledge base about the economic impacts of eworking is its effect on absenteeism and space utilisation. In the case of absenteeism, 31% of staff in the German, 47% in the Danish, 72-73% in the UK, 81% in the Italian and 91% in the Dutch survey organization stated that ework had enabled them to work when they were prevented from reaching a work location (generally by illness or transport problems). Around half the cases also identified substantial reductions in space requirements – to the point with one organization that it was able to completely dispense with a central office. However, large space reductions seem to require a transition from relatively ad hoc forms of eworking to a 'total solution' which involves staff giving up dedicated office space and working at a combination of home, hot desks and 'on the road'. In practice, few organizations have yet made this transition.

The project also examined the total transport impacts of eworking. Some previous US research has suggested that much of the reduction in commuting travel from eworking is eroded by other additional travel. One suggested reason is that, because an extra car is now available at home during the day, extra journeys undertaken by eworkers themselves or other household members. The survey found that offsetting travel varied between 14% of the commuting reduction in Italy, 19% in Germany, 24-25% in the UK and 73% in Denmark. One explanation of the high Danish figure may be the much higher proportion of women in the organization's workforce, who had a higher level of transport connected with child care and other domestic duties. The figures therefore show that eworking does seem to reduce total travel substantially – so that the US doubts do not seem relevant to Europe – but that offsetting travel is significant and can in certain cases erode most of the benefit.

Socially, the SUSTEL research found that most survey respondents felt that eworking was giving them a better quality of life and work-life balance. Many also reported health benefits. A significant number also stated that they were using local services more and becoming more involved in their local communities, with greater involvement in community development.

However, the project has confirmed the findings of some previous studies that eworking does seem to be associated with increased working hours for many people, especially in the UK. (Although it is unclear whether eworking is leading to even more working hours than those being experienced by large parts of the working population). Most people seem happy to accept this as trade-off for the benefits, but a small minority don't.

The finding that many eworkers report both longer working hours and better quality of life is paradoxical. More time working is usually associated with increased stress, domestic tension and other factors which reduce quality of life. One possible explanation is that, for many individuals, their increased working hours will be less than the time they have saved in commuting.⁹² Hence, they still have more time available for family and other activities. For some, the stress associated with commuting (especially for long distances) may be more than that arising from additional working time. Perhaps most significantly, eworking can in effect create time through opportunities for multi-tasking or greater control of activities. As one survey respondent noted "Although the amount of time has not changed it has made the Weekends freer, as domestic activities can be fitted in during lunchtimes or early morning."

The next stages of the SUSTEL project involve editing the cases and other research material for practitioner audiences, and placing them on-line within a sustainability assessment tool (SAT). This will allow organizations to quickly assess the economic, environmental and social impacts of their eworking scheme, and provide ideas on how it can be improved.

Contact & Information

*Peter James, Co-ordinator
SustainIT
3/7 Priestgate
Peterborough
UK PE1 1JN
Tel: +44 1733 311644
Fax +44 1733 312782
peterj@dsl.pipex.com
www.sustainit.org*

⁹² Most of the respondents, and the whole sample, are highly mobile managerial and professional staff, who tend to have longer commuting distances and time than the average.

4.8.4 Human Capital & Sustainability in a Global Networked Knowledge Society : TERRA2000 project



The unfolding of the Global Networked Knowledge Society (GNKS) challenges assumptions about how policy levers work, what effects they produce and the roles of public, private and civil society stakeholders. This applies particularly to the possible medium - to long-term unsustainability of a Global Networked Knowledge Society increasingly dominated by short-term dynamics. Analysis of sustainability has tended to concentrate on distinct domains (economic, social, environmental and cultural), but parochial approaches are insufficient to meet the challenge: sustainability is a global property of the whole system and the linkages across domains are of critical importance. Moreover, to effectively meet the challenge, sustainability analysis must consider the level of stress accompanying development, the resilience of the system in coping with shocks and the adaptability of the system in taking account of emerging information. This calls for a holistic approach that looks rigorously at specific aspects of the system, combines quantitative and qualitative methods, and considers a range of policy levers in appropriate combinations: joined-up problems call for joined-up thinking to find joined-up solutions.

TERRA2000 research is devoted to the exploration and testing of the 'IST Proposition' namely, that the new technologies of the Information Society (ISTs) seem likely to offer scope to enable economic growth, and to allow a more equitable distribution of wealth, without necessarily increasing consumption, pollution and energy use. This is accomplished by exploring a range of sub-propositions. Those of most relevance to new methods of work are:

- ISTs can catalyse the expansion of human capital and thus promote sustainable economic growth
- The expansion of the GNKS can result in sustained productivity growth and its diffusion throughout the globalised economic system.
- Moves towards 'tipping' (the emergence of welfare, digital and/or income 'divides') must be controlled or offset.
- The mere fact of globalisation – or the connection of each to all – does not of itself imply either integration (interpenetration and productive coexistence of people from a range of social, political, economic and cultural backgrounds – i.e. reduction of distance in geographic or other terms) or convergence (emergence of a common, 'globalised' culture, society) or polity (reduction of distance in social, political or cultural terms). ISTs can facilitate mutual awareness and thus respect.

Work during the past year has concentrated on two areas: continuing thematic analyses relating to human capital, equity and growth and information age sustainability; and deepening the theoretical analysis of ways in which the structure and dynamics of the GNKS differ from those assumed in conventional approaches.

The thematic analyses of most relevance to new methods of work are human capital and equity and growth. Human capital (tacit knowledge) affects economic development as an increasingly essential, if intangible, factor of production of information-rich goods and services and as the most essential input to innovation. The project has developed three broad classes of scenario relating to the increasing need for specific skills: 'sighting shot' scenarios that calibrate the extent of developing skill gaps and their consequences; policy-related scenarios that explore the feasibility of addressing the problems through specific policies; and interactive scenarios that highlight policy combinations offering attractive combinations of benefits across a range of criteria. Broad policy classes include education (to increase or retune skill sets available where production is currently located); immigration (to improve the geographic matching between skills and work by relocating human capital) and outsourcing (to improve the match by relocating work). The range of impacts includes the broader impacts of education, cultural dislocation and friction, changes in economic development (growth, employment) and returns to education in migration origin and destination countries, further population development

and family migration, etc. Specific recommendations are both policy-orientated (specific policy mixes dominate single-approach policies) and methodological.

The equity & growth thematic analysis deals in part with the impact of inequality sustainability. Again, a range of scenarios have been developed and analysed; exploring possible futures differing in broad terms of the extent to which externalities are successfully internalised and the degree to which solutions to collective problems are achieved by consensus rather than compulsion. The strongest specific connections to new methods of work are first that paid work remains the principal source of income and hence wealth and command over goods and services; and second that the efficiency and distribution of access to public goods that support welfare and the formation of citizens consensus around crosscutting public concerns are critically affected by the way work is organized and the social context to which the work relationship gives rise. Principal conclusions are that inequality and inequity contribute strongly to failures of sustainability; that mere redistribution will not address the problem; and that changes in the direction of co-financing and other forms of partnership are essential to sustainability and equity-enhancing growth paths.

Two particularly relevant aspects of the conceptual analysis are the theoretical analysis of networking and empirical exploration of the 'distributional proposition' (see below).

The project has developed a range of models of network formation and of the evolution of behaviour within networks. The network evolution models explore the growth of networks, develop relevant measures of clustering and connectedness within networks, establish the prevalence of 'power-law' distributions of power in networks, and calibrate the extent to which changes in the conditions affecting networking (e.g. the ease of making links and the extent to which the benefits of linking are passed on to network partners) affect network architecture. A separate line of enquiry (partially reported in last year's report) considers networks from a behavioural point of view and looks at the way the related phenomena of cohesion (continuing to behave in ways compatible with one's network partners) and contagion (changing the behaviour of network partners through accidental or intentional changes in behaviour) lead to such phenomena as small worlds, stable diversity, etc. These models, while theoretical have been used to explore such issues as the uptake of new working practices and the spread of 'informal innovation' from the work-floor up. Another aspect of these models is that they produce both 'punctuated equilibrium' (long periods of stability and localised change interspersed with brief periods of dislocating and widespread structural change) and local irreversibility (leading in some cases to cyclical behaviour).

Recent empirical work explores the distributional proposition: Distributions matter at least as much as aggregates because: i) welfare and incentives are relative (affected by the awareness coming from ISTs); ii) globalisation and the network economy upset old patterns of inequality by holding out the promise of greater equity while at the same time making it more likely that laissez-faire will exacerbate income, knowledge and digital divides; iii) different parts of the distributions respond in different ways to policy and GNKS forces, have divergent values and different sustainability footprints; and iv) network evolution can lead to small worlds, stable diversity, global convergence, etc. with only minor changes in the underlying parameters.

The empirical work is exemplified by an extension of existing work explaining growth in terms of income inequality and/or human capital. Income inequality has conflicting impacts on growth, since it represents the consequence of efficiency-enhancing incentives and differential access to education (decoupling rewards from contributions and discouraging those on the wrong side of the income, educational and digital divide. Studies of human capital tend to be too aggregate to shed light on how the inner workings of the GNKS are changing. The recent work uses measures of human capital distributions (and growth distributions) to find relationships that are both more robust and more consistent with intuition.

Contact

*Jonathan Cave
RAND Europe
cave@rand.org
www.terra-2000.org*

4.8.5 The VIP initiative



Ethical Guidelines for World Wide Work

Introduction

Information and communication technologies have brought people in dispersed organizations much closer to each other. This 'virtual proximity' offers new opportunities for collaboration between knowledge workers, but it also challenges traditional organizational thinking, management styles and manners of collaboration. To achieve full advantage of the technologies in work and business, there is a need to rethink a range of non-technical aspects – ethical as well as functional.

The rationale behind the VIP initiative is that a voluntary code of practice (see section 4.8.6) – based on ethical considerations – can help multinational enterprises and their networks of business entities to improve the quality of international operations. At the same time, a code of practice can foster responsible and foresighted conduct towards employees and the societies in which they operate.

Results from the VIP initiative

In addition to back ground research reports, the VIP package of outcomes includes 9 parts:

- The Code of Practice for eWork across borders
- The L'Ormond web site
- Two training packages/slide shows' for interest creation, introduction, internal learning and implementation.
- The Guidelines for eWork across borders – a readable brief handbook for use in companies. (in progress)
- Guidelines for implementation: General implementation model.
- Examples of methodologies for good practice for implementation.
- The VIP-Self-Assessment Tool.
- The VIP Database.
- General and specific tools for monitoring/auditing for the code compliance

Why a Code of Practice?

The issues related to work across national borders have not been noticed very much so far although they concern all multinational companies. Some of the rationales for a Code are:

- Work across national borders implies issues that need guidance
- Cross-border work is increasing rapidly – also within smaller organizations
- Properly arranged eWork across borders gains as well the company as their employees
- A Code of Practice can serve as complement and/or alternative to more substantive legislative directives.

A voluntary industrial code of practice has important advantages compared to international legislation as it is:

- More adaptable to company specific needs
- Easier to implement globally
- Clearly indicating responsible and foresighted corporate conduct
- More flexible over time
- Effectively fostering internal cooperation

Expected effects from the Code of Practice for eWork across borders

Value added for the employees:

- Reduced difference between 'company centre and periphery'
- Equal opportunities to remote workers
- Strengthened focus on integrity
- Improved communication among dispersed colleagues
- Enhanced inclusion opportunities
- Improved access to company information

Value added for the enterprise:

- Improved business performance
- Improved attractiveness to recruit the most qualified people
- Improved exchange of global knowledge and smoother cooperation between dispersed entities
- Reduced risk for conflicts with stakeholders
- Enhanced public relations and company reputation
- Support to internal initiatives addressing international operations and technology use

Value added for the societies of operation:

- More responsible business practices
- Enhanced contribution to knowledge building
- Enhanced contribution to technological, economical and social development
- More open information

Value added for the environment:

- Improved environmental standards
- More open and transparent information on business' environmental performance

More about the VIP Initiative

The VIP project has been initiated by European multinationals and is supported by the European Commission.

- Working partners have been AstraZeneca, Ericsson, Sonera, Centre for Social Innovation, Paavonen Consulting, UNEXT
- Various versions of the Code have been circulated to about 500 large companies and 200 social partner organizations, research networks, NGOs and universities

Following organizations have commented on various versions of the Code of Practice for Global Virtual Teams:

Companies:

ABB, Agilent, Alfa Laval, AstraZeneca, ATM, BT, Commerzbank, Ericsson, Erste Bank, Feratel, FCG, Findus, Fujitsu Invia, Gambro, H&M, IBM France, IBM Sweden, Intel, KappAhl, Kemira, Mobilkom Austria, Novartis, SAS, Scania, Siemens, Skandia, Sonera, Tekla, Telekom Austria, TietoEnator, TNT, Trelleborg och Unilever, Virtach Ltd.

International organizations:

Amnesty Business Group- International Labour Organization, ILO, UNESCO

Social partner organizations:

Austrian Federation of Trade Unions (ÖGB), Central Organization of the Finnish Labour Unions (SAK), Chamber of Labour, Austria, Confederation of Unions for Academic Professionals in Finland, The Austrian Trade Union of the Private Employees (GPA), The Confederation of Netherlands Industry and Employers, VNO-NCW, The Swedish Confederation of Professional Employees, Union Network International

NGOs, Universities, others:

Audencia - Ecole de Management, France, Beijing Software Industry Association, Business & Human Rights - Resource Website, Danish Technological Institute, Deutsches Netzwerk für Wirtschaftsethik, European Business Ethics Network, EBEN, Fair Trade Association, Finland, ICC – Finland, IESE Business School, University of Navarre, Spain, Institut of Business ethics, Universität St. Gallen, Switzerland, Institut für Internationales Management, University of Graz, Austria, Institute of Business Ethics, UK, IRENE Network, NL, Salisbury University, Perdue School of Business, The Finnish Information Processing Association, The International Business Leader Forum, University of Information Technology and Management in Rzeszów, Poland, University of Tampere, Finland, University of Westminster, UK

Contact & Information

Walter Paavonen & Hilikka Paavonen
Sweden
paavonen@algonet.se
www.unomondo.org

4.8.6 THE CODE OF PRACTICE FOR E-WORK ACROSS BORDERS - from VIP

(a) Work conditions

Equal opportunity and fair treatment of all employees – regardless of location – are essential for knowledge-based e-work involving dispersed company units. National legislation and values expressed by the ILO and OECD provide minimum standards for issues such as the right to organize, collective bargaining, workplace representation and recognition of existing unions across the company.

However, enterprises aiming to achieve fair work conditions across the global company should consider going beyond minimum requirements.

Enterprises can demonstrate their commitment by:

- Clarifying to remote workers their legal and organizational status and applicable legal and regulatory frameworks.
- Striving for harmonised work conditions – within the framework of local legislation, rules and agreements – across cooperating entities and for fair employment contracts and staff development opportunities.
- Integrating the virtual teams into the corporate community and combating discrimination of remote workers, e.g., electronic monitoring and poor inclusion, participation opportunities and access to information.
- Introducing company-wide occupational health and safety measures aimed at reducing risks related with frequent computer usage, e.g., eye sight, magnetic fields, repetitive strain injury in arms, back/spine problems, and considerations for pregnant employees, and paying attention to stress factors arising from work across different time zones, working life cultures and languages (cross-border stress).
- Respecting cultural diversity among dispersed employees – while always respecting the universality of human rights – and encouraging employees to influence a specific vital to their work/life balance.

(b) Data protection, security and integrity

Data protection and security are fundamental for e-work across borders. In particular, if the network includes workplaces in countries with different or insufficient data protection legislation, complementary frameworks are needed.

Enterprises can demonstrate their commitment by:

- Preventing fraud/crime and threats by providing connected remote employees with clear responsibilities and directions on information handling.
- Ensuring that the communication facilities and information systems used by individuals and entities are technically and organizationally secure in order to protect commercial, intellectual and innovation assets.
- Establishing rules of conduct for telephony, data transmission, e-mail, video/audio conferencing, Internet/Intranet/Extranet use, etc., in order to safeguard integrity and obtain the best possible network efficiency.
- Protecting the integrity of employees by introducing strict company-wide rules for gathering, processing and exposure of personal data.
- Specifying clear standards and fair solutions to guarantee employees' Intellectual Property Rights pertaining to the outcome of their work, and respecting copyrights.

(c) Work technologies and tools

Compatible working environments and tools across the organization are key elements for efficient e-work across borders.

Enterprises can demonstrate their commitment by:

- Adopting user-friendly and reliable technologies, and guaranteeing that all work sites match corporate technology standards.
- Emphasising 'interactivity' in order to enrich cooperation, when investing in new communication environments and tools
- Providing training in order to maintain employees' skills in teamwork technologies.
- Introducing technical support, e.g., helpdesk services that can facilitate local efficiency and global cooperation.
- Adopting corporate policies that facilitate information access and encourage broad-scale company-wide information exchange and knowledge sharing.

(d) Contribution to progress in the countries of operation

Good corporate citizenship implies responsible corporate conduct and partnership with the communities. Networks of entities and e-workers abroad can contribute to economic and social development in their countries of operation. By using their influence, MNEs can promote societal processes and defend human rights.

Enterprises can demonstrate their commitment by:

- Contributing to the technological development and knowledge building in their countries of operation by serving as a partner in technical development programmes, and as a local employer and partner in training activities.
- Upholding responsible business practices and encouraging partners, suppliers and contractors to do the same.
- Supporting local business development and economic progress by local sourcing of materials and services.
- Minimising negative effects on the local community in the event of discontinuing activities.
- Providing open and transparent information to employees and other relevant stakeholders on plans, activities and performance.

(e) Environmental performance

Multinational companies and the environment can benefit from the specific opportunities provided by information and communication technologies.

Enterprises can demonstrate their commitment by:

- Ensuring that the same environmental standards, responsibilities and management systems are applied across all locations – incl. non-manufacturing company units.
- Putting in place programmes, indicators and measures to minimise environmental impact, such as energy use and disposal of electronic equipment associated with computer work.
- Establishing objectives and initiatives to reduce commuting and business trips by utilising audio/video conferencing and other information and communication facilities.
- Providing open and transparent information to local authorities, employees and the general public on the entity's environmental policies and performance.

5. NEW DIRECTIONS FOR EUROPEAN RESEARCH AND DEVELOPMENT IN THE INFORMATION SOCIETY

The European Union has undertaken a coordinated approach to research and development of Information Society Technologies (IST) in Europe for several years through the series of Framework Programmes (FP).

IST in Framework Programme 6

The 6th FP, including the thematic priority on IST, was approved by the European Parliament and the European Council on 27 June 2002. The actions undertaken in FP6 will address three main headings :

- Focusing and integraty Community research
- Structuring the European Research Area
- Strengthening the foundation of the European research areas

The IST thematic priority contributes to the third of these.

Activities carried out in IST, following the conclusions of the Lisbon European Council and the objectives of the e-Europe initiative, are intended to stimulate the development in Europe of both hardware and software technologies and applications at the heart of the creation of the information society in order to increase the competitiveness of European industry and allow European citizens in all Union regions the possibility of benefiting fully from the development of the knowledge-based society. Concentration on the future generation of IST will bring IST applications and services to everyone and enable the development of the next generation of technologies to be more user-centered.

Europe is well positioned to lead and shape the future development not only of technologies but also of their impact on our life and work.

With a view to exerting maximum impact in economic and social terms, effort focus on the future generation of those technologies in which computers, interfaces and networks will be more integrated into the everyday environment and will render accessible, through easy and "natural" interactions, a multitude of services and applications. This vision of "ambient intelligence" (interactive intelligent environment) seeks to place the user, the human being, at the centre of the future development of the knowledge-based society.

The actions undertaken in IST will include:

Integrating research into technological areas of priority interest for citizens and businesses. Completing and building on progress expected in the development of basic technologies, this research is aimed at finding solutions for major societal and economic challenges, faced by an emerging knowledge-based society including the consequences for work and the workplace environment and focusing on:

(a) research on technologies addressing the key security challenges posed by the "all-digital" world and the need to secure the rights and privacy of citizens

(b) "ambient intelligence" systems offering access to the information society for all, regardless of age and situation (such as disability or other individual circumstances), as well as interactive and intelligent systems for health, mobility, security, leisure, tourism, access to and preservation of the cultural heritage, and environment;

(c) electronic and mobile commerce, as well as technologies for secure transactions and infrastructures, new tools and new methods of work, technologies for learning (such as e-learning) and

systems for corporate knowledge management, for integrated business management and for e-government taking account of user needs;

(d) large-scale distributed systems and platforms, including global resource information database (GRID) based systems that provide effective solutions to complex problems in areas such as the environment, energy, health, transport and industrial design.

The first call for proposals for IST closed in April 2003, and following evaluation and negotiation of contracts, the first projects will start early in 2004. Further details about the IST work programme and future calls can be found at www.cordis.lu/ist

Roadmaps for applied research to 2010

In preparation for the 6th FP, the European Commission DG INFSO Directorate for "New Methods of Work and Electronic Commerce" launched a series of *Roadmap* projects which started in early summer 2002, and were given a schedule of 12 months in which to complete their work.. The major objectives of these projects were :

- to identify the research challenges in the respective area, to assess Europe's competitive position and potential, and to derive strategic roadmaps for applied research driven by visionary scenarios;
- to build constituencies and reach consensus by means of feedback loops with the stakeholders at all relevant levels.

Below is an overview of the domains in which the roadmap projects were launched.



Updated information on roadmap projects is provided through the web-page www.cordis.lu/ist/ka2/roadmap.html or can be downloaded from www.cordis.lu/ist/ka2/future.htm.

Five roadmaps are particularly relevant to the field of new working environments, and their results are summarised in the following sections :

Working Methods and Workspaces		
38346	FUTURE-WORKSPACES	A Strategic Roadmap for Defining Distributed Engineering Workspaces of the Future
37278	ROADCON	Strategic Roadmap towards Knowledge-Driven Construction
Socio-economic aspects / sustainable development		
37373	INTELCITY	Towards Intelligent Sustainable Cities
38184	SASKIA	Strategic Action for a Sustainable Knowledge and Information Age
39080	NESKEY	New Partnerships for Sustainable Development and Knowledge Economy

5.1 Strategic Roadmap for Defining Distributed Engineering Workspaces of the Future



Introduction

Future Workspaces roadmap defines the 2013 European vision of collaborative engineering workspaces of the future and identifies future research challenges in implementing this collective vision that will bring together key players from across Europe. It addresses the aerospace, automotive and building construction sectors and shows how end user needs will be satisfied in the year 2013.

After deriving the collective vision for 2013 from the three perspectives of the users, of the technologies and of human factors, four detailed scenarios were described that show how these workspaces will be implemented at that time and define the benefits that will accrue from them. The benefits include improved time-to-market, reduced costs, reduced waste, reduced environmental impact and improvements to the work/life balance for the workers, their families and their communities.

The roadmap to develop the solutions to these research challenges places the focus initially on integration of current technologies during the next two years. While continuing with further integration actions, the emphasis shifts to introducing true mobility into these workspaces during the following three years. Finally, augmenting both integration and mobility over the next five years, the focus is on developing the intelligence inherent in these workspaces through the incorporation of intuition and human-friendly interfaces into them.

Ancillary issues are also considered – drivers, deployment challenges, barriers, dependencies and risks – that are part of achieving this collective vision, identifying actions that need to be taken in order to deliver the benefits. After enumerating the key actors who need to be involved in this challenging roadmap, the wider benefits associated with these Future Workspaces are outlined.

Collaborative engineering workspaces

Each involve a number of participants (actors) working together to achieve a joint objective, often geographically separated from each other, in which each of these individuals appears to the others to be co-located. The ICT tools and the infrastructure are configured dynamically to support this team of individuals to achieve their joint objective. The configuration of individuals, their tasks, roles and organization, the information they need and employ and the tools and equipment they use are defined as a collaborative engineering workspace. At the completion of the task and the achievement of the objective, the individuals, the ICT tools and the associated infrastructure are re-deployed in different configurations (workspaces) for their respective next tasks. These workspaces will be secure, the security of each domain being policy-based rather than discretionary, where trust relationships can be dynamically created and closed down between security domains, where industrial grids and virtual organizations can be created and brought into operation with a minimum of effort, yet retaining tight security control in all areas of confidentiality, availability and integrity.

Ultimately, engineers will be able to work seamlessly in their office environment with documents, scientific models and virtual prototypes, both alone and collaboratively with distant colleagues as if they were in the same room. Virtual and hybrid prototypes will be available as means for engineers to design new products. They will access specialised services via intelligent network infrastructures that can detect, predict and satisfy user demand when and where it occurs at any time and any place through location- and device- independent applications, which are able to seamlessly migrate across network technologies.

THE ROADMAP

The roadmap for achieving the vision of future collaborative workspaces is described by defining three landing places over 2, 5 and 10 year periods.

(a) Landing Place for Collaborative Workspaces in 2005

There are sufficient research results available right now that can improve the engineering workspaces of the present day, especially in their facilitation of collaboration between the various partners in an enterprise. Therefore what is required in short the term is to bring these research results together to create industrial solutions in workable forms. Hence, the emphasis for the next two years is placed on **Integration** of the relevant research results for industrial implementation. This target is mainly a consolidation of current technologies to develop the foundation for future collaborative workspaces to reach a high usability level. It is reasonable to set the following short term research targets to be achieved by 2005, based on the current maturity level of the technology and the readiness of the industry to deploy collaborative workspaces.

- Aim to deploy collaborative workspace technologies as a standard tool for supporting collaboration between geographically separated teams who belongs to the same organization.
- Establish a Software Framework which brings together deployable technological components and distribution services which support the easy creation of distributed collaborative workspaces.
- Deploy the advances in the communication technologies to provide transparent usage of networking services with adequate quality of services for real-time interaction and basic level of security for supporting inter-organizational collaboration.
- Establish an user interface framework which integrates various technologies such as audio, video, visual, haptic, advanced tracking, sensors, avatars, interaction metaphors which allows the workers to create easy to use personalised interfaces.
- Implement a "Workspace Authoring Toolset" to allow the easy construction of various workspaces by invoking various interface technologies, engineering simulation modules, engineering data flows and appropriate resources.
- Provide basic models, theories, systems and knowledge to better understand and design for human factors in complex distributed socio-technical systems.
- Develop new and expanded business models and human centred collaboration models, matching the progressive development of collaborative workspaces in detail. This is essential to the understanding, and thus ultimately to the delivery, of business benefits.

(b) Landing Place for Collaborative Workspaces in 2008

The target for 2008 is to build on the software integration efforts to improve ubiquity, usability, mobility, context-aware and security features of the collaborative workspaces and to establish its deployment among all the stakeholders of an engineering project. This 2008 collaborative workspace will support collaboration between multi-site workers, including mobile workers, at any time wherever they may be. This will require interfaces with inbuilt context awareness and transparent access to resources that are adaptable to the individual user and his/her terminal's capabilities, with greatly reduced intrusiveness of the devices upon the users, thus embodying unrestricted mobility in these collaborative workspaces, with **ubiquity** as an essential underlying characteristic. This target is based on the vision of an evolution of the engineering organization taking advantage of expected ICT progress. The co-location of product integrated teams is still considered necessary for programme development, but the number of people involved in these teams is decreased significantly due to the remote involvement of the key project partners and supply-chain partners. Only a small team from each sub-contractor will be fully involved in the product integrated team while a large number of sub-contractor people will remain on their home sites and/or will be able to contribute to the decision-making process from a mobile or remote location. To support this distributed team activity, it will be necessary to set the following research targets for 2008.

- Aim to deploy collaborative workspace technologies as a standard tool for supporting collaboration between geographically separated teams who work for different organizations.
- Achieve an integrated network platform infrastructure which brings together various networking technologies such as wireless technologies, including Personal Area Networks (PAN), WLAN, FWA,

Hyperware Automation Programs (HAP), digital broadcasting, satellite towards the realisation of their full service capabilities to provide seamless interaction and roaming facilities.

- The proliferation of IP-enabled wireless devices operating in a variety of environments (home, car, public transportation, office, shopping mall, conference centre, airports, etc). This raises the challenge of supporting secure ad hoc connectivity and reconfiguration in a multiplicity of environments.
- Establish network independent and scalable services to access audio-visual materials, 3D and mixed reality objects, distributed speech recognition over heterogeneous infrastructure with variable bandwidth and quality of service availability with a high trust level.
- Support context awareness within collaborative workspaces. Ambient environment will be based on large numbers of various sensors that track users location, activities and behaviour. The interpretation of this data will allow the recognition of the users context, allowing contextualised presentation of engineering knowledge to support individual and team work. The contextualised interpretation of the project team members will also be used to create visual illusion of "virtual project communities" encouraging social interaction and team work.
- Enhance the usability of the multimodal interface technologies and implement a range of ambient workspaces by integrating interface technologies (displays, sensors, wireless communication, speech recognition etc) with background objects such as walls, tables, chairs etc.
- Clear understanding of true collaborative network models, methods to assess performance, attitudes and effects on individuals of all new methods of working and human factors guidelines for developing collaborative workspaces.
- Human factors guidelines for developing collaborative workspaces and ambient interfaces.
- Validated models, theories, methods to reflect complex socio-technical systems needs, and use of cognitive /physical artifacts in a social setting.
- Better understanding of issues such as knowledge management, motivation to share knowledge, measurement and management of trust, effects of pace of change on performance, health and attitudes.

(c) Landing Place for Collaborative Workspaces in 2013

The target for 2013 is to achieve a higher degree of *Intelligence* in collaborative workspaces which are self learning and self organising to offer appropriate computing power, bandwidth and context-aware information to allow the workers to work more productively. These workspaces will be served by intelligent agents in the background for the workers to be more productive. These software agents will act on behalf of the user for actions such as finding and filtering information, ensuring procedures are followed, detecting changes or anomalies, automating workspace tasks, establishing ad-hoc workflows, retaining process and decision-making knowledge, and will provide a fundamental building block for a new generation of workspace innovation especially well-suited for ambient intelligence environments. The underlying technologies such as interfaces, network bandwidth, computing power and security will be dynamically configured to provide the appropriate setting for the collaborative workspaces to cater for user preferences and quality of services for various collaborative sessions. This challenging target is based on the vision of a completely new engineering organization centred on intelligent workspaces. In this organization, the product integrated team becomes fully distributed: the network of "business domain" teams becomes accessible and can provide knowledge at any time for any life-cycle activity. A supervision team controls true engineering activities performed by a network of engineering competence centres (the engineering activities themselves become truly ubiquitous!). This organization is expected to reach a high level of agility (high reactivity to business opportunities), adaptation (ability to adjust to key business parameters) and self-awareness (dealing with risks in a dynamic manner), bringing the best answers to foreseen business constraints. The following research targets are set to achieve such Intelligence by 2013:

- Aim to achieve complete deployment of collaborative workspaces, supported by trusted intelligent agents, among all the partners in a value chain, wherever located in all stages of product life cycle.
- Self-organising capabilities (ability to find and incorporate resources dynamically in the network, ability to restructure the organization to face workload peaks).
- Self-configuration capabilities (the workspace adapts itself to the context and the team members depending on their role) with quality of service determined by willingness to pay.
- Transparent management of contractual issues (incl. IPR) and security issues.
- Intelligent user interfaces based on bio-centric control and systems that understand relevant human communication including mental and emotional state as expressed through the observed person's

body language and explicit spoken language through sensors as well as generating output that is naturally understood.

- Adaptive training systems, supported by intelligent agents, embedded into the intelligent workspaces.
- Understanding and modelling of joint cognitive distributed systems.

Thus, the roadmap for collaborative engineering workspaces now has two intermediate goals, or landing places, and a final goal at which we are aiming over the next two, five and ten years. The following figure depicts how these will fit together.

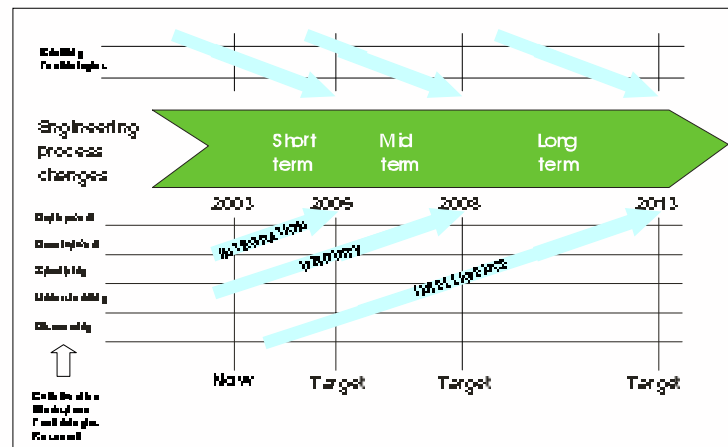


Figure 12: Collaborative Workspaces Research Roadmap

Benefits

Benefits resulting from these collaborative engineering workspaces will include better involvement of all parties in an enterprise and their clients in the specification, design and building phases, yielding cost savings, reduced wastage and reduce overall timescales. Emerging problems, which could have serious cost and timescale implications, will be resolved quickly by involving all the relevant parties at an early stage in identifying all associated issues and in seeking a solution acceptable to all of them. The integration of design tools will facilitate the design and development process, although some of those tools will involve such enormous computing power and memory consumption that they will only be able to be utilised fully once Grid technologies, power-on-demand and bandwidth-on-demand are fully available. Project management will be improved through the measurement, presentation and availability of all information required to keep massive, and not so massive, projects under control. This will include close integration between Concurrent Engineering and eBusiness tools.

Thus, these workspaces will bring benefits at three levels. Firstly, they will contribute to improving the market position of each of the organizations that implement them through cost savings, reduction of waste and of delays, improved quality of the products and services and better customer satisfaction. Secondly, they will contribute more widely to improving the competitiveness of European industry through the increased effectiveness of collaborative working. Thirdly, they will contribute to the EU strategy on sustainable development in the knowledge economy, reducing pollution and improving the environment and the Quality of Life of its citizens.

It is highly likely that these collaborative workspaces and their contributory technologies will spin off into other industries directly, e.g. shipbuilding, electronics, and more widely into other commercial and even leisure sectors. One could even envisage spin-offs into the games market, although heretofore this sector has tended to lead the engineering industry in some of the technologies and applications. Other demonstration workspaces will be used throughout the high street, where personalised designs are required – e.g. kitchens, bedrooms, apartments, houses – but there are just as likely to be sales

and marketing implementations in the insurance industry, in banking, in the legal industry (e.g. for representing scenes).

Applications in the healthcare industry are easy to envisage. Other applications in local administrations will be many, including citizen support centres, town planning, protection of the countryside and the environment. Entertainment applications are obvious, but these will stretch into edutainment and into education – not just subjects where visualisation can be helpful – history, geography – but also in teaching science, even languages.

Thus, this roadmap for collaborative engineering workspaces of the future will bring wide-ranging benefits across not only the industrial communities but also the social communities that they support

Contact & Information Details

Terrence Fernando
University of Salford
t.fernando@salford.ac.uk
Tel: +44 161 295 2914

5.2 The ROADCON project: a Strategic Roadmap for future RTD in Construction ICT

Introduction

ROADCON⁹³ is funded by the European Commission under the IST⁹⁴ programme. Its mission is to develop a strategic roadmap for research & development in ICT (*Information and Communications Technology*) in the Construction industry for the next decade and beyond, advocating the vision of model based, knowledge driven ICT as the main enabler for the future achievement of important societal, environmental, industrial, and business priorities in Construction. The underpinning idea in future use of ICT is computer interpretable (model based / semantic driven) information that will:

- enable enhanced automation, integration and communication in Construction, through value added ICT based applications and services, supporting the future development of enhanced and smart products
- contribute to support the needs of the construction industry, and its requirements for the future improvement of Construction Business processes
- and eventually, increase the impact of construction on sustainability, economic growth, employment, and the quality of life.

Approach and results

As a strategic roadmap, ROADCON is building on the wealth of available information from state-of-the-art research and practice across Europe. The main objectives and expected achievements of ROADCON can be summarised as follows:

- the development of a vision on how ICT can benefit the construction industry, along with a set of industry requirements for ICT support in the short, medium and long terms, taking into account results from a broad industry consultation
- the identification of the RTD requirements on ICT applications, ICT architectures & infrastructures, and ICT standards & technologies, to support the ICT requirements mentioned above (spanning the coming 10 years)
- the establishment of a forum of key actors in the European construction sector (including its suppliers and ICT vendors) to help in identifying and confirming ICT requirements and supporting research and development, thus contributing towards the goal within and beyond Framework 6 (FP6)
- the achievement of a consensus on common research and development priorities realising the most important tools, infrastructures and processes for knowing, design, building, operation and maintenance; and suggest practical measures for developing, agreeing and promoting standards to be adopted by the industry. This should lead to the production, validation, and dissemination of a roadmap that will include a prioritised and scheduled list of actions supporting the implementation of the vision of ICT in Construction and ensuring impact on the Construction industry. It includes scoping of themes and scheduling for future RTD activities, and general guidelines for dissemination, promotion and deployment activities.

The ROADCON vision for ICT requirements in Construction is synthesised in Figure 1 below. Thirteen main distinct ICT trends have also been identified in ROADCON that are seen as indicators to future RTD actions: they are summarised in Table 1.

⁹³ ROADCON: IST-2001-37278; Strategic Roadmap towards Knowledge-driven "sustainable" Construction. Web site: www.roadcon.org

⁹⁴ Information Society Technologies funded by the European Commission.

Figure 1: The ROADCON vision for ICT in Construction

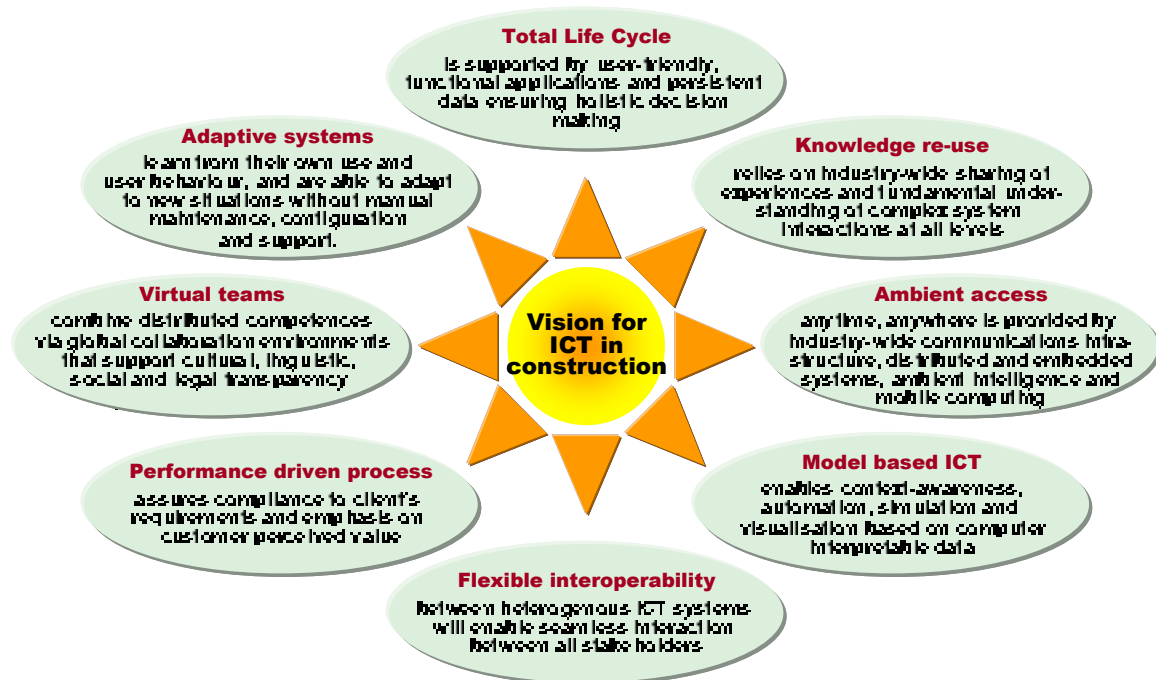


Table 1: Overview of the 13 Trends identified in ROADCON

Strategic Goals	Trends
Impact	● Value-prioritised: Shift towards "new" societal and environmental values like customer value, worker value and sustainability beyond the "old" economic values like cost, time and quality.
Business processes	● Knowledge-driven: should overcome the obstacle that in construction for each project the wheel is typically re-invented. Involves project-independent (often meta-) information (facts and experience). ● Performance-directed: introduces transparency towards the technical solutions chosen with respect to functional building problems. Also dealing with the processes of measurement and assessment of performance. ● Collaboration-managed: "Document-based". Meta-level Project/Information Management handling digital models, derived or related documents or even references to paper documents. Primarily maintaining overview and transparency and managing without going in the details (workflow, document/model management, mark-up, personal/synchrone collaboration tools). Dealing with Total Life-cycle Management (TLM) including Risk Management.
ICT Applications / Functional Solutions	● User-supportive: more functional applications really targeting and supporting the end-user (practitioners) needs throughout the building product life-cycle. ● Service-oriented: Integration of Processes & Information in "Objects with behaviour". Good example are Web Services based on WSDL and SOAP. Related to APIs. ● Generic-applied: Instead of sector-specific development, the application of sector-independent ("generic") solutions. Improved critical mass building and cross-sector interoperability.
ICT Infrastructures / Ubiquitous Access	● Server-shared: having all building info available, accessible via the most appropriate device, anywhere, anytime in the latest version from one logical place. Mobility is prime issue here. ● Web-enabled: The Internet and the future Next Generation Internet (NGI) or Semantic Web will be THE information infrastructure backbone for all communication. ● ICT-embedded: Advanced products like Intelligent Buildings and Infrastructures. Chips everywhere; the physical counterpart of the virtual building process.
ICT Standards & Technologies / Enablers	● Model-based: smarter software (applications and information) that better understands the building objects of interest and can support the all end-users of this ICT in more intelligent ways. ● Open-integrated: integrated ICT solutions are expected to be always built up from multi-vendor components that require open communication and integration between them making them interoperable. ● Self-adapted: technologies that enable systems to "learn" from their own use and user behaviour, and adapt to new situations without manual maintenance, configuration and support.

Relying on the Vision of ICT in Construction as shown in Figure 1, as well as the various ICT trends identified in ROADCON, the ROADCON roadmap (under elaboration) for ICT in Construction is to define the path of RTD actions to be taken to reach the envisaged future state. The following types of RTD actions, along with years to industrial transfer and deployment, will be considered:

- *Take-up*: adoption, deployment and demonstration of existing technologies (0-2 years);
- *Development*: implementation of clearly defined RTD to achieve exploitable results (3-5 years);
- *Research*: specification and prototyping as required to find the optimum way forward for further development (6-9 years);
- *Emerging*: exploration of RTD needs and opportunities for potential solutions in a long-term future (10-15 years).

Contact & Information Details

Alain Zarli
CSTB
290 route des lucioles B.P. 209
06904 Sophia Antipolis cedex
France
alain.zarli@cstb.fr
www.roadcon.org

5.3 Visions of Sustainable cities based on the emerging knowledge society - Intelcity

The INTELCTY roadmap addresses the parallel EU policy objectives of the "Knowledge Society" (KS) by 2010 and "Sustainable Development" (SD) by 2030 through an integrated research strategy towards the intelligent city - an integrated citywide ICT information system continuously accessible to all (planners, developers, politicians, designers, engineers, transport and utility service providers AND individual citizens) that will enable more inclusive decision-making and support more sustainable life-styles. This work has involved consultation with a wide range of stakeholders including a total of 23 city authorities, 20 ICT companies and over 50 research groups including 16 SMEs involved in a think-tank as well as four regional end-user groups. The research strategy proposes a range of prototyping studies in a number of EU cities aimed at advancing KS and SD at the city scale by focusing on a range of citizens' and business concerns about engagement with decision-making over the (re)generation and management of their local built environment.

The most significant barrier to more sustainable urban re/development of cities is the lack of consensus between citizens, politicians and business over actions and targets. Citizens do not have ownership, nor a common vision, of change towards more sustainable communities and life-styles. Effective local eDemocracy provided through access to information, opportunities to understand and discuss options for change with experts and fellow citizens and to express opinions in ways that empowers the individual is the vision of the "eAgora".

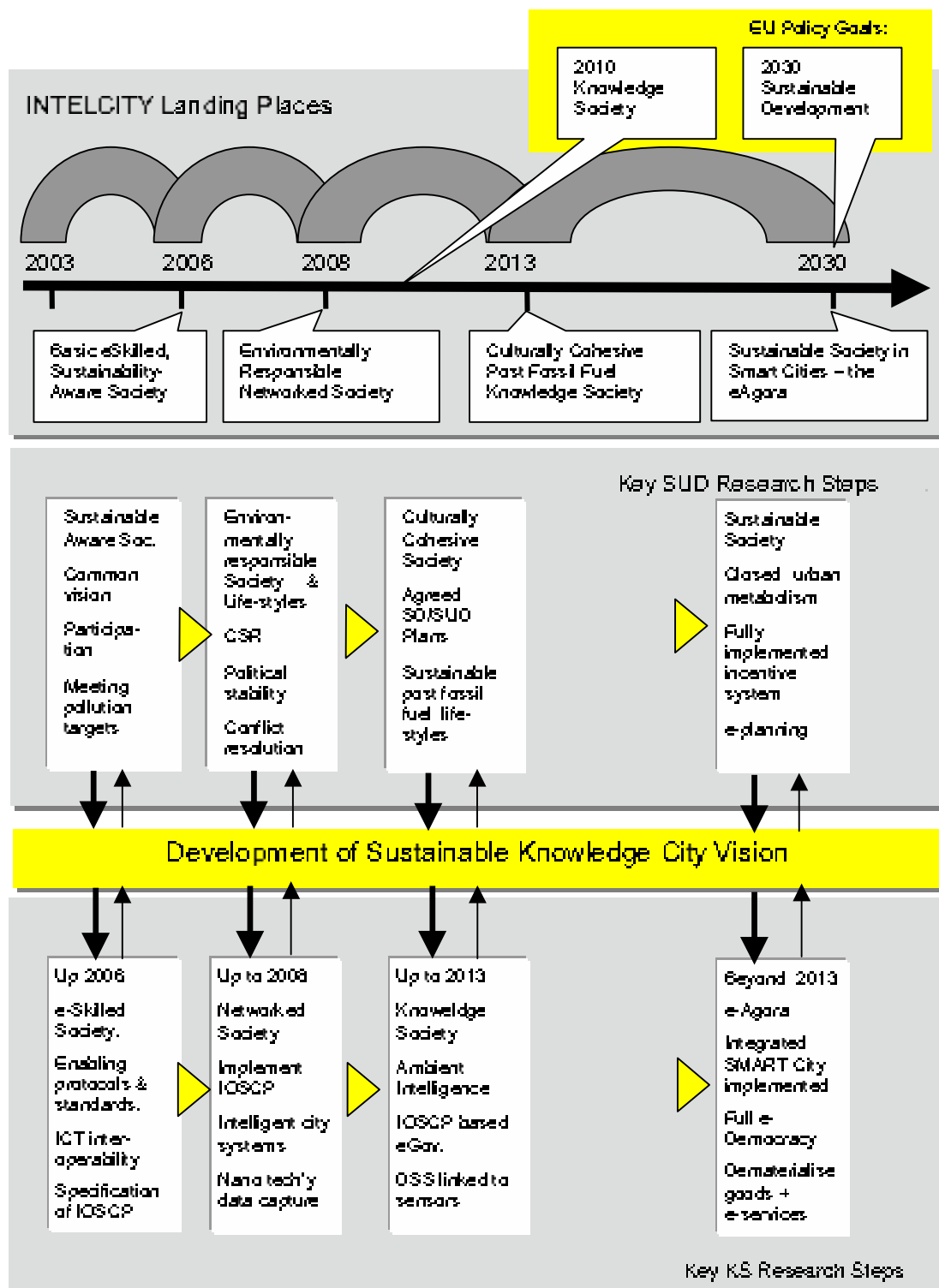
To meet these targets two interconnected research steps are necessary:

1. Social learning "laboratories" or test beds in cities in order to simultaneously explore, stimulate and demonstrate routes to inclusion as well as migration routes to the IOSCP identified in step 2. This will enable a number of iterative action research experiments where the implementation of more accessible technologies, administrative and planning process reengineering can take place that both identifies current eSkills and provides education which encourages demand for new solutions that advance the relations between citizens, public administration and business.
2. Development of a city-wide information system that integrates a wide range of current and to-be-developed urban services and activities through an Integrated Open-System City Platform (IOSCP) that is flexible and adaptable for the future. This will entail technical development and agreed standards for integration and interoperability between a range of systems and currently evolving technologies for eAdministrative Services (eGIF, Semantic Web), for city planning, management and visualisation (GIS/GPS, nD city models, VR, Augmented reality) and for real-time data capture.

The iterative research strategy proposed provides for, in the short term, prototyping studies for a range of eServices (administration, participation, physical and economic planning, mobility, etc.) founded on existing legacy systems in cities. The medium term seeks gradual integration of these, initially through loose coupling based on underlying multidimensional (nD) models and databases. In the longer-term deeper integration will move towards the full development of the IOSCP, which will be configured to provide intelligent analysis for users. Thus the proposed research strategy extends beyond the current state of the art in the provision of city information, through an incremental process that gradually provides citizens, business and city managers with "intelligent environments" that will support new more inclusive and educational planning processes. Ultimately this will provide the possibilities of much more rapid and consensual urban re/development decision-making, which balances public and private interests. This more agile governance will aid rapid business development whilst enhancing citizens' rights in urban decision-making via advanced visualisation, forecasting, simulation and sustainability evaluation of re-development proposals.

The Road map

To reach the vision of a sustainable knowledge city the roadmap summary diagram identifies the main research steps for the landing places (short, medium and longer time periods).



LANDING PLACES - 3, 5, 10 years ahead + 2030

The INTELCTY landing Places identify the main steps that need to be achieved in order meet the EU policy targets of KS by 2010 and SD by 2030. The bridge elements identify key actions that link both action lines.

Landing Place	Knowledge Society (KS)	Sustainable Urban Development (SUD)	Bridge
3 years 2006	Basic e-Skilled Society, Access to all, ICT knowledge for all citizens & disincentives to communicate eliminated. Protocols and specifications set for e-activities, e.g. e-democracy, e-voting Effective knowledge capture (and reuse) through job or activity mining giving improved job prospects, quality and enjoyment. Basic, open system city information platform(s) and interfaces (IOSCP)	Sustainability Aware Society - common understanding, awareness, vision, targets. Confidence building, e.g., effective participation, full(er) employment, for more effective personal and community action. Effective waste reduction/ recycling systems Meeting pollution abatement targets (Kyoto)	Local & regional action plans and master plans to consider ICT's. Demo projects linking e-Gov, e-administration, sustainable transport, recycling, etc., in leading edge cities.
5 years 2008	Networked Society Technology nearly everywhere-advanced e-skills and IOSCP. Increased flexibility of working Real-time intelligent systems, monitoring and interfaces Use and waste monitoring using advanced (nano?) sensor technology. E-administration in all cities E-government pilot implementation City models based on four SUD pillars	Environmentally Responsible Society of shared values and accepted targets Effective urban and corporate governance (CSR) with appropriate incentives/legislation. Political stability (in enlarged EU) Healthy, more environmental friendly lifestyles and habits Conflict resolution structures and mechanisms in place.	ICT/KS integrated in planning (e-planning & dev't control). Demo projects linking e-Gov, e-administration, sustainable transport, recycling, etc., in all cities.
10 years 2013	Knowledge Society Technology everywhere, high bandwidth access for all, full city knowledge system – no digital divide Work anywhere fully flexible working & learning = high level job quality & opportunities for most citizens Effective e-Governance implemented, e-voting, devolution, etc. Flexible resources use / infrastructure	Culturally Cohesive society providing safe, clean environment with no unemployment Strategies and plans agreed for rapid transition to SD/SUD Largely sustainable life-styles / mobility through citizen awareness Post fossil fuel and clean technology Circular urban metabolism Decoupled growth	Virtual products and services Full implementation of e-planning e-Democracy development & demo, towards the e-Agora
2030	Smart City (e-Agora) Integrated SMARTcity infrastructure fully implemented = full e-democracy Fully dematerialised goods & services	Sustainable Society with fully closed urban metabolism Fully implemented strategy, plans and incentive systems	E-skills fully embedded in society and culture.

KS depends upon a range of e-Services and on the quality of jobs and flexible working environment(s) produced. Thus e-skills and accessible cyber space are vital early steps. The long-term path of dematerialization of services and a flexible use of resources and infrastructure can start with monitoring use and waste through intelligent environments. The starting point for SUD = shared values and confidence building (e.g. meeting Kyoto targets, conflict resolution structures, increased employment and improved understanding of sustainability issues). Development of e-Democracy (participative decision-making and empowerment) is vital to responsible behaviour and lifestyles.

Research priorities for 3, 5 and 10 year time horizons

The research priorities identify the main issues that need to be addressed in order to deliver new knowledge and technologies to support progress towards the landing places. As SUD is a very long term phenomenon, the benefits of RTD in the next 5-10 years will be realised over the period up to 2030.

Time	Knowledge Society (KS)	Sust. Urban Dev. (SUD)	Integrating KS & SUD
3 yrs 2006	Enhanced hardware and software usability and accessibility (including wireless access). Advanced multidimensional databases Integrated ICT standards and 'common' protocols; e.g. XML, GML, IFC, VRML, eGIF, etc. Forms of ICT infrastructure & interoperability requirements. New data capture technologies. City/society information availability, capture, format, conversion & transferability.	Modelling cause and effect of human behaviour in cities (grounded in SUD concepts) utilizing enhanced information (environment, economic and social) from new data technologies Modelling cause and effect of incentives (including new ownership models) e-Participation (basic) e-Administration in city authorities	Demonstration projects, best practice case studies that link both KS and SUD (Phase 1) Public/private partnerships for bridging the digital divide Changing employment structures, flexible working Social shaping of technology, transfer and e-learning + institutional changes e-Security, safety & confidence ICTs for planning process efficiency and effectiveness Risk analysis modelling
5 yrs 2008	How to work "virtually"? Invisible (or attractive to use ?) man-machine interface(s) Information and model ownership "rights" and legal issues (e.g. digital signature) Advanced analytical tools and evaluation (intelligent agents, DSS, ES) Experiments in the smart city infrastructure in leading edge cities	Barriers to implementation of clean technologies, PEST LI steps to dematerialisation. e-Democracy, governance and empowerment (models, information quality, options, voting, tools) New financial instruments (knowledge asset) and effects on urban structure(s) and society	Integrated data models and knowledge management E-spaces / workspaces Group decision-support, e.g. integrated planning support tools Cause and effects of public-private partnerships (in a broader sense than current interpretation) New fiscal policy of/in the knowledge economy
10 yrs 2013	Device independent interfaces to provide 'feedback' (to modify citizen behaviour) Data representation models Intelligent products/devices, buildings and cities Development of symbolic/ambient techs. Integrated decision support - simulation, participation & sensor fusion	Sustainable lifestyles based on advanced dematerialisation. Virtual products and services Social and technological aspects of access for all Risk assessment in urban processes and developments	Theories and tools for bridging KS and SUD and integrating research outcomes. Long term implications of new flexible work patterns E-identity linking virtual and real worlds Demonstration projects for dissemination and implementation in "follower" cities (phase 2)

NB: the overlaps between fields and timeframes denote differences in prioritisation between groups who addressed different scenarios and potential user groups.

Contact & Information

Steve Curwell
S.R.Curwell@salford.ac.uk
Tel: +44 (161) 295 46 22
Fax: +44 (161) 295 50 11
www.scri.salford.ac.uk/icpart

5.4 An RTD Road Map for the Information Society's Contribution to Sustainable Development

SASKIA

Introduction and Methodology

The purpose of the SASKIA Road Map is to identify those RTD actions which will be required over the next decade if we are to achieve by, 2030 the state often referred to under the portmanteau term 'Sustainable Information Society'; that is, one in which the Information Society and its associated technologies make their greatest attainable contribution to sustainability, whilst itself being sustainable. This is a short summary of the work of the SASKIA project whose activities are reported in greater detail at www.is-sd.org

SASKIA's methodology was of the type most commonly used in RTD road-mapping: essentially the use of a core group of experts having substantial current involvement in research at the IS/SD interface, supplemented by written inputs invited from a much wider expert group, and by workshop events expanding the range of input even further. The wide scope of SASKIA's aim required an additional formal step in its process which is not commonly found in RTD Road Mapping activities, that of sectoral maturity assessment. In this step, the SASKIA topic was sub-divided into six sub-domains (production, logistics, consumption, economic, social, cultural). The relative state of maturity of each sub-domain was then assessed.

The very large quantities of input material to SASKIA manifested itself in three forms: a set of (eventually 13) written submissions each discussing in depth a single key class of topic (the Landing Place contributions); the six Maturity Assessments; and the very diverse range of contributions from the three SASKIA Workshops (held at Ulm (D) concentrating on the NGO community's contribution; at Kortrijk (B) on the industrial community's contribution; and at Helsinki (FI) on the contribution of citizens and their communities). From this material, five themes evolved:

Five Themes of Action

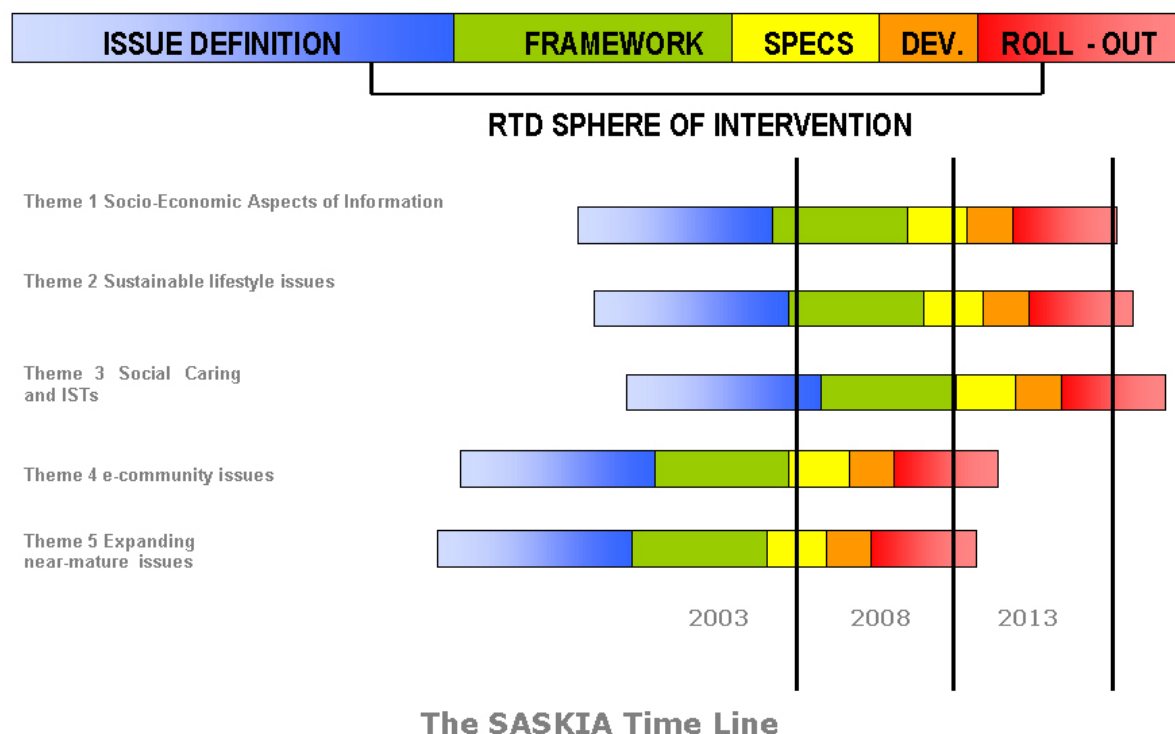
The final outcome of SASKIA is a straightforward statement of the five themes for action, with specific actions enumerated for each theme, an outline time line for their implementation and the identified need for involving different communities of actors.

- **Socio-economic aspects of Information**
 - Sub-themes here are IPR viewed from a social cost viewpoint; information governance and new perceptions of the meaning of 'ownership' and 'rights'; and the new economics of information and its corresponding economics of hybrid s.e.g. product/service systems.
- **Sustainable Lifestyle Issues**
 - Including issues of lifestyles in a Sustainable Information Society; of values and behaviour particularly related to sustainable lifestyles and of concepts of prosperity and all of Quality of Life.
- **Social Caring and ISTs**
 - These are the issues of the vast but often unseen Social Economy; of the Social Support and of the caring Society – equally vast but currently equally invisible.
- **E-Community issues**
 - This theme greatly extends existing work in e-Communities and e-Governance; adds vital issues of links between cultures old and new; and considers the IS to global linkage.
- **Near-Mature Issues**
 - Finally a significant number of as-yet untied loose ends are identified within the more mature areas of Economics; of Production, and of Logistics.

Sometimes described as the 'Digital Disconnect', there seems to be a considerable and growing gap between the Industrial and the Social Development aspects of the Information Society. In so far as any single over-arching theme can be discerned within SASKIA's large number of expert contributions, this is it.

Time Line and Mechanisms

The SASKIA time line reflects the considerable differences in maturity between more advanced domains such as production engineering and the economics of technology, and the less advanced domains, such as those of consumption sustainability and cultural development of the Information Society.



SASKIA not only proposes a new agenda of actions; it also identifies the essential place of new actors; and raises the possibility of the need for new mechanisms and financial regulations for research activities.

Contact & Information

Pol T. Descamps
 Barco n.v.
 Noorland 5
 Kuurne
 B – 8520
 Belgium
 Tel: + 32 56 233 211
 pol.descamps@barco.com

5.5 NESKEY – New Partnership for Sustainable Development in a knowledge Economy



Objective and Focus

NESKEY has the farsighted objective of establishing the agenda for research and high-leverage activities over the next five years – in the area of Sustainable Development in the Knowledge Economy, with focus on Information Society Technologies and Corporate Social Responsibility. The project has been focusing on the corporation as the key unit or entity around which to develop thinking and recommendations. To meet these objectives NESKEY concentrates on these areas:

- Measurement and reporting of sustainable development
- Intangible asset management
- Sustainable development practices in the built environment, particularly in cities
- Exploring capacity building and the capacity to access appropriate levels of ICT to promote sustainability
- Addressing integration challenges, societal level issues, and possibilities for a more systemic approach to sustainable development in the knowledge economy.

Achieving a sustainable economy requires a systemic societal-level feedback mechanism for sustainable development. NESKEY has focused on understanding the system of feedback for sustainable development that is emerging at the nexus of current work around:

- Corporate intangible reporting
- Corporate sustainable development reporting
- Widespread support for healthier and more sustainable management of built environment such as cities
- ICT capabilities that can support a very high level of transparent data reporting, integration and dissemination.

A core assumption is that coherence, integration and implementation of this systemic feedback mechanism requires new partnerships across those domains in order to integrate a wider range of societal players. It is further assumed that partnership development is dependent upon linking different working communities, and weaving a global thematic network or practice community that can serve as the vehicle for innovating new approaches – and that supports the refining and spreading of methods, effective tools, scorecards, and practices. A sustainable economy requires a system societal-level feedback mechanism.

The Neskey Vision

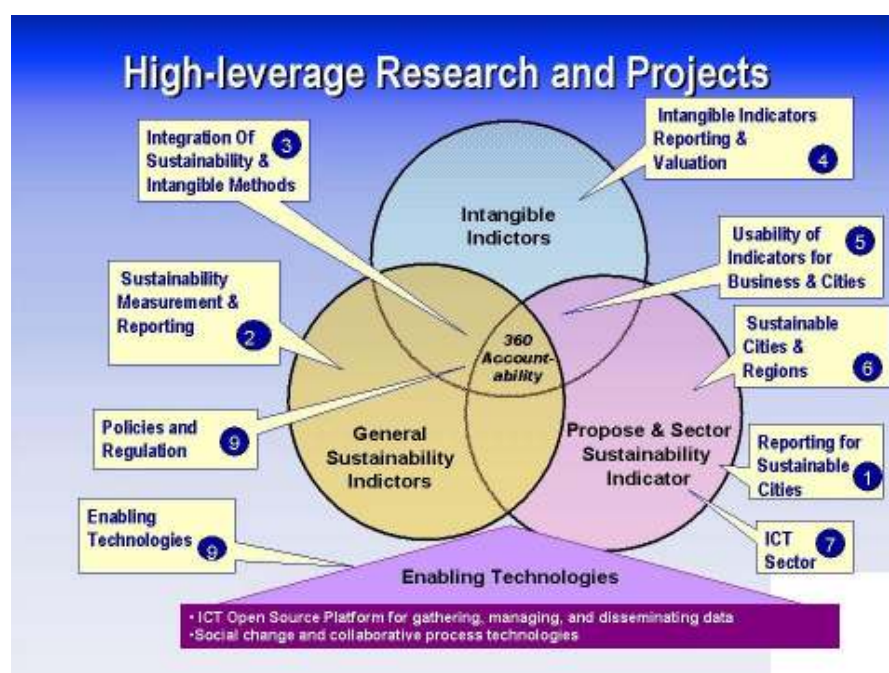
The NESKEY vision is that of a participative network of cities, companies, government, and civil society, all moving toward a society of responsible organizations. This sustainable society is based on a solid platform of a sustainable economy, which is guided by a systemic feedback system. The feedback system supports 360 degree accountability, 360 degree transparency and 360 degree participation, and utilises a core set of measures, indexes and methods commonly used by business, cities and regions, civil society, and governing bodies. Global networks and closely linked practice communities collaboratively improve measures and methods, and ICT capability supports databases and analysis tools for a wide variety of users and contributors.

Such a vision requires a core of widely accepted methodologies, frameworks and metrics that will allow a wide variety of users to both contribute to and access the core data and indicators. Integration of frameworks and methods must happen not only within each specialty area, but more importantly between each specialty area through linking practice communities. In the center of the following

diagram is the core vision of 360 degree accountability, transparency and participation. The three overlapping circles represent the three primary professional disciplines of Intangible Indicators, Sustainability Indicators, and Built Environment Indicators. This systemic approach comprises all the methods, tools, frameworks, and indexes that are required for coherent gathering, analysis, and reporting. Below these three overlapping circles is the foundation of technology expertise that included social technologies for linking practice communities and behavioural change, as well as ICT capability – to realise the vision of 360 degree accountability.

Roadmap towards the vision

NESKEY has identified nine thematic areas to focus research, and activities beginning immediately and extending roughly over a 30-year period. The NESKEY roadmap included detailed research questions, socially and technically focused activities, and supporting infrastructure issued in a detailed timeline to achieve success.



High level activities and research

Each Thematic Area details the specific urgent issues and activities that will be required over the next five years, both within an expertise area relating to sustainable development, and across boundaries where multi-stakeholder, interdisciplinary efforts will be required.

Thematic area 1 - reporting for sustainable cities

1. Catalogue and assess existing standards that address intangibles and sustainable development in order to identify which systems are most compatible and relevant
2. Identify indicators of corporate sustainability performance that can be meaningfully aggregated at a city and regional level.
3. Refine a core set of indicators and reporting standards for cities
4. Link city-level sustainable reporting to other measurement systems used at regional, national, and global levels.

Thematic area 2 - sustainability measurement and reporting

1. Develop further sector-specific, sustainability reporting guidance that expands the coverage of various technology sectors through a generally accepted framework.
2. Routinize Reporting
 - Research end users role of reporting in their decision making
 - Raise awareness and build capacity on using the information
 - Increase the number of companies reporting in a consistent manner and enhance uptake amongst small and medium size organizations
 - Expand sustainability reporting beyond the private sector to include other types of organizations
3. Develop tools, systems, and services that enable users to more easily access and analyse sustainability reporting.
4. Develop methodologies for individual companies to report on the sustainability impacts of their projects and services.

Thematic area 3 - integration of sustainability and intangibles methodologies

1. Catalogue and assess existing standards that address intangibles and sustainable development in order to identify which systems are most compatible and relevant
2. Assess delivery mechanisms for delivering legitimate and robust standards
3. Research which types of standards are actually most effective at delivering behavioural change
4. Identify which organization(s) or institutional structures are most appropriate for setting and enforcing standards in the area of intangibles and sustainable development
5. Developing linkages, networks and other institutional and research mechanisms to strengthen the connection between different standards that address different aspects of intangibles and sustainable development.
6. Determine the best policy mechanisms to encourage the development of new tools, the sharing of learning, and experimentation in practice or intangibles management
7. Enhance financial linkages by researching overlaps between sustainability information and practices in intangibles and risk management
8. Catalyse further exchange and raise awareness within the financial community on inter-relationships and impacts for evaluation and investments

Thematic area 4 - intangibles indicators, reporting, and valuation

1. Improve techniques for measuring, managing, and reporting intangibles
 - Identify linkages between business decision-making processes and social, environmental, and economic impacts
 - Understand what is material to an organization and its stakeholders
 - Connect and build on existing diverse approaches to intangibles measurement
 - Find the most effective way to determine and test best methods
 - Develop common tools and guidelines
2. Determine best incentives to influence behaviour of managers, investors, etc.
3. Build competency and capacity for applying methodologies through identifying needs and priorities, training and certification, and developing research and learning networks.
4. Identify the barriers to the development of commonly accepted standards (whether macro-institutional factors or micro-firm competitive factors) and determine how they can be overcome.

Thematic area 5 - usability of indicators for business and cities

1. Examine the relationship between corporate- and city-level measurement and reporting of intangibles to understand technical differences as well as pathways to inform and influence behaviour between cities and business
2. Identify critical intangibles for sustainability for cities and regions and potential tools for their measurement, management, and reporting
3. Develop tools for bridging the Knowledge Society (KS) and Sustainable Urban Development (SUD)
4. Catalogue and assess how cities are currently measuring and managing intangibles and reporting on performance
5. Generate and test business driver models for the management and measurement of intangibles in the context of sustainable development (e.g. a sustainability scoreboard)
6. Identify what systematic reporting and communication mechanisms are most effective for increasing the transparency of city/region sustainability performance
7. Research user requirements and decision processes for users and sustainability area.

Thematic area 6 - sustainable cities and regions

1. Conduct trials at the city and the region level for intangibles and sustainable development reporting. Determine which cities and regions would provide a useful testing ground, and set selection criteria.
2. Develop a city-wide information system that integrates a wide range of current and to-be-developed urban services and activities through an Integrated Open-System City Platform (IOSCP) that is flexible and adaptable for the future.
3. Provide citizens, business, and city managers with "intelligent environments" that will support new, more inclusive, and informative planning process.
4. Ensure systemic use of indicators for decision making in city-level planning and policy interventions.
5. Research intangibles (knowledge assets) and their effects on urban structure(s) and society.
6. Transfer learning about indicators, systems, and reporting to other cities.

Thematic area 7 - ict sector

1. Understanding effects of ICT products on new ways of working, intangible assets and liabilities, and the social, environmental, and economic impacts (direct and indirect) of these ways of working.
2. Understanding effects of ICT on social inclusion and employment processes.
3. Understanding effects of ICT on supply chain management processes and associated regional investments.
4. Sectoral-specific guidance for the technology sector for sustainability and intangibles reporting that links to a broader framework.

Thematic area 8 - enabling technologies

1. Address digital divide and other access issues, identifying stakeholder groups that need to be included but might be overlooked.
2. Conduct an analysis of current practices and behaviours within and between groups to determine appropriate interventions for behaviour change to support 360 feedback and accountability.
3. Link practice communities, design multi-stakeholder research activities, and support a Thematic Network.
4. Develop user requirements, design and launch Open Source Platform that can support data integration across a wide variety of user groups and organizations.
5. Determine pathways for resources, administration, and funding to support technology platform.
6. Develop and deliver educational seminars, workshops, e-learning tools, and training for key stakeholder groups and organizations.

7. Research data representation models and potential analytical tools.

Thematic area 9 - policies and regulation

1. Consider administrative issues around 360 degree feedback system, such as will there be a central clearing house for sustainability data, and if so, which administrative agency have oversight?
2. Explore possible policy interventions to encourage all citizens to take greater responsibility for themselves and for their contribution to society.
3. Research potential tax reforms that would penalise behaviours of corporate, civil society, and government organizations that subtract value from the common good in terms of energy and resources.
4. Reassesses practices around public spending
5. Revise public purchasing policies, encouraging sustainable and equitable practices.
6. Assess sustainability effects of public subsidies.
7. Consider temporary subsidiaries such as green investment funds.
8. Conduct systematic reviews for re-orienting public expenditures and policies toward sustainability.
9. Research possible revisions in the money and finance system where intangibles and sustainability are factored in, addressing the challenge of how to maximise balanced and equitable development without driving production, consumption, and investment practices to unsustainable levels.
10. Explore how EU can demonstrate commitment toward sustainable development by:
 - Ensuring that international trade, investment, and aid contribute to SD in other parts of the world.
 - Participating in restructuring old institutions or building new global institutions to enable the transparency required for 360 degree accountability.
 - Shaping the further evolution of global economic policies and institutions.

Contact & Information

*Jan Ahlskog, Director
EPPA
2, Place du Luxembourg
B-1050 Brussels
Tel: +32.2.7358230
Jan.ahlskog@eppa.com
www.neskey.com*

6. eWORK AGENDA - MAJOR ACTIVITIES IN 2002 - 2003

6.1 eWork in Europe Conference, Paris September 25-27 2002

Objectives

The idea of eWork is closely linked to the development of the information society in Europe, and to the priorities set out in the eEurope programme. Implementation varies between countries and the European eWork Assembly has provided a valuable opportunity to bring together specialists and pioneers in new methods of work for three days to review progress. This event, offering a chance for discussion and presentations of best practice, has been an appropriate time to learn and to exchange views.

The selected topics for the event were :

- demonstrate how eWork can improve competitiveness
- establish the relationship between eWork and corporate social responsibility
- choose the technologies best fitted to the different eWork activities
- discuss legal aspects linked to the implementation of eWork and the raising of performances
- understand the potential contribution of eWork to the health sector
- compare and exchange best practices between companies of different countries
- perceive the state of social negotiations at the European level
- stimulate new cooperation in Europe
- motivate the European actors to co-operate to the research projects of the 6th framework programme

Themes

Four themes had been chosen to focus participants' attention on the economic challenge of eWork and its social impact. The four key themes were :

eWork and competitiveness :

The intensity of worldwide competition is forcing companies to adapt their organization to the market requirements. eWork is one of the factors which can improve competitiveness while better balancing professional and personal life. Contrary to received wisdom, potential benefits are not restricted to potential real estate savings.

eWork and corporate social responsibility :

From 2003, listed companies will be obliged to make a report on their social and environmental policy. Ethical behaviour becomes a selection criteria for investors and eWork can take a significant part in the social and environmental commitment of corporate executives.

eWork, law and unions :

Some still consider that eWork expansion is held up both by legal constraints and by the attitudes of trade unions. However, this is not the case, as many case studies and agreements can demonstrate.

Technology for eWork :

Technology and co-operative tools are constantly improving. A focus on current development is essential.

PROGRAMME		
Wednesday, 25 september	Thursday, 26 september	Friday, 27 september
Opening of the Assembly	4 Parallel sessions	Plenary session
Plenary session	- eWork and competitiveness - eWork and corporate social responsibility - eWork, law and unions - Technology for eWork	Summary of the parallel sessions eWork European Trophy
Dinner-Cocktail and Exhibition	Gala Dinner	Closing of the Assembly

Participants

Corporate executives, politicians and civil servants from public administrations and territorial organizations concerned about attracting and keeping the best talents in a performing and reacting organization, which provides a pleasant working life. Personnel managers, trade unions and legal experts debated existing solutions in other countries. Researchers, developers and specialists met their international colleagues. All those with an interest in eWork and mobile work were able to debate the important issues.

About 400 attendees participated in the event and the level of satisfaction has been particularly high. One must say that the chosen premises for the event at the Ministry of Finance, Economy and Industry were perfectly adapted for a rich exchange amongst the participants and that the gala dinner at the Mairie de Paris reminds a wonderful memory for all those who attended.

The full proceedings are available online at www.ework-in-europe.com.

6.2 New Work 2002 – Conference in Badajoz, Spain, 3rd to 5th September 2002



New work 2002: "Designing a new work space: sustainability and ethical dimensions", organized by the Fundación para el Desarrollo de la Ciencia y Tecnología en Extremadura (FUNDECYT) was the 7th in a series of yearly conferences, organized by the International Telework Forum in collaboration with local entities.

The conference took place in Badajoz, in the region of Extremadura, the first time the conference moved to the South of Europe. The importance of the conference for the region is clear when taking into account the importance of sustainable development nowadays and its importance for Objective 1 regions, such as Extremadura., as well as the efforts taking place in integrating the region in the Information Society realised (with considerable success) by the Regional Government of Extremadura.

Interest in the new economy has existed for several years now. New ways of work organization and work itself have been the object of study on numerous occasions. However, a great amount of the discussion concerning topics related to working in the new economy tend to concentrate on technological aspects and business management. Many of the concepts and topics related to the new economy and working in it have grown beyond their original economic and technological context, creating the need for a different and more wider focus.

This congress brought together an international and interdisciplinary group of academics and investigators, both from the public as well as from the private sectors, around the topic "Designing a new work space: sustainability and ethical dimensions", with the aim being that of discussing the state of the art surrounding work in the new economy, and suggesting new directions for both investigation as well as for practice. The congress offered the opportunity to talk in depth the contemporary key topics relating to work in the new economy.

The participants came from countries throughout the world, with participation from most European countries, United States, Japan, Brazil, Mexico and Israel. A total of more than 60 participants represent a broad range of disciplines (economy, philosophy, enterprise management, human resources, etc.), allowing for a wide focus and different perspectives on the themes of the conference. The balance between public sector and private sector representatives was even, creating a rich exchange of views between the two sectors.

The main conclusions from the conference can be summarised as follows:

- Due to the increasing importance of ICT in businesses (virtual teams, networked enterprises, dispersed enterprises....) new forms of understanding and organising the enterprise emerge, which expand the initial concept of eworking towards new forms and possibilities of work organization.
- When looking at the implementation of new forms of working, the need to modify the mental models of people becomes clear, and change management becomes especially relevant in this situation. Research on how to overcome fear of change and change processes were presented as well as possible solutions, as the fear of change is one of the major barriers for the implementation of new forms of work organization.
- With respect to this, human resource management is fundamental, as aspects such as motivation, team management, etc. become of vital importance. The leader of a dispersed team is essential to its success, and needs to create the cohesion and foster the feeling of belonging without the need for face-to-face meetings.

- New forms of work organization will allow organizations to return back to normality (in record time) after natural disasters, strikes and other incidences, as the organization will not lose vital information, and it will allow the employees to work, even though they cannot physically reach the workplace.
- It is necessary to find a balance between the system, structure and culture of the organization on the one hand and the implications of the new forms of working on the other, developing new models for communication, rewarding, work distribution, etc.

Contact & Information

conference secretariat:

Concha Civantos

Fundación para el Desarrollo de la Ciencia y Tecnología en Extremadura (FUNDECYT)

Manuel Fdez Mejías s/n, 2ª planta

06002 Badajoz (Spain)

concha@fundecyt.es

www.fundecyt.es/itf2002

6.3 IST 6th Framework Programme - new challenge for Baltic States - Conference in Riga, Latvia 2-3 April 2003



The "IST 6th Framework Programme - new challenge for Baltic states" workshop was organized by OPEN LATVIA in the framework of the TELEBALT project funded by the Information Society Programme of the European Commission and in co-operation with EDNES, Infobalt and DataMedia Group.

The "IST 6th Framework Programme - new challenge for Baltic states" workshop aimed to strengthen scientific and technological co-operation between the European Union and the pre-accession states, in particular the Baltic countries in the field of IT application to new working environment, tourism applications with an emphasis on the unemployment problem.

The workshop main goal was to increase awareness about the actual 6th Framework Programme, by lesson learnt from the participation of pre-accession states in the IST programme under FP5.

The new Community Framework (FP6) for research and development introduces important shifts in the approach to EU funded research, both in terms of content and instruments. The IST priority in FP6 is an important part of the specific program on "Integrating and strengthening the European Research area".

"IST 6th Framework Programme - new challenge for Baltic states" workshop was organized as an additional event to Baltic IT&T 2003 annual forum. This forum is organized each year and has proven itself as one of the most important IT&T forums in the Baltic Sea Region States.

Contact & Information

www.telebalt.lv

6.4 Workspace03 – International Conference,
“Shaping the Future Workspace - Essential Tools for
the Future”. Venice, 3-4 July 2003.



In the increasingly challenging economic climate organizations are more concerned than ever to reduce costs and increase efficiency. Economic pressures of this kind have in the past led to deteriorating working conditions for many workers. However research and best practice experience suggest that the workplace, both virtual and physical, acts as an enabling tool for business.

In the context of today's knowledge economy the needs of the human individual must be placed at the centre of any future vision of the design and management of the workplace. The rationale for placing this vision within a framework of thinking holistically about business is the belief that human beings are increasingly important assets to businesses in the knowledge economy and that their productivity will be enhanced if treated as humans rather than capital assets.

While concern for the psychological, social and physical welfare of human beings in the workplace should be valued as an end in itself, increased knowledge and understanding of the business benefits of accommodating these issues acts as a powerful lever encouraging organizations to take action.

The two-day conference 'Shaping the Future Workspace; Essential Tools for the Future' explored how these issues can be addressed from the perspectives of users, policymakers and implementers, as well as suppliers and managers of the workplace. The conference was organized by the e-Locus cluster (www.e-locus.fundaciontekniker.com).

The conference brought together existing communities of interest working to improve understanding of user needs in the workplace and provided a springboard for establishing a wider understanding of our shared vision across Europe.

Results

The e-Locus project seeks to strike a balance between drawing new ideas, research and thinking together into a shared vision and acting to disseminate these ideas to the widest possible audience. The conference "Shaping the Future Workspace; Essential Tools for the Future" played an important role in creating a shared vision which could then be disseminated in terms of:

- recommendations and guidelines to employers
- a clear and concise statement identifying existing best practice and future challenges to the research community

Contact & Information

<http://e-locus.fundaciontekniker.com/venezia03>

6.5 Telework 2003 - The 8th International Workshop and Business Conference on Telework, Brazil, August 24-27 2003



The Regional Council of Administration of Sao Paulo (CRA-SP) and the International Telework Foundation (ITF) brought to Brazil in 2003, the 8th International Workshop and Business Conference on Telework, with the theme E-Work and Social-economical Development.

The event took place from August 24 to 27, 2003, in the CRA-SP Head Office.

During the event several topics were discussed, such as social and digital inclusion, e-learning, technological and organizational growth, new work opportunities, telecentres, and especially the future of work in society.

The following objectives were addressed by Telework 2003:

- Discuss the problem of Telework, particularly in the Ibero-American countries.
- Transmit scientific information on the practical application language and exchange experiences lived in the specialized area of the Telework
- Move and stimulate the production of researches and the relation of cases experienced by the old, actual and new generations of professionals, researchers and teachers, about Telework
- Bring together all the professionals that work in the specific, complementary or auxiliary areas of Telework
- Develop the promoters with intelligence and reference centers to the areas that manage the Telework
- Use Telework as a social instrument of the generation of work and income in the society

People involved with Telework in Latin American countries and Europe were invited.

Teachers - Universities, Business Schools, Training Centers, etc.

Researchers - Universities, Training Centers, Economical Development Centers.

Practitioner - Consultants (advisors), Counselors, Mentors, etc.

Official Policy Makers - Regional, National and International Governmental Institutes.

The presentations focused on the following sectors of e-work:

- Telework, Telecenters and Regional Development
- Changes in the way of working in Latin America and the new economy
- E-Learning
- Social Development and the new economy
- E-Government
- E-work Contracts and legal implications
- Telework impact in the work division in Latin America
- Telework practice: Discoveries and statistics
- Telework in the context of social and economical changes
- Telework and the domestic development perspective
- Telework as a tool to decrease social exclusion
- The evolution of the practice of Telework in Latin American organizations
- Telework implementation in the practices of the entrepreneur and the communities

Contact & Information

Alvaro Mello

Regional Council of Administration of Sao Paulo (CRA-SP)

865 Estados Unidos St.

Sao Paulo - S.P.

Phone: +55 11 3082 7066

alvaro@teletrabalho.com

www.crasp.com.br/telework/eng

teleworkcoordenacao@crasp.com.br



6.6 eChallenges e-2003 Conference, 22-24 October 2003, Bologna, Italy

eChallenges e-2003 is the thirteenth in a series of annual conferences, which regularly attract over 500 delegates from commercial, government and research organizations around the world. Focusing on e-business, e-work, e-government, knowledge work, and organizational knowledge, and supporting the eEurope 2005 initiative, the goal of e-2003 is to stimulate rapid take-up in Europe of research and technology development results by industry in general and SMEs in particular, and to help open up the European Research Area (ERA) to the rest of the world.

This conference series is recognised as an important event in the international research calendar, attracting delegates and speakers from around the world. Formerly known as the eBusiness and eWork Conference and supported by the European Commission under the Information Society Technologies programme, the scope of eChallenges has evolved with the transition from Framework Programme Five (FP5) to FP6.

e-2003 is a prestigious international forum to increase awareness of exploitable research results and applications, whether funded privately or at regional, national or European level. Increasingly, it is also being used as a forum for speakers from outside Europe to share their experience, as it provides an excellent networking environment to discuss problems and new ideas, share success stories and lessons learnt, exchange knowledge and experience, and obtain feedback from potential partners and users. This supports the goals of the ERA by increasing return on investment through better exploitation of results and better coordination of research activities.

The 3 day programme brings together an interesting mix of case studies, technical and policy papers and interactive workshops. As well as three plenary sessions, there are parallel streams focused on broadband and mobility, e-business, e-work, e-Europe, e-government, e-learning, , knowledge management, media and entertainment applications, security, smart and virtual organizations and SME related issues. The conference programme will be complemented by an exploitation-focused exhibition.

Conference topics

e-2003 will provide a forum to highlight the achievements of FP5 as well as ICT related Regional and National initiatives, and look forward to the future by focusing on the thematic priorities under FP6. The creation of the ERA (an internal market for science and technology) will also be discussed, as this is a key political goal of FP6.

The programme will combine strategic keynote presentations with case studies and technical, legal and policy papers in specific thematic areas. The exhibition will feature live technology demonstrations and posters outlining potential industrial benefits of national, regional and European funded project results.

The core thematic priorities for e-2003 are:

- e-business - e-government - organizational knowledge	- e-work and knowledge work - e-Europe 2005
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Related themes include but are not restricted to:

- Broadband and mobility - Interoperability and standardisation - Digital Ecosystems for SMEs - e-learning	- GRID applications, solving complex problems - Multimodal and collaborative work environments - Trust & Confidence - Smart & virtual organizations: regulation; technology
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Contact & Information

Conference Secretariat

Mireille Edin

ADERA Service

BP 196 - 33608 Pessac Cedex - France

Phone 33 (0) 556 15 11 99

Fax 33 (0) 556 15 11 60

e2003@adera.fr

www.eChallenges.org

ANNEX 1 : EUROPEAN WORK RELATED AWARDS

eAWARDS 2002

The European e-Awards (formerly the European Telework awards) were launched in 1997, and are the vehicle for highlighting better practice in a variety of areas relating to the information economy. Since 1997, about 200 examples from industry and administrations around Europe have been submitted as candidates and the awards are acknowledged to bring significant benefits to the participants. For the first time the awards were integrated into the eWork in Europe Conference held in Paris 25-27 September 2002, with the award ceremony being held on the afternoon of the last day (September 27th). The awards were supported by the Beep project, Best e-Europe practice.

Award Categories

(a) Work and Skills

This category was for organizations, projects and programmes, commercial and public, where the use of modern information and communication technologies (ICT) had contributed to the achievement of one or more of the following objectives.

- Improving skills and competences: addressing the higher-level cognitive and social skills needed for effective participation in decentralised, self-managed, knowledge-based work; creating continuous and flexible learning opportunities to enable employees to upgrade their skills over their entire working life as new technologies emerge and as their tasks change.
- Improving work structure and process: facilitating or enhancing work throughput (e.g. by supporting distributed "virtual" teams or augmenting the capabilities of co-located teams); improving decision-making approaches (e.g. via group decision support systems); making business processes more efficient (e.g. via workflow technologies); helping work groups capture and use what their community of practice has learned (e.g. via knowledge management systems).
- Improving quality of working life: increasing employees' engagement in and responsibility for their tasks; enabling more flexible approaches to working times and places.

(b) The Digital SME

Competing in this category were Small or Medium Enterprises (SME) which demonstrated a significant performance improvement in one or more of the following areas thanks to the use of modern ICT, as well as projects or programmes aimed at supporting SMEs "go digital" in these areas.

- Business networks, i.e. supply chains (exchange of information and management of relations, e-procurement); customer networks (CRM, integration of front-end marketing and back-end processes); collaborative networks (knowledge management, sharing and creation between peer members).
- Innovation, in organization (knowledge codification, information communication, decision making, ways of working); in processes (improving relations with customers, integrating processes with those of partners in the supply chain or in the collaborative network); in existing products or services with the help of digital technologies, or in new, digital, products or services.
- Resources, such as knowledge; human resources and skills; financial resources (e-sales, e-trade, e-banking, e-investments).
- Market position, as measured by classical indicators such as: market share and turnover, local and/or global; new market development.

(c) Social Inclusion

Candidates in this category were projects, programmes, and in general any type of initiative supporting and promoting the use of ICT to contribute to one or more of the following objectives aimed at narrowing the digital divide, whether between countries and regions, or between demographic groups.

- Facilitate access to ICT including: access to the infrastructure (the computers and the networks connecting them); access to the skills (required to operate the computers); reduction of access costs; design of appropriate interfaces for human-computer interaction (particularly for people with special needs such as the disabled or the elderly).
- Adapt education to the requirements of the knowledge society: improve and increase the availability of digital educational material; improve the digital literacy of teachers; evaluate new methods and processes of teaching and learning; improve ICT continuous training.
- Use ICT with the purpose to help vulnerable groups (young people, old people, unemployed people, women, low-income families, people with disabilities, minority ethnic groups).
- Raise awareness and inform policy-making bodies about e-inclusion issues.

(d) Regional Cohesion

Candidates in this category were projects, programmes, and in general any type of initiative supporting and promoting the use of ICT to help achieving one or more of the following objectives of welfare and wealth at a local or regional scale involving regional/local actors.

- Regional economic development: creating the conditions for long-term economic development, an increase in regional jobs and income, and an increase in the number and success of enterprises; upgrading regional competitiveness, innovation and diversity, the quality of the labour force and the quality of the physical and ICT infrastructures at the local/regional level.
- Regional environmental sustainability: this involves both natural and man-made environments, including physical planning, lack of pollution, congestion, etc.
- Regional social cohesion: maintenance and development of the social, community and cultural cohesion and values of the region.

eAwards nominations and winners

(a) Cat 1 Work and skills

Title	Website
Kalido (UK) Shell UK Exploration and Production (EXPRO) deployment of Kalido Dynamic Information Warehouse	www.kalido.com www.shell.co.uk
Solvision (Netherlands) founded in 1996 by three men with a common objective: to create a company where people enjoy working. Time has proven them successful, because six years later more than 500 people are working in the networked organization The Vision Web that emerged from Solvison	WINNER www.solvision.com www.thevisionweb.net
Siemens (Germany) This case shows how a large multinational went through a bottom up organizational change to become a knowledge-based company.	www.siemens.de

(b) Cat 2 Digital SMEs

Title	Website
Bennewitz (Germany) Traditional handicraft adopts B2C e-commerce to penetrate new markets	www.bennewitz.com/
eXtrapola.com (Italy) online media monitoring and clipping	www.extrapola.com/
Koncraft (Germany) virtuelle Schreinererei Konrath-Manufakturen Five ecologically oriented joineries cooperate within a "virtual joinery" to better serve customers by capitalising on network synergies and competences	WINNER www.koncraft.de

(c) Cat 3 Inclusion

Title	Website
Jobability (UK) is a new initiative, which aims to extend the effectiveness of Workability by providing new opportunities through ICT to disabled people in the United Kingdom searching for employment.	WINNER www.jobability.com
Cyberhandiwork (France) A project to enable individuals excluded from the work market by virtue of chronic illness, handicap or other invalidities, to rejoin the workforce.	www.cyberhandiwork.com/
Syslab (Norway) A new and unique way of transferring people and competence from one situation to another, i.e. from unemployment or redundancy to permanent jobs, and/or from one job to another during restructuring processes.	www.syslab.org/
Telework Feasibility (Netherlands) A real training course for aspiring teleworkers and it has the goal to teach how to evaluate the possibilities, the feasibility of changing our current job in a teleworking job without the need of changing position or company.	www.teleworkwhere.com

(d) Cat 4 Regional Development

Title	Website
Dschola (Italy) regional collaborative network of Piedmont schools.	www.dschola.it
Wired more (UK) initiated to empower the citizens of our rural community to access government using Information and Communications Technology. IT for the Terrified (IT4TT) equips citizens with the necessary IT skills. Wired Wedmore provides a developing, locally oriented, portal to government and local information which citizens need IT skills to access.	WINNER www.itfortheterrified.co.uk www.wiredwedmore.co.uk
A Ponte (Spain) was focused on introducing ICT (new technologies) in rural areas. The overall approach was to analyse the advantages of using it in secondary schools. Rural areas have some demographic, economic and socio-cultural particularities. These zones are usually isolated, have a low teacher-pupil ratio, and it is difficult to access cultural resources and events from them.	www.aponte.org/index.html

The overall favourite of the audience was Wired Wedmore.

The Jury's discretionary award was given to *Peter Johnston* of the European Commission for his outstanding contribution to the development of Telework in Europe.



Ian Culpin of Martech International announced in his closing remarks at the end of the eAwards ceremony, that after 8 years e-Week would no longer continue, remarking that it had served the eWork community well but needed to move on as well. He added that he hoped the eAwards would be able to continue highlighting best practice for the community. Peter Johnston and the participants at the conference supported this idea.

The etw website (www.etw.org) continues to exist and is evolving to reflect changes in the work and social environments, with a particular emphasis on good practice and broader socio-economic issues. The site will continue to carry news about events and activities related to new ways of working. We are looking at ways of cooperating with the European Commission, Industry, and other organizations to promote new working methods and would welcome suggestions for future activities.

Ian Culpin (iculpin@etw.org)

Martech International S.A.



Winners for Lifelong Learning, Diversity and Gender Equality and the 2003 list of 100 Best Workplaces in the European Union

The European Commission announced three Special Awards for excellence in the fields of Diversity, Gender Equality and Lifelong Learning and the 2003 list of 100 Best Workplaces in the European Union.

The awards were presented by Anna Diamantopoulou, European Commissioner for Employment and Social Affairs at a Conference and Awards Ceremony on 27 March 2003 in Brussels.

The workplaces are honoured for the quality of their workplace environments, as determined by a survey process analysing both corporate policies and employee judgements on their own organizations.

The honoured organizations have been selected from among the more than 1,000 participating organizations, including private and public companies, government agencies and NGOs. A total of approximately 210,000 employees in all 15 member states participated in the survey process. Of these, 124,196 employees completed questionnaires.

A Jury, selected by the Commission, picked the three Award winners among 11 short-listed companies. The Jury was chaired by Pehr Gyllenhammar, Chairman of Aviva, former executive chairman of Volvo and founder of the European Round Table of Industrialists.

Special Award Winners

The Jury chaired by Mr. Pehr Gyllenhammar selected the three Award winners from among the short-lists of nominees (listed alphabetically):

- Lifelong Learning: Botkyrkabyggen (Sweden), Hannes Snellman (Finland), Intenor (UK), Volvo Cars (Belgium).
- Diversity: Ford-Werke (Germany), Grundfos (Denmark), Intel (Ireland).
- Gender Equality: Eli Lilly (Belgium), Esy (Finland), Sara Lee/DE (Netherlands), Schenck (Germany).

The winners were:

- EU lifelong learning at the workplace award 2003: Hannes Snellman (Finland)
- EU diversity at the workplace award 2003: Intel (Ireland)
- EU gender equality at the workplace award 2003: Schenck (Germany).

100 Best Workplaces in the EU 2003 List

The first-ever list of 100 Best Workplaces in the EU, announced by the European Commission on 27 March 2003 is below. All 100 workplaces are recognised for their effort to create a high-quality working environment. The organizations are listed in alphabetical order. The Top 10 highest scoring organizations are marked in bold.

Accenture, Portugal	Ford-Werke, Germany	Novabank, Greece
Admiral Insurance Services, UK	Fresh, Sweden	Novartis, Finland & Italy
American Express, Italy	General Electric Plastics, Spain	Nova Nordisk Engineering, Denmark
Arthur O. Little, UK	Getzner Werkstoffe, Austria	Patagonia, France
Anup Consulting Engineers, Ireland	Goblet Lavandier & Associés, Luxembourg	Pentascopie, Netherlands
Asda, UK	Hannes Snellman, Finland	Pfizer, Denmark
Atronic International, Austria	Hexel, Germany	Piraeus Direct Services, Greece
AUBI Baubeschläge, Germany	Hilton, Ireland	Procter & Gamble Market Development, Germany
Bacardi-Martini, UK	IKEA, Austria	SAP Hellas, Greece
Bain & Company, France, Germany & UK	Infervention, Sweden	SEA6, Sweden
Bank of Ireland Retail Operations, Ireland	Intel, Ireland	rdäm, Germany
Banverket Telenät, Sweden	Imma, Denmark	SICK, Germany
Boehringer Ingelheim Denmark, Denmark	Janssen-Cilag, Greece	Skytec, Germany
Bristol-Myers Squibb, Portugal	JCOceano, Finland	SSoft, Germany
BUPA, Ireland	Johnson & Johnson, Italy	Soft Imaging System, Germany
Caixa Popular - Caixa Rural, Spain	Johnson Wax, Italy	Tapiolanryhmä, Finland
Caja Madrid, Spain	Kanal 5, Sweden	Technia, Sweden
Cisco Systems, France & Italy	Kingston Technology, UK	Tekes, Finland
Cloetta Fazer, Finland	Kraft Foods Hellas, Greece	Timpson, UK
ComMedia, Germany	Leo Animal Health, Denmark	Titan Cement, Greece
Danone, Spain	Lilly, Spain	Trelleborg Navex, Spain
Dansk Shell, Denmark	M&NA Ireland	Trodar, Austria
Datacon, Austria	McDonald's Denmark, Denmark	Unilog, France
Deichmann, Austria	Merck Sharp & Dohme, Denmark	Unimenco, Denmark
DHL, Portugal	Mercuri International, Finland	Vasakronan, Sweden
Diageo, Italy	Microsoft, Belgium, France, Germany & Ireland	Viking Direkt, Austria, Germany & Netherlands
DLA, UK	Middelfart Sparekasse, Denmark	Vorarlberger Kinderdorf, Austria
Electric Paper, Ireland	The Mill Gandon Logistics, Ireland	VX Company, Netherlands
Essy, Finland	Münchener Rück, Germany	Wallenstam, Sweden
FedEx, Italy	Nationwide, UK	Weberst Zentrale, Germany
Ferrari Maserati Group, Italy	Nice-business Solutions, Finland	What If, UK
Filestores, Ireland		Wiener Hilfswerk, Austria
Fishburn Hedges, UK		Winterheller Software, Austria
Flight Centre, UK		Woon en Zorg Heilig Hart, Belgium
		Wragge & Co, UK

Contact & Information

Great Place to Work © Europe Consortium
Oxford Research A/S
Amagertorv 19, 3rd floor
DK-1160 Copenhagen K
Denmark
Telephone: +45 33 69 13 69
Fax: +45 33 69 13 33
questions@eu100best.org
www.eu100best.org/

European Commission, DG Employment and Social Affairs
Dominique Bé
Dominique.Be@cec.eu.int

ANNEX 2 : EUROPEAN PROJECTS (IN ALPHABETICAL ORDER)

AUDIOTAIN	Empowering audio content providers through e-work and Interactivity management to exploit audio knowledge bases in the market for Interactive audio entertainment	IST-2000-29302
AUDIOTAIN enables audio content providers to exploit audio knowledge bases in order to effectively create interactive audio entertainment services for distribution across all digital media platforms. This led to new intra- and inter-organizational processes and, in particular, to new methods and models of e-work and e-commerce in the respective organizations employing the Audiotain technology and beyond. The technology development resulted in an end-to-end knowledge management solution consisting of: an Audio Interactivity System, an Audio Back-end Integration Tool, and new interaction models. This end-to-end-knowledge management solution was validated and demonstrated in three different next generation interactive audio applications in: interactive news and current affairs infotainment, interactive music entertainment, and interactive culture edutainment. <u>Project period</u> : September 2001 – August 2003 (24 months)		
<i>Contact</i>	<i>Rundfunk Berlin Brandenburg Hörfunk-Sendeleitung Masurenallee 8/14 D - 14057 Berlin</i>	<i>Reiner Raestrup Tel.: +49 30 3031 3227 Fax: +49 30 3031 3228 reiner.raestrup@rbb-online.de www.audiotain.com</i>

A/VPACK	Adoption and Enhancement of open frameworks for converged Audio/Video/TV provision for the home user	IST-2001-34447
A/VPack Trial project aims at the adoption and acquisition of technology and expertise in open standards and frameworks for delivery and management of voice and video based services to the end-user. The project first, will adopt and enhance an emerging Video delivery architecture and content handling framework proposed by the DVB forum (MHP) and will combine it with the emerging TASTE framework for time-shifted TV and second, the prevailing Packet Voice protocol (H.323 Voice over IP and Call Handler). The developments will be integrated in an existing system (based on Linux) and evaluated in a rich testbed. The target is to formulate a fully converged Audio/Video delivery platform for residential entertainment. The main proposer business sector is the offering of multifunctional gateway systems. <u>Project period</u> : September 2002 – February 2004 (18 months)		
<i>Contact</i>	<i>OTE - Consulting, Funded Programe Dept. 32 Kifisias ave. (Atrina Center B1) GR - 15125 Marousi</i>	<i>Vasilios Dermosoniadis Tel.: +30 10 687 9778 Fax: +30 10 684 8573 dermosoniadis@oteconsult.gr</i>

BALTPORTS-IT	Simulation and IT-Solutions: Applications In the Baltic Ports' Areas of the Newly Associated States	IST-2001-33030
The first steps are directed to establish the necessary organizational infrastructure, for enabling the successful knowledge transfer to the Partners of the Baltic Sea Sub-Region: development of business models of maritime companies, establishing of a "competence centre" for joint collaboration of companies, institutes, public and industrial organizations and researchers. The overall methodology used to achieve the objectives consists of: Simulation methodology for modelling of port logistics processes; Web-based and HLA-based technologies for studying harbour processes and combining different simulation and information systems located in different port areas of the Baltic Sea; LIS Technology and Formal Methods for Maritime Information Systems Design; Non-monetary Evaluation Methodology for Ports. <u>Project period</u> : August 2001 - July 2003 (24 months)		
Contact	<i>Fraunhofer institut fur Fabrikbetrieb.</i> <i>Sandtorstrasse 22</i> <i>D - 39106 Magdeburg</i>	<i>Eberhard Bluemel</i> <i>Tel.: +49 391 409 0110</i> <i>Fax: +49 391 409 0445</i> <i>bluemel@iff.fhg.de</i> <i>www.baltports-it.be</i>

BANCA	Biometric Access Control for Networked and e-Commerce Applications	IST-1999-11159
The project develops and implements a complete secured system with enhanced identification, authentication and access control schemes for Internet applications such as e-working and Web-banking services. One of the major innovations is to obtain an enhanced security system by combining classical security protocols with robust multimodal verification schemes based on speech and image. Specific objectives are: the development of scalable and robust multimodal verification algorithms; the development of scalable classifier combination techniques (fusion); the design and implementation of an overall secure architecture including security protocols adapted to biometrics; and the development of three demonstrators. In the first phase, real condition databases for image and speech have been collected using pre-defined hardware to form a common and meaningful basis for algorithm evaluation and refinement. Detailed specifications ensure compatibility and usability of the acquired data. This database is used to evaluate biometric technologies suitable to user needs for the envisaged applications. Concurrently, a pilot demonstrator was developed based on background technology for verification and on state-of-the-art technology for network security protocols (coming from the European projects M2VTS and OKAPI). In the third phase of the project, three demonstrators for e-working, web-banking and biometrics automatic teller machines were built and tested at developer sites. Final field tests were conducted for all three applications by providers and end-users. <u>Project period</u> : June 2000 - January 2003 (32 months)		
Contact	<i>IBERMÁTICA S.A.</i> <i>Avenida del Partenón, 16/18</i> <i>E - 28042 Madrid</i>	<i>Dolores García-Plaza</i> <i>Tel.: +34 91 384 9100</i> <i>Fax: +34 91 384 9144</i> <i>d.garcia-plaza@ibermatica.com</i> <i>www.ibermatica.com</i>

BEATRICE-SME	Best Enterprise practice using Advanced Technologies In Recycling Industries for e-Commerce and E-business In Small and Medium-sized Enterprises	IST-2001-35054
The overall objective of BEATRICE-SME is to explore and introduce new forms of smart organization of work of SMEs in the recycling domain and identify and implement appropriate advanced IST solutions to support such new forms of organizations, aiming at optimal achievement for both economic and ecological goals of the recycling chains. The application of the common methodology enables both users and catalysts to exchange experience on the best for new forms of collaboration. The methodology will also enable SMEs to increase their capability to initiate and realise innovative, smart forms of co-operation with other partners in the long-term. Five different business cases address 5 different forms of collaboration among the SMEs in recycling area. The solutions identified for these business cases are likely to be highly replicable primarily within the recycling sector, but also within a numerous SMEs in other sectors. <u>Project period</u> : April 2002 - September 2003 (18 months)		
Contact	<i>Przemyslawy Instytut Automatyki i Pomiarow Al.Jerozolimska 202 POL - 02 486 Warszawa</i>	<i>Cezary Lichodziejewski Tel.: +48 22 863 8233 Fax: +48 22 874 0204 celich@zsi.piap.waw.pl</i>

BEEP	Best eEurope Practices	IST-2000-26224
The BEEP project is concerned with analysing and exploring socio-economic best practice in four main domains of the eEurope initiative: employment and skills, digital SME, social inclusion and regional cohesion, and in the important cross themes between them. Extant data sources from both Commission-supported and other high quality initiatives are used, most of which were not widely used and few are interlinked, though there is a great need for understanding and exploiting available knowledge at a European level. BEEP also updates this best practice knowledge in line with on-going developments, especially by closely supporting RTD projects and taking up their results. Data is analysed qualitatively and quantitatively to draw out socio-economic best practice and provide benchmarking standards. Results are widely disseminated in the programme and produce three fully developed services: socio-economic best practice, benchmarking, and linked knowledge databases. These services comprise a comprehensive set of tools available interactively on a user-friendly web-site which organizations and individuals will be able to easily exploit. In July 2002, nine additional partners from N.A.S countries joined the project. The new N.A.S partners have enriched the knowledge base with additional cases across the four domains and have organized various dissemination events. <u>Project period</u> : January 2001 - July 2003 (31 months)		
Contact	<i>Danish Technological Institute Teknologiparken, Kongsvang Allé 29 DK - 8000 Aarhus</i>	<i>Jeremy Millard Tel. : +45 72 20 14 17 Fax: +45 72 20 14 14 jeremy.millard@teknologisk.dk www.beep-eu.org</i>

CAPERS	Computer Aided Post for Eastern States	IST-1999-20733
CAPERS transfers and deploys best practices and supporting technologies to enable pre-accession countries to operate postal services to the required European standards. The main partners, PostEurop and IPC, are non-profit making organizations established by national postal operators for the exclusive purpose of supporting and adding value to international postal operations. These partners transfer best business practices developed by the western Posts, under the auspices of IPC, to the eastern Posts whose formal representative is PostEurop. The detailed requirements' definition phase identify how the functionality of new track and trace systems will be allocated in each of the User countries. Each participant analyses which specific functions are already performed today and how, and identifies the sources of information that must be provided to the new system. The planning step translates the analysis results into definitions and acquisitions; defines interfaces to the track and trace system and technology aspects for required data capture. New local operational procedures and supporting material are defined and developed. Implementation takes the system to readiness for live operation. Project experiences including development business practices are documented and packaged to support dissemination to further countries. <u>Project period</u> : January 2001 - June 2002 (18 months)		
<i>Contact</i>	Association of European Public Postal Operators Rue de la Fusée, 100 B - 1130 Brussels	Marc Pouw Tel : +32 2 724 72 82 Fax: +32 2 726 30 08 marcpouw@posteurop.org www.posteurop.org/

COCONET	Context Aware Collaborative Environments for Next Generation Business Networks	IST-2001-37460
The COCONET project deals with the long-term context of human work and collaboration in ambient intelligent environments. In particular it focuses on exploring a new type of collaboration environment that is person-centred through the use of context-awareness, knowledge support, and personalisation services, yet at the same time being seamlessly embedded in business processes of networked enterprises. The context under consideration includes multiple dimensions such as: languages, locations, time scales, cultural backgrounds, personal domains, tasks and administrative work procedures. COCONET is preparing: - A strategy and roadmap for RTD of high industrial impact in the domain of context aware collaborative environments for next generation business networks - A research agenda for 5-10 years, including the organizational, user and policy environment - Possible innovative applications and business implementation paths with potential industrial stakeholders The key players in business and research, bring together their experience and expertise, in developing the research agenda and building the constituency. <u>Project period</u>: July 2002 to June 2003 (12 months)		
<i>Contact</i>	Telematica Instituut Drienerlolaan 5 NL 7500AN Enschede	Hans Schaffers Tel: 31.53.4850418 Fax: 31.534850400 schaffers@telin.nl

DEESD	Digital Europe : e-business and sustainable development	IST-2000-28606
DEESD aims to identify the crucial role that e-commerce and e-work can play in creating an information society that is more user-friendly, socially inclusive and environmentally sustainable. The project builds a convincing "business case" for the contribution that can be made by e-commerce and e-work to sustainable development, including a policy framework for "sustainable electronic markets" and makes further recommendations to the EC, EU member states, local authorities, businesses and NGOs. The specific objectives of the project are: to quantify the potential contribution of e-business to dematerialization, resource productivity and transport efficiency, to investigate the relationship between e-business and corporate social responsibility, to assess the impact of e-business on sustainable regional development. The consortium provides an overview of the latest thinking and research about e-business and sustainable development from around the world. The primary research phase of the project includes in-depth interviews with senior managers in companies, desk-based research and policy analysis, and an in-depth survey of corporate attitudes, results and policies relating to e-business and sustainable development. Case studies are a central component of the research. <u>Project period</u> : July 2001 - July 2003 (25 months)		
<i>Contact</i>	<i>Forum for the Future Overseas House 19-23 Ironmonger Row UK - EC1V 3QN London</i>	<i>Vidhya Alakeson Tel. : +44 207 324 3611 Fax: +44 207 324 3635 valakeson@forumforthefuture.org.uk www.digital-eu.org</i>

DRAGON	Development of an Interactive engineering portal for open networks	IST-2000-29366
The DRAGON project aims at the development of an Engineering Portal in order to innovatively support collaboration between dislocated business partners who have a common engineering task. Collaborations in this sense span from short term, project oriented co-operations to long term co-operations, such as joint ventures. The first hurdle to take is to find adequate collaboration partners which meet the established requirements. Then a collaboration has to be agreed upon. After that, so-called <i>virtual teams</i> are typically established across the companies' borders who do the engineering and administrative tasks. This scenario is particularly relevant to European companies as the globalisation of producer and consumer markets is rapidly advancing. <u>Project period</u> : August 2001 - August 2004 (37 months)		
<i>Contact</i>	<i>Institut fuer Rechneranwendung in Planung und Konstruktion Universitaet Karlsruhe Kaiserstrasse 12 D 76128 Karlsruhe</i>	<i>Ralf Stefan Lossack Tel.: +49 721 608 3374 Fax: + 49 721 661 138 gr@rpk.mach.uni-karlsruhe.de www.dragon.uni-karlsruhe.de</i>

DUNES	Dialogic and argumentative negotiation educational software	IST-2001-34153
In tomorrow's learning and working environments, people will be increasingly involved in tasks within multidisciplinary, multicultural and physically distributed teams. The participation to such tasks puts heavy demands on the individual for which he/she is not usually prepared. Informal reasoning (cognitive) skills and social skills of collaboration are not duly exploited, as practices, from school to university, very poorly address their acquisition. The DUNES project will result in a methodology and software tools to enable collaborative learning and the acquisition of "soft skills" through Internet-mediated discussion, argumentation and social interaction. The project will involve broad implementation, testing and validation in a "large-scale experiment" to be carried out by many players in formal and informal learning environments and in workplaces throughout Europe. <u>Project period</u> : March 2002 - August 2004 (30 months)		
Contact	<i>The Hebrew University of Jerusalem Mt. Scopus ISRL - 91905 Jerusalem</i>	<i>Baruch Schwarz Tel.: +972 2 588 1064 Fax: +972 2 588 2045 msschwar@mscc.huji.ac.il www.dunes.gr</i>

E3 WORK	eWork In Eastern Europe	IST-2001-33536
The E3WORK project aims to promote the use of e-work and best practices of e-work in five New Associated States: Hungary, Latvia, Lithuania, Poland and Romania helping them to fill the gap in this area of the Information Society. The project will create and develop local competences to further implement new methods of work in those countries. Local e-work projects were launched in each country, training of trainers organized, and pilot teams of e-workers hosted by industry, set up and monitored to formalise specific rules and overcome local obstacles, in relation to industry, law, local authorities and unions. The project's virtual community on the web is for the 5 countries members of the consortium a reference depository for the dissemination of information on e-work related topics, for complementary training by e-learning, and for awareness of the EU RTD Programmes. In each of the five countries, E3WORK organizes training and dissemination events, local surveys, and identifies the specific issues to be reviewed. <u>Project period</u> : October 2001 - September 2003 (24 months)		
Contact	<i>Distance Expert 17 rue de Chevières - BP 50434 F - 60617 La Croix Saint Ouen Cedex</i>	<i>Nicole Turbé-Suetens Mobile : +33 6 82 18 39 66 Fax: +33 3 44 91 14 93 europe@distance-expert.com www.mayeticvillage.com/e3work</i>

E-COGNOS		Methodology, tools and architectures for electronic consistent knowledge management across projects and between enterprises in the construction domain.	IST-2000-28671
The e-COGNOS project aims at specifying and developing an open model-based infrastructure and a set of tools that promote consistent knowledge management within collaborative construction environments. The work relies on a deep understanding of knowledge management activities of European construction companies. The analysis of the semantics within and across documents led to the development of ontologies and adaptive mechanisms that can organize documents according to their contents and interdependencies. The web-based infrastructure includes services allowing to create, capture, index, retrieve and disseminate knowledge. It also favours the integration of proprietary tools. The e-COGNOS approach was tested and evaluated through a series of field trials. This was followed by the delivery of business recommendations regarding the deployment of e-COGNOS in the construction sector. <u>Project period</u> : July 2001 – June 2003 (24 months)			
Contact	<i>DERBI</i> 18 Boulevard de la Bastille F - 75012 Paris		<i>François Giraud-Carrier</i> Tel.: +33 1 44 87 86 67 Fax: +33 1 44 87 88 22 giraud-carrier@derbi.fr www.e-cognos.org

E-GAP		e-Society Gap Assessment Project	IST-2001-35179
Surveys confirm that e-work is taking place on a significant scale in Europe, starting to induce a direct impact on employment practices and an indirect effect on the economy in a number of regions. Meanwhile, people observe discrepancies about the penetration of e-work between companies according to their size. The results are significantly lower among SMEs. Another criterion is the political support in the country. With a strong will to contribute to a better use of e-work at the levels of work people and policies framers, the E-GAP Project wants to identify, understand and highlight the hidden inhibitors to e-work, and give arguments and tools to bring flexibility into Community legislation taking into account regional contexts. <u>Project period</u> : July 2002 – July 2004 (24 months)			
Contact	<i>Futuribles</i> Rue de Varenne, 55 F - 75341 Paris 07		<i>Hughes De Jouvenel</i> Tel.: +33 1 53 63 37 71 Fax: +33 1 42 22 65 54 management@futuribles.com

E-LIVING	Life In a Digital Europe	IST-2000-25400
Through the use of a coordinated set of pan-European longitudinal household panel surveys this project describes, explains, models and forecasts the changing patterns of uptake and usage of Information Society Technologies (ISTs) across Europe. By collecting at least 2 waves of data on the everyday time-use, social and economic capital, quality of life and IST usage behaviour of the same individuals over time the project examines the causal relationships between changes in IST usage and any subsequent changes in individual's life-styles and life experiences. The knowledge thus generated is of significant interest to policy and strategic decision makers in both the public and commercial sectors and is widely disseminated to encourage exploitation by placing its analytic reports and integrated data sets into the public domain as a resource for current and future RTD projects. <u>Project period</u> : January 2001 - December 2003 (36 months)		
<i>Contact</i>	<i>British Telecommunications plc Martlesham, Adastral Park UK - IP5 3RE Ipswich</i>	<i>Diana Holm Tel.: +44 1473 642 511 Fax: +44 1473 648 600 di.holm@bt.com www.eurescom.de/e-living</i>

FUTURE- WORKSPACES	A Strategic Roadmap for Defining Distributed Engineering Workspaces of the Future	IST-2001-34346
Future-WorkSpaces brings key European researchers and industrialists together to define the 2010 vision of Collaborative Engineering Workspaces of the Future. Through consultation with expert and series of workshops, it reaches consensus regarding business demands, human factors issues and technological challenges involved in implementing the vision. The resulting roadmap for future development defines (a) where we want to go (vision of the workspaces of the future) and (b) how we want to get there (prioritised key challenges over 2 year, 5 year and 10 year period). The focus for the roadmap is the aerospace, automotive and construction industries and Future-WorkSpaces defines an indicative list of research projects required to satisfy the needs of these sectors. <u>Project period</u> : July 2002 - July 2003 (12 months)		
<i>Contact</i>	<i>University of Salford Business House, University Road UK - M5 4WT Salford</i>	<i>Terrence Fernando Tel.: +44 161 295 2914 Fax: +44 161 295 2925 t.fernando@salford.ac.uk www.avprc.ac.uk/fws</i>

GEM-EUROPE	Global Education In Manufacturing – Europe	IST-2001-32050
The GEM-EUROPE project aims at defining and understanding the needs of the manufacturing industry for training and education in manufacturing strategy on a global basis to comply with the concept of digital business and extended products. Specifications for a curriculum in manufacturing strategy at Masters level will be developed. GEM-EUROPE will cover digital business along the supply chain, development of extended products and end of life planning and operation. It will have a modular structure allowing both training courses in industry and a full Master degree from a university. The curriculum will be designed to comply with industry's needs. To obtain this, surveys will be conducted in selected industries and best practices will be studied. This activity is carried out in parallel in different GEM projects in several IMS regions (eg. Europe, USA, Japan, Canada and Australia). Training and education will have to be delivered in a way compatible with peoples work situation, i.e. it will have to be off-campus rather than on-campus based. This calls for new pedagogic approaches and new ways of delivery of training and education. The delivery will use ICT tools over the internet. The training will be based on application of multimedia. A demonstration to validate the pedagogic approach will be run with a course in project planning. The curriculum will be validated by a demonstrator and at workshops with industrial participation. It will be published on web and documented in a booklet. <u>Project period</u> : February 2002 - August 2004 (30 months)		
Contact	<i>SINTEF Industrial Management</i> <i>S.P. Andersens vei 5</i> <i>NO - 7465 Trondheim</i>	<i>Asbjorn Rolstadas</i> <i>Tel.: +47 73 593 785</i> <i>Fax: +47 73 597 117</i> <i>arolst@ipk.ntnu.no</i> <i>www.sintef.no/gem</i>

GEM-NAS	Global Education In Manufacturing – Europe	IST-2001-30178
GEM-NAS, with partners in Norway, Portugal, Ireland, Germany, Switzerland, Bulgaria, Poland, Estonia, Hungary, Romania, Lithuania and Slovenia, will in cooperation with industry define the needs for education and training of engineers to meet the challenges of e-work, digital business, ecommerce, extended products etc. A new curriculum for manufacturing strategy based on ICT tools, modern pedagogic and delivery mechanisms will be developed. The curriculum will contain 7 main modules. GEM-NAS will in co-operation with GEM-EUROPE develop 3 modules - Development of extended products, Digital business along the supply chain and End of life planning and operation. The other 4 modules will be developed by GEM projects in Japan, USA and Australia. <u>Project period</u> : July 2002 - August 2004 (25 months)		
Contact	<i>SINTEF Industrial Management</i> <i>S.P. Andersens vei 5</i> <i>NO - 7465 Trondheim</i>	<i>Asbjorn Rolstadas</i> <i>Tel.: +47 73 593 785</i> <i>Fax: +47 73 597 117</i> <i>arolst@ipk.ntnu.no</i>

HUMANTEC	Design for Humanization of Technologies	IST-2000-31046
The Humantec project makes a contribution to the comfort and humanity of the workplace in the global information society in terms of safety, ergonomics, environmental sustainability and to the overall quality of work and the working life. The project is a thematic network which involves universities, design centers, producers of technology and furniture manufacturers in a continual dialogue and exchange in order to obtain a panorama of possible scenarios for humanizing workplace technologies. A series of different initiatives and activities for the dissemination of the project's results and objectives were planned, so as to reach those designers and manufacturers who share the project's principles of sustainable design, and to involve the SME's of the office furnishings industry in such a way as to verify the concrete feasibility of designs for a sustainable workplace. <u>Project period</u> : October 2001 - April 2003 (18 months)		
Contact	CLAC - Centro Legno Arredo Cantù Piazza Garibaldi, 5 IT - 22063 Cantù (CO)	Andrea Cancellato Tel.: +39 031 713 114 Fax: +39 031 713 118 clac00@cracantu.it www.humantec.it

ICCI	Innovation co-ordination, transfer and deployment through networked co-operation in the Construction Industry	IST-2001-33022
The overall aim of ICCI is to enhance the co-ordination of research and developments in IST projects targeting the Construction sector, the promotion of the selected projects results, and a concerted support for the future implementation and deployment of new technologies in the building and construction industrial context. The objectives are to: synthesise industrial requirements, to publish ICT state-of-the-art in the fields of technical advances and commercial offerings, to synthesise information for the integration of human, organizational and technical elements, and to provide best practice guides, to assess the latest developments in the area of legal and contractual support for the use of ICT in construction, to deliver effective dissemination channels, and to provide guidance on future requirements, strategy and implementation plans for IT in Construction. <u>Project period</u> : September 2001 - December 2003 (28 months)		
Contact	Centre Scientifique et Technique du Batiment BP 209, Routes des Lucioles F - 06904 Sophia Antipolis Cedex	Alain Zarli Tel.: +33 4 93 95 67 36 Fax: +33 4 93 95 67 33 alainzarli@cstb.fr http://cic.vtt.fi

IDIA	Inclusive Design and Intelligent Technology for Accessible Workplace	IST-2001-33205
In the knowledge-based economy the workplace is anywhere: regardless of the individual location where intellectual work is underway. By including ICT on the premises one can describe the workplace as an 'intelligent' workplace. The IDIA Network aims at integrating the potential of the intelligent workplace with the principle of Design for All, and thus develop a new concept for workplace design -moving the current mindset away from the 'individual' thinking, that tends to alter basic designs, towards including from the outset the maximum number of naturally diverse human beings in the design and planning process. The IDIA Network establishes a multidisciplinary project team, coordinated by the IDIA Scientific Committee that carries out interdisciplinary analysis and studies for identifying user needs for the design of an accessible workplace, assessment of current and future technologies, and derive a collection of reference scenarios. The IDIA Network produces a number of exploitable results: guidelines and prospective scenarios related to the uptake of a Europewide market for the production of new design components for accessible workplaces; a community of actors supporting IDIA-compliant design concepts, that will continue to contribute ideas and results after the project end. <u>Project period</u> : February 2002 - July 2003 (18 months)		
Contact	<i>Centro Legno Arredo Cantu (CLAC)</i> <i>Piazza Garibaldi 5</i> <i>IT – 22063 CANTU (CO)</i>	<i>Andrea Cancellato</i> <i>Tel.: +39 031 713 114</i> <i>Fax: +39 031 713 118</i> <i>info@clac00.it</i> <i>www.idia2002.com</i>

IMAGE	Intelligent Mobility Agent for Complex Geographic Environments	IST-2000-30047
IMAGE aims to provide the users with mobile, personalised location based information on services, how to reach them and how to pay for them with mobile flexible means. It will introduce an holistic approach to end user's personalised electronic access to useful services for everyday life needs (where travel is a core element). The main objectives of the project are to: design and develop an open & modular service platform, which co-ordinates both end user request data and service provider response data; develop advanced key services, such as navigation, localisation & ecommerce services, and facilitate easy integration between them; re-organize business models and relationships by introducing a new business role, the mobility agent, that intermediates between the actors involved in service delivery; verify the integrated platform and inter-operation between agents of different test-beds; prove the feasibility of the platform through financial and marketing analysis. <u>Project period</u>: November 2001 – October 2003 (24 months)		
Contact	<i>Center for Research and Technology Hellas</i> <i>Hellenic Institute of Transport</i> <i>PO Box 361</i> <i>6th Km Charilaou - Themi Road</i> <i>EL – 57001 Themi – Thessaloniki</i>	<i>Evangelos Bekiaris</i> <i>Tel: +30 2310 498 265</i> <i>Fax: +30 2310 498 269</i> <i>certh@certh.gr</i> <i>www.image-project.com/</i>

IMAP	An Innovative Interactive Mobile Advertising Platform	IST-2001-33357
The main aim of the IMAP project is to boost the creation of next generation user-centred, cost-effective and interoperable, mobile (3G) interactive advertising tools in order to properly address the emerging large market of mobile advertising, set to have a \$16 billion value world-wide in 2005 and being the number one mobile commerce application in Europe by 2003. IMAP, through the combination of UMTS 3G wireless technology, positioning and geographic systems, and by coupling IST adaptive delivery mechanisms with privacy tools, will provide European mobile network operators, wireless portals and online advertisement agencies with easy-to-use, multimedia-rich and space-aware Advertising Campaign Management and Delivery tools along with the most effective business/revenue models to take advantage of this large upcoming market. <u>Project period</u> : April 2002 - April 2004 (24 months)		
<i>Contact</i>	<i>Telecom Italia Lab. Corso d'Italia 41 IT - 00198 Roma</i>	<i>Maurizio Cecchi Tel.: +39 06 3688 2415 Fax: +39 06 3688 2148 maurizio.cecchi@tilab.com www.imaproject.org/imaproject/hmain.jsp</i>

<u>INDICATOR</u>	A Cross Cultural Study on the Measurement and Enhancement of Employability In Small and Medium Sized ICT Companies	IST-2000-31070
In an ever changing, global, technologically demanding business environment, sourcing and retaining talent becomes the competitive battleground. One way to adapt the activities of firms to the exigencies of the fast changing demands in their environment, is to increase the employability of personnel. This involves (both at the level of the individual as well as the organization) the enhancement of job-related expertise and professional growth. In this project, seven European countries will provide psychometrically sound survey and interview data on software engineers working in SMEs in the ICT sector. Recommendations and a selection of the practical results to enhance employability will be communicated to SMEs, IST projects, policy makers and other related stakeholders. Moreover, best employability practices will be identified and disseminated widely across Europe. <u>Project period</u> : September 2001 - September 2004 (36 months)		
<i>Contact</i>	<i>Universiteit Twente Drienerlolaan 5 NL - 7522NB Enschede</i>	<i>Beatrice Van der Heijden Tel : +31 53 489 4227 Fax: +31 53 489 21 59 B.I.J.M.vanderHeijden@sms.utwente.nl www.alba.edu.gr/r&d/european/index.asp?poid=105</i>

INTELCITY	Towards Intelligent Sustainable Cities	IST-2001-37373
The thematic network seeks to explore the possibilities of novel and emerging ICTs in seeking better understanding of the future research options & priorities in the application area of sustainable urban development, beyond FP6. It brings together a wide range of European stakeholder interests & experience of planning, property development & management, utilities, urban transport, organizational knowledge management, e-business, e-governance urban modelling and scenario building in a consultative process. The network explores user needs and expectations of ICTs in terms of new ways of working in urban planning (application pull) as well as the research challenges for new developments in ICTs (technology push) for use in urban re/development in all regions of Europe. <u>Project period</u> : July 2002 - July 2003 (12 months)		
Contact	<i>University of Salford</i> <i>Bridgewater Building - Meadow Road</i> <i>UK - M7 9NU Salford</i>	<i>Steve Curwell</i> <i>Tel.: +44 161 295 4622</i> <i>Fax: +44 161 295 5011</i> <i>s.r.curwell@salford.ac.uk</i> <i>www.scri.salford.ac.uk/icpart</i>

JANUS	Joint Analytical Network for Using Socio-economic research	IST-2001-33300
The prime objective of JANUS is to function as a clearing house for knowledge developed in a wide range of IST projects by bringing together the results from these projects, and jointly reach out with unified messages. For this purpose JANUS has two overall goals: To establish an open mechanism to bring together, compare, coordinate and consolidate significant results of current socio-economic research within the IST Programme, related to the development of the information society and eEconomy, with particular focus on jobs. This will ensure that disparate efforts are effectively brought together to create a new synthesis, and will improve the work of individual projects and the IST Programme as a whole. The establishment of an open platform to communicate synthesised but also sharply focused results in concise and professionally designed formats to targets outside the Programme in wider European society which has a need to know, in a timely and accessible manner, the current overall status, results and directions of such research. Thus JANUS will provide a single consolidated voice representing main trends and conclusions of socio-economic research output of the programme as a whole. <u>Project period</u> : March 2002 – September 2004 (30 months)		
Contact	<i>Stichting RAND Europe</i> <i>Newtonweg 1</i> <i>NL 2333CP Leiden</i>	<i>Maarten Botterman</i> <i>Tel.: +31 71 524 5151</i> <i>Fax: +31 71 524 5191</i> <i>maarten@rand.org</i>

KISEIS	Key Interventions for Sustainable Employment In the Information Society for Disadvantaged Groups	IST-2000-26333
The project began with desk research, reviewing EU-level IS and employment policy to identify socio-economic hypotheses leading to programme intervention, and continued with a study of employment initiative models of intervention for supporting the transition of individuals from disadvantaged groups into sustainable IS employment. Projects and mainstreaming initiatives from four EU member states were identified and a framework of interventions developed. Qualitative field research began in four EU countries, to identify and study indicators of success in interventions. The study included interviews with former participants of employment projects currently in sustainable employment (such as former trainees), as well as employers of former employment participants, to identify the key solutions involved in the successful transition to employment. The other aspect of the field research was case studies of mainstreaming initiatives – programmes and projects delivering innovative initiatives that support the transition of individuals from disadvantaged groups into sustainable IS employment. Guidelines and models of best practice are developed, aimed at groups, organizations and policy-makers working on interventions for sustainable IS employment for disadvantaged groups. This phase also identified and analysed ways to strengthen future EU policy and research areas. <u>Project period</u> : July 2001 - February 2003 (20 months)		
Contact	<i>Models Research Ltd.</i> <i>Abbey House</i> <i>15-17 Upper Abbey street</i> <i>IRL - Dublin 1</i>	<i>Susan O'Donnell</i> <i>Tel.: +353 1 872 4911</i> <i>Fax: +353 1 633 5399</i> <i>susan@models-research.ie</i> <i>www.models-research.ie</i>

KM FORUM	European Knowledge Management Forum	IST-2000-26393
The European KM Forum aims to build a pan-European KM Community, and to identify and promote the principles of KM. This is primarily done by providing infrastructure for networking and pushing KM information to a broad KM community of experts and laymen as well as pulling information and feedback from them. This infrastructure supports face-to-face communication as well as virtual meetings over the Internet. Besides this, the project has also contributed to the ongoing debate about standardising KM application and implementation approaches and to create wide acceptance for these approaches by the community. The projects online community platform, at www.knowledgeboard.com, has attracted 5,500 members from 104 countries, and has won a number of external awards and accolades including "Best of the Web" from Harvard Business School in October 2002. <u>Project period</u>: January 2001 to December 2003 (36 months)		
Contact	<i>BIBA</i> <i>Hochschulring 20</i> <i>D 28359 Bremen</i>	<i>Frithjof Weber</i> <i>Tel.: +49 421 218 5536</i> <i>Fax: +49 421 218 5551</i> <i>web@biba.uni-bremen.de</i>

KNOWCOAT	Neural knowledge management solutions for the coating market value chain	IST-2001-33262
The objective is an operational knowledge development, management and distribution platform for the coating industry. Transparent information within the coating industry will result in more correct and timely information at decision level. This results in higher quality products and processes reducing economical and environmental waste. Current waste is estimated at 400 MEuro per annum in Europe only. Social objectives include increase in work efficiency and improvement of health and working conditions. Resulting innovations are coating expert knowledge to transform unstructured information into accessible knowledge, and integration of state of the art information management tools. Project results dissemination and exploitation is actively pursued through the industry reference group. The EC is leading in coating technology. The project connects partners from 10 countries that because of expertise, would not be able to reach the objective independently. <u>Project Period</u> : January 2002 – December 2003 (24 months)		
Contact	Zoorobotics Jan Lightarstraat 1 NL - 1817MR Alkmaar	Abraham Stalknecht Tel.: +31 725 143 695 Fax: +31 725 143 546 stalknecht@zoorobotics.com www.knowcoat.net

LAW	Labour market changes and welfare perspectives in Europe	IST-2001-33356
Labour market trends and welfare systems are currently among the most important issues debated in the European Union, due to the deep social and economic changes that are taking place. So far, these subjects have been analysed separately, generally neglecting the mutual connections. This project aims at filling in this gap, scrutinising the effects of the emerging atypical working profiles (self-employment, temporary work, e-work) on the welfare systems in several EU countries. The data, gathered from heterogeneous sources and structured by means of standardised indicators, will be collected in a central database, for a comparative prospect of the current situation and a projection of the expected trends. The final results will be presented at an International Conference to be organized for this purpose. The project outcome will be addressed to the institutions involved in the preparation and activation of policies supporting employment and social protection, both at national and European level. <u>Project period</u> : March 2002 - February 2004 (24 months)		
Contact	Istituto Nazionale della Previdenza sociale Via M. Gonzaga 6 IT - 20123 Milano	Giulio Giannetti Tel.: +39 010 5442303 Fax: +39 02 889 3200 giulio.giannetti@inps.it www.inps.it

MBNET	A Network of Excellence In m-Business Applications and Services	IST-2001-30164
MB-NET investigates the future of mBusiness by identifying research challenges, formulating policy recommendations, and providing strategic roadmaps on a 5-year horizon, through a robust methodological approach pursued by an independent discursive forum consisting of industry and research leaders that collectively represent excellence in mBusiness across Europe. MB-NET focused on identifying the right questions to be addressed for future focused RTD in this field. The main requirement behind MB-NET is the identification and pursuit of a rigorous and comprehensive methodological approach in order to overcome the difficulties associated with reaching informed conclusions about a future that is inherently difficult to predict and impossible to prescribe. To this end four methodological requirements have been set: (a) robustness, which is satisfied through the execution of a survey on technological trends in the area of next-generation networks and services and intensive national workshops; (b) condensed time frame, which is met in a 12-month project, strengthened by a sustainability plan to prepare the future of the network after the project end; (c) effective project management, which is ensured through two-levels of network membership (partners and members); (d) awareness focus, which is met through presentation of MB-NET results in key IST events (Prague, Copenhagen). The workplan includes roadmaps for next generation networks and services and roadmaps for mBusiness applications and services. <u>Project period:</u> July 2002 to June 2003 (12 months)		
Contact	<i>Athens University of Economics & Business ELTRUN -The eBusiness Center (GR) Eyelpidon 47A & Leykados 33 GR-113 62 Athens Greece</i>	<i>George M. Giaglis Tel : +30 210 8203663 Fax :+30 210 8203664 giaglis@aueb.gr www.mbnet-forum.org</i>

MILK	Multimedia Interaction for Learning and Knowing	IST 2001-33165
MILK aims to create a solution supporting knowledge and working processes in knowledge intensive organizations. It will do this by enhancing and extending earlier tools and methodologies for collaborative working and knowledge exchange, and developing a system able to support knowledge sharing among and within a community of people; promote learning processes in communities; support working processes providing the "right knowledge at the right time." The goals of MILK are: to define an integrated and comprehensive knowledge management solution which supports working in the best possible way – whether users are located in different places within or outside the company building, travelling; working at home alone or with others in open spaces, on coffee breaks or in other informal meetings to develop emerging approaches and methodologies in knowledge management and to implement them within organizations to measure their value on business processes and the organization as a whole to build and maintain a knowledge management "best in class" network of European academic institutions and public and private companies to share tools and practices. <u>Project period:</u> February 2002 to July 2004 (30 months)		
Contact	<i>Instituto Rso srl Piazza Giovani Italia, 3 I 20123 Milano</i>	<i>Thomas Schael Tel. +39 02 48016162 Fax: +39 02 48016195 milk@milkforum.com www.milkforum.com</i>

MIRROR	Mirror World Communities of Practice for Learning and Innovation In Natural Science	IST-2001-32504
The objective of the project is to establish a Europe-wide community of practice for learning and innovation in the area of natural science. In order to meet this objective, novel knowledge management techniques in combination with social theories of learning and scientific discourse are coupled with state-of-the-art information technologies including Internet acceleration and 3-Dimensional multi-user environment. In this framework, MIRROR innovation lies equally in both social and technological components of the project. A partnership of research organizations (academia and museums) and companies (IT and consulting experts) with complementary expertise will produce the innovative MIRROR methodology in knowledge management and a suite of software components to support the MIRROR approach. <u>Project period</u> : February 2002 - January 2004 (24 months)		
Contact	<i>Syntax Information Technologies</i> <i>Messogion 218</i> <i>GR - 15561 Holargos</i>	<i>Ioannis Anthopoulos</i> <i>Tel.: +30 1 654 3100</i> <i>Fax: +30 1 656 0880</i> <i>yantho@syntax.gr</i> <i>www.syntax.gr</i>

NEWTIME	New BworkTechniques In Micro-Enterprises	IST-2000-29568
NEWTIME's aim is to provide a factual basis for the specific modalities chosen for migration of micro-business IST networks from first generation low bandwidth, telework-enabled, networks towards networks with broadband IST at their core. Objectives include identifying the tools and techniques most valuable in new generation networks, identifying the individual technical and social skills needs emerging from first encounters between micro-businesses and high bandwidth access (ISDN, ADSL, SDSL, UMTS), reviewing the place of facilitation/mentoring, and linking to economic development and SME facilitation activities. Development guidelines synthesised from NEWTIME results will be widely disseminated in the IST and product design communities and to early adopting micro-businesses. <u>Project period</u> : July 2001 - June 2003 (24 months)		
Contact	<i>The Open University, United Kingdom</i> <i>Open University Business School</i> <i>Walton Hall</i> <i>UK - MK7 6AA Milton Keynes</i>	<i>Colin Gray</i> <i>Tel.: +44 1908 655 862</i> <i>Fax: +44 1908 654 746</i> <i>C.W.J.A.Gray@open.ac.uk</i> <i>www.openuniversity.com</i>

NESKEY	New Partnerships for Sustainable Development In the Knowledge Economy	IST-2001-39080
NESKEY establishes the agenda for research on Sustainable Development in the Knowledge Economy. (1) Measurement and reporting project addresses disclosure of information on corporate environmental, social, and economic performance for stakeholders' decision-making. It develops global guidelines for companies in the ICT sector. (2) Intangible assets project defines how to measure intangibles at micro and macro levels. It develops reporting standards facilitating evaluation the soft assets of a company, including the risk and opportunity elements. (3) Sustainable cities project develops socio-economic and environmental indicators and creates communities between companies, projects, individuals, NGOs, experts and cities using ICT' S contribution to Intelligent Houses as a test case. The final report publishing the combined results facilitates the development of EU models and scenarios for sustainable development and the knowledge economy. <u>Project period</u> : August 2002 – July 2003 (12 months)		
<i>Contact</i>	<i>EPPA Place Luxembourg B - 1050 Brussels</i>	<i>Jan Ahlskog Tel.: +32 2 505 60 24 Fax: +32 2 735 44 12 jan.ahlskog@eppa.com</i>

OPAL	Online Partnership Lens: A Social Browser for Networked Enterprise	IST-2000-28295
OPAL is addressing human capital in firms that need to find partners online, by presenting a specification and development plan for an archive and browser to store and manipulate profiles of partners' competencies, compatibility and trust. This novel resource extends the concept of human capital beyond competence modelling and includes emotional and moral dimensions. <u>Project period</u>: March 2002 to February 2004 (24 months)		
<i>Contact</i>	<i>Software AG Espana Rondo de la Luna 4 E 28760 Tres Cantos - Madrid</i>	<i>Cristina Arana Tel.: +34 91 807 9411 Fax: +34 91 807 9447 carana@softwareag.es</i>

PIDSS	Postal IT Directions Strategic Study	IST-2000-28721
The PIDSS project delivers a study on how new technologies applied to the Post operators may transform our lives in the broadest sense. Postal operators can play a crucial role in the improvement of the interaction between people and digital services and develop the use of computers in non-expert environments such as post offices. By offering new services that use new technologies, the Posts can bring new technologies closer to all citizens. The aim of the study is to look at the role postal operators can play in the aforementioned process and to propose concrete solutions and business strategies. <u>Project period</u> : January 2002 - December 2002 (12 months)		
<i>Contact</i>	<i>Association of European Public Postal Operators 100, rue de la Fusée B - 1130 Brussels</i>	<i>Marc Pouw Tel.: +32 2 724 72 83 Fax: +32 2 726 30 08 marc.pouw@posteurop.org www.posteurope.org</i>

PIKON	Personal Information and Knowledge Organizer Network	IST-2001-33487
The PIKON Project develops an integrated Information and Knowledge Management Environment that supports personal information and knowledge management needs and enables effective sharing of information and knowledge in the extended/virtual enterprise. The system comprises: an ontology and case-based method for information and knowledge management, a personal information and knowledge organizer, an enterprise cognitive network with semantic navigability. The solution will include thematic features and spaces for the exchange of ideas and creative activity and cater for eworkers and flexible teams. The solution combines both organizational and technical perspectives which have equal weight. <u>Project period</u> : February 2002 - January 2004 (24 months)		
Contact	<i>Consorzio per la Zona Industriale Apuana</i> Via Sforza 5 IT - 54100 Massa	<i>Sergio Menchini</i> Tel.: +39 05 854 1701 Fax: +39 05 854 1702 menchini@zia.ms.it www.pikon.zia.ms.it

PLANET	Network of Excellence In AI Planning	IST-2000-29656
The Planet project is a network of excellence in the field of Artificial Intelligence planning and scheduling. The project undertakes a variety of activities to support both the development of new directions in RTD and the exploitation of the technology, in particular with regard to the emerging e-work and e-commerce sectors, and it will promote the transfer of results to the benefit of innovative technological progress and competitiveness for European industry and enterprises. The main goals of Planet are to increase the awareness of the technology and to promote pan-European and international collaboration, to promote the orientation of research more closely towards application requirements and to open up new application areas, to provide a well-known and internationally recognised expert forum, to support high-quality training and teaching. European research in the field covers a wide spectrum of research, development, and application areas and there exists a large number of excellent groups with different and complementary expertise. The proposed network, currently with about 50 members in 13 countries, aims to effectively pool these skills. <u>Project period</u> : August 2001 – October 2003 (27 months)		
Contact	<i>Universität ULM</i> Oberer Eselsberg Gebäude 027/448 D - 89069 Ulm	<i>Susanne Biundo</i> Tel.: +49 731 502 4122 Fax: +49 731 502 4119 biundo@informatik.uni-ulm.de http://planet.dfki.de

PROMODAS	Professional mobile data service	IST-2001-36025
Maintenance service engineers and also medical experts are working outside the fixed working place more and more. To organize their work and to serve end-customers and patients better, flexible, mobile and remote working methods will be used in at least three trial-sites in Europe. The mobile trials are based on 2.5G/3G network and there are different mobile terminals used for normal operations and also for emergency situations. The most advanced tools and software are used and the front organizations are going to trial and build the infrastructure for that purpose. Also new integrated service concepts will be used and exploited by the organizations in different countries. The trial will be one of the most advanced mWorkforce trials and will be a continuous demonstrator of new working methods and serving systems in maintenance and medical care in Europe. <u>Project period</u> : June 2002 - November 2003 (18 months)		
Contact	<i>Celesta Mbusiness Oy</i> <i>Elektroniikkatie 8</i> <i>FIN - 90570 Oulu</i>	<i>Sakari Vaara</i> <i>Tel.: +358 8 555 88</i> <i>Fax: +358 8 551 3409</i> <i>sakari.vaara@celesta.com</i>

RESPECT	Professional and Ethical Codes for Technology-related Socio-Economic Research	IST-2001-32227
The development of an Information Society is creating rapid change in the requirements for technology-related socio-economic research, and in the methods used to carry out this research and disseminate the results, with growing requirements for inter- and multi-disciplinary collaborations in international teams. In a context in which there are wide variations in legal and professional requirements and in research practice, RESPECT will produce professional and ethical codes of practice for technology-related socio-economic research covering intellectual property, data protection and ethical issues at a Europe-wide level. This will be done in close collaboration with practitioners and users, who will discuss the draft codes at an international conference. RESPECT will produce directives of professional qualifications and professional bodies and a user's guide to socio-economic research for the broader policy and technology communities. <u>Project period</u> : April 2002 – March 2004 (24 months)		
Contact	<i>Institute for Employment Studies</i> <i>Mantell Buildin</i> <i>University of Sussex</i> <i>UK BN1 9RF Brighton</i>	<i>Ursula Huws</i> <i>Tel: +44 207 226 84 11</i> <i>Fax: +44 207 226 0813</i> <i>analytica@dial.pipex.com</i>

RIMSAT	Remote Intelligent Management Support and Training	IST-2000-28655
Knowledge is recognised as a firm's most valuable asset. Understanding how to identify, collect, classify and process the knowledge within and between organizations are major hurdles faced by those organizations embarking on a knowledge management programme. By integrating leading-edge and innovative knowledge engineering techniques to support knowledge management, RIMSAT will provide a novel way of using the acquired knowledge to improve organizational procedures. The RIMSAT system will be validated in a safety-critical environment where the sharing of knowledge is not only vital but is considered the norm. A process to measure the impact of knowledge management on the effectiveness of the decisions taken by an organization in dealing with safety-critical situations will be included. RIMSAT is designed to: - provide an innovative, 'intelligent', knowledge based solution aimed at improving the quality of critical decisions - enhance the competences and responsiveness of individuals and organizations involved in highly complex, safety critical incidents - irrespective of their location. The partners combine expertise in the management of complex scenarios, the management of knowledge, case based reasoning, model based reasoning, software and hardware development, training and commercial exploitation. <u>Project period:</u> October 2001 to March 2004 (30 months)		
Contact	<i>Kaidara</i> 15, Rue Soufflot F – 75005 Paris	<i>Eric Auriol</i> Tel.: +33 1 56242200 Fax: +33 1 56242266 eauiol@kaidara.com

RISESI	The Regional Impact on the Information Society on Employment and Integration	IST-2001-33189
RISESI's objectives are to provide a comprehensive and focused investigation of the relationship between constituencies potentially marginalized in the labour market (i.e. citizens with immigrant backgrounds, immigrants, women, displaced industrial workers, youth, etc.) and employment opportunities in economic sectors related to ICT. The main goals are to examine ways to overcome shortages of qualified personnel and to explore how marginalized constituencies can gain employment in ICT-related sectors in key regions in Sweden, the UK and Italy (Stockholm, Linköping, Cambridge, Cardiff and Rome). RISESI explores the relationships among regional growth poles, demand and supply of labour, social exclusion and economic restructuring, and aims to identify key factors promoting social inclusion. Expected results include policy recommendations in the area of employment and integration aimed at government, industry, university, trade union, and other interested parties (including women, citizens with immigrant backgrounds, immigrants, workers displaced from non-information society sectors and youth). <u>Project period:</u> April 2002 – September 2003 (30 months)		
Contact	<i>The National Institute for Working Life</i> SE-112 79 Stockholm	<i>Jonathan Feldman</i> Tel.: +46 8 730 92 13 Fax: +46 8 618 36 35 jonathan.feldman@niwl.se www.arbetslivsinstitutet.se/risesi

ROADCON	Strategic Roadmap towards Knowledge-Driven "Sustainable" Construction	IST-2001-37278
ROADCON is developing a Strategic Roadmap for future RTD projects and supporting measures in the Construction industry. It is concerned with preparing, from a strategic point of view, future research and developments for ICT in Construction, ensuring that companies from the building and civil engineering sectors achieve maximum business benefits from ICT solutions in the knowledge economy. It is also concerned with harmonising these benefits with environmental issues and quality of life of European citizens. The roadmap will support world-class collaborative research. It will provide mechanisms to ensure that research results are applied in practice in the European Union. It is intended that the strategic roadmap will lead to the development of an 'Integrated initiative' to support the needs of the construction industry. <u>Project period</u> : June 2002 - July 2003 (14 months)		
<i>Contact</i>	<i>Centre Scientifique et Technique du Bâtiment (CSTB)</i> <i>Route des Lucioles – BP209</i> <i>F - 06904 Sophia Antipolis</i>	<i>Alain Zarli</i> <i>Tel.: +33 4 93 95 67 36</i> <i>Fax: +33 4 93 95 67 33</i> <i>zarli@cstb.fr</i> <i>www.roadcon.org</i>

ROCKET	Roadmap to Communicating Knowledge Essential for the Industrial Environment	IST-2001-38245
Rocket has prepared a strategic roadmap for future developments in organizational learning relevant to the education of engineers and knowledge workers. The project identified the following developments as the key challenges within this domain: How to link knowledge management (KMI) at the level of an organization, with KMI and E-Learning at the level of people working within an organization or moving between organizations, so that knowledge that is new to someone can be captured and shared more readily and so that people can cope better with changes in their working life and their environment (including new colleagues, ever-changing tasks and processes, certification requirements, etc.) How to prepare organizations to monitor the fit between the external environment and their capabilities, their knowledge base, their performance and general competitiveness, in ways that enable them to learn more rapidly, cope more readily with change and generally perform better How (for example, through the use of simulations) to build capability in distributed co-operation in various environments, both for organizations and for individuals How to prepare engineering students, engineers and knowledge workers for work in organizations that are more dynamic (responsive) than today, including virtual organizations comprising distributed networks of small, medium or large organizations, brought together on a project-by-project basis or to participate on a longer-term basis in a supply chain. <u>Project period</u>: July 2002 to June 2003 (12 months)		
<i>Contact</i>	<i>University of Florence</i> <i>Via delle Gore 2</i> <i>I 50141 Firenze</i>	<i>Carlo Donzella</i> <i>Tel: +39 034 7777 0725</i> <i>Fax: +39 06 23321 4282</i> <i>carlo.donzella@unifi.it</i> <i>http://rocket.vub.ac.be/</i>

RURAL WINS	Broadband solutions and Applications for Rural Areas and Maritime Regions	IST-2001-39107
This Thematic network built a strategic RTD roadmap developing an ICT vision which will ensure the economically and technically feasible deployment of ICT solutions for rural areas (including also maritime regions and islands). The project analysed: trends in technology development of equipment needed and foreseen; deployment of services which integrate the equipment; and knowledge management development which will allow the integration of the above for the globalized rural collaborative work and life environment. The Thematic network will analyse different scenarios of joint public and private initiatives and business models to be constituted in the near future for collaboration at work. RURAL WINS solution will lower the discriminatory gap existing nowadays between rural and urban areas as regards broadband accessibility and applications deployment. As a result a broad constituency will have been formed around the proposed Information Society business models. <u>Project period</u> : July 2002 - June 2003 (12 months)		
<i>Contact</i>	<i>EUSKALTEL S.A. Parque Tecnológico, Ed. 809 E-48160 Derio (Bizkaia)</i>	<i>Leire Aginako Arri Tel. +34 944 011 000 Fax. +34 944 011 297 info@ruralwins.org www.ruralwins.org</i>

SANE	Sustainable Accomodation In the New Economy	IST-2000-25257
Current workplace design activities are focused on single work locations. SANE is a multi-disciplinary and multi-cultural R&D project that takes a location independent approach to the design of a sustainable workplace to ensure compatibility between fixed and mobile, local and remote work areas. The project developed a unified framework for the design of a sustainable workplace. This generated designs that empower distributed organizations to take full account in advances in location independent computing and ubiquitous networking. To assist the validation of the framework, a limited set of ICT tools was specified, prototyped and developed, the emphasis being on innovative application of emerging technologies and services rather than the development of new ones. The project also specified communication interface requirements of technology products and services. <u>Project period</u> : January 2001 – January 2003 (25 months)		
<i>Contact</i>	<i>DEGW plc 8 Crinan Street UK – N1 9SQ London</i>	<i>Paul Wheeler Tel.: +44 201 239 7741 Fax: +44 207 278 3613 pwheeler@degw.co.uk www.saneproject.com</i>

SASKIA	Strategic Action for a Sustainable Knowledge and Information Age	IST-2001-38184
SASKIA roadmaps the requirements and actors to ensure that the emerging knowledge society will be sustainable in social, cultural, economic and environmental terms. It identifies ways of unlocking contributions of IST and IST-based processes to sustainability, and how future research agendas can increase that contribution. This is a key component of the EU's Lisbon, Stockholm and Gothenburg strategies. SASKIA is based on networking and the creation of constituencies of RTD stakeholders, through workshops as well as ICT-based collaboration services. In its process dimension, SASKIA first defines a "landing place" scenario - where we want to be in 2030 - achieving a holistic vision through an inter-disciplinary integration of current approaches. From there, it roadmaps implementation models for actors, roles, required R&D and open variables to monitor. <u>Project period</u> : July 2002 - July 2003 (13 months)		
Contact	Barco n.v. Noordlaan 5 B - 8520 Kuurne (Kortrijk)	Pol Descamps Tel.: +32 56 23 32 11 pol.descamps@barco.com www.saskiaproject.org www.is-sd.org

SCOOP	Sophisticated Co-operation In Dynamic SME Networks Based on Co-operative Planning and Control	IST-2000-25200
Due to the growing competition in a global market, the importance of close co-operation and collaboration is steadily increasing in working environments, especially between SMEs. The main objective of the SCOOP project was the development of effective solutions and services to support world-wide manufacturing networks and co-operation, especially between SMEs in rapidly changing working environments. To this end, a co-operative production planning system was developed which facilitates a faster, more efficient, and less expensive execution of business transactions. Furthermore, it supports the high adaptability of business processes that is necessary to tackle today's challenges in highly dynamic markets. The entire planning is a dynamic working environment with an enormous potential for rapid adaptation through closed feedback cycles between modelling, simulation, and integration with existing legacy system infrastructures in the virtual enterprise networks. As a result, faster responses to customer demands in the supply network are enabled with a high degree of accuracy. The end users from print and textile industry form a test bed to achieve the SCOOP goals and transport the benefits through their networks to the potential marketplace. <u>Project period</u>: January 2001 – September 2003 (33 months)		
Contact	University of Stuttgart – IPVS Universitaetstrasse, 38 D-70569 Stuttgart Germany	Michael Matthiesen Tel. +49 711 7816414 Fax +49 711 7816248 Michael.Matthiesen@informatik.uni-stuttgart.de www.ipvs.uni-stuttgart.de

SHOENET	Shoe Information Network	IST-2001-35303
Shoenet objectives are related to the capacity of a company managing a trade mark (the parent company) to build a virtual constellation of small companies with a high degree of flexibility, to transform the traditional value chain, into a virtual value chain based in collaborative working environments in the industry. In the shoe industry, a high number of shoe components are present and in most cases each component means the participation of one company. The project supports SMEs from the shoe sector to collaborate at work using a tool based on the Internet and using multimodal solutions to implement diverse functions in the value chain, starting from the sales process – generating orders (virtual catalogues and GSM or GPRS – connection with the company) and finishing with the integration of a parent company (brand name owner) with subcontractor companies that work in a way that is neither permanent nor exclusive. <u>Project period:</u> May 2002-April 2004 (24 months)		
Contact	<i>INESCOP</i> <i>Poligono Industrial Campo Alto</i> <i>PO BOX 253</i> <i>03600 ELDA</i> <i>Spain</i>	<i>Enrique Montiel</i> <i>Tel.: +34 96 539 5213</i> <i>Fax: + 34 96 538 1045</i> <i>emontiel@inescop.es</i>

SIGIS	Strategies of Inclusion: Gender	IST-2000-26329
The project aims to provide policy-makers, designers, relevant practitioners and communities with a better understanding of the processes involved in the integration of women into the use and design of Information Society technologies. The first stage of the research builds a knowledge base providing a comprehensive overview of current trends, through a review of the available literature and statistics. The second stage explores through empirical work the problems discussed earlier. A number of specific case studies on public and private efforts to include women in ICT will be carried out to deepen the understanding of the variety of existing needs. Finally, the research involves an extensive crosscutting and synthetic effort to develop more general theoretical insights and explore the policy and design implications of the findings, through consultation with policy makers and practitioners <u>Project period :</u> August 2001 – January 2004 (30 months)		
Contact	<i>Research Centre for Social Sciences</i> <i>Institute for Studies of Science, Technology</i> <i>and Innovation, University of Edinburgh</i> <i>High School Yards</i> <i>Edinburgh EH1 1LZ UK</i>	<i>Robin Williams</i> <i>Tel.: +44 131 650 6387</i> <i>Fax: +44 131 650 6399</i> <i>R.Williams@ed.ac.uk</i>

SMART-UP		Small and Medium Sized Enterprise Alliance through Research In Tourism - Take up	IST-2001-34184
SMART-UP provides small and medium sized tourism enterprise with up-to-date tourism management know-how through modern information technologies. Initially, the participating universities design four learning modules which will be integrated into a virtual learning company. Additional dynamic information collected by web-search agent will also be integrated into each learning module. The contents are complemented by constantly updated benchmarking solutions, and chat facilities. The use of an information technology system as a learning tool ensures a fast and cheap know-how transfer amongst tourism SMEs and know-how producers (e.g. universities) throughout Europe. <u>Project period</u> : April 2002 - September 2003 (18 months)			
Contact	Siemens Aktiengesellschaft Oesterreich Siemenstrasse 90 AT - 1210 Vienna		Josef Withalm Tel.: +43 5 170 742 072 Fax: +43 5 170 753 281 josef.withalm@notes.siemens.at

STAR		Socio Economic Assessment Trends for the Digital Revolution	IST-1999-14122
The main goal of this project is to examine the socio-economic impacts of new technologies and services on the nature of work and business enterprise in the next decade, with a specific focus on the identification of new opportunities for economic and employment growth. The project will analyse emerging patterns in the development of the digital economy in Europe and the application of the new technologies to advanced (second-generation) services, assessing their contribution to the competitiveness of European industry and service providers, sustainable social and economic growth. This will be done by developing and demonstrating the implications of alternative evolutionary scenarios, in close interaction with the IST community and with a group of first-class international experts (the Future Work and Business Forum). <u>Project period</u> : September 2000 – August 2003 (36 months)			
Contact	Databank Consulting SpA Corso Italia 8 I - 20122 Milan		Gabriella Cattaneo Tel.: +39 02 7210 7508 Fax: +39 02 7210 7402 cattaneo@dbcons.it www.databank.it/dbc

TEAMWORK	Technology Exploitation and Adaptable Methodologies offering new Organizational Models and Practices for e-working Teams	IST-2000-28162
TEAMwork sets out to provide a novel, 'complete' solution (integrating technology, methodology and skills) for e-working teams operating in a distributed, multi-cultural environment. The TEAMwork solution will be trialed in three diverse distributed end-user domains: software engineering SME's, public service organizations and research networks. TEAMwork will offer these organizations the 'complete solution' for managing dispersed 'narrow-competence' teams and for effective decision-making in a virtual, multi-cultural environment. The solution represents a major advance on those currently-available because it can be enhanced, adapted and influenced by the end-user (a non-technician) to suit their particular operational requirements. The results of the trials will be disseminated widely to 20,000 IT managers. <u>Project period</u> : July 2001 - February 2003 (18 months)		
Contact	<i>Link IT (2000) Ireland Limited T/A TecNet The Technology Network Crestfield Centre IRL – Cork</i>	<i>Brian Foley Tel.: +353 21 485 8060 Fax: +353 21 482 3725 brian.foley@tecnnet.ie</i>

TELEBALT	Teleworking as a Tool for Information Society Technologies Programme Promotion to Baltic States	IST-2001-33041
TELEBALT advertises and promotes the IST Programme to Latvia, Lithuania and Estonia by fast and efficient dissemination and awareness actions targeted on Baltic countries as newly associated states to the EU. This objective is fulfilled using new methods of team work, such as e-working, virtual laboratories, etc. The project carries out technology studies of the present situation with IST development in the three Baltic countries and formulates appropriate recommendations to EU research and marketing communities as far as perspectives of potential Baltic markets is concerned. Telebalt will deploy and further develop a system of Information Demonstration Centres in Latvia, Lithuania and Estonia. TELEBALT organized major conferences and workshops in Vilnius, Riga and Tallinn, and introduced new methods of team work to develop project local points in participating countries able to operate in modern IST at a high level. The project provided training measures (distant and face-to-face) to promote dissemination of IST. CoBrow collaborative browsing virtual presence toolkit and PL@ZA groupware were introduced for EU-Baltic states team work. TELEBALT presented IST results to Baltic countries telematic, business, research and unemployment policy communities, emphasizing the major tendencies of European telematics activities. <u>Project period</u> : August 2001 - July 2003 (24 months)		
Contact	<i>EDNES 1A Place des Orphelins F - 67000 Strasbourg</i>	<i>Jean Bonnin Tel.: +33 3 88 60 50 63 Fax: +33 3 88 41 64 77 bonnin@selene.u-strasbg.fr www.telebalt.lv</i>

TELEMARA	Telematic Management For Ready-to-wear Satellite Workshops	IST-2000-28404
TELEMARA is a project to consolidate microcompanies working as satellite workshops for ready-to-wear SMEs as external elements of their production chain, by providing them with an easy-to-use telematic tool to manage and control their reciprocal relationship. Typically, ready-to-wear SMEs work with 10 to 15 satellites, each employing 3 or 4 persons – housewives and their female relatives in more than 90% of the cases - that produce over the 70% of the total output of their central SME. The main feature of these satellite workshops are a very high percentage of female representation, a predominance of self-employed persons working at home or at microcompanies located in their vicinity, mostly unskilled labour without promotion possibilities, virtually no application of management techniques and finally, rudimentary communication system between central company and satellites. <u>Project period</u> : September 2001 - February 2003 (18 months)		
Contact	AITEX Plaza Emilio Sala, 1 E - 03801 Alcoy (Alicante)	Silvia Aracil Tel.: +34 96 554 2200 Fax: +34 96 554 3494 vblanes@aitex.es

TELESOL	Telework solutions for promotion of EU cooperation in business and research with the Commonwealth of Independent States	IST-1999-29038
TELESOL promotes e-work in business and research areas between EU and the eight countries of CIS (Kazakhstan, Kyrgyzstan, Uzbekistan, Azerbaijan, Armenia, Georgia, Ukraine, Russia). The project uses a system of Information Demonstration Centres, in European CIS countries and create on this base, a system of Telework Competence Centres (TCCs). The core TCC is set up in Russia. TELESOL will create in the CIS countries pilot fully operational online e-work systems between EU and CIS participants in business and research areas. The first e-work systems will be set up around the core TCC, further development in new methods of work will follow in TCCs in Central Asian and European countries of CIS. TCCs will be the focal points for collecting relevant e-work information, training, exchange of experience, establishing contacts with interested parties in the EU. The TCCs will generate new e-work systems. TELESOL organizes a technology kick-off conference, a central Asian regional workshop and local planning/evaluation meetings and e-workshops; and develops curriculum on technology and on management aspects of new methods of work between EU and CIS. By these training and dissemination actions, TELESOL creates e-work awareness and helps overcome barriers to networking and to successful e-working projects between EU and CIS countries. <u>Project period</u> : January 2002 - December 2004 (36 months)		
Contact	United Nations Industrial Development Organization PO Box 300 Wagramerstrasse 5, Vienna International Center AT - 1400 Vienna	Hans Pruim Tel.: +43 1 26026 4755 Fax: +43 1 26026 6802 hpruim@unido.org

TERRA 2000	Terra 2000	IST-2000-26332
The technological, economic and social changes known as the 'New Economy' pose challenges to sustainable development, economic competitiveness, civil society and quality of life. The project brings together a unique combination of scholars and information technology specialists, founding members of the world modeling and scenario analysis disciplines and some of the most profound commentators on the New Economy. Terra provides a sound base for European policy deliberations around the emergence of the Globally Networked Society and the unfolding of its consequences for society and sustainable development. The project is producing a rich library of outlooks concerning that emergence: models, scenarios, and policy analysis. An active societal discourse is an essential part of Terra's activities. There is an invitation to all interest groups, NGOs, businesses, politicians and individual citizens, and researchers of all disciplines, to participate. <u>Project period</u> : January 2001 - December 2003 (36 months)		
Contact	<i>RAND Europe</i> <i>Newtonweg 1</i> <i>NL - 2333CP Leiden</i>	<i>Maarten Botterman</i> <i>Tel.: +31 71 524 5151</i> <i>Fax: +31 71 524 5191</i> <i>maarten@rand.org</i> <i>www.terra-2000.org</i>

THINK	Towards Handicap Integration Negotiating Knowledge	IST-1999-21179
The main goal of THINK is professional integration of people with disabilities, so that they become productive, profitable and self-sufficient by using information and communication technology. This is done through e-work. With the experience obtained from the successful pilot project in Portugal, the project creates and implements a technological, organizational and social model that can be adapted to the particularities of each participating country. A monitoring and support structure is built to provide the e-workers with the necessary tools to develop highly professional services to the final client, which are large and medium sized companies. In the short term, 500 disabled people will be integrated in areas such as accounting, programming, technical assistance to computer systems, etc. <u>Project period</u> : September 2000 - June 2002 (22 months) + extension Baltic countries (= 36 months)		
Contact	<i>TELEMANutencao – Assistencia Remota a Computadores, S.A.</i> <i>Apartado 117, Avenida Miguel Bombarda, N° 8 F</i> <i>PT - 2780 Oeiras</i>	<i>Miguel Reynolds</i> <i>Tel.: +351 21 441 6965</i> <i>Fax: +351 21 441 5767</i> <i>global@teleman.pt</i>

TRINE	Development and Implementation of a joined electronic commerce and traceability Internet solution for frozen fish	IST - 1999-57460
The project is to develop and implement a simple combined traceability and e-commerce solution dedicated to the frozen fish industry. This represents a first but tangible step in the integration and use of an e-business solution, applicable to SMEs in this traditional industry. The main technical objectives of the project are: the definition of fish traceability framework and e-commerce abilities; and the development of the associated tools and their combined implementation into the European Frozen Fish Industry SME community. The solution will be combined TRINE software, composed of: - Minitrader software: a local software for traceability management in frozen fish companies, allowing them to acquire quality and safety parameters based on tracerfish concerted action results, completed with harmonised identification, and adapted selection of data capture and labelling technologies. - Minitrader software: a simple b2b software, operative on Internet (ASP programming language on oracle database, and XML standard for information transfer) that can be incorporated at the existing web site of each frozen fish company. <u>Project period</u> : February 2003 - July 2004 (18 months)		
<i>Contact</i>	CIMA, Nuevas Tecnologias Informaticas, Sociedad Limitada 48-50 Calle Mayor-Bajo E 31610 Villava-Navarra	Alberto Alfaro Jimenez Tel: +34 94 842 6016 Fax: +34 94 842 6010 a.alfaro@cimanti.es

UNITE	Ubiquitous and Integrated Teamwork Environment	IST - 2000-25436
High performance of ever more geographically dispersed teams is the vision of the UNITE co-operative workplace. Providing seamless, fluid interaction between team members, contractors, consultants, etc. from any world-wide location stimulates virtual organization. UNITE offers team members intuitive and ubiquitous access to each other, and to information and resources of their project, secure and transparent to their physical workplaces and their own tools. Thus, team focus remains wholly on the project. UNITE captures the requirements, develops the paradigm of co-operative workplaces, a suitable platform through prototypes, validates its approach with real operating teams, disseminates and exploits results. The UNITE vision is a definite future; the consortium is committed to delivering a superior and affordable solution aimed at fostering collaboration and entrepreneurial spirit across Europe and beyond. <u>Project period</u> : January 2001 – March 2003 (27 months)		
<i>Contact</i>	IBM France Le Plan du Bois F - 06610 La Gaude	Gérard Lacoste Tel.: +33 4 92 11 48 07 Fax: +33 4 93 24 45 45 lacoste@fr.ibm.com www.unite-project.org/

USABILITYNET	Usability Support Network	IST-1999-29067
Despite compelling evidence of the benefits of employing user centred design methods to produce more usable products, most development activity in Europe does not use these methods, with the results that most computer systems are unnecessarily difficult to use. UsabilityNet provides a web site and support network to assist organizations with usability, user centred design and process improvement. The network disseminates information to purchasers, developers and EU projects, tailored to meet local and sector needs. Needs for certification and standardisation are being identified, and the use of a Common Industry Format for usability laboratory test reports is promoted. Dissemination includes organization of high profile European conferences for usability professionals, and setting up a European Usability Professionals Association to institutionalise good practice. <u>Project period</u> : February 2001 - January 2004 (36 months)		
Contact	<i>Serco Usability Services</i> 22 Hand Court UK - WC1V 6JF London	<i>Nigel Bevan</i> Tel.: +44 207 421 6474 Fax: +44 207 421 6477 nbevan@usability.serco.com

VIEW OF THE FUTURE	Virtual and Interactive Environments for Workplaces of the Future	IST-2000-26089
VIEW performs research and produces methodologies, tools, guidelines, and products to design workplaces utilising VE. Therefore it is necessary to understand the impact of VE technologies on their users. The particular objectives are informational (understanding of potential barriers, roles and impact of VEs), promotional (pilot application demonstrators), developmental (interaction and interface elements, mobile VEs prototype, usability test batteries) and supportive (interactive design support tool and strategic guidance). Industrial users will apply the pilot application demonstrators to be able to assess the new work processes and at the same time be a platform to perform tests and evaluations of the methodologies, tools and products developed in VIEW. The intended outcomes will be generic to help industrial users across Europe to apply VE systems and tools in different domains. A set-up of a new VE workplace will be produced as a result of the modules developed in VIEW. <u>Project period</u> : January 2001 - December 2003 (36 months)		
Contact	<i>The University of Nottingham</i> School of Mechanical, Materials, Manufacturing Engineering & Management University Park UK - NG7 2RD Nottingham	<i>John Wilson</i> Tel.: +44 115 951 4004 Fax: +44 115 951 4000 john.wilson@nottingham.ac.uk

VIP	Voluntary Industrial Code of Practice for IST –enabled work across national borders	IST-2000-25463
The Voluntary Industrial Code of Practice (VIP) refers to an agreement among international companies to consider ethical aspects when establishing and carrying IST-enabled work across national borders. The project invited large international companies to take part in the shaping of a human global Information Society and at the same time contribute to fair global competition. The objectives are: to clarify the essence of business ethics and to review relevant existing codes of conduct applicable to work across national borders and to develop a tool that facilitates analysis of consensus building process; to suggest an ethical code for IST-enabled cross border work and to obtain the endorsement of the VIP-Code by international companies. The research identified value systems and clarified linkages to business ethics and strategies, developed tools for analysis and consensus building, and provided a knowledge base from existing codes and agreements for VIP code formulation, in cooperation and dialogue with industry. <u>Project period</u> : January 2001 – May 2003 (29 months)		
Contact	AstraZeneca AB Vastra Malarehammen 9 S-15185 Sodertalje	Staffan Ternby Tel: +46 8 553 26107 Fax: +46 8 553 29000 staffan.ternby@astrazeneca.com www.unomondo.org

WINGS-FOR-SHIPS	Maritime Intelligent Workplace for Weather Information – Network, Guidance and Supervision on board ships	IST-2001-33107
WINGS-FOR-SHIPS aims to develop, demonstrate and validate a new maritime intelligent workplace based weather information system and decision support for maritime transport and other applications. These will be realised by linking fixed/mobile communications with navigation/positioning, efficient transmission and delivery over the network as well as geo-information. These services will allow the ship master to have seamless access to, and interaction with intelligent, customised (route based) rich content multimedia information on the efficient and safe navigation passage for passengers, freight and the environment both on board ship and inland. The new and intelligent approach is a decision-support tool looking at forces and stresses on the ship as a function of the local, accurate real-time weather information. Prediction models are also included for detailed estimation of weather parameters in local approach routes. The information is finally presented in a familiar user-friendly ECDIS digital chart on board ships, but also via Internet and WAP for shipmasters on land. WINGS-for-SHIPS will include an automatic system including dynamic calculations using ship and sea area models as well as real-time weather information. <u>Project period</u> : January 2002 – June 2004 (30 months)		
Contact	Maritime Eng. & Technology for Transport, Logistics & Education Les Cardoulines Bat 3. - 1360 route des Dolines F - 06560 Valabonne Sophia Antipolis	Carmine Giuseppe Biancardi Tel.: +33 4 93 00 03 39 Fax: +39 02 700 405 206 biancardi@mettle.org

WISTCIS	New Methods of Working for Information Society Technologies Programme Promotion to Commonwealth of Independent States	IST-1999-14106
WISTCIS will promote IST to seven European CIS countries (Armenia, Azerbaijan, Belarus, Georgia, Moldova, Russia, Ukraine) by dissemination actions and e-working targeted outside of IST, based on new methods of team work between interested EU and the CIS parties. WISTCIS will develop further the system of Information Demonstration Centres deployed in seven CIS countries, will organize two conferences and five workshops devoted to IST, will introduce new methods of team work in the CIS, and will provide training measures to promote IST to the CIS. Certification service for IST proposals preparation and electronic submission will be adapted for EU-CIS team work. WISTCIS will present first IST results to the CIS telematics community indicating the trends in European telematics activities. <u>Project period</u> : November 2000 – October 2003 (36 months)		
<i>Contact</i>	<i>Earth Data Network for Education and Scientific Exchange</i> <i>1a, place des Orphelins</i> <i>F - 67000 Strasbourg</i>	<i>Jean Bonnin</i> <i>Tel.: +33 3 88 60 50 63</i> <i>Fax: +33 3 88 41 64 77</i> <i>bonnin@selene.u-strasbg.fr</i> <i>www.ednes.org/wistcis/main_e.htm</i>

WWW-ICT	Widening Women's Work In Information and Communication Technology	IST-2001-34520
The project provides a focused investigation of the gender gap in ICT professions and proposes some pathways to improve equal opportunities, women's participation in the ICT labour market and quality of life in ICT professions. It aims at achieving four scientific objectives : comprehensive understanding of the various aspects of gender disparities in ICT professions; empirical investigation of these disparities; policy implications of equal opportunities in ICT professions; dissemination of results, recommendations and good practices towards agents of change. The project implements an integrated approach to the various dimensions of gender gaps in ICT professions, covering explicative factors linked to education and training, working and employment conditions, and professional and technical culture. A conceptional framework for analysis is developed with extended reference to the state of the art of existing research. The project focus is on qualitative empirical information, to be collected through biographical interviews and sectoral case studies in seven countries (Austria, Belgium, France, Italy, United Kingdom, Portugal and Ireland). The work will include an inventory of good practices. Policy recommendations will be developed in the following areas: education and vocational training models, employment strategies and work organization patterns, and institutional frameworks. The dissemination of results targets agents of change in human resource management, professional orientation, organization of training and policy making. <u>Project period</u> : May 2002 - April 2004 (24 months)		
<i>Contact</i>	<i>Fondation Travail-Université</i> <i>Rue de l'Arsenal, 5</i> <i>B – 5000 Namur</i>	<i>Gérard Valenduc</i> <i>Tel.: +32 81 72 51 22</i> <i>Fax: +32 81 82 51 28</i> <i>gvalenduc@compuserve.com</i>

XMOB	eXtreme MOBility – Developing a Pan-European ASP-Oriented Open Mobile Platform	IST-2001-37789
In Europe mobility has become a necessity and a competitive advantage, both for citizens and the human capital of companies, and is rapidly evolving to become a complete commodity. Mobility as a commodity can be defined by five main properties: ubiquity (i.e. mobility anywhere), transparency (i.e. the user does not detect the change between fixed and mobile workplaces), fundamental asset (i.e. the user simply can't live without it), universality and inclusion (i.e. everybody can join the mobile world), and a value proposition booster (i.e. it is user-governed and adds real value to the user). This new concept of mobility, also called "extreme Mobility" (X-MOB), will be realised in this project through the development of an XMOB application platform (XMAP), to host mobile applications, which are multi-device/channel, multi-network, multi-user, multi-service (ASP-based model), multi-country (federated model), open-standards based (Java/J2EE compliant). XMAP benefits and outputs will be validated through the development of two vertical applications (healthcare and logistics) involving 2G, 2.5G, 3G, satellite and multiple different device types. The consortium envisions immediate European exploitation of the project results (including new users, countries and services) following the ASP approach. <u>Project period</u> : July 2002 – February 2004 (20 months)		
Contact	<i>DMR Consulting</i> <i>Pº de la Castellana, 141, 9º</i> <i>28046 Madrid</i> <i>Spain</i>	<i>Pablo Argaiiz Rodrigo</i> <i>Tel: +34 9157900</i> <i>Fax: +34 9157901</i> <i>pablo_argaiz@dmr.com</i> <i>www.x-mob.org</i>

ANNEX 3: EUROPEAN WEBSITES FOR COLLABORATION@WORK

eWork Association Sites

Austria	Österreichische Telearbeitsvereinigung (ÖTA) Austrian Telemark Association	www.oeta.at
Belgium	The Belgian Telemarketing Association (BTA)	www.bta.be
Bulgaria	Bulgarian Telemark Association	www.bg-telework.org
France	Association Française du Télétravail et des Téléactivités (AFTT)	www.aftt.asso.fr
Ireland	Telework Ireland	www.telework.ie
Italy	Telemark Web Italia Società Italiana Telemark (SIT)	www.telemark.rassegna.it www.societaitalianatelemark.it
Netherlands	Netherlands Telemark Forum (Stichting Nederlands Telemark Forum)	www.teleworkforum.nl
Portugal	Associação Portuguesa para o Desenvolvimento do Telemark (APDT)	www.apdt.org
Spain	Asociación Española de Telemark	www.aet-es.org
Sweden	Distansforum – Swedish Telemark Association	www.distansforum.se
UK	The Telemark Association (TCA)	www.tca.org.uk/

Other European Country Specific or Local Language Sites

Austria	Austrian Telemark Website (German)	www.telearbeit.at/
Belgium	Telework initiative	www.televillage.be www.telework.televillage.be (dutch) www.alcatel.be/telework
Europe	Euro-telework service (supported by D-G Employ)	www.euro-telework.org
Denmark	Distancearbejde (Danish Retail and Office Workers Union, HK) Digital Denmark national programme Freelancers service	www.distancearbejde.dk www.digidigitaldanmark.dk/english www.freelander.dk
Finland	National Telemark Theme Group The Finnish Work Environment Fund Finnish Information Society in facts and figures (english) Statistics Finland Ministry of the Labour Workplace Development Programme eWork projects with ESF funding	www.e-work.fi/english/index.htm www.tyosuojelurahasto.fi/english/ www.e.tinland.fi www.tilastokeskus.fi/index_en.html www.mcl.fi/english/index.html www.mcl.fi/tyke/new/english/index.htm www.e-work.fi/esraportti/frame_index.html
France	Council of IT (CSTI) EAdministration	www.csti.pmgouv.fr www.service-public.fr
Germany	OnForTe (best practice in Telemark) Internet Telemark Job Exchange TA Telearbeit	www.onforte.de www.telejobservice.de/default.asp www.ta-telearbeit.de
Greece	Telemarketing Greece	www.teleworking.gr
Ireland	eWork Business Awareness Campaign Telemarketing jobs online Family Friendly working arrangements Information Society Commission Irish Internet Association	www.e-work.ie www.exp.ie www.familyfriendly.ie www.isc.ie www.iia.ie

Italy	INPS Ministry of Labour CENSIS Foundation IT Companies Association Federation Confindustria Telelavoro nella Pubblica Amministrazione	www.inps.it www.minwelfare.it www.censis.it www.assinform.it www.federcomin.it www.telelavoro.fomez.it
Norway	Projet Telework	www.ementor.no/temarbeid/index.asp
Romania	Stetou Home Page with general information on teleworking	www.geocities.com/eureka/park/3622
Spain	Spanish Chamber of Commerce	www.camdata.es
Slovenia	Research on Internet eWork Action Plan Institute of Macroeconomic Analysis and Development	www.irs.org/indexuk.html www.alpeca.si www.gov.si/umar
Sweden	Facts on ICT	www.sika-institute.se
UK	UK On Line initiative Institute of Employment Studies eGovernment	www.dlee.gov.uk/ukonlinecentres www.employment-studies.co.uk www.dti.gov.uk

General Sites

European Commission IST programme	www.cordis.lu/ist
IST – New working environments	http://europa.eu.int/information_society/topics/ework/index_en.htm
eEurope	http://europa.eu.int/information_society/eeurope/index_en.htm
IST projects results service	www.istresults.info
eWork IST success stories	www.flexwork.eu.com/members/iststor.html
Benchmarking Telework Trends in Europe	www.scatt.com
Statistical Indicators Benchmarking for the IS	www.sibis-eu.org
European Telework Online	www.sto.org.uk
Andrew Bibby – Telework notes	www.andrewbibby.com/telework.html
BT web site for flexible working	www.workingfromhome.co.uk
British Telecom – Telework reports	www.labs.bt.com
Connected – Alan McClusky : news/links	www.connected.org
Guide to Flexible Working	www.flexibility.co.uk
Home office partnership	www.hop.co.uk
Telework Links (global)	www.telework101.com/links.htm
eWork 2001 (Conference Helsinki)	www.telework2001.fi
eWork 2002 (Conference Paris)	www.ework-in-europe.com
eWork awards	www.etw.org
European workplace awards	www.eu100best.org
e2002 (Conference Prague)	www.abaw.net
eChallenges 2003 (Conference Bologna)	www.edchallenges.org
CSR Europe (Corporate Social Responsibility)	www.csreurope.org
MHC International (CSR)	www.mhcinternational.com

European RTD Project Sites

ATTRACT	www.cyberce.gr/attract	ROADCON	www.roadcon.org
AUDIOTAIN	www.audiotain.com	SABARECO	www.sabareco.com
AVATAR-CONFERENCE	www.avatar-conference.com	SANE	www.saneproject.com
BANCA	www.ibernatica.com	SASKIA	www.is-sd.org
BEEP	www.bEEP-eu.org	SEAMATE	www.seamate.net
B2B METRICS	www.info.de/b2b	SOCOOP	http://socoop.informatik.uni-stuttgart.de
CAPERS	www.posteurop.org	SIGIS	www.sigis-eu.org
DSSAD	www.digital-eu.org	SIGIS	www.rcss.ed.ac.uk/sigis
DIECOFIS	www.istat.it/diecofis	STARMATE	http://starmate.tti-upt.tlg.de
DIVERSITY	www.e-diversity.com	STILE	www.stile.be
E-CONSTRUCT	www.ecxml.org	SUSTEL	www.sustel.org
E-COGNOS	www.e-cognos.org	TEAM-HOS	www.team-hos.net/teamhos/home.nsl
E-GAP	www.egap-eu.com	TEAMWORK	www.euteamwork.net
E-LIVING	http://www.euresoom.de/e-living/	TELEBALL	www.teleball.lv ; www.teleball.ee
E-LOCUS	http://e-locus.fundaciontekniker.com	TELESOL	www.ednes.org/telesol
E3WORK	www.e3work.com	TERRA2000	www.terra-2000.org
EMERGENCE	www.emergence.nu	THINK	http://think.w3.it
EXTERNAL	www.dnu.no	THINK BALTI	www.think.lv ; http://think.w3.it
FAMILIES	www.families-project.com	TOWER	http://tower.gmd.de
FLEXWORK	www.flexwork.eu.com	UNITE	www.unite-project.org
FUTURE_WORKSPACES	www.avpro.ac.uk/fws/	VISOCON	www.cancer-network.de/videocon
HUMANTEC	www.humantec.it	VIEW OF THE FUTURE	www.viewiao.tlg.de/
IOCI	http://ioci.vti.it	VIP	www.unomondo.org
INTELCITY	www.scri.salford.ac.uk/intelcity	VISION	www.km-vision.org
JANUS	www.janus-eu.org	WHALES	www.gloriosa.com
KNOWCOAT	www.knowcoat.net	WIST-CIS	www.ednes.org/wistas
MOTION	www.motion.selleco.it	WWW-ICT	www.ttu-tamur.org/www-ict
NESKEY	www.neskey.com		
NOPIK	www.nopik.com		
OSMOS	http://ac.vti.it/projects/osmos		
OSP	www.osp-craft.com		
PRISM	www.eumtangibles.net		

International Sites

Canadian Telework Association	www.jvc.ca
Gil Gordon - telecommuting (USA)	www.gilgordon.com
Jala International (USA)	www.jala.com
Japan Soho Association	www.j-soho.or.jp
Japan Telework Society	www.telework-gakkai.jp
International Telework Academy (successor to Infi Telework Foundation)	www.telework-academy.org
The International Telework Association & Council (ITAC)	www.workingfromanywhere.org
& Telework America	

ANNEX 4 : DEFINITIONS AND GLOSSARY

Definitions

eWork

There are many definitions of eWork. This causes difficulties when trying to compare the results of different eWork surveys and research. The common element across all aspects of eWork is

"the use of computers and telecommunications to change the accepted geography of work."

Its origins can be traced to the introduction of the term "telecommuting" by Jack Nilles in the USA in his publication *The telecommunications transportation trade-off* (John Wiley & Sons, 1976), to denote this type of working arrangement. It was popularised by futurist Francis Kinsman in his book *The Telecommuters* (John Wiley & Sons, 1987).

The term "telework" had been popularised in Europe through its use by the European Commission, which from the late 1980s and early 1990s had sponsored considerable research in this field, particularly into the use of telework as a means to develop economic activity and create work opportunities in rural areas or places with economic problems.

The year 1999 saw the introduction of the eEurope initiative and of a new phase of European co-operation in the shift to a digital, knowledge-based society. The broadening in scope of ICT enabled work styles was reflected by the introduction of the term "eWork". The most commonly encountered terms are explained below.

Telecommuter

Generally interpreted to mean someone with an arrangement to avoid commuting by working at home, or closer to home.

Flexible Working

An employer-centred concept that encompasses a wide spectrum of new working practices, including flexible working hours as well as flexibility of work location, flexible contracts of employment. It can also mean flexible use of office space, such as 'hot-desking', where a group of people don't have personal desks but share a smaller number of desks, and use whichever one is free.

Telecentres

These are shared office facilities that provides a range of office services, often for employees of several companies, or different departments of the same company. It means that employees can use the office that's most convenient to him or her, rather than specific office space owned by their company or department.

Telecottages

A special class of telecentre, named because of its origins in rural villages. The telecottage movement started in Scandinavia and has now spread to many other parts of Europe, such there are now estimated to be over 500 telecottages across Europe. Telecottages perform multiple roles including offering training in teleworking technology and relevant skills, attracting work that uses these skills and hence being a stimulus to local economic development. They also provide local organizations and businesses access to more expensive office and hi-tech equipment.

Home-based Telework, Home Teleworking

In this mode of telework, the home is the locus of work and the main work location or base of a teleworking employee or self-employed teleworker. Part of the home is an 'office' workplace, with typical office facilities, such as filing cabinet, business phone, fax and a computer, plus of course, a modem or ISDN link into computer networks.

No madele (peripatetic) eWork

These eWorkers have no obvious single location where more work takes place than any other. Armed with mobile telephone and/or portable computer, their office is where the nearest phone plug is (or anywhere if they are on battery power and radio communications). Their work is location independent.

Remote Office eWork

A location physically distant from the main office, where one or more workers work. Such work may be individual work e.g. a member of a team who has not relocated to be physically close to the rest of their team, or a whole 'back-office' team. Such workers typically have 'remote access' to computer systems at the main office.

Offshore telework

A term coined by Management Technology Associates during their 1992-1993 Telework Study for the UK Department of Trade & Industry. A variant of the remote office idea where work is split across several countries. Jobs are shifted from one region, town or country to another. Pan-European call handling centres are example of this.

Televillage

This concept is an extension of the telecottage and is very much about lifestyles and preferences. A televillage is a whole community highly geared to the future work and lifestyles. The whole village is 'wired' and each home is fully equipped with an internal network connected to the village network and through broad band communications to the 'global village'. As portable and mobile technology become more pervasive, the wide range of working modes considered as one form of telework or another, start to blur, as does their comparison with 'conventional' work.

Teletrade

Teletrade literally means "doing business over networks". It uses advanced information and communications technologies (such as the Internet) to market and sell goods and services, enhance customer relationships and reach distant markets without the overhead of a local 'physical presence'. Although similar in concept to electronic commerce, the latter most often refers only to the actual trading transaction e.g. the placing of an order. EDI (Electronic Data Interchange) is an example of a technique that exemplifies the narrow view of electronic commerce. Teletrade covers all aspects of the selling cycle and the buyer-seller relationship. It includes making potential customers aware of products and services, such as through the Internet; providing means of ordering and in some case making payment over electronic networks; providing online support and generally enhancing customer relationships via focused two-way communications (e.g. via email or electronic communities) between buyer and seller.

Telecooperation

Telecooperation is the application of information and communications' technologies by individuals and organizations to enhance communications and access to information. People working collaboratively over a networked as part of a virtual team are an example of telecooperation. So is alliance building to create a network of dispersed individuals who come together to cooperate for a shared purpose. When more formal, this network may be considered a virtual organization (see glossary). Telecooperation entails new skills and changes to organizations. In particular the information and communications flows of traditional organizational hierarchies are undermined, and the barriers of communication across organization boundaries are dissolved.

Glossary of Terms

AET (Asociación Española de Teletabajo). Spanish Telework Association.

AFTT (Association Française de Teletavail et des TÉMactivités). French Telework Association.

Ambient Intelligence. The concept of ambient intelligence (Ami) provides a vision of the Information Society where the emphasis is on greater user-friendliness, more efficient services support, user-empowerment, and support for human interactions. People are surrounded by intelligent intuitive interfaces that are embedded in all kinds of objects and an environment that is capable of recognising and responding to the presence of different individuals in a seamless, unobtrusive and often invisible way.

Broadband. Generally data transmission speeds in excess of 1 Mbps. Contrast modem speeds of 28.8Kbps and an ISDN channel of 64Kbps.

Browser. The software used to display HTML pages on the World Wide Web. Netscape's Navigator and Microsoft's Internet Explorer are the world's most widely used browsers.

BTA. Belgian Telework Association.

Cable modem. A device that interfaces between coaxial cable television/voice channel and home computing equipment. Holds the potential for providing high speed Internet access.

Call Centres. An example of remote office working, where work previously dispersed is centralised into one centre, often located in an area with available labour, lower costs and good telecommunications connections. Calls to local customer service centres are automatically diverted to the centre, which typically covers a large region or continent.

CSCW (Computer Supported Cooperative Work). The software tools and working methods used to support team work, especially virtual teamwork (q.v.). It includes the use of computer conferencing, electronic 'white board' systems and use of intranets. A more popular, though restricted, term is groupware (q.v.).

CTI (Computer Telephony Integration). The integration of computer systems with telephones. This may be dial-out facilities from a computer, or more typically use of intelligent exchange facilities that brings up caller information and database records on a computer screen when a telephone is answered.

Cyberspace. A term used to describe the imaginative "space" where people communicate electronically using email and other online services, normally over the Internet. The name was originally coined by William Gibson in his science fiction novel *Neuromancer* to describe the "world" of computers, and the society that gathers around them.

Desk Top Conferencing (DTC). Videoconferencing where communications is from computer-to-computer, rather than remote video camera to local monitor.

Digital economy. Characterisation of the new global economy dominated by digital infrastructures, i.e. electronic or digital networks based upon ICT infrastructures and especially the Internet. (See also network economy).

eCommerce. Sales and purchase of goods or services over telecommunication networks, notably the Internet.

EDI (Electronic Data Interchange). The exchange of structured electronic messages (such as orders or invoices) over special telecommunications networks to replace paper transactions.

eEurope. An initiative by the European Union to accelerate the development of the knowledge economy.

eGovernment. The use of information and communication technology in public administrations combined with organizational change and new skills in order to improve public services and democratic processes and strengthen support to public policies.

ETIO. European Information Technology Observatory.

Email. Electronic mail. Sending and receiving messages over computer networks, such as the Internet.

ERDF (European Regional Development Funds). One of the four Structural Funds of the European Union.

ESF (European Social Funds). One of the four Structural Funds of the European Union.

eWork. Work practices making use of information and communication technologies to increase efficiency, flexibility (in time and place) and the sustainability of resource use.

Extranet. A network using Internet protocol, that allows external organizations, such as suppliers or customers, access to selected internal information. In essence, it is an intranet (q.v.) which gives external users restricted access (for example using password protection) to particular information through the firewall.

Free agent. A US term for an individual similar to the traditional free-lance worker but extended over a much wider geographical range and a greater number of interlocking markets because of new networking capabilities.

ftp (File Transfer Protocol). The process for transferring binary files (e.g. documents or software) across a network.

Groupware. A class of computer software that allows several users to collaborate through sharing information. Computer conferencing and group decision support systems are types of groupware.

GSM. A European standard for cellular phone digital communications. Allows mobile phones to be used in countries across Europe and certain other parts of the world (over 130 in total).

HTML (HyperText Mark Up Language). The code used on WWW pages to instruct the browser how to display the text.

http (Hypertext Transfer Protocol). The protocol used to transfer information across the World Wide Web. It indicates that the information is encoded in HTML (q.v.).

ICT (Information and Communications Technology). A general term that covers both information technology (computer hardware and software) and telecommunications equipment and services. Its increasing use indicates the growing convergence between these strands of technology.

Information Society. The term adopted by the European Commission to indicate a society where information is a key component of economic and social activity. Citizens, both consumers or workers, use information intensively.

Intelligent Agent. A piece of software using artificial intelligence techniques that operates autonomously using a set of rules. A common type of agent is one that roams the Internet and searches out information. Other types filter incoming information and messages for items of relevance to particular users.

Internet. A network of computer networks, estimated to be around 10 million world-wide. Any computer can join the Internet and exchange information, provided it makes an appropriate physical connection and operates the TCP/IP protocol. See also Intranet and Extranet.

Intranet. An internal Internet. In other words an internal computer network that runs the Internet Protocol (TCP/IP). Most intranets have a computer 'gateway' to the wider (external) Internet and deploy a 'firewall' to prevent unauthorised access to a company's information.

IPR (Intellectual Property Rights). Rights to intellectual material normally in the form of content on electronic networks where it can be difficult to control copying and use without the IPR holder's knowledge and/or permission.

ISDN (Integrated Services Digital Network). Services that allow sharing of multiple devices on a single line, e.g. telephone, fax and computer access to online services. Basic rate ISDN service (ISDN-2) consists of two 64kbps digital communications channels, while primary consists of 32. Although ISDN offers significant benefits for certain kinds of telework, their costs and ease-of-use have deterred many home workers when contrasted with high speed modems.

ISP (Internet Service Provider). A supplier of Internet services including access. Originally distinguished from IAPs (Internet Access Provider) since they provided the major back-bone connections between countries, and sold on bandwidth to smaller local IAPs.

ISPO (Information Society Project Office). A service unit established by DG Enterprise and DG Information Society to act as a bridge builder between Commission Services and external counterparts active in Information Society issues.

IST (Information Society Technologies) Programme. A European Union research, technology development and demonstration programme under the Fifth Framework (1999-2002) and Sixth Framework (2002-2006). The IST 5th Framework Programme was based around four Key Actions, including Key Action II on *New Methods of Work and Electronic Commerce*, as well as a number of cross programme activities and accompanying measures. The IST 6th Framework Programme includes the area of *IST for economic challenges* and the subarea of *eWork*.

IT (Information Technology). Strictly speaking is only computer hardware and software not including telecommunications equipment and services (cf. ICT), but is often used synonymously with ICT to mean both these types of technology especially as they are now substantially converged.

LAN (Local Area Network). A network that connects computer together within a small area, usually a single office. Facilities such as printers and disks can be shared. Many LANs have gateways to connect their users to external services such as the Internet.

MPEG (Moving Picture Expert Group). A group that defines compression standards for video (moving) images, notably MPEG-2. A new standard, MPEG-4, defines images in terms of objects and their attributes, making it easier to manipulate audio-visual objects remotely over networks.

NACT. National Advisory Council on Teleworking - National Council established by the Irish Government to advise it on the development of teleworking employment opportunities in Ireland and to recommend attainable actions which will contribute to the realisation of those opportunities.

NA5. New accession states – the 13 countries negotiating accession to the European Union (the 10 that are due to join in May 2004 plus Bulgaria, Romania, Turkey).

NC (Network Computer). A computer that relies on a computer network for its ongoing operation and software, which is downloaded as required.

Network economy. Characterisation of the new global economy dominated by networks, i.e. multitanous nodes and connections in contrast to hierarchical and otherwise controlled economies. Normally means the electronic or digital network based upon ICT infrastructures and especially the Internet. (See also digital economy).

NTF (Nederlands Telewerk Forum). The national teleworking association in The Netherlands.

RISI (Regional Information Society Initiatives). Part of the Article 10 of the Structural Funds.

SIT (Societa Italiana Telelavoro). A national society for teleworking in Italy.

Social Partners. Organized representatives of labour market interests such as employers associations' and trades unions.

SEEM. Single European Electronic Market.

SOHO (Small Office Home Office). Defined by marketers as a segment of buyers with common characteristics. This is a small office, that may be part of a person's home. The amount and size of equipment used is generally lower than that in large offices, and users more cost sensitive.

SME (Small to Medium Enterprise). In European Union terms this is defined as an enterprise which has less than 250 employees, is less than 25 per cent owned by large companies, and has a total turnover of less than 40 MECU or annual balance sheet of less than 27 MECU. This definition dates from 1996, and replaces an earlier definition that included enterprises less than 500 employees. It includes medium, small (less than 50 employees) and micro-enterprises (less than 10 employees).

TCA (Telework Association). The biggest telework association in the UK. Although its roots are in the telecottage movement and its full title was previously The Telework, Telecottage and Telecentre Association.

Teleactivity. A general term, not widely used, to include all types of teleactivity that are part of telework, teletrade or telecooperation. Examples of teleactivities are teleshopping, telebanking, telemedicine etc.

TWI. Telework Ireland, the professional association of Teleworkers in Ireland

UMTS (Universal Mobile Telecommunications System). The third generation mobile standard that supports speeds up to 2 Mbps, and designed as a successor to GSM. Its name is slightly misleading in that one of its aims is to provide seamless services to users across both fixed and mobile networks.

Videoconferencing. The use of camera (with microphone) and monitor to allow visual communications over a high-speed communications link (typically 1Mbps or higher) instead of proximity face-to-face communications.

Virtual Organization. An organization of various independent members that operates cooperatively (and may have been created) without the constraints of space and/or time.

Virtual Communities. Communities that have been developed around an area of common interest, and use online techniques to sustain themselves.

Virtual Teams, Virtual Teaming. The concepts of virtual working applied to a work team. Members of the team work at different locations and use telecooperation methods to progress their joint work.

Webcasting. Broadcasting live video and audio data over the Internet. For example, speeches and talking heads from conferences can be received by Internet users over the ordinary telephone network in real time.

WWW (World Wide Web). The collection of HTML pages that reside on Web servers across the world. It is estimated that there are over 100 million publicly accessible WWW pages on the Internet, a number that has been more than doubling every year.

ANNEX 5 : PUBLICATIONS

Publications of the European Commission

Title	Reference	Date
ISTAG <i>Scenarios for Ambient Intelligence in 2010</i>	ISBN 92-894-0735-2	February 2001
eEurope 2005 <i>An information society for all</i>	ISBN 92-894-3782-0 COM(2002) 263	May 2002
eWork 2002 <i>Status Report on New Ways To Work In The Knowledge Economy</i>	ISBN 92-894-3956-4	July 2002
eWork 2002 <i>Les nouvelles méthodes de travail dans la société de l'information en 2002</i>	ISBN 92-894-3957-2	July 2002
Research Networking in Europe <i>Striving for global leadership</i>	ISBN 92-894-3859-2	September 2002
Information Society Technologies Work Programme 2003-4	ISBN 92-894-4092-9	January 2003
The European e-Business Report 2002/2003 Edition <i>A portrait of e-business in 15 sectors of the EU economy</i>	ISBN 92-894-5118-1	March 2003
eGovernment Resource Book <i>Synopses of IST projects relating to eGovernment</i>	ISBN 92-894-5509-8	March 2003
Choosing to grow : Knowledge, innovation and jobs in a cohesive society <i>Report to Spring European Council Commission staff working paper in support of the report</i>	ISBN 92-894-4802-4 COM(2003) 5 ISBN 92-894-4810-5 SEC(2003) 25	March 2003

Publications obtainable from the Office for Official Publications for the European Communities, L-2985, Luxembourg

Electronic versions of Commission documents can be obtained by entering a search process at
<http://europa.eu.int/eur-lex/search/index.html>.

eWork magazines

Title	Publisher/Other Details	Frequency
European Journal of Teleworking (English)	Addax Comix Ltd. 70 Causewayhead, Penzance, Cornwall, TR18 2SR, UK Tel.: +44 1736 332736 Fax: +44 1736 334702	4 per year
Telewerken (Dutch) (including the N.T.FORUM Newsletter)	Overkleeft Uitgeverij bv Binkpoortstraat 38 7411 HS Deventer Tel.: +31.570 611044 kema@nademet.nl	6 per year Price: FL 72,50 per year Available by subscription only
Teleworker (English)	The Telework Association The Other Cottage Shortwood, Nailsworth Gloucestershire, GL6 0SH Tel.: 0800 616 008	6 per year

eWork Associations in Europe

Country	Address	E-mail/www	Tel/Fax
Austria Austrian Telework Association (ÖTA - Österreichische Telearbeitsvereinigung)	Akademistra. 2/4 A-1010 Vienna	info@oeta.at www.oeta.at	T +43 1 5852300-23 F +43 1 5852300-11
Belgium Belgian Teleworking Association	c/o Teleport Brussels Buro&Design Centre Esplanade du Heyzel B-1020 Brussels	info@bia.be www.bia.be	T +32 2 475 2000 F +32 2 475 2010
Bulgaria Bulgarian Telework Association	Vesselin Spindonov Khan Asparuh Street 49 Entrance A, Apt. 7 Sofia 1000, Bulgaria.	bgta@virttech-bg.com www.bg-telework.org	T +359 2 981 4762 F +359 2 981 5541
France Association Française du Télétravail et des Téléactivités (AFTT)	4 rue Jean-Jacques Rousseau 75001 Paris	info@aftt.asso.fr www.aftt.asso.fr	T +33 2 54 95 61 61 F +33 2 54 88 19 19
Ireland Telework Ireland (TWI)	Siochán Duffy Ballaghanna Mountrugent Co. Cavan	siochán@telework.ie www.telework.ie	T +353 47 72069 F +353 47 72070
Italy Associazione Lavoro & Tecnologia	P.O. Box 2395, 00100 Rome	dinicola@mdink.it www.telelavoro.rassegna.it	T +39 338 87 59 486 F +39 06 4 91 066
Italy Società Italiana Telelavoro (SIT)	Corso Vittorio Emmanuele II 209 I-00186 Roma	si.telelavoro@tin.it www.societaitalianatelelavoro.it	T +39 066 88 099 44 F +39 066 82 131 14
Netherlands Nederlands Telework Forum	Pompmolenlaan 10A NL-3447 GK Woerden	info@telewerkforum.nl www.telewerkforum.nl	T 31 348.483858 F +31 348.482288
Portugal Associação Portuguesa para o Desenvolvimento do Teletrabalho	Av. Miguel Bombarda 8 F, Apartado 117, 2780 Oeiras	global@apdt.pt www.teleman.pt/apdt	T +351 1 4416965 F +351 1 4415767
Portugal Associação Portuguesa de Teletrabalho	Av. D. Nuno Álvares Pereira 27 2735 Cacem	telework@automail.pt www.teletrabalho.com www.automail.pt/telework	T: +351 1 913 85 03 F +351 1 913 70 99
Spain Asociación Española de Teletrabajo	Las Calas 3 28016 Madrid	aet@aet-es.org www.aet-es.org	T +34-639-486 332 F +34-91-435 62 70
Sweden Distansforum - Swedish Teleworking Association	Box 70 S-184 03 Ljustero	info@distansforum.se www.distansforum.se	T +46 8 542 421 20 F +46 8 542 421 99
United Kingdom TCA – Telework Association	Freepost CV2312 WREN Warwickshire CV9 2RR	www.tca.org.uk teleworker@tca.org.uk	T +44 24 76 69 6986 F +44 1453 836174

European Commission

Collaboration@Work. The 2003 report on new working environments and practices

Luxembourg: Office for Official Publications of the European Communities

2003 — 258 pp. — 21 x 29,7 cm

ISBN 92-894-5755-4