*e*WORK 2002

Status Report on
New Ways to Work
in the Knowledge Economy

eWork 2002 - September 2002

Foreword

This report on the status of "eWork" development in Europe demonstrates continued progress in a new phase of European co-operation in the shift to a digital, knowledge-based economy.

The new common policy framework: agreed at the Lisbon Summit in March 2000 - to make Europe "the most competitive and dynamic knowledge-based economy, capable of sustained economic growth with more and better jobs and greater social cohesion" - is now reinforced by the agreements in Stockholm and Goteborg. Substantial progress towards this goal has been realised through implementation of the e-Europe Action Plan in 2000.
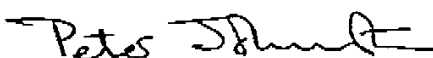
The new phase of European co-operation is also supported by the 5th Framework Programme for Research and Technology development, notably in the Key Action on "New Methods of Work". European projects are now underway and their first results are described in this report.

This new phase also has the broader scope of "ework" development for a substantial proportion of the European workforce. This includes continued development of telework, with its now proven benefits of flexibility in time and place. However, i now includes a greater concern for the "quality of work" and anticipates the revolution in work for most people as new wireless and display technologies change office equipment and design, and as the nature of work itself changes in a knowledge economy where the creativity and innovation became more important than simple productivity in routine tasks.

It must also now reflect the linkage between the transition to a knowledge economy and the achievement of sustainable development.

This report is again the joint effort of many people across Europe. We hope that it will be both a point of reference and a source of inspiration.

The views expressed are those of the authors and do not necessarily reflect those of the European Commission.

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1 Introduction

This report again provides an opportunity to take stock of the changes in work as Europe moves further to a knowledge economy.

In 2002, Internet use has again increased, and we have the highest levels of use of digital mobile telephony in the world. Despite the slowdown in growth, and the difficulties in the Technology and telecommunications sectors, we still have excellent prospects for sustained economic growth. In 2002, we can also now realise the full benefits of the single currency. Yet substantial structural change is now more widely accepted as vital. Structural change means change in the way governments and business operate and in the way we work.

These changes are most urgently needed to boost productivity and increase non-inflationary growth. But they will be also necessary if we are to successfully manage the transition to a stable but older population, and to greater environmental and social sustainability in a global Information Society.

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

Section 2 summarises and updates the policy framework for eWork development in the context of the Lisbon Strategy for a the transition to a knowledge economy and the EU strategy for sustainable development.

Section 3 includes new research results for some of the current EU research activities now underway in the 5th Framework Programme.

Section 4 summarises the extent to which ework has been introduced in Member States, in some of the Countries now in Accession negotiations to join the Union and from the USA, Canada 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 methods of work in the last 12 months.

Section 5 summarises the directions and priorities for research and technology development (RTD) in the European Framework Programme. An updated set of RTD projects are described in Annex 3.

Section 6 is devoted to the wider "eWork Agenda" : reports of major conferences in 2001, and of the European *e*Work Week in November 2001.

2   European Policy Framework for eWork

The Lisbon strategy

The European Council in Lisbon in March 2000 set a new strategic goal for the Union for the next decade : **to become the most competitive and dynamic knowledge-based economy capable of sustained economic growth with more and better jobs and greater social cohesion.**

The overall aim is to raise the employment rate from an average of 61 % as close as possible to 70% in 2010 and to increase the proportion of working-age women in employment from an average of 51% today to more that 60% in 2010.

The e-Europe Action Plan was a first step. It was adopted in June 2000, and set targets in 11 areas where co-ordinated action by Member States was most needed: one of these is in the **modernisation of work organisation in a knowledge-based economy**.

European Heads of State have reviewed progress at the European Councils in Stockholm in March 2001 and in Barcelona in March 2002. Europe enjoyed 3.5% growth in 2000. Over 2.5 million new jobs were created: more than two-thirds of them taken up by women; and unemployment fell to its lowest level since 1991. In 2001, business and consumer confidence which weakened and growth slowed. Job creation also slowed, with forecasts suggesting that only 3.3 million jobs will be created in the period 2001 to 2003 in contrast to the 2.4 million created in 2000 alone.

In November 2001, almost 50% of the population (over 15 years) used the Internet either at home, at work, at school, in public access places or on the move. Over 100 million Internet users go online at least once a week, and this is likely to rise to over 200 million by 2004; over 73% use digital mobile phones, and these will become a second, and probably preferred, method of accessing internet services when 3G capabilities become widely available in 2003.

In Stockholm, Heads of State nevertheless strengthened their commitment to increasing participation in employment, with intermediate targets of 67% for the whole working-age population, and of 57% for women by 2005. They also set an EU target of 50% employment participation for older men and women (55-64) by 2010.

Framework agreements for telework

Heads of State are committed in the eEurope Action Plan to support telework through agreements by Social Partners. In December 2000 the European Social partners (UNICE, ETUC, UEAPME and the CEEP) agreed in principle to discuss an agreement. In March 2001, the Commission formally requested them to establish general framework provisions at Community level, and Heads of State in Stockholm and Barcelona looked forward to a positive outcome of these discussions - due in June 2002.

The Commission has proposed a wide definition of telework as "a method of organising and/or performing work in which a considerable proportion of an employee's working time is : away from the firm's premises or where the output is delivered, and when work is done using information technology and technology for data transmission, in particular the Internet". This covers telework at home, alternation between work in the firm's office and at home; mobile telework, and work in local telework centres.

The Commission has proposed the following general principles : voluntary participation and the right of return to "normal working", maintenance of employee status, equality of treatment, adequate information on assignments and working conditions, coverage of costs by the employer, a guarantee of specific training, health and safety provisions, respect for working time, protection of privacy and personal data, contact with colleagues, collective rights, and equal opportunities.

Indicators of change

The *e*Europe initiative provides an ambitious policy framework. But, accurate and consistent information about the current extent of change is an essential foundation against which further progress can be monitored. In 2000, the "Status Report" on eWork development in Europe included the results and analysis of the major survey carried out for the European Commission in 1999-2000 of the extent to which telework has been introduced in 10 Member States. It showed that telework was already an established working practice for about 10 million Europeans. Extrapolation of current trends at that time suggested that over 11% of the European workforce would telework by 2005.

In 2001, the first "Eurobarometer" survey[1] of new working practices in all Member States confirmed that the overall level of "officially recognised" telework, within negotiated framework agreements is still too low - only about 4% of the EU workforce as a whole. However, it also shows how fast work is changing: in 2001, 45% of workers used a computer - 74% of all "white collar" workers - and 20% of workers also used a computer at home for work purposes : although only 1 in 10 were yet connected to their employer's Intranet.

Computer users for work by gender and occupation - 2000-2001
(% EU workers by category)

Nov. 2000
Oct. 2001

Men 44,4 / 52,4
Women 45,9 / 54,4
Self-employed 41,5 / 52,1
Managers 79,8 / 87,0
Other white collar 68,8 / 77,1
Manual workers 21,8 / 27,2
average EU workers 45,0 / 53,2

Source: Eurobarometer
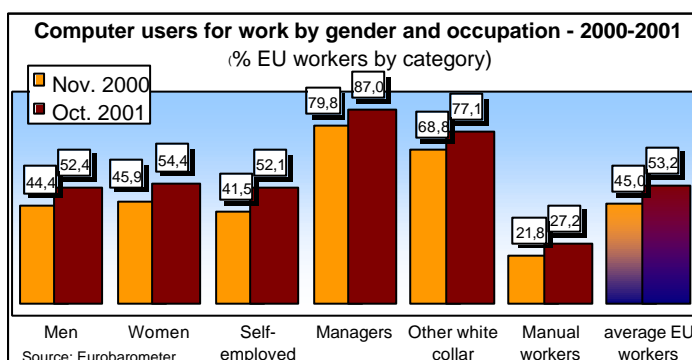
More than half of EU workers use computers for their jobs, and this number is continuosly growing - by about **a fifth since last year**. Three out of four white collar workers are ICT users. However, ICT penetration among manual workers is still worryingly low, presenting a serious barrier for their adaptability. Though ICT usage is increasing throughout the economy, its intensity differs across sectors[2] and the up-take is much lower in small and medium sized enterprises (see B2).

Marked differences among the Member States prevail, but **progress** is overall encouraging and **particularly significant in some countries** which were below the EU average last year[3].

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[1]   *Benchmarking report on "Strategies for Jobs in the Information Society" : January 2001.*

[2]   *See EITO report 2001, 139 pp; European Commission, Communication on the impact of the e-economy on European Enterprises : Economic analysis and policy implications, COM (2001) 711.*

[3]   *Eurobarometer have the advantage of an EU-wide survey with samples of about 1000 interviews per Member State. However, readers are reminded that survey results are estimations within confidence-limits of up to 3 % for samples used by Eurobarometer. For these confidence limits, a slight decrease compared to last year, as e.g. for Portugal in the above chart, may not necessarily imply a decrease in actual numbers.*

Use of computer for work
(% of workers per Member State)

	2000	2001

Chart values (2001): B 50,5; DK 73; D 55,5; EL 35,6; E 42,4; F 44,9; IRL 43; I 57,8; L 66,1; NL 64,8; A 57; P 27,2; FIN 66,8; S 71,4; UK 58,9; EU 53,2

Source: Eurobarometer, Nov. 2000, Oct.2001
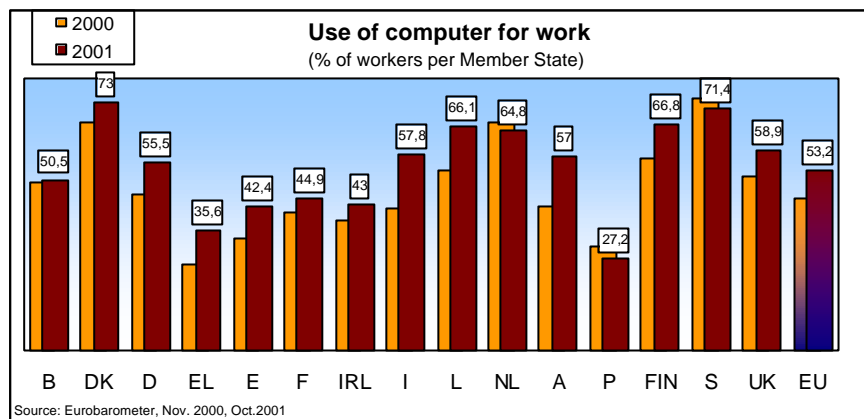
User jobs are increasingly **networked**, with about three out of four computer users for work accessing the Internet[4].

Internet use among computer users for work
(% EU average by category referring only to computer users for work)

Chart values: Men 75,7; Women 64,9; Self-employed 74,4; Managers 81,9; Other white collars 68,1; Manual workers 57,6; average EU comp. users for work 71,1; average EU citizens (June 01) 34,3

Source: Eurobarometer, Oct. 2001 (for computer users for work), June 01 (for all citizens)
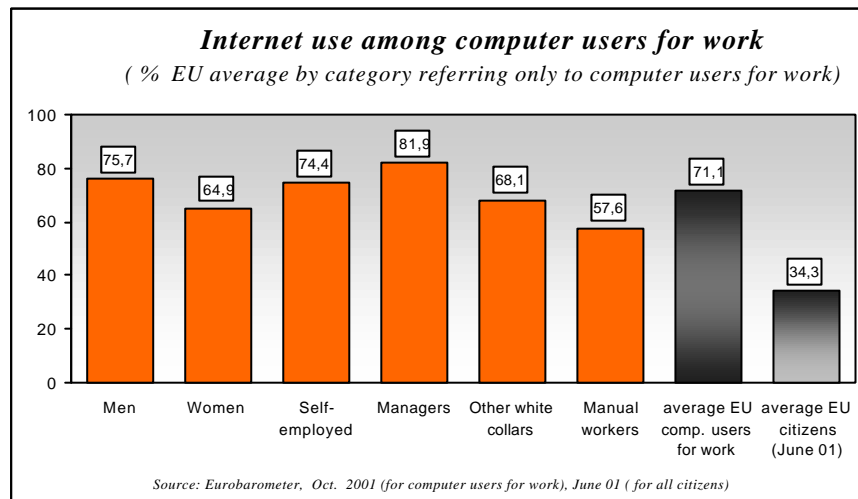
Digital skills are becoming essential for the **employability and adaptability of all workers.** More than 90 % of users perceive computers and the Internet as important for **for doing, getting or keeping a job**.

For ework, the latest "Eurobarometer" survey results from November 2001 show that expectations of rapid growth have not been met over the last year, if a *traditional* definition is applied[5]. eWorkers are still at about 5% of EU workers, and marked differences prevail among Member States, and according to occupation and gender.
However, the survey also highlights the **huge untapped potential**, as one worker in four has used a PC for work-related purposes at home in the last year and would be interested in teleworking.

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[4]   *For a detailed analysis of Internet usage and digital divides among the EU population see the Commission Staff Working Paper on "e-Inclusion", SEC (2001) 1428; for the eEurope benchmark of Internet access in EU households see the [Communication on eEurope benchmarking, February 2002].*

[5]   *Definition of Eurobarometer question : "Telework occurs when paid workers carry out all, or part of, their work away from their normal places of activity, usually from home, using ICT."*

eWorkers and interest in ework
(% EU average by gender and occupation)

Legend:
- teleworkers 2000
- teleworkers 2001
- interested in teleworking 2001
- use computer at home for work 2001

Men: 6,1 / 6,1 / 25,0 / 26,2
Women: 4,8 / 4,7 / 27,3 / 20,5
Self-employed: 7,1 / 7 / 20 / 36,9
Managers: 15 / 11,9 / 38,2 / 51,7
Other white collars: 6,4 / 6,6 / 34,8 / 21,6
Manual workers: 1,2 / 1,5 / 19,3 / 7,6
average EU workers: 5,6 / 5,4 / 26,1 / 23,8
unemployed: 36,4

Source: Eurobarometer, Nov. 2000, Oct. 2001

The results of the EMERGENCE project, reported in section 3, applying a **broad definition** of telework[6], indicate that the dominant forms of eWork by employees within organisations have become the use of **remote offices**, many of them call centres, and the employment of **multilocational workers**, rather than fully home-based eWork. In addition, the largest and strongly growing proportion of e-work involves **outsourcing driven** by the search for technical expertise (software development and support, creative work including design, editorial work, multimedia content generation etc…), cost and quality considerations.

New ework facilities, via advanced mobile and handheld devices, are expected to spread across the workforce in the years to come. This could strongly extend the potential benefits of e-work (e.g. in terms of productivity, work organisation, and work/life balance), but will also create new challenges for safeguarding health and safety and the quality of working life.

From telework to eWork - new skills and better jobs

This new phase has the broader scope of "ework" development for a substantial proportion of the European workforce. This includes continued development of telework, with its now proven benefits of flexibility in time and place. However, it now also anticipates the revolution in work for most people as new wireless and display technologies change office equipment and design, and as the nature of work itself changes in a knowledge economy where the creativity and innovation became more important than simple productivity in routine tasks.

Greater participation in work requires that work is not only more accessible, but that it is more attractive: Not just "more jobs", but also "better jobs" : a good working environment, a better reconciliation of work and personal life, health and safety at work, employee involvement, and diversity in working life. As a first step, the Commission published in March 2002 a report - "Quality for Change" based on the results of the Eurobaromenter survey and imput from Member States through their representatives in the Committee on the Employment and Social Dimension of the Information Society. It clearly shows that the Knowledge Society opens new perspectives for the quality of work : creating the conditions for change in existing jobs, generating new working methods and new ways of organising work, allowing greater flexibility in the workplace.

The Eurobarometer survey confirms the **overall positive impact of ICT for quality jobs**. Nine out of ten respondents say that Information Technologies help to use higher skills, to increase responsibility, to work more productively, to manage better relevant information flow, and to better combine work and private life.

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[6]   *The definition of "ework" applied by the EMERGENCE project encompasses any work which is carried out away from an establishment and managed from that establishment using IT and a telecommunication link for receipt or delivery of work.*

Quality of work changes by using a computer, e-mail/Internet
(% of responses on each item - sample : EU computer users for work)

	need more/less skills in your job	have more/less responsibilities	carry out more/less tasks in one day	easier/more difficult combine work and private life	job is easier/harder	easier to manage relevant information
less/decreased	9,7	9,2	6,9	13,8	12,1	6,5
more/increased	90,3	90,8	93,1	86,2	87,9	93,5

Source: Eurobarometer, Oct.. 2001

■ more/increased   □ less/decreased

The scope for innovation and gains in productivity is also enormous: liberation of nearly 50% of Europe's workforce from the constraints of the keyboard and CRT display (in the proper use of which less than 20% have been properly trained) can improve work satisfaction and efficiency for a wide spectrum of people, and allow companies to rethink work organisation within the office as well as outside.

New research frameworks and priorities

The 5th Framework Programme for European Research and Technology development, notably in the Key Action on "New Methods of Work" is now completely implemented, and results are becoming emerging. Some are highlighted again in section 3 of this report.

This support for European research and technology development will continue in the 6th Framework programme, now adopted by co-Decision of the Council and Parliamnet for the period from 2003 to 2006. This includes provision for further support to research on eWork systems, focused on new workplace designs incorporating innovative technologies to facilitate creativity, increase resource-use efficiency and to extend work opportunities for all in local communities.

Towards sustainable development

The broader scope reflects new policy priorities. Telework is not just about greater efficiency and labour - productivity - it is increasingly the most effective way to improve the work/life balance; the way to stimulate new creativity and the way to more efficient use of office space and transport infrastructures.

Sustainable development will not be easily achieved, even in a knowledge economy dominated by trade in immaterial services. Social and economic sustainability will require greater efforts to engage everyone in creative activities, in strong communities that preserve the cultural diversity of Europe. Environmental sustainability will require much greater collective efforts, by both the business community and governments to improve resource-productivity through better organisation of work and business.

In building on the successes of the European Council in Lisbon, the Commission therefore proposed to link the strategy for the transition to a knowledge economy with a comprehensive strategy for sustainable development in Europe.

The Summit in Göteborg in June 2001 confirmed the commitment of Member States to broaden the Lisbon strategy to encompass the environmental challenges to sustainable development within the transition to a knowledge economy, in a win-win combination with increased business efficiency and competitiveness. eWork features specifically in the new measures proposed by the Commission to reverse unsustainable trends in congestion and land-use, as well as in green-house gas emissions[7].

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[7]   *A sustainable Europe for a better world: A European Union strategy for sustainable development : COM(2001)264 15.5.2001*

3   New research results
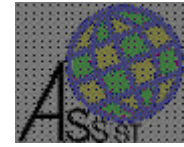
3.1   Immaterialisation - Defining the problem : ASSIST project

Perhaps the greatest challenge that the European Community faces is that the lifestyle which it supports and promotes, and indeed which it wishes to extend to others beyond its existing boundaries, is in all probability not sustainable in the long term.

One of the key benefits claimed by proponents of ework has been that it should benefit sustainability, particularly by the reduction in energy use associated with firstly, reduced commuting and secondly, reduced business travel (which are actually quite different issues). Although no single study seems to have been so large or so wide-ranging as to offer convincing proof, there is at least enough evidence available to lend support to the view that commuting is reduced. However the case for the overall reduction in business travel remains unproved and often strongly disputed, lack of evidence either way notwithstanding. The relatively undeveloped state of tools for making an environmental assessment of e-work impact has, in the past, been offered as one reason for this lack of certain proof. The relatively immature state of IST (and particularly broadband) deployment is also offered as a reason for lack of clear benefit in some areas. These two reasons no longer really apply: our toolbox is filling up with useful devices, and (at least in some regions) broadband's deployment is generating a new generation of ISTs. There is a third issue, however, and that is the failure of the key concept of immaterialisation to develop either a rigorous theoretical base or (perhaps in consequence or perhaps as a cause) a strong base of support. The sustainability benefits of ework form a very large sub-set of the topic of immaterialisation, to the extent that a full understanding of the two topics, ework and immaterialisation, involves a critical level of interdependency. We can not fully understand ework without fully understanding immaterialisation, nor can we fully understand immaterialisation without understanding ework.

A new understanding of Immaterialisation

The ASSIST study responded to the need which thus arose for a fresh look at the subject from the very beginning, starting from the underlying needs and values that influence such basic attributes of life as our consumption patterns and our modes of work. Relevant studies and theories in sustainable development; and a wide variety of socio-economic theories and theories of and about consumption (which, in general, had been derived without the benefit of any strong view of the future development of ISTs) were utilised in order to achieve a deeper and more appropriate understanding of IST immaterialisation (sometimes called 'substitution'; or 'eco-efficient services').

The result of this fundamental (re) assessment was the recognition that immaterialisation operates solely as a switch motivated by, and effecting, lifestyle change. In this switch, individual needs come to be satisfied by some new (and far less material) complex of IST-based satisfiers than before. Single products and services are not particularly relevant except in the aggregate, and there is not generally any question of making a one-to-one direct substitution of the sustainable for the unsustainable. IST immaterialisation is thus a social rather than an individual activity, modifying the entire lifestyle of an individual; a group of people; an enterprise or possibly a culture or sub-culture by a succession of immaterialising switches, each of which is a discrete step but not, of itself, a total solution.

In-depth analysis of the switch mechanism directs attention very clearly to three essential components, which can be paraphrased as quality-of-life enhancement; the attractiveness of ISTs; and the influence of generational succession.

Conclusions - Integrated Lifestyle Packages

The outcome of the ASSIST study is a new and (for the first time) implementable understanding of what has the potential to become the dominant contribution of ISTs to sustainability. All of the essential understandings are now in place: some gaps in knowledge are identified as in need of attention, and the expression of the subject remains to some extent limited by lack of familiarity of the concepts and by the consequent lack of an accepted vernacular within which to discuss it, but it is now nonetheless possible to move away from theoretical development and on to pilot

action on implementation.

An Action Plan for pilot implementation of immaterialisation is proposed which has as an objective the exploitation of alignments available between the commercial imperatives of IST development and the imperatives of sustainability.

The Action Plan proposed will fill some perceived gaps in knowledge; develop the understanding of ISTs as 'Integrated Lifestyle Packages'; bring assessment tools (such as LCA-I) to a more advanced state that would allow confidence in their use and results; and extend the existing bridges between the IST community and those communities with wider interests in lifestyle issues in society as a whole.

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ATTRACT

3.2   *Advanced Teleworking Techniques and Teleservices for Insurance Agents and Customers : ATTRACT project*

This report presents the objectives and up-to-date results of the ATTRACT project.

The current project adopts an eworking scenario on how insurance industry players can be empowered using the advanced capabilities of digital technologies. Beyond the traditional business models of the insurance sector, possible impacts of introducing e-technologies to the insurance sector's work are examined. Two new business models have arisen the first revolutionizes the relationships, and subsequently, the methods of work between insurance agent - customer and insurance agent - insurance company and the second between the insurance provider and vendors from content related complementary markets.

Two-way communication with insurance customers can be accomplished via the Web. It is evident that the capabilities of electronic commerce may radically change the way of such communication. In the insurance business, consumers will soon be able to post their needs on a Web site, and have on-line insurance companies provide them with quotes for tailor-made policies. This will definitely change the rules of competition in this industry. However, changing the rules of the game in the insurance industry is not merely an issue of electronic distribution channels. It is about *new methods of work* and *new types of interactions and relationships* among the key industry players. Hence, the core question lies not in the design of new e-applications, but in redefining the business models that can describe new methods of work and new types of interactions among the insurance industry business roles.

The main players that are usually involved in the insurance industry environment include :

- Insurance Company (viewed only as the 'manufacturer' of insurance products)
- Insurance Agents
  - o Exclusively employed by an Insurance Company
  - o Aggregators or brokers - they promote and sell products of more than one Insurance companies
- Customers (current and potential)
- Vendors from content related complementary markets (for example, content related complementary markets to an insurance product for cars can be car alarm or car stereo markets).

In the digital era, the geographic coverage of a services company can be maximised due to the increased mobility and capacity of the insurance agents who are able to telework. Employing digital technologies, the interactions among the various stakeholders of the insurance market become more effective. Agents may now use the proposed tele-working solutions to achieve mobility, increase the effectiveness of contacts with customers and prospects and receive support and information from the "mother" insurance company. The customers may prefer to interact with a virtual insurance agent through which they can get insurance products and services. Moreover, insurance products and services can be packaged together with goods that need to be insured. Hence, combining complementary markets' products with their insurance counterparts augments significantly the proposition to the customer.

To support the new methods of work that have been identified, the Attract project develops an integrated systems that delivers three sets of services :

- *eWorking techniques for agents.* It is an advanced occupational tele-business environment for agents instead of the traditional working one, in order to empower and facilitate insurance workers in remote and direct access to valuable information and to extend dynamic work flow and process management for promotional and merchandising activities. Furthermore, through value-added eworking techniques, this e-system facilitates the remote use of tested business practices and methods for customer profiling and financial planning. Finally, eworking accomplishes the just-in-time communication among agents and the insurance company.

- *Tele-services for Customers.* Through the set of tele-services provided to customers, this e-system aims to provide direct access to personal information management for customers and the ability to perform remotely event-driven transactions. Moreover, tele-services empower the direct communication between customers and their agents as well as the adoption of tailor-made solutions provided by insurance agents or company.

- *Cybermediation (on & off line) for Vendors.* By means of this e-system, vendors will be facilitated for the cross-selling of content related complementary products and services to potential customers. A customer is identified by the third trusted party of an agent, always incorporating customer right protection principals in accordance with EU data protection legislation.

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3.3   *Adaptability of Work Arrangements in the EU : AWAI project*

ICT-enabled new ways of working are in general associated with increases in flexibility, and as such are central to the European Employment Strategy. In the course of the SIBIS project (*www.sibis-eu.org*) work was undertaken on innovative ways to compare the progress individual EU Member States have made with regard to the diffusion of flexibility on labour markets. In order to do so, an index model was set up that aims to be in line with key policy objectives of the European Community, which means using a radically different approach as compared to existing labour market flexibility indices such as the one developed by the OECD.

Underlying this work is the observation that discussions about flexibility trends tend towards oversimplific ation and inadequate generalisation of developments. All divergences from 'regula r employment relationships' are treated much as being made from the same cloth. In reality, we may observe a number of diverse and possibly contradictory developments. We have to take into account, for example, that the issue of flexibility always contains the question of how flexibility is distributed between the supply and demand side of the labour process. For this reason, SIBIS distinguishes between *worker-centred* and *company-centred flexibility*. The AWAI (Adaptability of Work Arrangements Index) thus consists of two elements: one subindex measuring worker-centred flexibility and another one measuring company-centred flexibility.

Against this background, the changes affecting work organisation can be conceptualised by looking at its four basic dimensions: working time, working place(s), type of contract, and work content (applied skills).

For each of these dimensions, a number of key indicators were identified. The selection is based on the SIBIS model of changes in work relationships, but also influenced by data availability concerns (as only indicators for which up-to-date, time series data is available were chosen). The table below shows the selection of indicators for both sub-indices :

Indicators for measuring adaptability of work arrangements (AWAI)

Dimension	Indicator (source)[8]	
	Worker-centred flexibility	*Company-centred flexibility*
Time	Voluntary part-time working (LFS)	Part-time working (LFS)
Time	Temporal autonomy in job (ECaTT)	Workers with atypical working times (evening, night, weekend work and working long hours) (ESWCs)
Place	Home-based teleworking (excluding self-employed) (ECaTT)	Tele-cooperation (ECaTT)
Place	Teleworkability (ECaTT)	Mobile teleworking (ECaTT)
Contract	Satisfaction with job security (Eurobarometer 44.3)	Employment Protection Legislation Indicator (OECD)
Contract	Average job tenure (OECD/LFS)	Workers with temporary work contracts (excluding voluntary and contracts for training) (LFS)
Content	Share of population aged 25-64 participating in training (lifelong learning) (LFS)	Employees who have had training provided by employer (past 12 months) (ESWCs)
Content	Participation in decision-making concerning changes at workplace (ESWCs)	Management by objectives (ESWCs)

For both subindices SIBIS calculated AWAI scores for each of 10 EU Member States for which data on all indicators was available. Comparing the results for both sub-indices (see table below, where a high score value indicates high flexibility) shows that there are marked differences between both rankings, with some countries performing well in one subindex and below-average in the other.

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[8]   *LFS = Community Labour Force Survey (quarterly), ECaTT = Benchmarking Progress on Electronic Commerce and New Methods of Work (1999), ESWCs = European Survey on Working Conditions (1990; 1995; 2000), ISSP = International Social Survey Programme (annual).*

AWAI Subindices on worker-centred and company-centred flexibility: Results

	Worker-centred flexibility		Company-centred flexibility	
	Score	Rank	Score	Rank
Denmark	5.88	3	5.13	4
Finland	5.88	3	6.00	3
France	2.38	9	3.50	7
Germany	5.13	5	3.38	8
Ireland	2.50	8	4.00	6
Italy	4.63	6	2.38	10
Netherlands	6.63	1	6.63	1
Spain	2.00	10	3.00	9
Sweden	6.13	2	4.63	5
U.K.	4.50	7	6.63	1

Comparing the results for both subindices, we can distinguish between four groups of countries (in columns we have put the difference between both AWAI values, where a positive value means that the country ranks higher in average with regard to worker-centred flexibility, and a negative value indicates that it performs better with regard to company-centred flexibility) :

- The first group consists of countries that perform well in both subindices: In particular the Netherlands (0.00) which are at the top of the rank in both indices, and also Finland (-0.12) and Denmark (+0.75). These Member States seem to come closest to reaching the aims of the European Employment Policy.

- A second group is made up by countries who perform weak in both subindices and includes France (-1.12) and Spain (-1.00). Here it seems that these countries still have a long way to go before they reach at least EU average levels of labour market adaptability.

- A third groups contains countries that score high on the worker-centred subindex, but much lower on the company-centred subindex: Italy (+2.25), Germany (+1.75) and Sweden (+1.50). In these EU Member States, flexibility on labour markets is distributed in favour of workers, while companies may be in need of a more flexible regulatory environment.

- The last group is made up by countries that score high on the company-centred index, but low on the worker-centred index, and includes the U.K. (-2.13) and Ireland (-1.50). In these EU Member States, flexibility on labour markets seems to benefit mainly employers.

The research on AWAI is work in progress, which means that the selection of input indicators is by no means considered to be final. In particular, availability of data puts constraints on the possibility to input indicators that optimally reflect changes in labour markets. The SIBIS project (described elsewhere in this volume) represents one of the efforts of the European Commission to come up with more up-to-date indicators. SIBIS not only develops new statistical indicators, but also pilots them through a set of EU-wide general population and establishments surveys. It is planned that some of the indicators tested in SIBIS will feed into the next version of the AWAI, to be published in the last quarter of 2002.

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3.4   *Exploiting IT for Maritime business in the NAS Free Ports areas : BALTPORTS-IT project*

The BALTPORTS-IT project is aimed at promoting and supporting the dissemination of knowledge gained during the execution of the successfully completed EC funded projects such as AMCAI, DAMAC-HP and SPHERE and the Lithuanian regional research project ITMK, as well as it's industrial utilisation and transfer of technologies, simulation models and information systems. It focuses on the sub-regional activities within the NAS Free Ports Areas.

The objectives of BALTPORTS-IT include :

- Set-up of the Baltic sub-regional Competence Center for promoting and supporting the distribution of research knowledge in the field of advanced IT-solutions and simulation with maritime applications, Riga (Latvia)

- Dissemination of research knowledge gained during the execution of the EC projects AMCAI, DAMAC-HP and SPHERE and regional project in the field of IT-solutions and simulation of harbour managing

- Industrial customisation and exploitation of the project results from AMCAI, DAMAC-HP, ITMK and SPHERE by involving user groups in the Baltic region

- Development of recommendations for the application of results and thus creating new market opportunities

- Creating opportunities for the training of specialists in maritime information systems design and port logistics by using web-based technologies and distance learning courses.

The expected results of the project are :

The industrial customisation of simulation systems in collaboration with user groups from the Baltic region will provide new approaches for :

- the non-monetary evaluation of general characteristics for port operations
- the optimisation of logistic operations in container terminals
- the optimisation of logistic processes in oil terminals
- a methodology of combining port simulation and information systems.

A demonstrator for distributed and web-based simulation of port environments will be built.

Web Page: http://www.baltports-it.com

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3.5   *Developing a Shared Virtual Workspace for project teams in construction : DIVERCITY project*

Background

The European construction industry accounts for approximately *11% of GDP*, and *employs 8.8 million people directly* and 26 million people indirectly. Amongst the total number of construction companies in the EU (2 400 000 companies), *SMEs* count for *83%* of the turnover.

A typical construction team on a project comprises 20 or more organisations, formed into a temporary project team. Such teams are likely to be a unique combination of partners for each major project. These organisations are geographically separated. They have a pressing need to follow efficient project processes, set up integrated communications infrastructures, and develop shared models of the project and the buildings they are constructing. According to the Egan report[9], the construction industry is dealing typically with projects as a series of sequential and largely separate operations undertaken by individual designers, constructors and suppliers. There is considerable benefit to be gained from substantially integrated solutions being applied by project teams as a means of re-engineering the project process. A building project can be considered as a successful project only if the final result meets the expectation of all the stakeholders. All parties need to work together as a temporary virtual organisation and get involved in setting up common objectives to deliver the final product successfully.

A recent benchmarking review of IT usage in briefing and design has identified serious shortcomings in the construction industry[10]. IT systems being used in the industry at present support stand-alone point to point applications dealing with parts of the internal operations of participants in the process.
This lack of technological uptake is compounded, in Europe, by the fact that research is under funded - investment is limited to 0.3% of the sector's turnover, compared with the situation in Japan where investment is of the order of 2.0% -3.0% [11].

There is scope for considerable improvement in the industry's performance, productivity and ability to meet increasingly demanding customer needs by the prudent use of ework within the construction industry.
There is a genuine need in the construction industry to explore the use of interactive computer modeling and simulation environments to improve client briefing and design reviews. Such environments can then be used to capture the client's needs and to ensure the compatibility between the client's vision of the project and the resulting product.

Furthermore, such interactive technology can be used to consider life cycle issues such as concept and detail design, environmental impact, space planning, facilities management, emergency evacuation, security and constructability during design reviews. This can facilitate concurrent engineering by involving planners, architects, designers, civil engineers, contractors, facility managers and security personnel.

The Divercity Project

DIVERCITY is a framework 5, IST funded project. It aims to develop a "shared virtual construction workspace" that will allow construction companies to conduct client briefing, design reviews, simulate what if scenarios, test constructability of buildings, communicate and co-ordinate design activities between teams. Both synchronous and asynchronous interaction will be emphasised in this software framework. This multi-disciplinary research project is developing innovative workspace technologies for the construction industry and is evaluating the results on live projects. These novel workspace technologies being developed give due considerations to organisational, human and environmental issues to enhance current work practice in the construction industry. The partners are based in Denmark, Finland, France, Italy and UK.

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[9]   *In early 1998, the UK's Department of Environment, Transport and the Region formed a Task Force, under the leadership of Sir John Egan, to set an agenda for the construction industry to improve its efficiency. The report produced by this group (Egan Report) has identified five key drivers for the construction industry: committed leadership, a focus on the customer, integrated processes and teams, a quality driven agenda and commitment to people. The Egan report also recommends the innovative use of IT tools to support integrated teams and the use of computer modelling techniques to minimise the problems of construction on site.*

[10]   *Construct IT, «Bench Marking Best Practice Report : Briefing & Design », Construct IT, UK, 1996, ISBN 1 900491-33-8.*

[11]   *«The Competitiveness of the Construction Industry», Brussels, 04.11.1997, COM (97) 539 final.*

The research undertaken in the DIVERCITY project has the following objectives :

- Creation of a **client-briefing workspace**, which can facilitate interaction and communication of design ideas between the client and the architect
- Creation of an **interactive design review workspace**, which can facilitate multi-disciplinary design reviews involving different stakeholders of a construction project (i.e., planners, architects, designers, civil-engineers, electrical engineers, contractors, facility managers and security personnel etc.)
- Creation of a **virtual construction workspace**, which can assess the constructability (construction sequence, scheduling, material handling etc.) of a building
- Specification and development of a software framework for integrating the above three workspaces and sharing them over networks to support collaboration between geographically distributed project team members.

Results to Date

To date, Divercity has developed six products, namely :

a) <u>Client Briefing</u> : the application aims to provide a tool to support clients and designers during the initial stages of a construction project. The application aims to provide tools for capturing the basic details of a design project, identifying the strategic and spatial requirements and to allow experimentation of alternate spatial layouts, developed from the captured data.

b) <u>Acoustics Simulation</u> : the acoustic module of Divercity offers users the ability to automatically read the CAD-model, to interactively change materials of the building components (walls, floors…) and to "listen" to the acoustic environment inside a building taking into account sound scenes inside and outside the room.

c) <u>Thermal Simulation</u> : the thermal module of Divercity offers users the ability to automatically read the CAD-model yielded by a CAD tool supporting IFC export, to interactively change materials of the building components (walls, floors,…) and to simulate variation of temperatures in different rooms and calculate exploitation costs.

d) <u>Lighting Simulation</u> : the lighting simulation module of DIVERCITY provides realistic simulation of light transfers. Moreover, it is the first time that a lighting simulation involving radiosity provides interactive solutions to the user. They can change and move objects or lights in the building and see updated simulation interactively.

e) <u>Site Planning</u> : the site planning and analysis module aims to evaluate space use and safety in the construction site, and to provide ways to generate enhanced construction site layouts with respect to time and safety criteria.

f) <u>Visual Product Chronology</u> : the Visual Product Chronology module provides visualisations over various data and their interdependencies. In these visualizations the "Time" aspect is crucial. The module links the time tags with the appropriate building components and their data. This results in the visualisations of the status of the building and its components at the selected point of time.

These products will collaborate via a distribution module, which is transparent to the end user. They are all designed to be IFC compatible. This provides a further dimension of integration among the Divercity products as well as between Divercity and third party products.

The products are now in their Beta testing version. They have been tested on two separate case studies of real buildings, one a French chalet, and the second an office building near Helsinki airport.

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3.6   EMERGENCE study indicates eWorking to triple by 2010

The numbers of people working from home or on the move in the European Union could reach over 27 million by 2010, concludes the latest EMERGENCE study, *Modelling ework in Europe: estimates, models and forecasts from the EMERGENCE Project.*

The study draws on the results of the EMERGENCE 18-country employer study and combines them with data from European labour force surveys to develop a model of ework. It concentrates on 'individual' forms of ework, which take place away from traditional office premises. Whilst the results of the survey show that 'collective' forms, which take place on remote office premises, are even more important in the European economy, official data are not yet available which enable these to be modelled effectively over time so no forecasts could be developed for these types of ework.

Four distinct types of 'individual' eworkers are identified in the study :

- *Telehomeworkers :* these are employees who use a computer and telecommunications link to conduct their work and who are based wholly or mainly in their homes. Their numbers are estimated at 810,000 in 2000
- *Multilocational eworkers :* this is a much more numerous group, estimated at 3.7 million in 2000, including employees who alternate between a home and an office workstation, or who work nomadically from multiple locations
- *ELancers :* these are self-employed workers who supply business services to clients using a computer and a telecommunications link, estimated at 1.45 million in 2000
- *The eEnabled self-employed :* this category was not included in the EMERGENCE survey, which concentrated on the remote supply of business services, but can nevertheless be regarded as a form of ework. It is made up of self-employed people who work from their homes but who do not supply business services. These people may be doing anything from managing a farm to running an electrical repair business. They are included in this category only if they require computers and on-line links to their customers in order to be able to function effectively. Using the UK labour force survey to determine what proportion of self-employed people in each sector were eEnabled, it was possible to use data on self-employment from the European Community Labour Force Survey (CLFS) to estimate that this group stood at some 3.08 million in 2000.

Adding these figures (which are summarised in Table 1) produces an estimated EU total of 9.04 million eworkers in 2000.
Interestingly enough, when compared with other estimates of eworkers produced by other means, there is a strong convergence, suggesting that the EMERGENCE methodology, despite involving some rather large assumptions, is relatively sound.

One alternative approach was to take the overall figures on homeworking from the CLFS and use data from the UK to estimate how many homeworkers in each sector were likely to be using ICTs to carry out their work. This produced a slightly higher but not dissimilar estimate of 9,830,000 eworkers (including irregular eworkers).
This can be compared with an estimate from the ECATT project that in 1999 the combined total of 'regular' plus 'supplementary' teleworkers in Europe stood at 9,009,000[12].

Table 1 : Estimates of 'individual' eWorkers in Europe, 2000 (EU 15)

1. Telehomeworkers (person equivalent)	810,000

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[12]   *ECATT Project, Telework Data Report, Bonn, 2000*

2. Multilocational eWorkers (person equivalent)	3,700,000
3. eLancers	1,450,000
4. eEnabled self employed workers	3,080,000
TOTAL	**9,040,000**

Source : EMERGENCE analysis, 2001

Looking to the future, the EMERGENCE team developed forecasts for the spread of each of these forms of ework over the next decade, summarised in Table 2.

In the study, the effect of a general growth in employment was separated from the effect of increasing ICT diffusion and organisational change. If current employment trends continue, approximately ten million new eworkers are likely to appear over the ten-year period. However if technological and organisational change continue at current rates there is likely to be considerable growth in ework which, combined with the effects of employment growth, will effectively triple the numbers, to reach 27.12 million by 2010.

By far the largest part of this growth will involve multilocational eworking by employees, forecast to top 14.3 million. This is generally regarded as the most desirable form of eworking. For the employee it offers the security of a permanent contract whilst reducing the risks of social isolation and poor career prospects associated with telehomeworking; whilst for the employer it offers flexibility, improved retention and loyalty and efficiency gains.

This is followed by eEnabled self-employment, which is predicted to grow to 6.6 million. This form is likely to grow more slowly and reach a plateau sometime after 2010. The reason for this is that, unlike eLancing, self-employment in sectors other than business services shows no evidence of expansion across the EU. Once ITC penetration has reached its maximum in this group, there is therefore no further scope for growth.

Table 2 : Projections of growth in 'individual' ework to 2010 (EU 15)

	Employment Growth	**ICT diffusion/organisat ional change**	**Employment growth & ICT diffusion**
Telehomeworking employees	950,000	2,750,000	3,170,000
Multilocational eworkers (person equivalent)	4,309,788	12,462,907	14,332,343
eLancers (providing business related services)	1,790,000	2,490,000	3,040,000
eEnabled self-employed	3,080,000	6,580,000	6,580,000
Total estimate of individualised eworking	10,129,788	24,282,907	27,122,343

Source : EMERGENCE analysis, 2001

The study concludes that the willingness of employers and workers to embrace technological and organisational change will be a decisive factor in shaping future working patterns in the EU.

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3.7   *Work-family balance in the eWork era : FAMILIES project*

The FAMILIES project studied the implications of ework for work-family reconciliation and balance in Europe. A broad perspective was applied in order to take into account the variety of manifestations of ework (such as working from home, shift-working in call centres and 24/7 technical/customer support) and the variety of different family types and circumstances (such as couples with or without children, single parent families and families caring for elderly or disabled dependants). The approach was primarily a heuristic one, with the aim being to identify the emerging issues and to provide guidance for policy consideration, for technology research and development, and for larger-scale socio-economic research on the topic.

The methodology chosen to undertake these investigations was therefore qualitative in nature. It involved :

- Identifying often difficult to locate families, at least one of whose members was working using ICT-based work methods
- Developing an analytic framework for the project which, *inter alia*, identified four different family types and four different types of ICT-based work
- Undertaking case studies of families who were working under these new work arrangements in each of the four participating countries
- Analysing the very large amount of mostly qualitative data which emerged from the case studies.

Full details of the methodology are available from the project Website : *www.families-project.com.*

More than 100 family case studies were carried out in the four countries - Ireland, Italy, Germany and Denmark. To date, there has been a limited amount of investigation into the issue of the impact of ICT mediated new work forms on families. The project makes a significant contribution to improving the state of the art in relation to the interaction between new work forms and family life and outcomes of the new work forms for different types of family units.

Main Results from the FAMILIES project

The main results for the project point to some emergent issues of importance to the interactions between families and eWorking. These are diversity, gender, technology, and supports.

- There is considerable diversity in the circumstances and issues that are involved, including the variety of family situations, the different forms of ework that are emerging, the range of reasons why eworkers are adopting the new work methods, the variety of ways that ework can affect work-family interactions, and the implications for all of the stakeholders in the family (not just the eworker). This diversity needs to be taken into account in the development of policy in relation to eWorking.

- Gendered factors can play a central role in relation to reasons for adopting eworking and in determining the impacts that it has for eworkers and for other members of their families. Close attention to these factors will be needed to ensure that the wider adoption of eworking results in more equality of opportunities for both women and men.

- Technology plays an important role as a driver of new working practices, as an enabler of change and as a mediator of work-family interactions and their outcomes. There are gaps in available technologies that are constraining developments as well as emerging opportunities for new products and services at the work-family interface.

- The flexibility in time and place offered by eworking can add new solutions to the current repertoire of family-friendly options but various supports, such as wider availability of suitable child and elder care services, more consideration of family needs in the design of eworking arrangements, etc. will be needed to ensure that the positive benefits are maximised and any negative threats are minimised.

The following Table outlines some of the main results to emerge from the project in relation to these issues :

Diversity: Varying family needs and eWork characteristics	One of the core aims of the project has been to take into account the diversity of family situations and of emerging forms of eworking in Europe. On the one hand, families differ in the types and amounts of care (for children and/or for elderly or disabled dependants) that need to be provided and in the resources available to them (one or two partners, suitable childcare services, and so on). These differences affect family requirements in time and place and the degrees of freedom available to support the reconciliation and balancing of work and family needs. On the other hand, emerging forms of eworking involve various patterns of working time and place, and different degrees of flexibility and choice in relation to time and place. Consequently, different forms of eworking can be more or less suitable for the needs and circumstances of different types of family.
Diversity: Positive opportunities but also new threats	Many of the FAMILIES' cases show how ework can increase flexibility and degrees of freedom and thereby provide new opportunities for workforce participation and/or for better quality of, and balance between, work and family life. Other cases, however, show that some forms of ework can be associated with reduced flexibility and degrees of freedom, particularly where extensification of work in time and/or place is involved, and thereby can have negative implications for family life.
Diversity: Working from home	The cases show that eworking partly or primarily from home can offer solutions to the challenges of work-family reconciliation and balance faced by many families, at least for critical stages of the family lifecycle. Reduced need for commuting, flexibility in the organisation of working times and places, and proximity of working and family activities can help in the logistical management of work and family life, as well as the possibility of psychosocial benefits through less stress and fatigue. However, the achievement of these benefits may sometimes require important compromises and trade-offs by eworkers and/or their families. For example, there may be reduced social contacts or negative career implications and there may be challenges for eworkers and their families in adjusting to the new situation and learning to manage the looser boundaries between work and family life. Also, while working from home may sometimes be the only viable option (e.g. for some single parents or carers), it may not necessarily be the preferred one - going out to work can be important for respite from family duties.
Gender: Family- or work- orientation	Our cases clearly show the centrality of gender in all of this. To begin with, the decision to adopt a particular form of eworking and the reasons for that decision are often highly gendered. Apart from couples without children (and without other care responsibilities), our cases suggest that women are more likely to adopt eWorking from home for family reasons and men are more likely to do it for personal or work-related reasons.
Gender: Who gets the benefits	Gendered factors are important in determining how the benefits from eWorking are distributed within the family. When compromises have to be made to meet family needs, our cases suggest that women are more likely to be the one's whose situations are affected in a negative way, for example, by having to accept negative career implications or social isolation. There are exceptions, however, and some of the cases show examples of men downshifting to take on more family responsibilities and thereby support their partner's career development.
Gender: Signs of new opportunities for men	For some men, also, certain forms of eworking (in particular working from home) are helping them to become more involved in family life. Our cases show examples of men becoming more involved as parents through eworking and of separated men using eWorking to maintain contact with their children or to have quality time with them when they have access.
Gender: Sharing of domestic tasks	Finally, although the cases suggest that eworking may sometimes improve the sharing of domestic tasks in two-partner families (e.g. when the man works from home or sometimes where they or their partners work shifts), there is little indication of any truly radical changes in this arena as of yet. In fact, some cases show that there is a risk that when women go home to work they can sometimes be expected to adopt an increased domestic burden as well, reinforcing or exacerbating existing inequalities.
Technology: Opportunities	The cases also suggest that there may be promising market opportunities for new products and services at the work-family interface. These include household networking and services to support workers who deal with family matters from the workplace.

Supports: Needed	Supports that are needed include wider availability of suitable childcare and eldercare services, more consideration of family needs in the design of eWorking arrangements, better preparation of eworkers and their families by employers and by the educational system (workers need technical and self-management skills, families need to be prepared for the changes associated with eworking), and more awareness and understanding by everyone (family members, neighbours, employers and work colleagues) of what eworking involves and of its legitimacy as "real" work. Gendered attitudes and practices in relation to paid work and household work will also need to be tackled if the benefits of eWorking are to be shared fairly within individual families and between men and women more generally.

Conclusions

The FAMILIES case studies provide new insights into work-family life at the dawn of the ework era. It is already clear that the issues are complex and that developments in ework can have both positive and negative implications for work-family balance in Europe.

The project consortium comprises Work Research Centre in Ireland (co-ordinators), empirica in Germany, Danish Technological Institute in Denmark, Databank Consulting in Italy.

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3.8   International Network System to support innovation commercialisation : HARMONY project

Abstract

Fast development of internet technologies is bringing new possibilities to use IT in industry beyond e-commerce and logistic network management. This article describes the outcomes of the Intelligent Manufacturing Systems (IMS) project HARMONY, that aims at improving the yield of innovation projects via an internet based support system. Harmony is designed to help start-up support institutions better manage their processes. The novelty of this approach is that it is not aiming to support the entrepreneur directly but indirectly. By doing this, it is much more than a "train the trainer" concept. The methodology implemented into a software tool, decomposes a start up support project into smaller component "Tasks" and distributes the execution of them to worldwide experts. In addition it stores the information gathered by the support projects for re-use.

Introduction

Business innovation is the translation of invention to market success. In contrast, technological invention is the creation of products and processes. Unfortunately, the process of converting technological invention to business innovation is still very inefficient. Typically nine out of ten projects fail (Meyer/Rouse/Savolainen, 1997).

The role of potential inventers, start-ups and young innovative SMEs is widely recognised in politics to improve the industrial structure. The support and co-operation network around the business invention project should build a global business process chain. In spite of the logical clarity of this chain, most of the support initiatives are focused very locally. In addition, or even as a result of this shortcoming, there is a lack of focus which leads to performance shortcomings in branch or sub process specific expertise of the start up support institution (Söndgerath/Lüken, 1999)[13].

Approach

Today different regional, national and multinational funds are available to support start up projects. As diverse as the funding scene is the range of potential start-up support institutions. A variety of organisations from employment exchange offices or chambers of industry and commerce to incubator centre or private consultants are potential organisations offering start-up support. Adding the third dimension - the branch of the start-up project, the fourth dimension - the funding source for the start-up company, the fifth dimension - the geographical target market, the situation becomes more and more complex.

On analysing this situation for start-up support projects, the following very few key findings could be identified :
- No person or physical working group is able to have enough expertise to support adequately any start up project.
- Any start-up project may be unique, but nevertheless there are very likely projects running at any given time span, word wide, that require or generate very similar information. While start-up projects are innovation processes, start-up support is a routine process.
- If the start up does not get the expert able to answer all his potential questions and making all the necessary contacts, he needs a specialist to build up a virtual organisation around his start-up project not a second class project worker.
- Since many organisations, even in start-up support, are competing in the same market, in the long term the only organisations which will be successful are those who are efficient in their processes either to the customer or to their "share holder".
- As high tech start ups do not act locally, so the support needs to be globally oriented as well.

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[13]   *References and further information sources:*
        Meyer C., Rouse B., Savolainen T. : Harmony, Coping with the Complexity of Business Innovation, Endorsed IMS Abstract 97008, July 1997.
        Söndgerath, B.; Lüken, M.: HARMONY - Coping with the Complexity of Business Innovation, in: Fraunhofer IFF Jahresbericht, 1999

Harmony addresses all these five key findings by this software founded, knowledge based start up support institutions network.
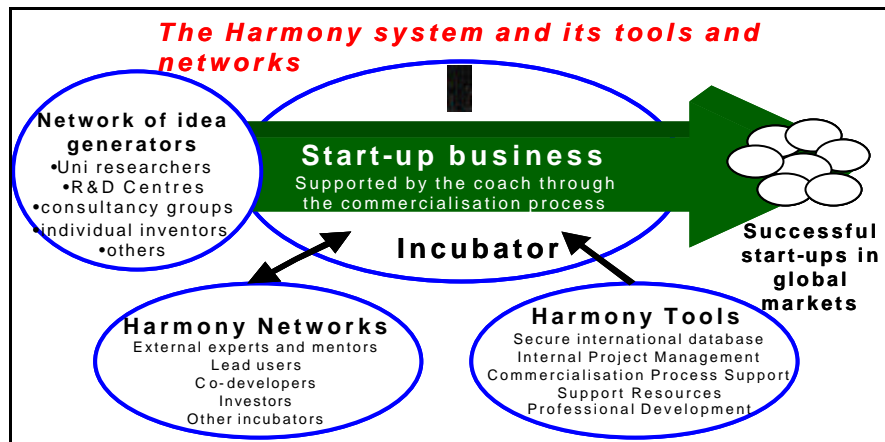
Figure 1 : the Harmony components to support the innovation commercialisation process

Harmony solution

If an entrepreneur knocks on the support organisations door the Harmony system will start its work in assisting the "consultants" routines. After the case has been filed it never leaves the system again. Without question, the system supports the business plan generation in any mode but it acts as an enterprise resource planning system specialised for start up support projects as well. Finally it strongly supports eworking between support institutions, experts and financiers. It's document management system is adoptable and advanced, allowing full tractability of the data used in the business plan.

But this is only the operative side of the solution. By applying the Harmony solution, reference processes and knowledge libraries are available to speed up the project manager's work and to assure a defined quality level. Finally an international virtual community is provided not only to exchange work packages but also to offer continuous training programs for employees active in the start-up support field.

www.harmony-net.info may be truly an internet solution offering asp software specialised for start up support but it will mainly support people to people businesses, people information and training as well as efficient interaction in a very confidentiality dominated environment.

Innovation Commercialisation Process

Phase 1 - Contact

Entrepreneur → Internet research

Entrepreneur → Extended Harmony network

Internet research / Extended Harmony network → Entrance Tool

Phase 2 - Preparation

Cluster operator = supporter (regional distributor)

Select case manager

Phase 3 - Validation

Face to face contact and validation

Phase 4

Start-up process

Idea — Development — Introduction — Growth

Business opportunity screening — Business model building — Business plan building — Business plan implementation

Knowledge-Base-Tool

Support process

IPC

Figure 2 : the Harmony approach for start up support organisations

Offer

Since the project is in it's final stage, Harmony is open to anyone to test the Harmony software prototype and to join the community of more than 30 Harmony users in Europe, Australia and Japan. Beginning in 2003, after the commercial organisation has been set up, an annual fee of €3000 for an organisation (or a group of organisations) and a fee of €1000 per project manager within the support organisation is planned.

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3.9   Innovation co-ordination, transfer and deployment through networked Co-operation in the Construction Industry : ICCI project

Objectives

The ambition of the ICCI initiative is to build a cluster upon a set of IST projects related to IT in construction, with the following goal: to improve harmonisation and coherency of research and development, and thereby to benefit efficiency in IST projects, assist knowledge transfer to industry, and reduce time to market of exploitation. The ICCI objectives are :

- to collect, synthesise, consolidate and validate at a true European level, the user requirements and use cases/scenarios from projects, in order to lead to industrial requirements and some (set of) reference model(s) for ICT in construction
- to collect, synthesise, and publish ICT state-of-the-art in the fields of technical advances and commercial offerings, state-of-the-art in ICT markets, standards and R&D, and synthesis of ICT infrastructures
- to synthesise information for the integration of human, organisational and technical elements, and to provide best practice guides, and specification of the training needs of employees in the construction sector
- to assess the latest developments in the area of legal and contractual support for the use of ICT in construction, comprising (1) state-of-the-art review, (2) identification of potential legal gaps and problems and (3) integration of contractual and legal aspects into an ICCI IT services platform
- to deliver internal dissemination (close interaction between the consortium members) and external dissemination (typically through conferences, seminars, workshops, exhibitions, online newsletters, user interest groups, etc)
- to provide future requirements, strategy and implementation plans for IT in construction, comprising (1) co-ordination and integration of global clustering activities and (2) identification of future needs, strategy and plans at a European level.

The cluster project ICCI initially provides an umbrella for improved co-ordination and broader dissemination of the results of the six following projects :

- **OSMOS** (*Open System for Inter-enterprise Information Management in Dynamic Virtual Environments*)
- **eCONSTRUCT** (*Electronic Business in the Building and Construction Industry: Preparing for the new Internet*)
- **DIVERCITY** (*DIstributed Virtual Workspace for Enhancing Communication within the Construction Industry*)
- **ISTforCE** (*Intelligent Services and Tools for Concurrent Engineering*)
- **eLEGAL** (*Specifying Legal Terms of Contract in ICT Environment*)
- **GLOBEMEN** (*Global Engineering and Manufacturing in Enterprise Networks*).

The member projects, and therefore the technical objectives of ICCI, relate to most action lines of IST Key Action II[14], some examples of key technology topics being :

- Collaboration platforms for distributed teams (including groupware, model servers, etc.)
- Integration and promotion of standards for information exchange and communication
- Contractual and legal issues regarding ICT usage in construction
- Web services dedicated to the construction processes
- Best practices, demonstrations and other means to promote deployment of ICT

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[14]   *New Methods of Work and Electronic Commerce.*

- And other topics as well, related to other projects that are closed to (and already having liaisons with) ICCI, e.g. knowledge sharing between actors in construction projects or mobile applications (e.g. for construction sites and mobile staff).

ICCI should be beneficial in different ways, e.g. preparing future research and developments for ICT in Construction, and ensuring that, in the future, companies from the building and civil engineering sectors achieve maximum business benefits from ICT solutions in the knowledge economy.

Target Constituencies and Dissemination Channels

ICCI brings together research experience from all parts of Europe. At the same time, all partners have extensive industrial networks in their own countries in particular and in the European and global construction industry at large. They have been involved in several relevant local, national, regional, and global programmes and projects related to methods, models, tools, technologies, and infrastructures for IT deployment in the construction industry.

The consortium aims to use ICCI as a gateway to reach various stakeholders in different constituencies in terms of degree of involvement in ICT in construction. ICCI services, such as the ICT glossary, FAQ, and Public Forum are targeted towards these stakeholders. In addition to these services, industrial workshops, presentations, and targeted publications will be used. Identified ICCI stakeholders forming targeted constituencies are shown in Figure 1.

Figure 1 : ICCI stakeholders and dissemination channels

Key emerging results

The ICCI project can already exhibit a first set of initiatives and results, the main ones being :

- An On-line (Web) ICT glossary of terms (along with a FAQ and a public discussion forum), put at disposal through a Web service at http://itc.fgg.uni-lj.si/projects/icci/glossary.cgi. The glossary is populated with selected topics covering several aspects of Product and Process Modelling, IFC, e-commerce and e-government in English language (approximately 1350 terms). Additionally, it has been or will be extended on two different ways : (1) with available glossaries from clustered projects and (2) based on log file analysis of query terms as entered by users (new terms or whole concepts will be added according to frequently used query terms that are not available in the existing glossary). The consistency and relevancy issues of the glossary will be under supervision of the editorial board.
- A collection of Industry User scenarios from all member projects of ICCI and all recently finished or ongoing industry-driven IAI projects are presented in an ICCI report. This reports the first phase of work - including

identification of actors, roles, tools / systems deployed and used, information and communication streams. It outlines the overall roadmap of ICCI, an Introduction presents a walk through the studied projects and other considered resources. The main part of the report presents the collected 24 user scenarios, comprising 77 subtasks. A table that maps the user scenarios to AEC industry processes lists the results of the pre-classification of the collected scenarios in terms of AEC/FM project phases.

- A proposal developed with CEN/ISSS for a rolling Workshop on eConstruction has been elaborated in the fields of standardisation activities. The objective of this CEN Workshop is to draw together the many efforts, initiatives, projects, organisations, companies and people that are currently active in research, development, application 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-volution" in the European construction sector.

Relationships have already been developed with other initiatives and projects including e-COGNOS (www.e-cognos.com), VOSTER (voster.vtt.fi) and prodAEC (www.prodaec.com), the IAI (www.iai.org), the ENCORD network (www.encord.org), and the German project iCSS (http://cib.bau.tu-dresden.de/icss/). A lot of dissemination activities have been undertaken as well, including the ICCI public Web site (http://icci.vtt.fi), a first ICCI public Newsletter (edited in March 2002), and two special issues of the ITCon journal.

Future expected results include a description of processing and synthesising Industry requirements and needs in global eBusiness along with a survey of adequate reference models to be applied for processes / data / communication, a State-of-the-art report on ICT standards & standardization efforts, a Synthesis of projects ICT infrastructures as developed in the various ICCI member projects, a proposal for an ICT ontological framework and classification, etc…

Additionally, ICCI is organising the European eSM@RT 2002 Conference in Salford, UK (19-21/11/02). This major event is also supported by VOSTER and the prodAEC thematic network, and is sponsored by the European IST Programme with the support of European national funding bodies, including EPSRC in UK, TEKES in Finland, etc… The conference will involve key players from European Construction IT research, and will to provide an opportunity for industrialists, academics and policy makers across Europe to :

- reflect on past and ongoing national and international experiences (including the Framework 5 programme)
- promote the European Research Area in Construction and related sectors
- provide the foundation platform that will shape and devise the strategic roadmap(s) in the sector from which integrated projects and networks of excellence will emerge for the Sixth Framework.

Relevant Websites & key publications

OSMOS : *http://cic.vtt.fi/projects/osmos*
eConstruct : *http://www.econstruct.org*
Divercity : *http://www.e-divercity.com*
ISTforCE : *http://www.istforce.com*
eLegal : *http://cic.vtt.fi/projects/elegal*
Globemen : *http://globemen.vtt.fi*
e-COGNOS : *http://www.e-cognos.org*
ICCI : *http://icci.vtt.fi/*
VOSTER : *http://cic.vtt.fi/projects/voster*
ProdAEC : *http://www.prodaec.net/ OR http://www.prodaec.org/*
eSM@RT 2002 : *http://esmart.salford.ac.uk/eSMART.htm*

Two special issues of the ITCon journal. (http://www.itcon.org/) were issued with the following themes :

- Information and communication technology advances in the European construction industry (http://www.itcon.org/2001/specialeu.htm)
- ICT for KM in Construction (http://cic.vtt.fi/itcon_km.html).

Project participants

Centre Scientifique et Technique du Bâtiment, University of Salford, Technical Research Centre of Finland, Netherlands Organisation for Applied Scientific Research, Technische Universität Dresden, Loughborough University, University of Ljubljana, AEC3 Ltd, Delft University of Technology.

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3.10 Worksupport tool for team oriented production and management of multimedia content for cross-media publishing : MULTIPRO project

Media companies such as broadcasters, publishing houses, multimedia agencies and the like are all producing and managing multimedia content and they all face a new challenge in cross-media publishing. Cross-media in this context means the production and delivery of digital content to multiple platforms.

Within the framework of the IST-project MultiPro four technology and three application partners from the broad- and webcasting domain worked together to develop and validate new tools, systems and technologies that allow for collaborative team working. The core objective of MultiPro was to develop a distributed online-based production and management system for rich cross-media services (video, audio, text/graphics).

The system facilitates collaboration between all the personnel involved at the different stages of content production, in particular it supports the planning and co-ordination process of parallel and non-linear production processes. It supports the media production process from heterogeneous work places and furthermore it enables editorial staff to package media products for distribution on different channels/platforms. Support of information retrieval and compilation of media content from internal and external sources is an integral part of the system. In other words, the developed system is a groupware solution for media production which facilitates and streamlines content production processes as well as generating new content and enhancing existing content.

The MultiPro-system covers the following main features :

- Integrated program & task planning combined with resource management and team communication facilities
- Web based document management
- Enhanced video preview archive
- Media neutral data storage
- Remote access via PC/notebook, mobile devices and in asynchronous mode

The overall system is made up of four tools which were developed within the project - a work support tool (WST), the Content Exchange System (CES), the Asynchronous Access Tool (AAT) and the Mobile Access Tool (MAT). The core of the MultiPro system is the WST which provides the main teamwork features and the web-based common user interface for the integrated solution. The basic structure of the innovative user interface is a segmentation into a team space and a private space. The team space is a community platform for the whole team which mainly contains all relevant planning and content data for a media production and the respective workpackages.
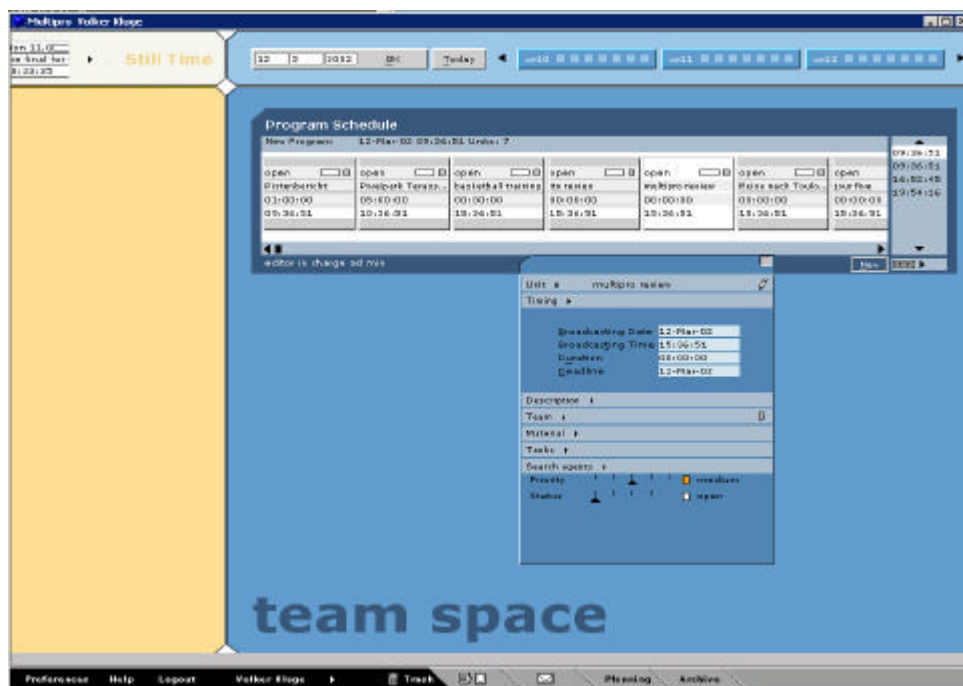
Graphic 1 : team space with programme schedule and one programme unit

The private space is a closed working space for each team member which can be used for the preparation of new content, scheduling of personal appointments and meetings. In addition, it offers different communication features (e.g. direct messaging) as well as simple and advanced search and retrieval mechanisms across all media types.
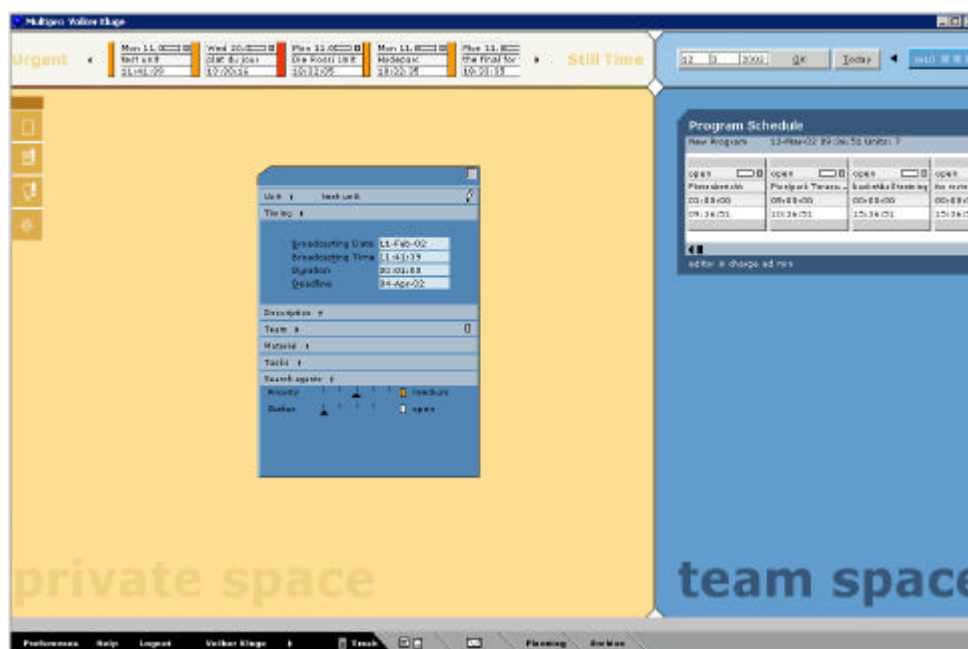
Graphic 2 : private space with programme unit

The CES provides the archive component and enhanced pre-production functionality for AV-material in low resolution. A key feature of the system are the remote access components - MAT and AAT which allow for the integration of remote team members. Whilst the MAT manages in- and out-going messages through different

communication channels (SMS, paging, fax, voicemail, outdial, email), the AAT enables secure and authorised access and transmission of digital content from broadcaster to reporter and vice versa in an asynchronous mode.

The technical development resulted in a working prototype of the overall system which provides the main functionality. After setting up test installations at each of the application partners' sites the prototype was validated, tested and demonstrated with regard to its general applicability in three different rich cross-media production. The results of this final test phase gave valuable hints for following commercial implementations in media production environments. Generally, the overall concept and solution reveals a promising and innovative approach for supporting team work processes in a new way.

Within the project's lifetime the application focus of the MultiPro system was placed on the media production sector. Due to its general and flexible approach MultiPro is however also applicable in other domains where the planning and co-ordination of widely dispersed teams working with complex content and workflows play an important role.

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3.11 Open System for Inter-entreprise Information Management in Dynamic Virtual Environments : OSMOS project

IT in use in the construction industry needs to find the right balance between, on the one hand, integrated information infrastructures, tools and systems, and, on the other hand, the organisational peculiarities and complexities intrinsic to this sector. There is a need to support smooth co-operation between non co-located teams, and the co-ordination of their work and activities in an environment that promotes trust and social cohesion. This overall infrastructure should give construction project participants increased flexibility, and effective access to project information regardless of its form, format, and location.

The need for inter-enterprise information management in dynamic virtual environments has now become a core necessity for enterprises collaborating and operating under the modulus operandi of virtual enterprises. This is a theme that is addressed by the OSMOS project, which has been harnessed to develop an Internet based groupware environment to support non co-located teams in project-based industries such as construction. The environment is configured to support the "plug-and-play" of distributed services interacting with each other through OSMOS without necessarily knowing if the other exists or not. As such, end users can "plug-and-play" document management, cost control, facilities management, etc. services and access them through a single location. Additionally, there is the capability of for example associating an "object" from one system, with that of another, without each "third party service" physically communicating with each other.

Goals

The major goals of the OSMOS project were :

- Specify Internet-based services for collaboration between dissimilar construction applications and semantic cross-referencing between the information they manipulate.
- Specify Internet-based services allowing the co-ordination of interactions between individuals and teams in a Construction virtual enterprise.
- Specify a model-based environment where the release of, and access to, any shared information (including documents) produced by actors participating in projects is secure, tracked, and managed transparently.
- Provide low entry level tools (cheap and user-friendly) to small enterprises to act and participate in construction virtual enterprises.
- Set up two OSMOS Internet-based team work service providers for the purpose of the project, and ensure their take-up as commercial offers after the completion of the project.

The Basic OSMOS Infrastructure

The OSMOS project has yielded a collection of solid models enforced and executed through an API. On top of this, several tools have been developed to enable users to invoke API methods and get back responses (available both as Java objects and XML strings). The basic tools (reference implementation) developed include :

- *Service Management Tool* : this tool provides functionality to a Server Administrator to manage the server. Main functionalities include the registration and management of different core and third party services, API invocation logging, etc…
- *VE Server Administration Tool* : this tool is a web-based environment for facilitating the configuration and maintenance of the OSMOS platform in term of projects, organisations, employees, etc. It is to be noted that this tool is a simple interface to relevant API calls for initialising a VE project.
- *VE Project Administration Tool* : this tool is basically a subset of the VE Server Administration tool and is developed in particular to configure and manage a particular VE project. Once a project has been set-up, control is passed over to a "VE Project Administrator" who then uses this tool to configure and manage it.

- *Web-based Information Browser* : this tool acts as a low-level entry environment to the OSMOS workspace. In simple terms, the objective of this tool is to present and expose to VE participants based on their roles and associated access rights, the different objects and their associated service methods to which the VE participants have access.

OSMOS is proud to mention the realisation of three commercial implementations of its findings in terms of infrastructure development and implementation by its end-users. The OSMOS-SGTi implementation in France by DERBi enables the OSMOS infrastructure in parallel with a document management system, RyhtiWeb developed by Olof Granlund in Finland is a powerful virtual enterprise manager supporting the OSMOS infrastructure in addition to numerous facilities management modules, and the OSMOS-Dokumenbanken integration developed for JM by Carasoft supports the OSMOS infrastructure in addition to a document management and email handling system.

The OSMOS Impact

The results and overall impact of the OSMOS project is perhaps best understood through a comparison with the "traditional" way of doing business in one-of-a-kind project based industries such as construction.

Traditional Approach	OSMOS Approach
Platform hardware is owned/leased	Platform hardware is maintained by OSMOS service provider
Application software is licensed	Applications are rented for a project
Technology/application driven	Service driven
Desktop is the computer	Network-interface is the computer
Technology needs to be integrated	Service integration is done by the OSMOS service provider
Many points of service and support	Single point of contact for service and support
Data/information redundancy	Data/information integrity

The core findings of the OSMOS project are available for public download at the project website (*http://osmos.vtt.fi*).

Consortium

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Granlund, Finland
JM, Sweden
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Bringing RTD Results to Practice: Facilities Management in Finland

Facilities management involves the participation of different actors from different organisations, all engaged to perform, report, or manage certain tasks. The typical mode of operation is that of the virtual enterprise. Main actors involved in facilities management include building users, maintenance personnel, facility managers, consultants, maintenance managers, etc. It is to be noted that not only do these different actors come from different organisations, but at a given time are involved in the management of multiple facilities with different actors. In such situations involving multiple actors and facilities, the challenge is to provide information content and services to not only the right people at the right time, but through an interface that does not necessitate persons to switch their mode and application of working from one project to the next. This calls for a single entry point for individuals to "plug-and-play" and hence interact with multiple applications through a single interface.

From RTD Results to Practical Applications

The Technical Research Centre of Finland (VTT) and Granlund, a facilities management tool and service provider from Finland, joined hands with a European consortium to explore and develop an environment that would enable the plug-and-play of applications for use within a virtual enterprise. The key challenge here being to first identify organisational needs in terms of requirements for a virtual enterprise management solution that would manage projects, actors, roles, access rights, enable plug-and-play between heterogeneous data sources and applications all through a unified single interface. Translating these requirements to a tangible open solution has been one of the main achievements of the OSMOS project. While research and academic partners such as VTT focussed on robust models and the core RTD aspects of the solutions, end-users such as Granlund endeavoured to translate these findings to practical applications for commercial use.

Granlund have been a lead provider of facilities management software to the facilities management sector. A core tool used by many global clients has been Ryhti. Initially available as a windows client based version, the tool provides several modules providing distinct functionality and services over a facilities management database. These modules include: maintenance, help desk, long term planning, energy monitoring, technical, document management etc.

The main challenge for Granlund in the OSMOS project has been to make available a web-based version of Ryhti in addition to creating an infrastructure for facilitating the facilities management virtual enterprise. The later has been achieved through the development of two integrated tools: the GranlundWeb Browser, and the Granlund VE manager.

The GranlundWeb browser is a generic HTML-based tool that provides basic access to a virtual enterprise's project data and services. It is based on the core OSMOS models for access and service invocation. The main focus is the ability to handle and respond to requests made by both Ryhti's facilities management services in addition to external third party services.
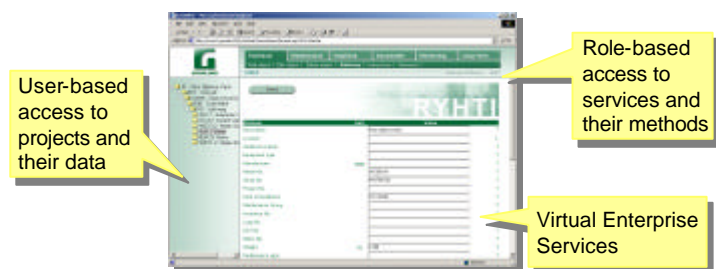
The GranlundWeb Browser

The Granlund Virtual Enterprise Manager is primarily an administrative tool that is used for the basic initiation and configuration of a virtual enterprise, its participants, and used services. The tool basically :
- Manages users and roles
- Manages projects
- Allows any web-based service to be registered and used in the virtual enterprise
- Controls access to registered services through a role-based model

The Granlund VE Manager

The Case of Senaatti Properties

Senaatti Properties is a government owned enterprise responsible for managing and letting property assets of the Finnish state. Buildings include universities, offices, prisons, and defence buildings. Currently Senaatti Properties own more than 2600 facilities of which up to 2000 are in a facilities management database for facility management purposes.

With limited personnel (200), there is a need for external business partners to support the facilities management process. A first step in this direction has been the recent (March 2002) introduction of a new web-based document management system (DOCS). The purpose of this system is to provide access to facility documents such as: technical drawings, operational and maintenance manuals, rental contracts, etc. With many business partners, the establishment of roles and access rights to the documents alone is becoming increasingly difficult through the current implementation. Furthermore, FM data and documents are not integrated. The problem is to be efficiently resolved through the OSMOS based tools developed by Granlund.

Benefits of the OSMOS Solution through Granlund Tools

The main challenge for Granlund in providing a solution to Senaatti Properties was to provide access for external business partners to both FM data and related services through a controlled and integrated mechanism. Main benefits delivered through the Granlund solution include :

- One logical interface to all building related data
- Simplified access control to document data through roles/services and projects
- Links though cross-referencing between buildings (FM data) and documents
- An flexible interface to add and integrate other additional external services

Implementation Framework

Initially, the system is configured in terms of actors, roles, access rights, projects, available services and service methods, etc. using the Granlund VE manager. The configuration details are stored in the VE server. A step by step procedure of the internal dynamics of the system from the perspective of the end-users (extranet users) is as follows:

- An end-user logins in through the GranlundWeb Browser which sends a login request to the VE server
- The VE server checks the login request and if valid, performs a role to project and available service mapping before forwarding the details of the same to the facilities management server
- The facilities management server exposes and presents to the end-user the project facility data and services to which he/she has access rights to
- A user may invoke certain facilities management services or request a document related to an object. The document request is in the form of sending a Building ID to the document management server
- The document management server cannot directly act on a Building ID alone and needs more information. To get this information, a request is made to the VE Server in the form of an API call
- The VE Server receives the request from the document management server, checks the credentials of the user requesting, and sends back to the document management server access verification in addition to the Document ID for the document to which the user has access
- The document management server releases the document to the user.

It is to be noted that all this happens through a single user interface and that access rights based on predefined roles are enabled through the VE server and not the document management system.
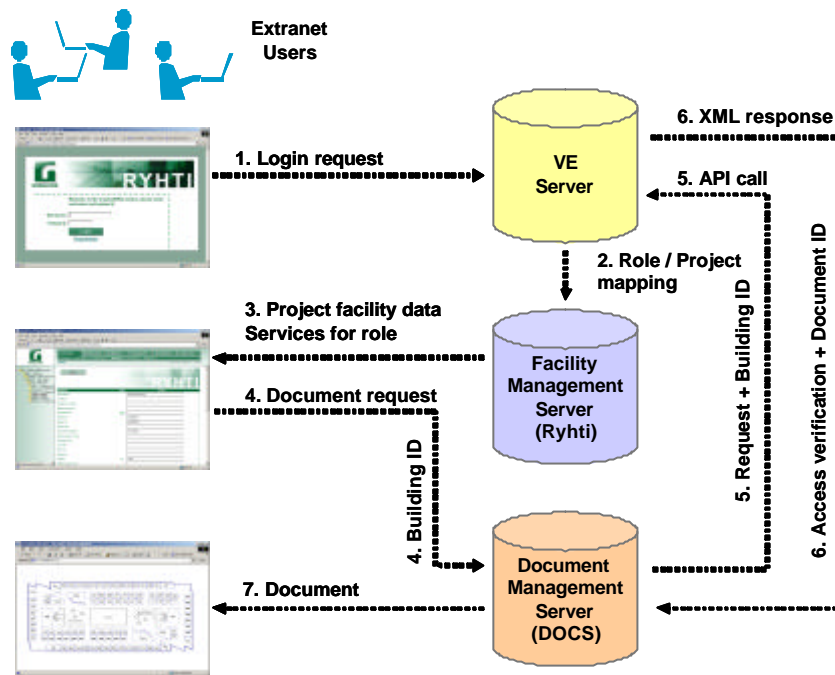
Implementation Framework for Senaatti Properties

Implementation work is currently in its final stages and application and service launch for use by Senaatti Properties planned for early Summer 2002.

Key Finnish Contacts

Granlund is the largest engineering company in building services consulting in Finland. Founded in 1960, it employs 270 people, and is privately owned (mainly by the employees). The company's main activities are building services design, facilities management consulting, and development of design and facilities management software.	*http://www.granlund.fi*
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VTT - Technical Research Centre of Finland, is the largest research establishment in the Nordic countries and one of the largest in Europe. The research group of VTT Building and Transport involved in the OSMOS project focuses on four main activities: design methodology, project management, information networking and product data technology.	*http://www.vtt.fi*

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3.12   Satellite-Based Remote Mutli-Project Reporting and Controlling in Construction Industry : SABARECO project

Introduction

Construction management companies are in the situation of managing several very complex construction projects in different phases in parallel. Often these construction sites are distributed (sometimes world wide) and sometimes they are located in dispersed regions (e.g. projects in the desert). Typically, especially during the set up of a construction site, no sufficient ICT (Information and Communications Technology) infrastructure for fast and efficient communication is available.

The goal of SABARECO is to overcome constraints imposed by distance and time. This is to be achieved by inter-linking heterogeneous workplaces by means of standard based services (Internet protocols, IFC, XML) using satellite links as the carrier. The information base is set up by integrating already existing applications for the domains ERP (FORgest), Project Management (GIGROS), and Inspection (Audit Manager). This text describes :

- The integration of these software systems using the IFC/XML approach and reports the experiences gained in industrial usage
- The characteristics, benefits, and difficulties using TCP/IP protocols over geostationary satellite links using the InterSKY gateway.

Innovations

Concerning technology use in the affected business processes the following innovations can be realised :

- In comparison with the traditional way of reporting remote construction progress (phone, fax, personal visits) the SABRECO solution offers the possibility for the on-site manager to report directly into the application. Therefore, the probability of making mistakes by retyping data from faxes, etc. is minimised.
- Construction progress can be made visible for many other organisations (customer, suppliers, etc.) at the same time.
- Automatic reporting extracted from databases reduces the information collection and editing work for progress reports.

The proposed solution has two main technological innovation aspects :

- The combination of the originally separate applications chosen for this trial has not been used before.
- The usage of the InterSKY satellite links has the following innovative benefits: broadband access possible, support of video applications, fast file transfer, DVB and IP standards, fast deployment, operation in regions without broadband access, and reliable access, passes bottlenecks in the Internet access.

Current Status

SABARECO has a lifetime of 18 months and started in December 2000. It has successfully installed and tried the InterSKY satellite link and the three integrated software modules GIGROS (Project Management), FORgest (EPR), and Audit Manager (Inspection) at construction sites of end user CONSULGAL. It has been proven that the SABARECO solution is applicable to daily work. The Consortium is now in the phase of evaluating the cost-benefits of the solution and to prepare marketing actions. The status and results of the project can be seen on the Web Site : *http://www.sabareco.com.*

Experiences and Results

Characteristics of TCP/IP Protocols over Geostationary Satellite Links

The SABARECO InterSKY satellite link provides transparent TCP/IP connectivity. The user only needs Internet access. SABARECO assures data security by using VPN encryption. The handling for end users is manageable by their own personnel, since the InterSKY gateway only consists of a specially equipped MS Windows NT4 PC connected to a satellite antenna. The effort needed to align the antenna to geostationary satellites is no more than that of installing a TV satellite dish at home. After 1 to 2 days of basic training, end users themselves can move the satellite gateway from a completed construction site to the new one.

One lesson SABARECO had to learn was to overcome the delayed response times resulting from using TCP/IP protocols over geostationary satellite links. The signal propagation delay of approximately 0,3 seconds is no obstacle for the user, as long as complete responses are transmitted (as with Audit Manager and FORgest). But database client server applications (GIGROS) had to be reprogrammed to cluster database enquiries and to avoid detailed multi-step handshaking database transactions.

Integration of Software Systems Using IFC/XML

The required software compatibility can only be ensured by the means of standards such as IFC. IFC (Industry Foundation Classes) is a class library for exchanging model data. IFCs enable interoperability among software applications, thus end users can share the model data by IFCs.

IFCsvr Implementation of the IFC (Industry Foundation Classes)

In order to implement IFC, SABARECO made use of the free software IFCsvr. The IFCsvr ActiveX component handles the IFC model data input/output and provides additional operations, such as searching, changing, and creating IFC objects. This component provides an IFC compliant programming in the quasi-standard Microsoft environment. IFCsvr is open software allowing its incorporation into own software including commercial and non-commercial products.

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PRODUTEC	Bremen, Germany	Project Co-ordinator and Software Supplier	www.produtec.de
CONSULGAL	Oeiras, Portugal	End User	www.consulgal.pt
FORDESI	Lisbon, Portugal	Software Supplier	via www.sabareco.com
Shiron	Petach Tikva, Israel	Satellite System Supplier	www.shiron.com
UNIQUE	Bremen, Germany	Software Supplier	www.unique-bremen.de

3.13   Safe Food Enhancement System - through Remote Monitoring : SaFES project

SaFES allows food manufacturers and food processors to ensure the safe production of food in a cost effective manner. It features dedicated software and hardware resulting in a much simpler way to ensure safe food production. It uses the latest internet technology to help everyone involved with the food production process, including auditors, to monitor progress and communicate results.

SaFES is web-enabled and acts as a HACCP[15] Design tool, a day-to-day operational tool that monitors all the critical control points in a food processing plant and makes the data available to all interested parties within the supply chain and in particular acts as an auditor's due diligence tool.

The remote monitoring results are accessible from anywhere in the world, thereby providing more scope for flexible working and family friendly policies. The tool enables management to keep in touch with what is going on in the plant when away on business. There has been improved communication between members of the company, the tool can alert a vital member of staff in the case of an exception whether that member of staff is in adjoining office, working at home or as part of a distributed organisation. A fast, informed decision can then be made that potentially can impact the bottom line of the company.

The tool takes away repetitive jobs and allows staff to concentrate on more value-added activities thereby improving staff interest level, motivation and job satisfaction. It takes away the risks associated with manual readings and logging of critical data. There is thus lessened requirement for the supervisory function of checking data. The SaFES tool has already created interest generally in the plant and has meant that more of the staff have more of an interest in the ensuing good quality of the product. The tool is also encouraging the use of e-Working between producer and peripheral suppliers to the plant for microbiological results. The initiative in this case came from the analysis laboratories as they saw the cost benefits involved by timeliness of data. There have been productivity gains within the company and improved communications in the management chain within the organisation.

The indication is that the thrust for usage of the tool is likely to be top down in the supply chain, where a producer will encourage its suppliers to participate but we suspect there is a certain coyness in opening up the information to players above in the supply chain. Nevertheless, the tool offers transparency of data (under account and password control) to all players in the supply chain and the greatest benefits are to be gained when entire supply chains are able to co-operate in a spirit of openness. The improved communications that we have witnessed above within the company can then be replicated within the supply chain.

We are confident that the tool will generally reduce inter-company travel time. Quality Control departments within a processing company (or the reseller) no longer need to be co-resident with the processing activity. Furthermore, more roles in the reseller organisation can become involved very cost effectively, as the burden of travel is removed. For example, in a reseller organisation sales, marketing, finance, quality control can become involved and they may be distributed across the globe and still participate simultaneously in a common view of the data. They can make comparative studies of data from a variety of suppliers across the globe. Centralised large organisations can see the relative performance of all their processing plants and can deduce from the results, those plants that are operating with least non-conformance incidents.

Rural producers should benefit as the tool can be used as the first stage of a pre-assessment exercise before a site visit. The site visit need only take place if the results of the pre-assessment are acceptable. More ad hoc, frequent, non-invasive audits can be undertaken by the reseller or the Auditor on behalf of the resellers or regulatory bodies. Again, this is expected to level the playing field for Europe's SME food producers. Thus we expect encouraging results in the re-engineering of the audit process, where it has the potential to lessen the number of in-situ audits but not eliminate them entirely.

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[15]   *HACCP is Hazard Analysis and Critical Control Points and is a risk assessment methodology for analysing where the hazards are within a food processing plant and a derivation of the ensuing Critical Control Points.*

The tool is applicable to all food processing plants however large or small. The tool comes into its own in a complex plant as the benefits to be gained in terms of automatic data collection are increased in terms of cost savings and lessened risks of recording of incorrect data.

We expect some psychological challenges to the data being readily available to all interested parties in the supply chain. There may be some tensions. Encouragement of take-up can be achieved by one of two means, either by a top-down approach where supermarkets and large purchasing organisations see the merits of the system and impose its usage on all of their suppliers or preferably by suppliers recognising the benefits to their business and offering up transparency of data to the purchaser as a competitive edge. Clearer the latter would be more palatable, but the approach to be adopted will be dependent on the cost of sale!

We suspect that there will be a barrier to the usage of an e-Work system in the regulatory framework where people are used to the conventional paper-based system. Such organisations are conservative in their approach, are not always prepared to move from their traditional ways of work outside their comfort zones and are often not inspired by cost savings to be made. This is an area that needs to be addressed at a national or international level and may be beyond the scope of the individual tool vendor.

Papers

Wademan, Dr. Janet H,: SaFES, an egalitarian catalyst for change harnessing ubiquitous web technology, offering transparency for all stakeholders in food quality. E-Work and E-commerce, Novel Solutions and practices for a global networked economy, Volume 2, pp. 970 - 976, IOS Press, 2001.

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3.14 *Shared work environments and information appliances : SANE project*

Background

The 1990s have seen a revolution in the way that space and time are used in many organisations. New Ways of working have allowed many organisations to integrate the physical work environment into the business process, to increase density of occupation within office buildings while at the same time creating effective work environments that encourage interaction and communication.

The current decade will see even greater challenges: both at the level of the individual trying to use the scarce resource of time more effectively and at the level of the organisation trying to manage a dispersed workforce while creating the spirit and teamwork necessary for organisations to continue to generate new ideas and thrive. Increasingly organisations will move outside of the physical container of their own buildings into larger organisational networks across cities, countries, the region or the world.

Once again information technology has played an essential role in the transformation, allowing forward thinking organisations to integrate a wider range of urban work settings into their corporate workspace. The need for building or space ownership becomes less significant as space is purchased on demand, on an hourly, daily, or monthly basis or as non-owned spaces such as hotels, airport lounges and clubs become a standard part of the working week. The city is the office.

DEGW are exploring the implications of the distributed workplace in detail through SANE[16] (Sustainable Accommodation for the New Economy). The focus of this project is on the creation of sustainable, collaborative workplaces for knowledge workers across Europe, encompassing both virtual and physical spaces. It is hoped that SANE will accelerate the transition from a location centric to a location independent approach to work and will enhance creativity, productivity, agility, learning and co- operation.

Distributed Workplaces

The distributed workplace model developed by SANE assumes radical changes in both the supply and demand sides of the building procurement model. At the supply side of the equation developers will increasingly realise that increased profits will result from thinking of buildings more in terms of the opportunity to deliver high value added services on a global basis to a customer base rather than as a simple passive investment vehicle.

From the users' perspective there is increasing interest in the provision of global solutions that provide flexibility and break down the old barriers between real estate provisions, building operation and the provision of business services. For global organisations it is also becoming more important to reduce the number of providers of work environments to maximise the economies of scale they can achieve.

The role that buildings are playing in many organisations is also changing. Historically buildings have often provided a way of demonstrating organisational wealth, power and stability. The solid 19th century bank and insurance headquarters buildings in the UK and the 20th century drive for taller and taller office buildings, often in the absence of a sound financial or real estate case for them, are both demonstrations of this.

With distributed workforces only accessing buildings periodically the role of buildings is shifting dramatically. Work can take place anywhere so why should some one come to the office? The office is seen as an opportunity to express the culture and reinforce the values and beliefs of an organisation. The physical work environment and the opportunities it provides for interaction and collaboration aids knowledge transfer and communication and will form the infrastructure for learning organisations.

The distributed workplace model also tries to incorporate the increasing congruence between physical and virtual work environments, acknowledging the impact that information and communications technologies have had on the work process of most individuals and organisations.

The model also examines the continuum between public and private space and produce novel solutions to their integration into work places. The workplace is divided into three conceptual categories according to the degree of privacy and accessibility they offer. The three categories of place used in the model are "public", "privileged" and "private".

Each of these 'places' is composed of a number of different types of work settings, the relative proportion of each forming the *character* of the space. **Public space** is predominately suited for informal interaction and touchdown working for relatively short periods of time. **Privileged space** supports collaborative project team and meeting spaces as well as providing space for concentrated individual work. **Private space** also contains both individual and collaborative work settings but with a greater emphasis on privacy and confidentiality, with defined space boundaries and security.
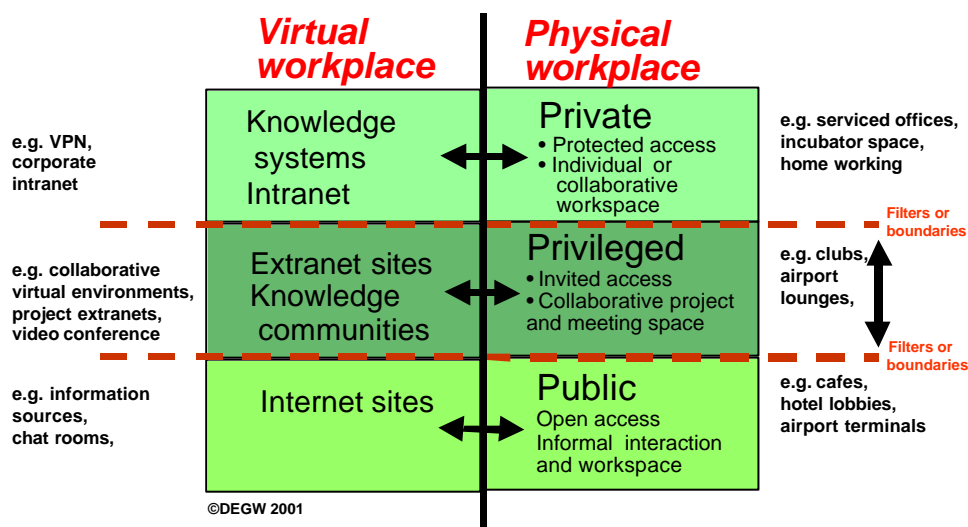
Figure 1 : SANE Space Environment Model.
<u>*Source*</u> *: DEGW 2001*

Each of the physical work environments has a parallel virtual environment that shares some of the same characteristics. The virtual equivalent of the public workplace is the **Internet** where access is open to all and behaviour is relatively 'unmanaged'. The equivalents of the privileged workplace are **extranets** where communities of interest use the Internet to communicate and as an information resource membership.

There are restrictions to entry into a knowledge community (such as registration or membership by invitation only) and membership has obligations and responsibilities attached, perhaps in terms of contributing material or communicating with other members. The virtual equivalents of the private workplace are **intranets**; the private knowledge systems belonging to an individual organisation that contain the organisation's intellectual property. Access to the Intranet is restricted to members of the organisation and the value of the organisation is related to the contents of this virtual space - the customer databases, the descriptions of processes and project histories.

When designing accommodation strategies organisations will increasingly need to consider how the virtual work environments will be able to support distributed physical environments. How can virtual environments contribute to the development of organisational culture and a sense of community when the staff spend little or no time in 'owned' facilities.

An organisation could choose to locate the Public, Privileged and Private workplaces within a single building and location. In many ways the rich mix of work settings provided in New Ways of Working implementations could be said to already do this. In the diagram below this type of combined work environment is referred to as **'Office is the**

City'. All workspace is owned by the organisation and is occupied solely by them. Zoning within the building is often used to reinforce culture and community and urban metaphors such as 'neighbourhood', 'village' and 'street' may be used to describe these zones.
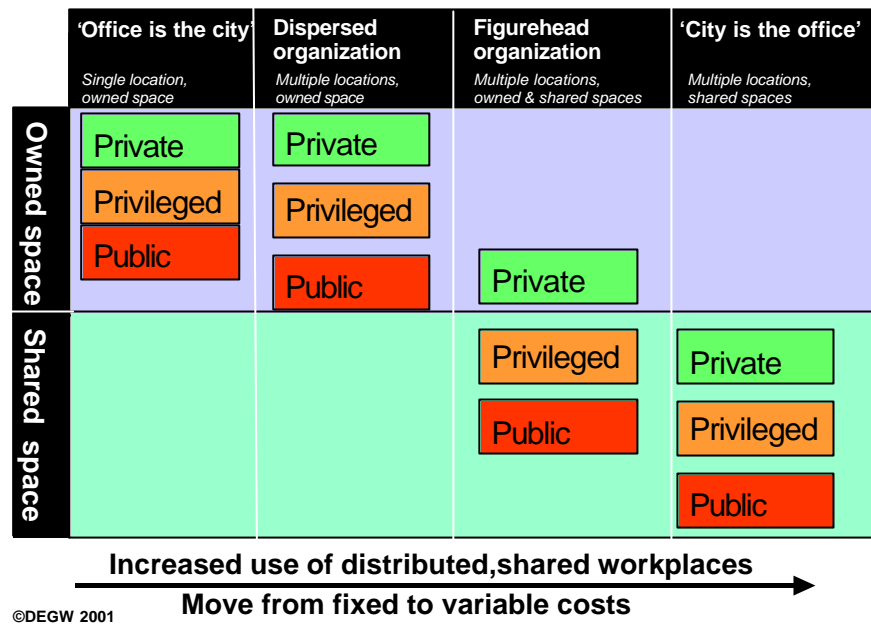
Figure 2 : Property strategies for dispersed organisations.
<u>*Source*</u> *: DEGW 2001*

As the level of remote working increases in an organisation it may not be desirable to house all types of workplace in the same location. Distributing workplaces around the city may allow staff to reduce the amount of commuting they need to do and allow the organisation to start using the attributes of the city to reinforce organisational culture and community. For example an organisation that wants to be thought of as innovative and trendy could choose to locate drop-in work centres in downtown retail/ leisure area such as Soho in London or Chelsea in New York while the bulk of their workplace could be in more traditional business locations. In the diagram above this property strategy is described as **'dispersed.'**

As mentioned previously organisations are increasingly incorporating semi-public spaces such as hotels, serviced office centres, airport lounges and cafes into their work environments. It is possible that this trend will continue to the point where the only spaces actually owned by the organisation are the Private Workplaces including such things as Headquarters Buildings, Training and IT Centres. All other space could be provided by outside organisations on a flexible, 'as used' basis as well as many of the business support services. This type of real-estate strategy is described as **'figurehead'** in the property strategy diagram above.

If this move away from owned organisational space is taken to its extreme it is possible to envisage an organisation where virtual work environments are used to house the organisation's knowledge and information resources and all physical work takes place in either individually owned space (for example, staff working at home) or in shared work environments booked on an 'as-needed' basis. In the diagram above this is described as **'City is the Office.'** If this strategy is adopted by an organisation issues, relative to training and knowledge transfer, use of ICT to support the work process, management of distributed work teams and informal interaction and team building will need to be carefully thought through.

The introduction of a distributed workplace strategy potentially has both efficiency and effectiveness benefits that can work at the level of the individual, the organisation and the City. The Space Environment Model suggests that workspace in the future will be broken down into smaller units distributed across the city, including both suburban (close to home) and urban (close to clients) space.

Smaller units of space can more easily be incorporated into the existing city fabric and, when combined with new methods of delivering both voice and data communications, these smaller units may be accommodated within old or previously obsolete buildings in downtown areas. Opportunities are therefore provided for regenerating existing city districts to provide homes for New Economy companies. An example of this is the re-use of obsolete office buildings in Wall Street, New York (Silicon Alley) that have been wired up for high bandwidth communications and now act as incubator space for dot com companies who occupy the space on a 'space for equity' basis.

The re-use of buildings contributes to sustainability in terms of avoiding the construction of new buildings (materials and energy) and in the maintenance and support of existing communities. Remote working, whether at home or at neighbourhood work centres (café / club type space) aids sustainability by improving the quality of life for individuals (reduced commuting time) and by the reduction of energy consumption.

The increased use of shared space has economic implications for the organisations concerned. Buying space on an 'as needed' basis rather than by committing to long term leases allows organisations to move from a fixed cost structure to a more variable, freeing up capital to be invested in developing the business rather than just housing the existing business.

As well as providing re-use and regeneration opportunities across the whole city, a distributed work strategy also offers opportunities to specific cultural and historic facilities and areas that can attract organisations who want to use these cultural facilities to reinforce their organisational culture in the absence of their own buildings. Museums, historic castles, art galleries, universities and even Department Stores could all earn extra revenue from providing café or club type services office centres.

At the level of the individual, distributed working allows more control over the use of time, with reduced commuting and an ability to match the work environment to the tasks required : to use visits to the office to meet with colleagues and work with project teams and use a range of other locations for concentrated individual work, away from interruptions and distractions.

Sharing workspace with other organisations also provides opportunities for interaction with people from other professions, which may lead to the development of new business ideas or projects as well as opportunities for career development and networking.

The Space Environment Model can be applied in many different ways to meet the needs of a specific organization. One of the key purposes of the set of diagnostic tools being developed to support the Space Environment Model is to help organizations develop appropriate solutions to meet the requirements of their business process and the needs of their employees.

However, to further develop the model and evaluate the implications of the model on the design and management of the workplace, we are developing models of a number of generic real estate components that together could form the elements of a distributed strategy for organizations of various sizes, appropriate for a range of countries and market sectors. These generic components can be described in terms of whether they are public or private, in terms of shared access by other individuals or other organizations, and whether they are localized, close to the homes of the people using the components, or centralized, close to commercial or city centres.

The four generic real estate components have been identified as :

- Personal Centre
- Project Centre
- Corporate Centre
- Operations Centre
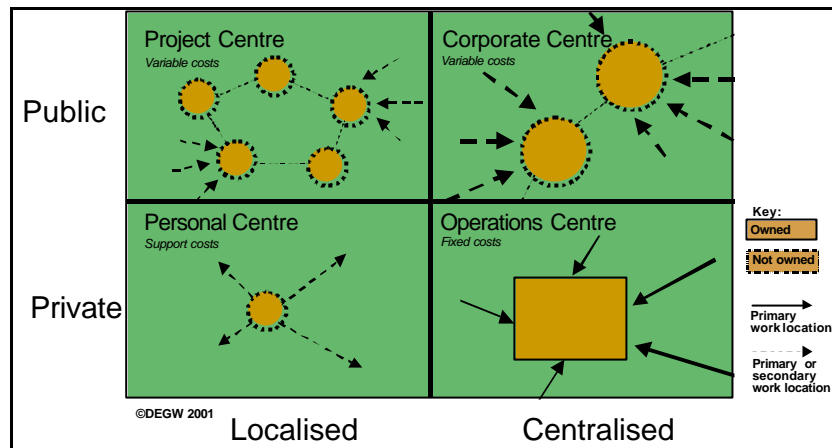
Figure 3 : Generic real estate components for the distributed workplace

The **Personal Centre**, or home office, may be the primary work location for some people working as freelancers or in roles that can be entirely undertaken from home using technology (e.g. distributed call centre employees). For the majority of knowledge workers, however, home will be a secondary work location that is used for individual concentrated working or to carry out routine tasks that do not require the physical involvement of other people for their completion (e.g. dealing with emails, expenses, standard reports).
Working from home for part of the week may provide individuals with significant work life benefits in terms of avoiding long commutes or flexibility in dealing with family or other responsibilities.

For some people working at home is not appropriate either because of technology limitations, family or other distractions or because the size of the home is not sufficiently large to allow the setting up of an effective home work environment. **Project centres,** located in suburban and other areas near where the employees live, for example as part of neighbourhood shopping and commercial centres, will still allow individuals to achieve many of the same work life benefits (such as reduced commuting time).

These centres could be shared by a number of organisations or they could be completely open to the public. As well as providing a location for individuals wanting to work near home these centres could also be used to provide longer-term project spaces for teams collaborating on a specific project. These teams could also be from different parts of a single organisation or people from a number of different organisations could form them.

A wider range of work settings and services will be provided in the **Corporate Centres** which are likely to be housed in more expensive space in central business districts close to where the organisations' clients are likely to be located. The Corporate Centres will also contain both individual work settings that can be used by 'drop in' visitors as well as longer term project space. In addition the Corporate Centres may also contain a wider mix of meeting and other client facilities such as presentation rooms and private dining facilities.

It will also be possible for Corporate Centres to be shared by a number of organisations with project and client areas being branded for specific events or projects if appropriate.

The **Operations Centre** will primarily house business functions that are not directly client facing. These are likely to be located in less expensive space outside the central business district and may include functions such as Finance, Human Resources, Information Technology and Training. The Operations Centres may also house representatives of the service partners who will be supporting the Project and Corporate Centre networks. The populations of the Operations Centres are likely to be more resident and predictable than in the other types of Centres. While there may be relatively low external mobility there may be high internal mobility, requiring a rich mix of work settings to support the work processes being undertaken, including call centre space to provide administrative and service support to users of the other Centres.

It is also likely that the Operations Centres will continue to be leased or owned by individual organisations rather than shared by a number of organisations. This is because of the more stable populations in the Operations Centres, the nature of the work being undertaken there and the lower real estate costs in the more fringe locations where these are likely to be located.

Project Centre	**Corporate Centre**
• Primary/ secondary work location	• Primary/ secondary work location
• Close to home	• Close to clients
• 24 x 7 flexible working	• 24 x 7 flexible working
• Itinerant workers (indiv/ collaborative work)	• Itinerant workers (indiv/ collaborative work)
• Project teams	• Project teams/ Solution
• Training and development	• Training and development
• Supported by high speed network	• Supported by high speed networks
• Shared with other users	• Shared with other users
• Lower cost space/ suburban locations	• Higher cost space
Personal Centre	**Operations Centre**
• Primary/ secondary work location	• Primary work location
• Knowledge and service workers	• International/ regional centre
• Concentrated work, low face to face	• Business support functions
• Intermittent/ continuous use	• Knowledge Centre
• 24 x 7 flexible working	• Resident/ non resident
• Distance learning	• Low external mobility, high internal mobility
• Supported by high speed connection	• Mix of settings including call centre
• Work/ life balance issue	• Flexible and shift working
• Privately owned space	• Lower cost owned space

Figure 4 : Characteristics of the generic real estate components

From these descriptions you can see that we predict that two key types of work locations, Project Centres and Corporate Centres, in the future will be shared facilities. In these centres people from a number of organizations will share the same space and purchase a range of additional spaces and services from the suppliers of the workplace on an 'as needed' basis.

Information appliances - making sense of shared workplaces

If these shared workplaces are to succeed they will have to be supported by a number of information appliances that allow the users of these workplaces to make sense of how the facility works, to order additional services and products on demand and to locate and interact with other people in physical and virtual space.

The providers of Project and Corporate centres will seek to maximise their revenue from their centres by selling value added services. Active directories around the Centres will ensure that users know what is available as a regular service and what special events and products are available at any particular time. If the Centres sell 'memberships' to users, so that an accurate database of potential users exists, mobile telephones and PDAs can be used to broadcast this information outside of the physical workplace to encourage members to use the space and facilities of the Centre.

These devices will also have a critical role to play in helping a mobile worker 'on the move' to find out where appropriate spaces and services are available at that location, accessing the global booking system of the workplace provider.

Information appliances located throughout the Centres will be used to display whether users have reserved rooms or work settings, the availability of the setting over time and perhaps even cost and other related information. These devices may also function as the interface to order audiovisual or IT resources and catering requirements.

With smaller scale shared workplaces it may be relatively easy to determine who else is in the Centre and to locate colleagues from the same organization. We envision that Corporate Centres could be very large, housing hundreds, or perhaps even thousands of workers from a number of organizations. Some of these people will be located in the Centre for a number of months or years occupying a dedicated project space. Others will be more transient, occupying a range of spaces and settings over time for the brief period that they are in residence at any one centre. We believe that there is a valuable role for some sort of 'office positioning' system within these centres that can be

used to accurately locate each individual user who wishes to be locatable. Obvious privacy issues will need to be addressed if any such appliance is to gain acceptance.

If each person has a unique identifier they can be found within the centre by accessing a display screen on the Centre's intranet or on plasma screens located around the Centre. With appropriate access control the system could be interrogated to locate all people from a particular organization or all people with a particular set of skills that you need. Personal profiles built into the system would also determine how willing people are to be found or to interact with people from other organizations.

If the provider operates a number of Centres in different locations the system should be able to be interrogated across all locations, identifying where the person is and what resources are available at that site to facilitate communications. Virtual corridors between Centres, constant videoconference links, could then provide opportunities for people to meet informally to follow up on a phone call and perhaps share documents or other information.

If each person is wearing the unique identifier, whether or not it is set to be visible to the system displays, this device can also be used as the primary vehicle for paying for goods and services while in the centre. The contents of the information directories can also be dependent on the identifier of the person interacting with the device, providing company specific, sector specific or skill dependent information based on the person's profile. This profile could be entered into the system or it could be developed by the system as choices and purchases are recorded over time. The information appliances will, in effect, have the ability to map the information networks onto physical space.

Shared workplaces have the potential to be large, anonymous workplaces where there is little interaction or sense of community. An airline lounge on a large scale, with people arriving, working and moving on without any sort of meaningful social experience. Information appliances, we feel, can help to change this by making sense of the space, providing access to the spaces, services and people who inhabit the Centre and to act as the catalyst for new types of interaction and communications between the occupants. Information appliances will also act as the bridge back to the cultures and communities of the 'home' organizations of many of the users and will help these workers to continue to feel part of the organization, regardless of where they are physically located.

Supporting collaboration and interaction among distributed work teams

We have identified, with numerous other authors, that team or project based knowledge work will make important contributions to corporate success in the future. We have also identified above trends and models enabling a more distributed working strategy. If the benefits of this move are to be realised, new and emerging technologies will have to be applied to the problem of supporting collaboration and interaction among teams of distributed co-workers. Existing groupware solutions contain many useful features but fall far short of reproducing the information rich context that can be provided by the physical workplace. Referring to the physical workplace here we are referring to a somewhat idealised version. While many workplaces still fall short of this ideal, innovative designers such as DEGW working with leading companies through the 1990s have developed a very clear understanding of how interaction and collaboration can be maximised among co-located workers.
This section of the paper will focus on one of the core problems the SANE project sets out to address- the problem of freeing knowledge workers from locational constraints.

As we have identified above, knowledge is the key to success, yet leveraging knowledge across an organisation is problematic. During the 1990s many organisations made considerable investments in knowledge management systems with varying results. What we can say is that despite the best efforts of knowledge managers, knowledge documentation always runs behind acquisition: the latest and often the most relevant knowledge is in peoples' heads not yet in their reports. The socialisation of knowledge - promoting the direct exchange of ideas in conversations and other interactions - speeds up the exchange of knowledge thus allowing organisations to get more value from it. However, this takes place most readily when people are located in the same physical environment.

From our research into interaction in the physical workplace we have identified a number of factors that we believe are important for sustaining collaboration and knowledge exchange. Our experience suggests that spontaneous interaction and ad hoc meetings decrease as distance between people increases - people rapidly become less likely to leave their worksetting to have informal discussions with colleagues. Teams working dispersed within large

organisations often recognise this consciously and create informal interaction time by meeting together for breakfast, or at some other time. These meetings are essentially social yet provide an important forum for informal knowledge exchange.

Within the office environment ambient information seems to play an important role in our interactions with others - we may be unconscious of the presence of a co-worker in the corner of our field of vision until faced with a problem that they can help us resolve. For example, when I look around the room I see that Graham is available and I can ask him for help. I also have other information - I may see that he is on the phone, talking to other colleagues etc. I may even be able to sense whether he is deep in thought.

Distributed workers has little or none of this information about their team mates and co-workers. Specifically they have little or no information about the availability of co-workers and their willingness to be interrupted. The absence of this shared information rich context acts as a barrier to spontaneous interaction and can lead to friction rather than enhanced collaboration.

Applications are being developed that start to provide us with a sense of the virtual presence of others. While writing a first draft of this paper on a Sunday afternoon I could see from the project extranet site who else from the project team was logged on, enabling me to decide whether or not to discuss some aspect of this paper with a colleague. To access this information in its present form I do have to make the conscious decision to check a web page; however projects such as Tower have gone a long way towards developing ambient indicators which could provide users with this information. An early Tower[17] demonstration linked what could be described as a 'lava lamp' to the project extranet. The rate at which bubbles formed in the 'lamp' was related to use of the site. Team members discovered that this provided a constant project pulse - providing project managers with a crude but effective sense of activity on the project.

Within DEGW's office another application displayed on a large plasma screen shows the floor plan of a partner's office with avatars indicating the identity and location of workers in that building. This system enables me to be aware of the presence of team members although they are located hundreds of kilometres away. Working on a problem in my office I can see who is available in the other office to help me. This kind of application starts to give the distributed worker some of the richness that they have lost by being removed from the same physical environment as their colleagues.

While providing locational information to distributed workers does appear to provide benefits it does also raise problems. Systems that provide this information are essentially tracking systems which can produce a record of people's movements. Some concerns have been voiced, although not by our users, about the privacy implications of these systems. Should organisations be able to track individuals' movements second by second throughout the day? While generations brought up with game shows such as Big Brother may not find this as disturbing, older generations may have reservations, and there are serious privacy implications. If in-building monitoring systems were combined with external tracking, based perhaps on 3G, even more serious issues about the ownership and use of this information would have to be addressed.

To better understand these issues we can use the physical working place as an analogy. The working environment at DEGW provides me with a range of different settings from which to work. Supported by wireless laptop and phone technologies I can move relatively seamlessly between them. My choice of setting in this environment provides information to my colleagues about my degree of accessibility - the extent to which I am willing to be disturbed. Sitting in the central open 'club' area, where I can see colleagues and they me, indicates that I am willing to be interrupted. Alternatively I could move to a quiet booth if my work required uninterrupted concentration - again the setting chosen provides information about my state. Leaving the quiet booth door open or closed can further refine the information provided. I could also choose to work in a room away from the main circulation routes in the office and effectively isolate myself completely. We also use project spaces where people will work when they are working in a particular project.

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[17]   '*A Day in the Life of a Tower World User*' *provides a useful introduction to the project.. This scenarion can be found at* *http://tower.gmd.de/TowerUsageScenario.pdf*

Similarly with locational information provided electronically. If I wish to contact a team-mate but notice that they are in a formal meeting room with several others I probably will not disturb them. If they are in the project space of the project I am working on I can assume that they will be willing to be interrupted to discuss the project. Since the system allows me to see who they are talking too, or at least who they are with, I may choose to phone Pete when I see him talking to Rupert so that I can discuss a problem jointly with both of them at the same time.

Three important points emerge. Firstly, in the physical work environment the user can choose between settings thereby controlling their degree of accessibility. Secondly, in the physical work environment under most conditions, information flows are symmetrical. While I can be watched in the open plan space, and to a lesser extent in a glass fronted quiet booth, I can also see who is watching me. This is a very different state of affairs from being watched. The introduction of CCTV, widely used in the UK, has already created an asymmetry for some workers. Finally information about the context is used in real time to influence decisions on interaction.

We believe that if technologies that provide locational information are to be widely accepted users must be provided with choice- including the choice not to provide information on their location. This can be achieved simply by fitting the device (all current systems rely on something like an active badge) with an off switch. More sophisticated systems will allow users to set the levels of information that they choose to make available to others, and will also allow them to discriminate between different users. Returning to our Public/Private/Privileged metaphor, public access information might be limited to revealing that an individual is 'at work' giving no locational information at all. Privileged access might reveal the general location at the level of the building. Only at the Private level would detailed information be made available.

Individuals should also be able to 'see' others when they are being 'seen'. Where users are working in environments with similar locational positioning systems providing reciprocal information would be straightforward. However where locational positioning systems are not in place users might be required to log into the virtual 'club' or relevant project space before being able to receive information about others. How this information should be represented to users is an issue for interface designers. The most promising approaches are those that do not attempt to crowd more visual stimulus onto the electronic desktop but which, as demonstrated by the Tower project, provide ambient indication.

For the individual user most benefits come from access to real-time information and concerns about intrusion can be resolved, given choice and symmetry in informational access and provision. The issue of stored data is more problematic. Few users see benefits from being able to review where people were, and many feel uneasy about others being able to track their past movements. It may be that if systems of this sort are to gain widespread acceptance, either past information is not stored, or stored information is made anonymous. This information would be available to provide facility managers with aggregate information about building use and performance but line management might not have access to information about the behaviour of individuals.

The discussion above illustrates how new and emerging ICTs can assist, in some dimensions, the construction of a richer shared informational context between distributed workers. Much more work remains to be done exploring other dimensions of the social and informational space that we share with our co-located workers. The role of information appliances in the distributed workplace is a key issue that will be explored in the SANE project during the next year. Participation in the SANE project is welcomed. Further information can be found at the project website : *www.saneproject.com.*

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3.15 Sustainable eWork - Assessing and optimising the ecological and social benefits of eWorking : SUSTEL project

SUSTEL project aims to :

- develop a framework to assess the economic, environmental and social impacts of teleworking

- undertake surveys and develop case studies to better understand its economic, environmental and social impacts and the ways in which these can be optimised

- synthesise the findings into user-friendly tools and materials which can be used by organisations to assess and optimise the sustainability of eworking initiatives.

It involves a collaboration of seven official partners - Avanzi (Italy), BT (UK), Danish Technological Institute (DTI), Empirica (Germany), Telewerk Forum (Netherlands), University of Bradford (UK) and the project co-ordinator, the UK Centre for Environment and Economic Development. Other telcos such as Telecom Italia are also collaborating with the research.

Since the project began in January 2002 it has developed a draft conceptual paper on the relationship between eworking and sustainable development, and undertaken a pilot survey of eworking staff at BT (see *www.sustel.org* for details of these and other outputs). The pilot survey received 1874 responses from a sample of 5128, giving a response rate of 36%. This makes it one of the largest such surveys ever undertaken. Initial analysis has shown that BT eworkers believe that eworking has enabled them to have a higher quality of life, have more time for community involvement and to travel less. However, it also showed that most work for longer hours than previously. Following careful analysis, a revised questionnaire is being produced as the basis of a full survey in the five national partners. These will be accompanied by six organisational case studies. During 2003 the results will be distilled into guidance and tools for business, and policy recommendations for Governments, as to how the sustainability benefits of eworking can be maximised.

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3.16 eWorking as a Tool for Information Society Technologies Programme Promotion to Baltic States : TELEBALT project

Main objectives

- 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, vitual 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. Basing on IDCs, to organize the Telebalt major project conference in Vilnius, Lithuania, the workshop in Riga, Latvia, and the outlook demonstration 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 capacity 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 the consortium led by University of Ulm, Germany (Shopaware 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.

Main issues

The Telebalt brochure was issued in the English, Latvian, Lithuanian and Estonian languages. It describes goals, objectives, main events, participants and other important features of Telebalt. Project materials were disseminated through Telebalt Newsletter Vol. 1 in English and electronically, via Telebalt Web-sites.

Telebalt web-sites were developed based on the concept of information and knowledge portals. They are hosted at servers of all project partners: the main one at Infobalt, Lithuania (*http://www.infobalt.lt/Telebalt),* also at "Open Latvia", Latvia (*http://www.Telebalt.lv*), EDNES, France (*http://www.ednes.org/Telebalt/*), and Inforing AS, Estonia (*http://www.Telebalt.infopress.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; *etc*. The web-sites also promote new methods of work, such as "EU-CIS Teleworking 2001" (JCM Consultants, France), CoBrow and Virtual Presence System (VPS) toolkits (University of Ulm, Germany), European Knowledge Platform (EKP) (GRI, Germany), *etc*.

Information Dissemination Centres (IDCs) deployed at Infobalt throughout association in Vilnius, "Open Latvia" association in Riga and Inforing AS in Tallinn will disseminate information on opportunities that IST creates for Baltic countries concerning new methods of work. IDC at Infobalt will host a conference entitled "Teleworking for Business and Partnership Promotion" which will focus on business. The IDC at "Open Latvia" workshop entitled "Telematics for Tourism and Social Integration" will focus on tourism. The IDC at Inforing AS workshop will be entitled "Telematics challenge to employment opportunities". Each IDC Web-site will be clearly target oriented. Latvian IDC Web-site will deal with information technologies and tourism. Estonian IDC will focus on employment opportunities. It will develop and maintain a specialized Web-site containing :

- a comprehensive constantly updated on-line database of existing vacancies and demands
- a service for electronic submission of curriculum vitae
- a consulting service
- a list of partner organizations, useful links, *etc…*

The IDC web-site in Infobalt, Lithuania, will be devoted to telematics for business and research information dissemination and exploitation. The Lithuanian IDC in contact with the Committee on Data for Science and Technology of International Council for Science will collaborate in development of the scientific part of the web-site.

The Telebalt workshop "Information Technologies, Tourism and Social Integration" was organized in Riga, Latvia, by Open Latvia on April 4-5, 2002. It was held at the same time and in the framework of Baltic IT&T 2002 Forum (*http://www.ebaltics.com/forum2002*). The Telebalt workshop aimed at strengthening scientific and technological co-operation between the EU and Baltic states in the field of IT applications to new methods of work and tourism with an emphasis on social integration. The European and Baltic companies learned about the ways of practical implementation of joint research activities in the framework of the European funding allocated by the EC. Preliminary agreements of co-operation were signed between the participants wishing to implement possible joint projects. The workshop presented a unique opportunity for European and Baltic companies to exchange innovative and successful experiences, improve scientific and technological research and initiate first steps towards cooperation in IT applications.

The following IST projects were presented at the workshop: Emergence, E3Work, Teamwork, FlexWork, Palio, SmartUp, Ontour, Easycraft, Think. Pl@za groupware developed by Teamware Group Oy, Finland, was presented and demonstrated on-line. Information about the workshop is available on Latvian Telebalt website (*http://www.Telebalt.lv/).*

Telebalt focuses on development of a community in the Baltic countries capable of operating efficiently in a modern information society. An important component of such development is the selection and evaluation of IST products and telematic tools suitable for EU-Baltic states teleworking. CoBrow collaborative browsing toolkit developed by Ulm and Freighberg Universities, Germany, PL@ZA groupware developed by Teamware Group Oy, Finland, European Knowledge Platform developed by German Research Institute, and Teamwork eworking teams kit will be among the pilot examples of such IST products.

Training courses are being developed by telematics experts of EDNES headed by JCM Consultants, France. Three lectures were prepared entitled "European Union", "Enlarging the European Union" and "Fifth and Sixth Framework Programmes".

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3.17 eWork solutions for the promotion of EU co-operation in business and research with the Commonwealth of Independent States : TELESOL project

Introduction

Telematic methods of work are the natural consequences of the progress in technology and telecommunications. Such concepts as: ework (aka telecommuting), distributed office, televillage, telemedicine, are the facts of everyday business life in EU countries. The businesses and organizations in these countries have a vast experience in telematic methods of work. They also identified, selected and concentrated on the best solutions and best practices in that area.

The same process of gaining knowledge in telematic methods of work is taking place in the CIS (former USSR) countries. During the last decade there emerged both business and non-profit organizations who obtained knowledge and experience in telematic methods of work. Recent surveys show that eworking by programmers in Russia (for other countries) will amount in 2002 to 170M euro, and grows annually by 20-30%. The equivalent figure for Ukraine is 45M euro, growing annually by 60-80%.

At the same time, these countries often lack systematic knowledge and need to gain from the experience of others. So emerging everyday problems are not properly addressed, and the results of telematic work are far from optimal.

TELESOL project : its goals and objectives

The Telesol project is in the framework of the IST program of the European Commission. The co-ordinators of the project are UNIDO - United Nations Industrial Development Organization, and the association EDNES (Earth Data Network for Science and Education), France. The main objectives of the project are :

- To gather information in the participating CIS countries, concerning their technological and readiness for telematic methods of work
- To create ework awareness in the local business and research communities
- To identify the local ework problems; to make use of the best practices of EU companies to address these problems
- To disseminate widely the relevant information to develop a training course on telematic methods of work

The goals and objectives of the project defined a choice of the participants. We were able to identify in the participating countries the business and research organizations, involved and/or experienced in telematic methods of work. These organizations are considered to be the focal points of the project in each of the participating CIS countries.

The participants of the project are the following countries of CIS: Central Asian (Kazakhstan, Kyrghyzstan, Uzbekistan), Caucasian (Armenia, Azerbaijan, Georgia), Slavic (Russia, Ukraine).

The EU companies who take part in the project were chosen for having the knowledge and experience in telematic methods of work, including cross-border ework and cross-border ework with CIS or East European countries.

Technical innovations and variations between countries

Telematic methods of work, by definition, explore the latest results in technology and telecommunications. In our CIS examples of ework we clearly see how the structure of ework is changing, for instance, with the development of Internet. Telesol aims to bring the best of these innovations to the participating countries.

It is relevant to mention here that there are different priorities in ework issues for various CIS countries - and thus there is variation in what EU experience is relevant.

Project participants from the Slavic countries and countries like Armenia, and the ework community there, find the business issues of ework, especially in the IT area, the most important. Thus we focus on such issues as :

- Technical and communicational infrastructure and its readiness for ework

- Local legal and fiscal ework environment
- Synchronization of work processes, the challenge of cultural diversity
- Product certification, development of eworking personnel.

Apart from bringing to these countries the experience and best practices of ework from their west European counterparts, the project TELESOL will establish new links and contacts between EU and CIS ework communities.

For some countries the concept of distributed office, i.e. ework within one company or organization, is the most important. First of all this is so for Kazakhstan, a country with large geographical distances between cities and with two capitals, old and new. It can be mentioned here, that the cities are interconnected by satellite channels (instead of laying cables through the desert). Most companies have just opened their branches in the new capital (Astana), at the same time retaining headquarters in the old one (Almaty). Thus the issue of the distributed office is important.

Finally, the countries with as yet limited communication resources (such as Uzbekistan or Kyrghyzstan) tend to concentrate those resources on critical applications and they develop first of all in such directions as telemedicine.

Events and materials

TELESOL will achieve its goals and objective using the following means :

- Regular meetings and conferences of the participants and of the telematic work community in the participating countries. At this moment, the following events are planned :
  - o Kick-off meeting in the Bishkek (Kyrghyzstan) : 8-9 June 2002
  - o Caucasian workshop in Erevan (Armenia) : November 2002
  - o Caucasian ework conference in Baku (Azerbaijan) : spring 2003
  - o Workshop in Kiev (Ukraine) : autumn 2003
  - o Central Asian ework conference in Almaty (Kazakhstan) ; spring 2004
- The creation of Telework Competence Centers in the participating CIS countries. It is envisaged, that TCCs will be the focal points for knowledge, experience and best practices of telematic methods of work in each participating country
- The development of a training course on telematic methods of work and pilot use of this course at the conferences and meetings
- The wide dissemination of relevant information, including a yearly issue of the project newsletter and the creation of a project web-site.

Local experience and the expected results of the project

There are business and research organizations in the CIS countries that successfully use telematic methods of work. Even at this early stage of the project we identified plenty of them, mostly in the area of information technologies. We expect them to benefit from the project by absorbing the knowledge and best practices.

We also expect the local competence centers to remain, after the end of the TELESOL project, as the sources of knowledge, disseminating the information and training on telematic methods of work.

Finally, we expect that the increased activity, more contacts and better understanding in the ework community in the participating countries, will lead to new successful ework examples.

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3.18 Human Capital & Sustainability in a Global Networked Knowledge Society : TERRA 2000 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 challenge applies particularly to the threat of medium - to long-term unsustainability of the Global Networked Knowledge Society, which seems increasingly dominated by short-term dynamics. Sustainability has several distinct dimensions (economic, social, environmental and cultural). Sustainability discussions and policies limited to one or two dimensions or isolated parts of the GNKS are insufficient to meet the challenge: sustainability is a global property of the whole system. 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 during the past year has concentrated on two areas: framing, methodological and definitional investigation related to the central problem; and thematic analysis of the impact and sustainability implications of the GNKS for human capital.

In the first area, the project has developed working definitions of the key concepts and identified specific aspects where additional modeling and analysis are required to understand the magnitude and significance of the unfolding GNKS. This term, for instance, incorporates :

- *Globalisation* of economic, social, environmental and cultural activities
- *Networking* both in the technical sense of network reach and connectivity and the more instrumental sense of the patterns and nature of interactions occurring within physical networks and their impacts on behaviour, values, welfare and, through them, on the evolving geometry of networks
- *Knowledge* meaning information (codified knowledge, whose spread and distribution are cheaper and faster), tacit knowledge (human capital remains relatively scarce, expensive to form and slow to distribute but is essential to unlocking the private and social value of information) and systemic knowledge (sometimes called organizational or social capital, this is knowledge that is not owned by individuals, but is a local public good embodied in institutions including networks)
- *Society* indicating that the various dimensions of human activity (including economic) are not separate, but must be analysed as a whole.

The resulting concept of sustainability is elaborated along four dimensions (cultural, economic, environmental and social) and takes account of *stocks* of essential resources, maintenance of *capabilities* or capacities (to take due account of substitution) and *resilience* to shocks. It takes essential account of *linkages* among and within systems, and resulting dynamics. Among the most important are the positive feedback loops that produce *rebound* effects: for instance, improvements in the efficiency with which non-renewable resources (or resources whose extraction, use or disposal creates significant pollution externalities) should lead to falling prices, which in turn stimulate greater levels of extraction, use and disposal. The net result may be a reduction in sustainability. On the other hand, rebound effects can provide improved or accelerated signals of unfolding problems and can thus be harnessed to help anticipate problems and develop solutions before the problems become insoluble. Another positive feedback characteristic of the GNKS is the autocatalytic knowledge creation cycle. The thrust of the analysis is to determine when more information leads to more knowledge, when more knowledge leads to more understanding, and when more understanding leads to greater sustainable welfare. These are by no means inevitable, and there is ample scope for policy intervention to increase the odds of success. Keys to understanding this are the balance among types of knowledge, the distribution of knowledge and its rewards, and the ability of knowledge to be applied to solving global problems.

To develop a balanced view of these essentials, TERRA2000 is proceeding in a phased thematic manner, concentrating on: human capital, equity and growth, information age sustainability and, finally, holistic analysis. The rest of this report briefly discusses the human capital theme.

Human capital (tacit knowledge) affects economic development in two main ways : as an increasingly essential, if intangible, factor of production and as a source of innovation. The GNKS has potent reciprocal relations with: the skills demanded by and supplied to the economy, methods of working, including ways of working together, the pace and content of learning and knowledge capture, distribution and exchange, the development, implementation and

(sometimes) codification of new knowledge and the returns to human capital investment. It has been observed, for instance, that the GNKS is associated with widening inequalities among nations, among skill or occupational groups within nations and even within skill groups. This manifests itself in different ways: in market-dominant economies, it shows up as income inequality; in social market economy it shows up as inequality between employed and unemployed. The explanations offered by economists range from trade (globalisation leads to exports of knowledge intensive goods from developed areas or sectors and increases returns to skills in globally short supply), skill-biased technological progress (which increases the productivity of skilled workers and creates the possibility for a few individuals to serve the needs of an increasing market) and migration (which combines elements of both). The associated policies are those affecting education, migration of workers, changing production methods and migration of work. The trends and shocks to which policy must respond include increasing pace of knowledge production, the growing importance of 'intangible capital' devoted to knowledge production and maintaining the human substrate of human capital (education, health care, etc.), the shift of jobs to knowledge-intensive activities (not just in high-tech sectors), and the implications of increasing skill complementarity. The resulting problems include growing 'divides' (digital, knowledge, income, welfare, environmental, etc.), migration and its resulting strains, clustering, etc. To illustrate the emerging results, this report concludes with an example.

In addition to the 'supply-side' policies traditionally used to address mismatches between human capital, attention has recently turned to immaterialisation and improved labour markets to allow escape from inefficient equilibria such as those shown in the matrix below :

	Low skill	High skill
Low specification	(c, c)	(a, b)
High specification	(b, a)	(d, d)

Employers (row, first payoff) and workers (column, second payoff) receive 'co-ordination game' payoffs, where $c > b$, $d > a$ and $d > c$ - Nash equilibria are shaded and (Low, Low) - **a stylised *status quo* of skill shortages and skilled unemployment** - is inefficient relative to (High, High). First, policy (to lower c or increase b) can help a society 'stuck' in the inefficient equilibrium. Further insight comes by letting many parties interact with their *network* neighbours.

If behaviour evolves - for example, by random opportunities for players to change to behaviour that is optimal against neighbours (subject to a random shock), long-run outcomes *may* be efficient - *if the efficient equilibrium is also risk-dominant* (if $c-b < d-a$. This holds for a range of network structures. The policy needed to secure escape from the inefficient equilibrium may be to increase the opportunity cost of being 'High' in a mismatched market (b-c) *or* to raise the opportunity cost of being the 'Low' player in a mismatched market (a-d). Further analysis has established how making network structure endogenous (e.g. liberalising labour markets) can stabilise efficient outcomes that are not risk dominant, speed convergence to stable outcomes or even destabilise the inefficient outcome.

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3.19 New methods of working for IST Programme - Promotion to Commonwealth of Independent States : WISTCIS project

The main goals of the WISTCIS project are to :

- Demonstrate IST objectives, opportunities and telematics products to the CIS community
- Conduct eworking technology studies in European Union and the CIS countries
- Develop a community in European CIS countries capable of operating efficiently in the modern information society
- Demonstrate IST results to the CIS telematics community
- Select and adapt telematics tools produced by IST to the participating CIS countries
- Encourage submission of new project proposals to the IST Programme with participation of EU member states and CIS countries and to contribute in this way to development of the huge CIS potential market for EU IST products

Results achieved during the project implementation

The project disseminates results of eworking technology studies through WISTCIS Newsletters, Web-sites, conferences and workshops.

The main WISTCIS Web-site (*www.ednes.org/wistcis*) as well as focal point's project web-sites in Ukraine, Moldova, Azerbaijan, Belarus were launched.

The new project Cluster-Pro, under WISTCIS initiative is a cluster of five IST projects : WISTCIS, TELESOL, TELEBALT, E3 Work, TEAMWORK.

The training course as the main tool of encouraging submission of new proposal concerning eworking to the EC was prepared by Pricewaterhouse Coopers (principal contractor) and introduced at the conference and two workshops.
The lectures of these courses are available in English and Russian on the Wistcis Web-site : *http://www.ednes.org/wistcis/main_e.htm*

The manual "New methods of Work for EU-CIS Teleworking" 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.

WISTCIS kick-off Conference "Teleworking 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. Achieving this goal, the following elements took place: plenary and posters sessions, seminars, workshops, demonstrations and discussions. 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.

The 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 has 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. The workshop also spread information and knowledge about new telematics products and technologies implemented in the EU and the CIS countries and IST Programme possibilities.

The WISTCIS Workshop "E-working, Distant Training and Environmental Monitoring: New Opportunities", Baku, Azerbaijan took place on 13-14 December 2001. The major part of the audience represented educational and research communities of Azerbaijan including teachers, postgraduate and graduate students of universities.

In total more than 600 participants from Armenia, Austria, Azerbaijan, Belarus, China, France, Georgia, Germany, Latvia, Moldova, Portugal, Russia, the Netherlands, Turkey, Ukraine attended these events. The conference and workshops promoted the following IST projects: Shopaware, Telesol, Telebalt, TeleinVivo , Teamwork, Think, StarMate, Unite.

In addition the gatherings promoted the following EU thematic products: Louis Dreifus, EUR-OPA Telematic System for Natural Disaster Consequences, French Telematic systems for earthquake and volcanic observations which have been presented by the conference.

Contact

WISTCIS Web-site : http://www.ednes.org/wistcis/main_e.htm

4   eWork - National Reports

EU Member States

Austria

Background on general economic and employment status

Following a high 3.2% growth rate of the GDP in 2000 decreasing domestic demand and a marked slackening of exports and equipment investment led to a sharp decline of the growth rate of real GDP to only 1.1% in 2001. GDP may grow by 1.2 percent in 2002, accelerating to a rate of 2.8 percent in 2003: "*The sharp cyclical downturn is putting strain on the labour market and on public finances. Employment is set to decline in 2002, accompanied by a jump in unemployment. With automatic stabilisers operating, the general government balance will slip into a temporary deficit in 2002. Inflation should decelerate markedly under the impact of falling energy prices*"[18]. However, political developments as of spring 2002 affecting OPEC member countries might prove such positive expectations false. On the other hand, "*inflation has not been boosted by the introduction of euro notes and coins early this year. Abstracting from price increases for seasonal goods (…), consumer prices edged down from December. Apparently, dual price advertising, price surveillance and competitive pressure have all had a positive effect in this regard. With inflation having gained momentum in other western European countries, the Austrian rate is now clearly below the average for the euro area*"[19].

General economic trends in Austria did change quite a lot in recent years because of EU policies and Austria's involvement in processes such as increased competitive pressure and liberalisation in areas which were previously protected. Because Austria is a net payer to the EU budget it is very important for internal politics that an overall economic evaluation indicates that EU membership produced welfare effects - mainly for consumers - of about 2 percent of GDP. Since 1995, the full integration of Austria in the Single Market and in the early stage of EMU resulted in an cumulative increase of real GDP of 3 percentage points (or of about 1/2 percent per year)"[20].

Against this background information on ework developments during the year 2001 and in early 2002 reveal a major distinction in comparison to previous ework debates: there is less 'heated' argument, more reliable data is available and, more significantly, impact is taking off rather smoothly. There is still no particular legislation established in Austria concerning ework. However, new measures have been initiated or are under discussion that will elevate the flexibility and mobility of the work force in Austria. Such measures include reduction of the numbers of civil servants (and major changes of their legal position, e.g. in schools, universities, and government administration), up until now rather restricted opening hours of shops, and labour laws (particularly time regulations). 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.

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[18]   *Markus Marterbauer: Pronounced Cyclical Downturn, Recovery not Before Mid-2002. Economic Outlook for 2002 and 2003 (WIFO-Quarterly, 1/2002).*

[19]   *Ewald Walterskirchen, Signs of Cyclical Recovery Becoming More Frequent (WIFO-Monatsberichte 3/2002).*

[20]   *Fritz Breuss, An Evaluation of the Economic Effects of Austria's EU Membership (WIFO-Quarterly, 4/2000).*

Framework agreements

In Austria, three general collective agreements concerning ework have been negotiated 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 was concluded in November 1999. This collective agreement applies to 140,000 industrial employees. 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"[21].

- The third collective agreement at sector level is of concern for employees in services of automatic data processing and information technology. From the union's perspective "this collective agreement - valid for 20,000 employees, starting on 1st January 2001 - 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 teleworkers. 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."[22]

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.

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eWork figures

The empirical results of the EMERGENCE employer's survey positions Austria with a (weighted) total of 53% of eworkers slightly above of the European average of 49%[23]. Only minorities of about 1% of employees are working in telecentres, telecottages or other office premises owned by third parties. Moreover, also home-based eworking employees make up only for roughly 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 premises[24].

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. In the first quarter of the year 2002 a total of 53% of the Austrian population aged older than 14 had internet access, real users are 47%, and intensive users (several times a week) are 38%. Among the young population (14-19) 85% are internet users. 28% of the users (European average: 26%) access the internet via high speed connections (cable, LAN, DSL, ISDN). It seems relevant that private access from home increased sharply during the last two years from 16% (1999) to 33% (2000) and 42% in 2001. Internet usage from offices (23%), via schools and universities (10%) remain rather stable. Online shopping (B2C) and particularly internet-banking continues to grow at fast pace (plus 48% in 2001).[25] Austria has four mobile telephone providers who serve

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[21]   *GPA, National Report; http://www.euro-telework.org (November 1999).*

[22]   *GPA, National Report; http://www.euro-telework.org (December 2000).*

[23]   *http://www.emergence.nu/news/employer.html*

[24]   *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; http://www.euro-telework.org (2000).*

[25]   *AIM: Austrian Internet Monitor (sample: 18.000 interviews/year; 4.500 quarterly); http://www.integral.co.at.*

more than 6.4 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[26].

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".[27] According to international comparative research Vienna is one of the top 12 regions in terms of ITC-related occupations in Europe[28].

Examples of key projects on eWork

In large sectors of industry ework is on the way to becoming mainstream in suitable enterprises. IBM is offering services under the title "e-space" : This involves re-organisation of work as part of office planning activities. Together with Porr AG, the largest construction company in Austria, a major urban development project has been launched earlier this year. Development of this site in Vienna will create thousands of up-to-date networked housing facilities as well as thousands of eworking opportunities.

The concept of ework is not yet as widespread in the public sector. The most advanced eworking schemes in Austrian public administration have been implemented in 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 ework schemes, enabling civil servants to ework from home or do mobile eworking. Model contracts as well as a "General Framework Agreement" have been adopted.

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[26]   *Telekom-Control Austria; http://www.tkc.at.*
[27]   *Unternehmensberatung Markant, National Report; http://www.euro-telework.org*
[28]   *U. Huws, N. Jagger, P. Bates, 2001: Where the Butterfly Alights. The Global Location of eWork; Brighton: IES Report 378 (ISBN 1-85184-307-8).*

	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, the authorities are looking at the potential of ework to help solve problems of road traffic congestion, and of high levels of unemployment in post-industrial areas.

Socio-economic background

The total population of Belgium is about 10,343,000 (March 2002). It is increasing slowly by 2 to 4% annually. Around 4,020,000 persons have a job (3,340,000 are salaried and 680,000 self-employed) and 450,000 are unemployed (10% of the total workforce - 13% if one takes into account the 163,000 unemployed over the age of 50). The employment rate is just below 60 % of the population of working age.

The GDP reached an estimated 257 billion euro in 2001, a 3.6 % increase over 2000 (forecast 2002 : +3.3%), and the inflation rate was 2.5 (forecast 2002 : 1.6). Export of goods and services represented 85% of the GDP.
Source : *Carrefour de l'Economie 2002/2B, published by the federal ministry of economic affairs (http://mineco.fgov.be).*

Take-up of ICT

The number of active Internet connections grew again significantly in 2001 : + 25% to a total of 1,425,000. The number of business connections increased by 37% over the year, to a total of 185,000.

The year 2001 was marked by the explosion of broadband (ADSL and TV cable) with a number of connections that more than tripled over the year to over 460,000. At the end of 2001, broadband represented one third of all active Internet connections.

ADSL connectivity is available to 90% of the Belgian population, a coverage that is unique in Europe. The dominant operator Belgacom will soon deploy SDSL and aims to reach 80% of all enterprises as from mid April 2002.
Source : *http://www.ispa.be and http://www.internetaddict.be*

How many eWorkers?

Eurobarometer

The Eurobarometer 54 poll conducted in 2000 revealed that 9.4% of all Belgian workers who are using a computer to perform their work, were practicing some form of ework (EU average : 12.2%).
Source : *http://europa.eu.int/comm/employment_social/soc-dial/info_soc/esdis/ eurobarometer00.pdf*

EMERGENCE

The IST project EMERGENCE performed in 2000 a European survey of enterprises with over 50 persons, and found that in Belgium 51% of these enterprises were using ework (EU average : 49%).
Source : *http://www.emergence.nu/news/employer.html*

Alcatel

At the end of 2001, the Alcatel corporation commissioned the InSites consultancy to carry out the 'most extensive survey' so far on ework in Belgium : 1660 employees and managers of companies with at least 10 employees were interviewed.

Among the enterprises :
- 25% are using some form of ework
- 10% of the others have plans to start in 2002

Among the employees :
- 10% ework occasionally or regularly (56% from home, 17% from satellite offices, 5% from various places, including trains, hotels, etc.)
- 80% of the others would be interested to ework

Source : http://www.alcatel.be/telework

Major eWork development factors

- Traffic congestion, and regularly visible resultant pollution, in and around Brussels (one million inhabitants and over 250,000 daily commuters) and other major cities, provides motivation to reduce the use of cars and unnecessary travel.
- The take-up of broadband, the generalization of mobile telephony (75% of the population), the continuing increase in Internet connections, as well as the promotion of e-business by all market actors, should support further developments of ework.
- 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 (*http://www.bta.be*), with some 50 corporate members out of a total of nearly 80.

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Denmark

Background on general economic and employment status

Denmark remains one of Europe's and the world's leading and pioneering ework countries. This arises from many factors which come together in a uniquely Danish way, successfully balancing strong governmental and institutional interest and support, on the one hand, with generally high levels of individual and workplace autonomy, and even scepticism of authority, on the other. The government typically provides clear signals and structures for workplace and technology development, for example, through flexible but secure labour market policies and the *Digital Denmark* national programme (*http://www.detdigitaledanmark.dk/english*). These support and enable, for example, the social partners to set in place framework agreements at the workplace which now cover much of the workforce. They also consciously promote the development and use of ICT, both through the market mechanism - Denmark is reckoned to be about two years ahead of the European average in telecoms liberalisation - as well as in measures to tackle the digital divide.

The search for flexibility is the driver

According to the 2001 annual survey of Danish use of ICT, undertaken by management consultants PLS, the main driver of ework in Denmark is the desire to improve work flexibility. What started with a simple need to be able to complete unfinished office work at home has developed into a more general search to maximise flexibility for the employer (and hence increased productivity and work quality) but also for the employee (who wishes to adjust the needs of work to family and personal circumstances). Two thirds of those Danish firms which practice ework achieve significant increases in flexibility, and 48% see clear productivity improvements as well. The equivalent results for the public sector are 65% and 52% respectively. In terms of problems thrown up by ework, the most important is the extra costs of equipment and maintenance (48% of firms and 58% of public sector organisations mentioned this), followed by the increased pressure on IT departments (43% and 50% respectively). Only about a quarter of firms and public organisations thought that ework was difficult to control and coordinate, and only 10% and 15% respectively thought that ework weakens workplace culture. The PLS survey also showed that most eworkers in Denmark remain those who work in IT departments or functions, but that this is rapidly spreading to a much larger range of occupations as the use of ICT becomes a basic ingredient of almost all types of job.

Significant labour force trends

Home working is reported to be a regular feature of the working life of almost one in five of Denmark's 417,000 employees, as revealed by a major new survey undertaken by Statistics Denmark (*Danmarks Statistik : http://www.dst.dk*). The survey shows how the everyday life of many Danes has changed its character quite radically in the last few years. Almost all parents now have full-time jobs and almost all children have access to child care facilities where and when these are needed. In order to achieve the flexibility necessary to ensure that working and family life can be combined, 17% of employees now work at home for all or some of the time. Of these, 37% (or about 6.3% of all employees) also have a home PC with on-line access to the workplace's network. These data are confirmed by the latest European Labour Force Survey which show that 21% of all Danish workers (i.e. both employees and the self-employed) work for some or all of the time at home. This level is only exceeded by the UK at 24%, but is much greater than the European average of 11%.

This increase in both home working and home-based ework in Denmark is going hand in hand with an increase in the number of employees who work flexible hours. One in four now determine their own working hours through flexitime arrangements, and this seems to be the result of greater trust by employers and managers who are increasingly delegating responsibility for day to day work decisions directly to employees. Many Danish employees have thus become adept at balancing work and family. In the recent past, flexibility at work was purely introduced for the employer's benefits. Today, the benefits for the employee and his or her family are seen to be just as important. In parallel with this, the Danish survey shows that employees are increasingly choosing jobs and changing jobs for reasons of personal development and fulfilment rather than stability in working conditions or remuneration. This is especially the case for younger and better qualified workers, but the general trend is clear, that job interviews are no

longer simply about what the prospective employee can do for the company but just as much what the company can do for the employee. The emphasis has decisively shifted.

The 'Families' European IST project supports these conclusions about the Danish attitude to ework at home when compared to families in Germany, Ireland and Italy. In results made available in 2001 *(http://www.families-project.com)*, Danes seem less concerned with family benefits as such when compared to these other countries and more concerned with the individual and personal goals of the worker. The research shows, however, that this is not lack of family values on the part of Danes so much as the existence of a comprehensive and well functioning social and family support network in Denmark, not seen to the same extent in the other countries. Based on a total sample of 105 families, the 'Families' project research also showed that 66% of eworkers are generally very satisfied with home-based eworking and only 2% dissatisfied.

One negative aspect of these general developments in the Danish labour market, however, is that for a minority of workers working life can become more difficult to manage and more stressful. The digital divide in Denmark today, as a country with relatively widespread availability of high performing and affordable technology, is less and less about the mastery of technology as such. It reflects, instead, much more a separation between individuals who possess the ability to master complexity in everyday life, on the one hand, from those who do not possess such mastery on the other.

Policy supporting eWork

Denmark was one of the first countries to introduce the very popular employee home-PC scheme. This exempts from tax a computer paid for by an employer for private use by the employee and his/her family at home, as long as there is some use for work-related tasks and some form of IT training, although this is often left to the discretion of the employer. Over the years, the scheme is reckoned to have been extremely successful in both upgrading the ICT skills of the Danish labour force (as workers often learn skills at home in their own time and are encouraged to participate in ICT courses such as the European Driving License), and increasing access of the Danish population generally to both ICT and to the skills needed to use the technology. Sixty percent of Danish families had access to the Internet from home in 2001, rising to 76% who had access either from home or at work. When the government withdrew the scheme from general applicability in January 2001, the resultant outcry from both sides of industry prompted the new incoming government to re-instate it at the beginning of 2002.

The other major Danish policy plank which is thought to have been instrumental in pushing Denmark to the top of Europe's ework take-up league is the widespread implementation of framework agreements by the social partners, strongly supported by the government, which ensure that employees do not suffer worse conditions of employment or inferior workplace facilities compared to non-eworking colleagues. Indeed, Denmark is leading the world in the development and implementation of such agreements so that today about 70% of the workforce is covered. LO, the Danish Confederation of Trades Unions *(http://www.lo.dk)*, is a leading player in such developments and has developed a programme entitled the *developing workplace* covering most perspectives and dimensions of ework. The major trades union supporting ework is HK, the Union of Commercial and Clerical Employees in Denmark *(http://www.hk.dk)* which often takes the lead in action and awareness raising. For example, HK has developed Denmark's most comprehensive and widely used general eWork web-site *(http://www.distancearbejde.dk)*, and because of the rapid growth of "free agents" in Denmark, it has also established Denmark's first web-site and special services for freelancers *(http://www.freelancer.dk)*.

Danish Environmental Research on commuting, eWork and transport

The Danish Technological Institute has embarked on a key survey of the effect of home-based teleworking on commuting and the environment together with Copenhagen University and the Institute of Local Government Studies in Denmark. The TRIP project is financed by the Danish Environmental Research Programme and is in the process of constructing a commuting model incorporating detailed socio-economic information, for example concerning household structure and the nature of concrete transport systems. Furthermore, the model is being built so that that it can be integrated into a broader interregional macroeconomic model for Denmark, LINE. One important aspect of

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this modelling work is to incorporate teleworking as a modal option within the general commuting model. Both the general commuting model and the teleworking sub-model will be constructed to enable forecasts of future transport effort, and thereby emissions to the environment, to be made.

TRIP will also identify causal mechanisms behind the growth of teleworking and develop a forecasting model for teleworking in Denmark. It will identify the nature of the relationship between changes in levels of teleworking and changes in transport effort, both for commuting and for other purposes, including both the possible substitution and complementary effects of changes in levels of teleworking, and will relate these changes in transport effort to changes in emissions to the environment. Finally, the research will identify the types and characteristics of firms or organisations which promote teleworking as well as identify the barriers to its implementation. *See : http://www.akf.dk/trip/index.htm*

Survey of eWork in Denmark

The IST EMERGENCE project has defined eWork as information-based work carried out away from the employer's premises and delivered over a telecommunications link regardless of whether this is carried out on office-type premises or elsewhere, or whether it is carried out by employees of the organisation or outsourced. In 2001, EMERGENCE analysed patterns of ework across Europe as practised by organisations with at least 50 employees. A number of additional surveys have now also taken place of organisations of up to 50 employees, including one in Denmark sponsored by HK Service, the Union of Commercial and Clerical Employees in Denmark.

The main conclusions are that compared with the rest of Europe, levels of ework in Denmark are high. Over six out of ten establishments practice some form of ework, compared with just under half in Europe as a whole. Small establishments are considerably more likely to use ework for typing and data entry than larger establishments (at 20.6% compared with 4.1%-4.6%). They are also nearly twice as likely to use ework for financial and creative functions and marginally more likely to do so for tele-sales and customer services. However they are less likely to use ework for software development and IT functions and for management, HR and training functions, perhaps because these functions are less likely to be separated from general management and administration in small organisations. Comparing the picture with the rest of Europe, Denmark deviates in several respects from the average. Most strikingly, software development, creative functions and management functions are much more likely to be carried out on the organisation's own premises in Denmark than on average, perhaps because of the greater availability of in-house expertise.

Overall, the EMERGENCE eWork survey of Denmark concluded that :

- Denmark is clearly one of the most advanced countries in the EU in its use of ICT to build a highly networked organisational culture with a complex internal division of labour for the supply of information-based business services and a thriving knowledge sector.
- Denmark trades actively with its neighbours in Northern Europe and to some extent with the rest of the world both in the purchase and in the supply of eServices. Its strengths lie in the more highly-skilled, high value-added services, and customers in other countries select Danish suppliers for their expertise and high quality rather than low cost. They are more likely to seek destinations in lower-wage countries for low-skill work such as data entry.
- Danish employers lead Europe in the development of socially responsible forms of ework involving a flexible mixture of work on the employers' premises with home-based work or work on other premises. This is the form of ework which is associated with the fewest risks to the workers (such as social isolation or lack of promotion prospects) and to employers (such as loss of motivation, or poor team working). It seems likely that the existence of broad collective agreements covering teleworking have contributed to this positive state of affairs.

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Finland

Major trends in the Finnish economy

The main phenomenon in contemporary business and work is structural change towards work in networks and virtual environments. Nowadays the use of information and communication technology is so widespread that it can be seen as common practise in working life. However, there are some groups which are not involved in this development process and there is a risk that these groups will increasingly be pushed out of employment or even be excluded from the labour market. A critical element for productivity and employment is work organisation. Here the challenge is to combine human capacity, technology and social structures in a way which will boost creativity and innovation processes.

The virtual or networking environment is neither like the physical nor the social environment. Unfortunately we are not yet totally aware of the actual and desirable structures of ework. Those companies that are looking for innovation and positive flexibility will find the best business opportunities and socially sustainable forms of work. In the virtual environment, technology is the main tool supporting human creativity and networking.

The Finnish economy is based more and more on human capital. Simply because of the need to generate knowledge and innovation continuously for the purpose of satisfying customers. Only human beings are able to fulfil this challenge. This leads to two obligations. Firstly, technology and the way it is applied in organisations must be controlled by people. Secondly, social and ethical factors must be given the highest priority in the organisation of work and business in the knowledge economy.

eWork in Finland

eWork is one way for knowledge and clerical employees to arrange work on the time-space dimension so that the physical, technical, and social factors of their working environment support thinking and the production of innovation. The production of knowledge and innovation is based on individual thinking and the collective process. Work as a process of thinking and action can be realized in physical, virtual, and social environments.

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.

There are several advantages and some disadvantages concerning ework. These are not absolute but depend on the nature of the organization of business and work. Since ework very seldom is closely related to the business or personnel strategies of organizations, the advantages are generally individual and local. The advantages of ework are based on the immediate benefits of functional organization of work, the utilization of the possibilities of technical systems, personal work performance, customer orientation, and growth of networks. The possible lengthening of working time is one disadvantage, and in some cases also the use of quantitative labour market flexibility.

The efficiency factors of ework are connected to several aspects of the theory concerning intellectual capital, especially the modification of the internal structure of the enterprise and maintaining customer capital. eWork is a way to adapt to the fast-paced activity in value-added chains, in which the importance of formal organizations decreases and the importance of cooperation through networks increases.

http://web2.shh.fi/biblio/papers/fulltextes/104-951-555-721-6.pdf

The Ministry of Labour to lead eWork co-operation

The Government has made a decision in principle concerning the arrangement of ework co-operation. The guidelines for co-operation between the ministries and other actors in the national development of ework are drawn up by the

decision on principles for co-operation. The aim is to strengthen and support the systematic implementation of ework in Finland. The co-operation group on ework ETR began their activities on 18 April 2002.

eWork has earlier been understood as working "at a distance" from the conventional workplace, later on as work regardless of time and place. The term ework, which has become general recently, refers more extensively to working in information networks. The term ework refers to traditional telework as well as to a more comprehensive utilization of electronic data communications in work organization. The Government considers it important to promote the expedient use of ework for reasons of labour market policy, regional policy, communications and family policy as well as for reasons related to the principles of sustainable development. The Ministry of Labour has been appointed the promotor of the ework co-operation group.

The co-operation body ETR supports the systematic implementation of ework and decentralized work. Its principle aim is to further the transfer of work and business to the information network environment. The transfer of work to the information network environment brings forth several challenges and possibilities, the consideration of which requires co-operation between different administrative sectors. 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 aim of the co-operation body ETR is inter alia to clarify the present situation of ework taking place via electronic data networks, promote the research of ework and other innovative forms of work and support the formation of an ework skill network. The aim is also to support the transmission of information on ework by maintaining *www.ework.fi* services.

Workplace Development Programme

The main element in achieving efficiency, employment and quality of working life is understanding and managing change as a wide and long-lasting process. In industrial and employment policy the support for these kinds of processes is of essential importance. A major example of that is the Finnish Workplace Development Programme (1996-2003), the goal of which is to improve effectiveness and the quality of working life at Finnish workplaces. The programme provides expertise and partial funding for development projects in both companies and public bodies. The basic premise of the funding is a shared view by management and employees to join forces for workplace development.

Development projects typically focus on promoting team work and empowering methods of management, increasing multi-skilling, improving coping at work and building networks between companies. All projects must be workplace initiated. Both management and employees take part in planning and carrying out the projects. The programme has funded so far 490 development projects at 1000 Finnish workplaces, and the results achieved so far are positive in terms of productivity and quality improvements, introducing new forms of work organization, and enhancing employee well-being.
See : *http://www.mol.fi/tyke/new/english/index.htm*

Cases : Supporting eWork for Regional Development and for Public Administration

eWorkKurVi (2000 - 2003) is a training and development project within ESF Objective 2 to be carried out in Finland in the area known as Upper Pirkanmaa. The idea of the project is to bring the existing decentralised business/ework network of expertise within the reach of SMEs and the public sector. The project is being implemented in collaboration with the University of Tampere Institute for Extension Studies and the Northern Pirkanmaa Institute of Education. The project serves to assemble regional, national and in the future also international expertise.

The advantages of business activity which is decentralised in a controlled manner are success factors for more and more companies. Public organisations are also expressing interest in the potential of ework. Today practically every company has what it takes to derive full benefit from IT and information traffic connections. Thus the place to make investments is not so much in equipment as in expertise.
More information is available : *http://www.ework.fi/english/telework.html*

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eTuulos - onto the information highway with skill (2001 - 2002) is a project financed by the ESF, the Council for Häme Region and the municipality of Tuulos. The aim of the project is to train people in the municipality of Tuulos to be IT competent, so-called agents. With the support of these agents there will be a drive to upgrade the information society skills of the people of Tuulos according to their own wishes and requirements. The pilot project provides an opportunity to kickstart the development of ework. By fostering ework the municipality can offer its summer residents a chance to spend more time in Tuulos, i.e. increase the amount of time per year that they live in their summer homes and possibly take to living in the municipality all year round. As their IT skills improve, the Tuulos locals would also have more opportunities for ework.
More information is available: *http://www.ework.fi/english/telework.html*

Extending eWork in public administrations - this project started in early 2001 and provides training and information to workers in government agencies and offices. It creates an organisation to monitor and evaluate progress and the results of the ework. Seven Government agencies are involved in the project. The planning and training activities took place in 2001 and implementation started in 2002. The project will also assess the current status of ework in government agencies in Finland and develop a system for evaluating the effects of ework. The project will also initiate general debate about the possible effects of ework on the local economy and regional policy.
More information : Tapio Penttilä University of Turku, Centre for Extension Studies
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Publication - "The Overview of Finnish ESF Telework Projects" is available on
http://www.ework.fi/esrraportti/frame_index.html

Conference proceedings of ework 2001, the 8th European Assembly on New Ways to Work,
are available on *http://www.telework2001.fi*

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France

Socio-economic background[29]

The world economic slowdown that began in the middle of 2000 in the United States persisted throughout the year 2001, deepening in the second half. Both the United States and the countries making up the eurozone posted declines in activity, in Q3 for the former, Q4 for the latter. France was not spared this general tendency and its GDP showed a fall of 0.1% in Q4.

The deterioration in the business climate at the end of 2001

Against a general background of falling corporate demand, the events of 11 September further worsened expectations. In France, as in the whole of the eurozone, the worsening of the business climate intensified. Productive investment in the eurozone fell, from a year-on-year change of 7% at end-2000 to -4% at end-2001. In France, the corresponding fall was of the order of 0.5%, whereas at the end of 2000 it had shown a rise of 11%.

A spectacular decline in world trade

The decline in corporate demand led to a marked diminution in international trade. In the first place, the decline affected, as early as Q2 2000, the new technologies sector. The decline in the trade flows for the leading eurozone countries led to a marked diminution in intra-European trade. Exports (including intra-zone trade) eased from year-on-year growth of 12% at end 2000 to a decline of 2% at end 2001, the corresponding figures for imports being +10% and -4%.

France took its place in this general panorama, posting an unprecedented contraction in its exports and imports at the end of last year. The import cycle was amplified by events in the new-technology sector. For example, taking French data, this sector accounted for more than 40% of the slowdown in imports of manufactures seen between end 2000 and end 2001.

Slowdown of employment growth

Dependent employment growth in the competitive sector began to slow down in Q2, following three extremely favourable years. The probable outturn for job creation in 2001 is 230,000, as against almost 570,000 the previous year. In the first place, this decline is linked to the slowdown in economic activity but it is also explained by the weakening of the impact of the reduction in working hours following the major waves of the shift to the 35 hour week by the largest firms in 2000.

The weakening of the employment situation has had an unfavourable impact on the tendency in the unemployment rate. Having declined to 8.6% in Q1, it then picked up again in Q2 before stabilising since the beginning of Q3 at 9.0%.

Perceptible signs of recovery in activity in the early part of the year

Certain signs of recovery in the world economy have emerged in the early part of this year. The new technology sector, where the downturn had been the trigger for the slowdown in the world economy in 2000, seems to be regaining strength. Above all, the business surveys indicate an improvement in the outlook reported by firms in the eurozone. France is participating in this improvement. The prospects for own-firm production reported by industrial business leaders have picked up substantially. The improved outlook reported in the latest business surveys is not confined to manufacturing industry. A similar tendency is to be seen in services.

All in all, following a marked slowdown in French activity in 2001, with GDP actually falling slightly in Q4, it can now be expected to pick up gradually to an annualised rate of close to 2% in Q2 2002. This would match the growth pattern expected for the eurozone as a whole.

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[29] *For more informations, see http://www.insee.fr/fr/indicateur/analys_conj/conj_article.htm*

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eWork legislative development

There are no particular laws established in France concerning ework. However, new legislative measures have been initiated or are under discussion about information society.

The legislation changes

Several decrees have adapted French legislation to the development of information technologies :

- the law of 13 March 2000, concerning proof and the electronic signature right. This law recognizes for the signed electronic act the same value of proof as an act signed on a paper
- by opening the local network of France Telecom to competition, the decree of 12 September 2000 facilitates the distribution of internet broadband (ADSL technology), that opens many new service perspectives, particulary multimedias
- the law of 15 November 2001, concerning daily security, gives to judges the ways to control criminal uses of IST
- the project of law on information society, presented in June 2001, aims to guarantee the liberty of on-line communication, to clarify the legal bounds of electronic commerce and to promote confidence in network uses. It also aims to democratize internet use by improving the digital information access and by furthering the territorial dissemination of network systems

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Consumer protection

Decrees aiming to favour the development of novel business models frequently comprise a part to protect the consumer :

- decrees of 17 March 1999 authorize the utilization of data encoding. Thus, the transmission of confidential data, such as numbers of e-cards, could be protected. Nevertheless, the power of cryptology keys is limited, but the law project on information society anticipates the easing of restrictions on their usage (see above)
- the law of 10 July 2000 on public auction reform takes into account on-line auctions and regulates them
- the prescription of 23 August 2001, transposing in French law the European directive on mail-order selling, strengthens the protection, the access to information and the right of retraction of the consumer that buys by mail-order. If there is a fraudulent utilization of the method of payment, the consumer's responsibility no longer applies

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Development of eWork centres

Growth in the call centre[30]

In 1999, there were an estimated 130,000 agents in France with a 30% turnover; in 1997, they were 92,000 employed in 1500 call centres including 25% in banking and insurance, 24% in France Telecom, 23% in other telecoms companies, and 12% in public administrations. The structure of the call centre market is unusual because agents are not concentrated in large sites, but in small ones with around 50 people. Figures for 1997 show that only 8% of sites had 100-400 agents, whilst 1% had more than 400.

France Telecom's customer call centre has been operating since 1998, and experienced a substantial increase in the number of calls answered (without an increase in the number of agents) after introducing a virtual call centre service. This service is linked to an ACD call centre by pre-routing calls to the France Telecom network on the basis of pre-defined agent groups. As a result, each group may be made up of agents from several call centres and, consequently, each agent may belong to many groups.

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[30]　　*http://www.telework-mirti.org/dbdocs/werdigie.pdf, CALL CENTER REPORT*

Growth in call centre desks (x1000) in France (*Source: Ovum 1999*)

CTI desks		Virtual desks		Web desks	
1999	2004	1999	2004	1999	2004
18	173	2	97	0	9

The reduction of the digital divide

The access conditions to data-processing and to the Internet remain unequal: it is profitable especially for the most well-to-do and the most well-educated people. It is easier to access in town than in the country. Since 1998, the Government has put much effort in reducing these "digital divides" by the implementation of several concrete measures.

By 2003, 7,000 public access points will be created in libraries, national employment offices, city halls or associations. Among them, 2,500 public electronic spaces allow both the exploration of IT tools and free initiation into multimedia. In addition, these measures help to promote and facilitate the broad adoption of novel practices for e-Work and e-Commerce.

Another objective of these government initiatives, aims to reduce territorial inequalities in IST access. This is true in metropolitan France and this is equally true in French overseas territories (see below the example in French Polynesia).

Intelligent workplace for all in French Polynesia[31]

French Polynesia, an overseas territory of France is located in the South Pacific Ocean, 3,000 km south of Hawaii and halfway between New Zealand to the west and South America to the east. The capital is Papeete, which is located on Tahiti, the largest island in the territory.

French Polynesia consists of 35 volcanic islands and more than 180 low-lying coral atolls (ring-shaped islands with central lagoons). The islands are part of a much larger area known as an "exclusive economic zone" that covers 5 million sq km of land and ocean.

Because the division of the territory (a great number of islands distributed in an area as wide as Europe), the great distance and the time difference of 12 hours with Europe, the needs and opportunities of IT solutions are very important in French Polynesia.

With the development of information society technologies in French Polynesia (95% of local companies use e-mail), and the adoption of on-line service by the local administration, since 2001 each local citizen having a computer connected to the Internet is able to access all available services of these administrations.

To facilitate access to services on-line, to restore equity between Papeete and districts or islands without forgetting the most remote citizens, to support local development and to further new forms of cultural expression, local authorities are gradually setting up access points to Internet (Fare Metu@ 'Oire) in the city halls of every island.

This space is intended to be the decentralized window of all administrations. Users have direct access to these services. It is managed by a local person in charge, under the authority of the mayor. These access points can be used also as intelligent workplaces to search information and documentation through Internet and to ework.

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[31]   *http://www.presidence.pf*

Key factors affecting eWork development

The government action program for the information society [32]

According to official statistics, at the end of year 2001, more than 15 million French people used Internet regularly. The computer has become a work instrument for more than half of active people and a tool of information and spare-time activities in more than one family out of three.

The government action program for the development of the information society (PAGSI) set up in 1997, has accompanied these changes. This voluntary policy was applied in many areas: usage of Internet in school, electronic administration, support of innovators, reduction of communication costs development of public access points to Internet, launching of broadband plan, etc.

The rapid expansion of information technologies use

By end 2001, the proportion of households with computer equipment was between 33% and 36%, almost twice that in 1997 (16 to 19%). During this period, the rate of growth of French households equipment has been in line with the European average. A recent study of the European Commission shows that 55% of French youths (15 to 24 years old) use computers at least once a week, at the European average and more than the use by English and German youths.
By end 2001, France had 15.6 million Internet users of 11 years old and more (there was between 1 and 2 million in 1997). About one French person out of five has access to Internet from their home.
In June 2001 there were about 2,500,000 personal web pages and 44% of youths used e-mail regularly. 62% of French people had cellular phone (close to 37 million people), they were 10% in 1997.

The growth of enterprises in the new technologies sector

The rate of business start-up in the IST sector is growing. From 3.9% at the beginning of 1996, it was 6.5% at the end of 2000. Thus, in 2000, more than one business start-up out of 15 appeared in the IST sector. The number of business start-up in the sector of new technologies grew from 7,653 in 1998 to 10,777 in 2000 (74% have taken place in computer services).
All in all, since 1997, the part of information technologies in global growth is estimated at 20 % in France. By end 2001, close to 3 million employees work in this sector.

The expansion of e-Commerce[33]

Electronic commerce is defined in France by sale or purchase of goods or services made by means of electronic systems. Payments may or may not be made on-line. Close to half of French companies have a web site; it is used for communication, service to clients, relationships with suppliers.
Direct on-line sale still seems to be unusual: at end 1999, only 9% of industrial companies declared to receive orders on-line. Intercompany purchases represented 6.1 billion euros in 2000, and retail trade 1.2 billion euros.
In France the leaders of electronic commerce are the ticket sale sector (transport, tourism, entertainment) and the sectors of cultural and computer products. Since 1998, several measures have been introduced to develop the consumer confidence concerning on-line payment (see above).

The e-administration[34]

Since the launching of PAGSI, on-line administration is a priority. Information Technologies allow the improvement of the public service relationship with citizens, and the introduction of new services and the modernization of the functioning of the State by simplifying procedures and by placing individual and professional users needs at the core of the administrative process. In four years, close to 4,200 public web sites have been opened. At end 2001, the totality

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[32]   *http://www.premier-ministre.gouv.fr/*
[33]   *www.telecom.gouv.fr/comelec*
[34]   *La lettre du gouvernement -cahier spécial -24 janvier 2002, La société de l'information - http://www.premier-ministre.gouv.fr*

of most current forms for private individuals were on-line, particularly thanks to the portal "service-public.fr" *(www.service-public.fr)*.

Public web site assesments of 2000 and 2001 show that the number of visits has been multiplied by 4.5 between 1998 and 1999, and by 2 between 1999 and 2000. For example, www.servic e-public.fr records more than 600,000 visits by month and www.finances.gouv.fr count an average of 130,000 monthly visits.

The school on-line - School equipment

In 1997, multimedia was not very common in schools. By end 2001, multimedia training exists in all institutes where future teachers are trained. All high schools, 91% of colleges and half of primary schools are connected to the Internet since 2001. The integration of multimedia in the training of teachers and the offer of adapted pedagogical contents has rapidly progressed. The number of pupils per computer for pedagogical usage has considerably decreased (schools with only one computer in 2001 had reduced to 23% of the number in 1997; 6 pupils per computer in high schools in 2001 against 12 in 1997).

The school of distance learning engineering

Specialist in distance learning pedagogy, the French National Distance Education Center (CNED) has created a specific structure named School of Engineering of Distance Training (Eifad). Its role is to train professionals of distance learning in the different aspects of distance learning.
In 2001, this institute has delivered on-line a first programme (duration : six month) in e-learning engineering and pedagogy. This training is intended for leaders of e-learning projects in different French-speaking countries. This e-learning programme has to be continued in the future years with new promotions for learners.

Culture as a determining factor

Organizational culture as a main obstacle of eWork in France

We can draw the following lessons from the poll on ework carried out by Rhinfo [35] in October 2000, (308 replies of human resources managers) :

- 60% of respondents think that some of their employees wish to telecommute, but half of them think that only 20% of the personnel could be involved
- Two thirds of them declare that no project in this sense has been managed in their enterprise
- the main expected benefits of ework are organizational: one third of respondents consider that ework is a way to introduce flexibility
- enterprise culture appears as the main inhibitor (39.6%), while the mode of management is quoted as the second obstacle (18.8%).

Internet and French centralism

In France, ninety percent of the leaders of the new economy work in Paris. This is one of the conclusions from the survey carried out by the virtual Newspaper "Journal du Net (JDNet)" in October 2000[36].
Technology of ework, e-mail and the Internet seems nevertheless to be trapped in the French culture of centralism. A virtual debate on this matter organized from October 2000 to July 2001 by JDNet confirms this observation. Among advanced reasons, we can note :
- the fact that the first appointment, seminaries, conferences, main actors of internet development were situated in Paris
- the fact that the servicing of Paris by international transport is better than in other cities of the country
- the strong presence of the money market in Paris

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[35]   *http://www.rhinfo.com*
[36]   *http://forums.journaldunet.com*

- the fact that all the main media are situated in Paris and the fact that they tend to favor information about companies based in the capital
- the centralism of public services

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The multi-centered culture as a favorable factor to eWork development

A study carried out on 10 applications of ework in SMEs[37], underscores one of the favourable cultural factors of ework development. It seems that ework is facilitated by a form of multi-centered culture. Indeed, when remote work (between sites, or between remote people) is required by the organisation, ework finds its place more naturally in people's minds and in daily practice than in classic companies, mono-centered, and/or in which networked work (e-mail, groupware,) is still not required.

As Nicole Turbé-Suétens[38] notes, compared to its European partners, France has evolved very slowly concerning the organisation of work. A number of enterprises give as a reason that the French right of work doesn't allow them to adopt new modes of organisation. Nevertheless, this pretext is only an excuse for those who don't want to evolve and innovate concerning the organisation of work.

Enterprises that consider organisational change as one key element of ework success are distinguished by the rigor of their methodological approach, EDF-GDF (2000 eworkers in 2001[39]) finalized such a methodology in 2000-2001.

The introduction of eWorking as an organisational change according to EDF-GDF[40]

Apart from isolated examples of eworking applications which are designed exclusively for solving individual problems, there is every reason to look on the introduction of eworking as an organisational change. To ensure that this change, regardless of its nature, is able to attain its objectives and remain durable, the following three conditions must be satisfied :

- it must represent a true value-added for the firm or establishment concerned
- it must bring about real benefits for the main players involved
- the players concerned must be able to recognise and exploit these benefits.

Implementing an eworking system in an organisation is based on a two-stage process involving :

- an analysis of the scenario and the design of a project that fulfils the aforementioned conditions
- the introduction of what constitutes a technical and organisational change.

The setting up of an eworking system involves a 5-stage process :

- an exploratory phase for formulating expectations and needs
- a preparatory phase for formalising the agreed hypotheses
- a launching phase for organising a solution
- an experimental phase for testing the operational implementation of the system
- an assessment phase for determining the results of the project and ascertaining the possibilities of extension or duplication.

The following table summarises these various phases :

Phases	*Objectives*	*Means*	*Results expected at the end of the phase*
Exploratory *Formulation of needs*	Clarify the elements of the problem to be solved	Making an initial diagnosis based on immediately available information. This is a conceptual phase likely to be affected by radical changes and differentiation.	Initial design of one or more eworking scenarios. Formulation of hypotheses concerning the expected results, the nature of the context, players' reactions and expectations, problems to be solved.
Preparatory	Validate or reject the preceding hypotheses.	Information obtained especially from diagnoses and/or surveys (documentary	A diagnosis that enables a well-reasoned project scenario to be

37   *Le Télétravail en question, PROJET ADAPT F-97238A1, Ergo'In, ICTT, ANACT - avril 2001.*
38   *Le télétravail et le contrat de travail, Nicole Turbé-Suétens - 28 Février 2001, http://www.rhinfo.com*
39   *Jean- Marie Rouger est chef de mission télétravail à EDF et Gaz de France. Cefrio, CAHIER SYNTHÈSE DES ACTES DU COLLOQUE, Du télétravail aux nouvelles formes de travail dans la société de l'information, 4 e trimestre 2001 - Site Internet : www. cefrio. qc.*
40   *Retour d'Expérience, Rapport d'étude pour la Mission Télétravail EDFGDF- Jean-Claude Marot, Mai 2000.*

Formalisation of agreed hypotheses	Refine the eworking scenario	research, interviews, study groups, etc.). The concept takes shape but remains liable to change.	drawn up and provides a basis for evaluating the chances and feasibility of the project.

Launch *Organisation of the system*	Formalise the schedule of conditions applying to the experiment.	Transitory phase preceding action, for defining the organisation, functioning and planning the realisation of the project. Mobilisation of resources but possible cancellation of the project is kept in mind.	Schedule of conditions and planning for testing the envisaged systems. Specification of procedures for introducing the system and of monitoring arrangements.
Experimental *Confrontation with reality*	Create a real situation, observe how teleworking is carried out in daily practice, the behaviour of direct and indirect players and the resulting effects, planned or unforeseen.	Verification of the conceptual approaches and identification of the variables to be dealt with to ensure the reproducibility and viability of the project. The project is put to the test of reality and possible modifications are identified.	Definition of conditions for the concrete functioning of the eworking system, and of the limits of validity of the results expected. Measure of the expected impact and identification of unforeseen effects. Defining the necessary changes.
Final assessment *Lessons to be learnt*	Evaluate the spin-off on the economic and social plane.	Assess the gap between final results and initial objectives and evaluate the real benefits and limits of the project.	Draw lessons from the experiment prior to envisaging any reproduction, general introduction, possible modification or even total abandonment of the project.

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The most recent[41] study drafted by INSEE shows that France is rapidly reducing its deficit in IT equipment with 57% of the population of and over 15 years old having access to a computer and 38% to the Internet. A very important aspect revealed by this study is the fact that at the present time the absence of a computer at home, at the office or at school is not compensated by the possibility to use IT equipment in public places or at the close relatives. This proves - at least for the French society - that access to IT equipment is still more of a private nature. Said study is accurate in what concerns populations and habitudes and it should determine political milieus and employers to really think about making a public campaign regarding the necessity of acquiring IT equipment by the largest part of the population as possible. This is also valid as regards the new market needs and consequently the employment rate and also the social integration of a larger part of the population.

Briefly, there are few signs of teleworking having significantly progressed in France as of last year in spite of the general perception that an increasing number of employees have access to various forms of information; moreover, the employment milieu seems to be characterized by nomadic tendencies. This lack of formalism in the progress of the work conditions is not probably dramatic in itself; it could be but a reflection of an evolution of work habits in a more and more competitive environment. The disadvantage is that such a rather archaic development does not allow the enterprise to benefit from the advantages of a real reform of work organization. In fact such arrangements that can be considered amicable lead to a lack in formal organization of work conditions and to the impossibility to put into practice new means of performance measuring adapted to an efficient organization.

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[41]   *INSEE Première N°850 of June 2002, www.insee.fr*

The reasons of such a behavior are probably of a historical and cultural nature, a fact well illustrated by ANACT in its case study on ten enterprises. This study was conducted under the ADAPT programme and can be found at : *http://www.anact.fr/publications/collections/etude.html*.

ANACT Study on teleworking

Making recourse to teleworking means that an enterprise has to reconsider the very principles of work organization, management and work conditions for the entire personnel, primarily because it entails a different approach of the classical "space/time" dichotomy.

Based on the ten case studies, the study proposes a synthesis structured around different themes regarding the work conditions:

- **eworking context, and the manifestation conditions**
The eworking must appear in a favorable context in order to offer a permanent solution for the enterprise. The key condition is the joint existence of an offer from the organization and a demand from the employees.

- **equipment and tools required in eworking**
The eworking requires a minimum equipment to have access to a message box and in certain cases to the intranet of the enterprise. In most of the cases the proposed solutions imply access to internet. There are other aspects that have to be taken into consideration also : arrangement of the work space, the possibility to isolate the work space from the rest of the space, etc.

- **eworking and work conditions**

In the case of teleworking there is the problem of the work space. eWorking is rarely 100% of the time carried out at home, "pendulous" eworking is often seen, meaning that work is carried out partially at home and partially at the office. eWorking is also a common practice in tele-centers. Each organization has it specific problems in what concerns the work conditions, the feeling of isolation, the possibility to mitigate the perturbation factors (noise, telephones, etc).

- **social negotiation**

In several cases teleworking has been subject to approval by the Safety and Health Committee and resulted in an addendum to the labor bargain. In most of the cases studied the teleworking was carried out in a rather informal manner, without being registered in official documents; it was more like of a "personal arrangement" for the partners.

- **eworking, management and work organization**

eWorking raises two problems for the enterprise : first, it is a question of management because it is not easy to control from a distance the work of a subordinate; second, it impacts upon the work organization since it requires a reallocation of tasks between the teleworker and the team. This is undoubtedly the most important problem faced by the employers intending to introduce the teleworking system in their organizations. There are enterprises that have been originally established on a multi-location basis, in their case, the ework concept is present from the very beginning and the work organization is based on this characteristic.

- **preservation of the social element**

In this particular system, the eworker runs the risk of feeling isolated. But in most of the cases this risk has been in a way mitigated by the pendulous teleworking allowing individuals to bond with a team by being present in the enterprise at regular intervals.

- **the "key success factors" for an efficient implementation of the teleworking system**

They can be summarized as follows :

-        a thorough and comprehensive approach from the very beginning

- the enterprise has to make a minimum investment
- a discussion with the teleworker's team to reconsider a reorganization of the work
- the teleworker has to be endowed with a real capacity of being autonomous
- the pendulous teleworking (part time) is easier to put into practice by the enterprise (work organization) and for the teleworker (alleviation of the isolation feeling, maintaining social relations).

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In February 2002, a new legal decree was published which obliges large corporations listed in the stock exchange to publish results about their social and environmental performances. This is a first step towards CSR implementation. eWork might be a factor to consider in those two new fields of corporate performance appreciation. But, one has to be careful and know exactly about the induced effects of a ework scheme and not just think that, for example, working at home reduces transportation by car and that flying to Paris once a week while working the entire week in other town diminishes pollution. Things are not that simple. A study carried out on behalf of the DIGITIP[42] aimed at showing the extent to which teleworking contributes to save energy and diminish the greenhouse effect has revealed the following:

1) It is possible to make recourse to eworking to save energy in the service sector and in transportation, but this benefit is essentially working in the case of eworking at home, even part time.

There are approximately 22 million active individuals in France, of which 80% get to their office by car. 15.5 million individuals work in the service sector, most of them performing their work in a space other than their home.

In our study we have compared energy consumption in transportation on one hand and at home on the other hand (heating, hot water, electricity, etc.) by focusing on several given situations. It is true that a given situation is not exclusively descriptive of a certain category of individuals; it merely allows having a general perspective on the global favorable or unfavorable tendencies in terms of energy consumption and taking general measures in reference to the gain or loss implied by a certain tendency.

The examples that the study has focused on are as follows :

- a "normal"[43] worker. To get to the working place, he has to travel by car twice a day the distance home-workplace (he has lunch at work). He occupies an office the surface area of which is half of the space per employee in the service sector (halls and annexes included).

- a home worker. He does not travel to a work place, he carries out his tasks at home, in one of the rooms. Energy is saved only if this worker does not travel by car during the day in other places, trips that an employee working "at office" would not normally have. For simplicity's sake, we will suppose that there is no connection between home-workplace trips and trips had during the day. This hypothesis remains speculative and needs confirmation.

- a worker in a telecenter (alternative office). He travels less to get to his workplace and used to this end non motorized means (walking, bicycle). His office space with the telecenter is similar that of an average office (annexes included).

Based on the last two types implying part time work, we have established 6 "type-individuals" :

- the normal worker

- the full time home worker

- the worker combining home work and "normal" office work

- the worker in a telecenter, on a full time basis

- the worker combining work in a telecenter and work in a "normal" office

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[42]   Direction générale de l'industrie, des technologies de l'information et des postes. This body is part of the Department of Finances, Economy and Industry.

[43]   Rread the basic meaning of the word: who subscribes to a norm. The appreciation is not moral, but statistical.

- the worker combining work at home and work in a telecenter.

Admitting several of the hypotheses mentioned in Annex 2, the saving resulted from the passage from the «normal situation» to other situations would be as follows.

Workplace	office, full time	home, full time	home, 50% & office, 50%	local center, full time	local center, 50% & home, 50%	local center, 50% & office, 50%
Travel energy saving, in % against average annual consumption per French individual	0.0%	10.7%	5.3%	10.7%	10.7%	5.3%
Energy saving for the services sector, in % against average consumption per French individual[44]	0%	34%	14%	-7%	14%	-4%
Total saving, in % against average consumption per French individual	0%	45%	19%	4%	25%	1%

The table above shows that the gain is not automatic irrespective of the mechanisms. In fact, the new system of «distance» eworking (employee living in Toulouse and coming to Paris to work, for example) is suspected of being even plainly disadvantageous compared to the reference situation. Thus, we have compared other three cases to the "normal" situation :

a) a person residing at 200 km of his office. He travels to his office one day per week, out of the 46 work weeks, by car, the rest of the time working at home.

b) a person residing at 200 km of his office and at 10 km of the train station. He travels to his office once a week, by train (then by public transportation means), after going to the train station by car.

c) a person residing at 500 km of his office where he gets once a week, by plain (then public transportation means).

The results read as follows :

Situation	1 (200 km, train)	2 (200 km, car)	3 (500 km, plane)
Evolution compared to the reference situation (services included)	-29%	2%	151%

Thus, in only one case - the person working at home, using a car, and traveling to the office by train from time to time - we can speak about energy saving; the other cases are neutral; when the plane is used there is even a clear surplus of energy consumption (+150%).

The energy saving implied by this system is possible but it does not come automatically. It is worth noting however that, when saving energy is part of an objective, it is possible to achieve it by using a telework solution.

Admitting that 50% of the individuals working in the services sector (that is 7 to 8 million people) turn to the telework system, the energy saving for the entire country would read as follows, depending on the mechanisms used:

Workplace	office, full time	home, full time	home, 50% & office, 50%	local center, full time	local center, 50% & home, 50%	local center, 50% & office, 50%
Potential gain, in million tons of oil	0.0	11.4	4.8	0.8	6.1	0.4
In % of the energy consumption in France	0.0%	4.6%	1.9%	0.3%	2.4%	0.2%

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[44] *It is supposed that a space is reserved for work at home, thus reducing the space need of an enterprise*

The table above clearly demonstrates that only home working can lead to substantial saving.

2) It is possible to use the eworking system to diminish the gas emission creating a greenhouse effect.

Admitting the same hypothesis as above, the passage from the "normal" situation to the eworking system leads to an amount of saving that varies depending on the mechanism used.

Workplace	office, full time	home, full time	domicile, 50% & **home**, 50%	local center, full time	local center 50%& **home** 50%	local center, 50% & **office**, 50%
Gas emission creating a greenhouse effect saved in transportation (equivalent in kg carbon)	0	490	245	490	490	245
Gas emission creating a greenhouse effect saved in services sector(equivalent in kg carbon)	0	514	170	-174	170	-87
Total (equivalent in kg carbon)	0	1000	420	320	660	160
% of average emission of a French individual	0.0%	36%	15%	12%	24%	5%

As we can see in the table above the advantage is obvious in all cases. How explain this difference? The null balance, even slightly unfavorable, registered in the case of energy saving represents in fact the sum between the saving seen in all trips by car - using only fossil fuel - and the excess of energy in the services sector in certain cases of the study, knowing that the energy of the services sector comprises for a large part nuclear energy.

This is the reason why when it comes to gas emission with a greenhouse effect the conversion to the eworking system always presents advantages.

We have to remember however that the favorable balance is by far that one registered in the case of home working, provided that the domicile-workplace trips are not replaced by equivalent (in terms of distance) trips during the day, for professional purposes or not.

Admitting again that 50% of the individuals working in the services sector (that is 7 to 8 million people) turn to the teleworking system, the resulting saving of gas creating a greenhouse effect - for the entire country - depending on the mechanism used, would read as follows :

Workplace	office, full time	home, full time	home, 50% & **office**, 50%	local center, full time	local center 50% & **home** 50%	local center, 50% & **office**, 50%
Potential gain, in million tons of carbon	0.00	7.69	3.18	2.42	5.05	1.21
In % of the national emission	0.0%	4.5%	1.9%	1.4%	3.0%	0.7%

3) The experience gained shows that the implementation of a telework scheme is generally beneficial for an enterprise

During the study a series of discussions with companies was organized which permitted to draw some conclusions. The three companies part of the panel that put telework into practice at a significant level in France (IBM France, EDF Gaz de France and France Telecom) have all agreed that this work system is beneficial:

    - the employee is more efficient, being at the same time (or because of it!) more serene;
- from a financial perspective, the enterprise gains. This confirms the calculations made during the study showing that, even if they do not take into account all sides of the story, especially the production income, the saving is significant both for employee and enterprise.

Of course, as in all cases, success is not guaranteed, but it is obvious that the enterprise implementing such a work system may obtain certain savings.

4) It is already a fact that an increasing number of employees wish to ework and those who already do it are satisfied with the results.

The above mentioned discussions also reveal that, contrary to the common idea that employees are afraid of teleworking, there are already a number of them that express their interest but without any result yet.

In addition, the inquiries amongst employees partially involved in a eworking scheme show that they are satisfied with the mechanism and very few of them wish to return to the traditional way of working.

In the case of the large companies mentioned above, which have several thousands eworkers, on a full or part time basis, it does not seem that there is a certain category that prevails amongst the teleworkers.

The study has demonstrated that the present technological conditions are sufficient for most of the cases; eworking at home requires special space arrangements.

It is often said that teleworking requires work conditions at high standards and the existence of broadband facility. This is probably true for the eworking centers that intend to recreate an environment similar to that in an "office" and offer the same services, in particular instant connection and without debit limits with the server of the enterprise.

Our study has revealed that broadband is not essential[45] for the home teleworkers in all cases: this depends on the job performed, but most of the times this is rather an element of comfort than a real need. It is true that the existence of such an element facilitates the activity performed, but we have to avoid seeing eworking only from the technical perspective. As we are going to illustrate below, the main obstacles are of a cultural nature.

However home teleworkers must have a minimum precise material endowment : an office physically isolated from the rest of the family space and the capacity to handle family relations so that he can work in the normal schedule and avoid doing the work at hours normally reserved for resting ("the right to disconnect").

It is obvious that in France the obstacles are not necessarily there where certain try to place them. In fact, when the individuals concerned (employees, management) agree on an organization including the teleworking system, the element of resistance is mainly cultural in nature, being primarily motivated by a lack of information.

The unanimous opinion of the participants to the discussions held for the purposes of the study is that, when there is a real will to implement a work organization including teleworking, the obstacle that might hinder its implementation is on one hand the attitude of the first level management and on the other hand the attitude of the trade unions.

It seems that such resistance is generally grounded on unmotivated fears :

- fear of the isolation feeling, even if it not a fact for teleworkers

- fear of losing contact with the management, however this does not seem to represent a real problem

- fear of administrative complications (insurance, payment of the employment taxes, relation with the work inspection, etc), which do not seem to be of importance for those who have turned to the new work organization

- fears of legal incertitude, which in this case also seem to be unimportant for the present teleworkers in the sense that such problems as work schedule for example are generally solved ; the fact is that the solutions are not known to the candidates for teleworking

-fear that the employee might reveal confidential information, a fact that again finds no real ground upon investigation (in fact there are already lots of occasions when such information might be revealed).

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[45]   more and more teleworkers do chose a DSL connection for the sake of comfort and efficiency at work; which is half way between traditional connection and real broadband.

More information about this study can be found at : www.manicore.com

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All these aspects show that in addition to the necessity of accelerating the pace of adaptation to the market and to the use of IT equipment by the largest part of the population as possible, the French population also have to overpass rapidly the social, cultural and historical obstacles. As regards the measures allowing a faster development towards the information society, a large number of measures have been taken and continue to be taken. Such measures are necessary especially in the light of a survey performed by BNP Paribas Lease Group (*www.bnpparibas-leasegroup.com*) dealing with the Internet situation in the French small and medium size enterprises. France is slightly under the level of its neighbors, with 82% of its small and medium size enterprises having access to Internet, but it is currently catching up on the losses incurred during the previous years. It is France that registers the highest progression between 2000 and 2001, with +9 points. 76% of the managers declare they have Internet access (+2 points against the previous year). The use of the Internet is still generally focused on e-mail and information search.

The report drafted by Senator Harrison establishing a balance of the objectives of the Telecommunication Law of 1996 demonstrates that there is an improvement of the public services in the domain of telecommunications. It also raises the problem of a territorial numerical fraction. The technology is focusing on the intense population areas, which are more profitable, and avoiding other areas : 20% of the territory is presently not covered by GSM8 and it is expected that 20 to 30% of the territory be left out in the future in terms of broadband access (the ADSL has the most efficient coverage). His survey covers also a number of proposals[46].

The Barreau de Paris continues its efforts due to the Teleworking Sub-commission, which in December 2001 published the results of its work in a synthesis addressed to the enterprises in order to guide the same in their teleworking implementation attempts[47].

The item of the Internet being used for personal purposes in the office during the working hours has also been widely discussed during the last months.

e-Monitoring of the employees is a subject regularly discussed in France. The use of the mail and more generally of the Internet at the office represents an increasing concern for the employers and for the social partners. Chronopost International has recently published the results of a study revealing that French declare they surf an average of 23 minutes/day for personal purposes. The French Law deals with the e-monitoring, through on ordinance of October 2, 2001. The Court of Cassation has reminded that the employee has the right (…) of a private life and private mail.

The CNIL[48] has drafted a report on these issues the main conclusions deal with : the control of the Internet connections and the use of the mail, the use of Internet by the authorities representing the personnel, the proposal of an annual balance "Information and Liberties" submitted to the enterprise committee, the designation of delegates for the protection of data[49]

In France, the integration of the e-learning is still in its primary phase compared to North America. A study undertaken by Arthur Andersen covering 74 large French companies demonstrates that only 8 of them have implemented e-learning solutions, focused mainly on languages and ICT[50].

In the end, to prove its commitment, France has decided to host the annual conference of the European Commission called «European Assembly of Teleworking», which will be held in Paris next September 25-27 at the Conference Center Pierre Mendès France, Department of Finances, Economy and Industry : *www.ework-in-europe.com*

Contact

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46   http://www.senat.fr/rap/r01-273/r01-273.html

47   *The remunerated telework, Les cahiers du DHR, supplement of No. 50, Edition Lamy, 2001*

48   *Commission Nationale de l'Informatique et des Libertés*

49   http://www.cnil.fr/frame.htm?http://www.cnil.fr/textes/recomand/d010571a.htm

50   http://solutions.journaldunet.com/0011/001121introlearning.shtml

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Germany

Background : from telework to eWork

As already outlined in the ework 2001 report, telework in Germany started to diffuse and penetrate to a larger extent in the 90s and is slowly being expanded and replaced by a variety of different forms of flexible working which are commonly summarised under the name of ework. It seems as if telework was just the prologue to a main act that now follows.

Further growth of eWork

With 6% of the labour force being either regular or occasional eworkers in 1999 the penetration of ework in Germany compared exactly to the EC-average. These ECaTT figures (*www.ecatt.com*) were largely confirmed by the 2000 Eurobarometer (although a different definition and methodology were used) which came up with a figure of 3.4% of the German workforce being classified as eworkers. However, and as already noted in the eWork 2001 report, ework has been booming in Germany in the period from 1994 to 1999 and we estimate that it has further grown in the years 2000 and 2001 although no further empirical data have become available (the IST project SIBIS "Statistical Indicators Benchmarking the Information Society" is conducting a representative EU-wide survey which will provide up-to-date data for 2002, cf. *www.sibis-eu.org*). Our estimate is based on anecdotal evidence which tells that in Germany ework mainly spreads via "quiet" implementations, i.e. organisations just do it without making a big fuss about it.

As a result of this, large organisations like the LVM insurance company have achieved a figure of more than 600 eworkers out of a total of 2300 staff members. It appears as if with 25% of the staff being eworkers, the organisation has reached a "natural" boundary. Other companies like BMW have reached 1500 eworkers and the figure is constantly increasing. These are just two examples of large corporations where ework has become a "normal" issue and part of the other standard offers for flexible work organisation such as flexitime. In conclusion it can be said that ework has reached the stage of common practice in many large organisations.

To an increasing extent larger organisations now move towards the next step in implementing new ways of working by taking up and implementing desk-sharing concepts, mostly after having already successfully implemented eworking, to reap further benefits such as cost reductions. The company dvg in Hannover is a good example in this respect. After building a completely new office it implemented a concept where work places for only 75% of the total staff of 1850 have been installed. In line with the original idea behind the "touch-down office", dedicated work places have been abolished in favour of staff being assigned a work place when they enter the building every day. A similar system is now in place at the German headquarters of Sun Microsystems in Heimstätten where 680 of the total staff of 980 take part in desk-sharing.

eWork still not top priority in many organisations despite existing demand by staff members

However, still a significant number of organisations are rather slow in implementing and expanding eworking in their organisations. In most cases, ework does not rank top of the priority list. The reasons for this are manifold. For instance, in the insurance and banking industry but also other services sectors DP and organisation departments have been kept busy with the year 2000 issue and the changeover to the euro and are currently engaged in product and services development etc. relating to the "Riester Rente" (Riester pension) which emerged as a result of a major change in the German pension insurance scheme. In other cases, the most pressing demand for ework by the workforce could already be met with pilot projects, which are not yet further expanded. However, demand for more flexible work arrangements is still very high among women since the availability of child care facilities in Germany in

general and their opening times and flexibility is seen as absolutely poor and insufficient (cf. also the results from the IST project FAMILIES, *www.families-project.com*).

SMEs still lagging behind but eworking has now reached the public sector

Compared to larger organisations, SMEs are still lagging behind in ework implementation and use. Hardly any formal eworking schemes have been set up by SMEs; informal arrangements with eworking staff members prevail. Many SMEs continue to operate in traditional forms of work organisations and only slowly start to identify the advantages and benefits they will be able to achieve with more flexible types of work organisation.

For a long time, the public sector appeared to be immune against eworking but the topic has now also reached this sector. The Federal ministries have been the frontrunners and shining examples in this respect, which again demonstrates the potential and power of the public sector to positively impact ICT implementation and diffusion in other areas and at other levels (not only at the Federal but also e.g. at Federal State and municipality level). Hamburg for instance is one of the positive examples where the issue of eworking was picked up rather recently with an implementation on a larger scale. This has started with 50 eworkers in 2001 which is planned to be expanded over 10 years to more than 50% of the 80,000 workers of the Federal State of Hamburg to become eworkers. Other authorities at Federal State level and German cities of all sizes have implemented ework. It at least appears as if the DATEL (Datensichere Telearbeit in der kommunalen Verwaltung - Telework in public administration) contest organised by the Federal Ministry of Economics and Technology had an impact and has fuelled ework implementation in the public sector. Altogether it has initiated the implementation of ework in 37 municipalities. Examples include cities like Düsseldorf and Salzgitter.

Trend towards mobile eWorking

It also appears from anecdotal evidence that the trend towards mobile eworking is gaining speed in Germany with an increasing number of people working at various work locations. Very often this is the result of organisations closing down their branch offices in the regions to save on cost. As an alternative they implement home offices for their staff members who used to work in these branch offices and equip them with portable ICT to enable them to also work directly at the customers premises and while mobile.

eWork no longer a topic at Federal policy level, some little activity on Federal State level and diminished presence in the media

eWork has been the subject of quite a few support programmes at Federal and Federal State level in Germany in the second half of the 1990s. However, at Federal state level ework is no longer a priority area. The Federal government and its ministries have reached the conclusion that after the support programmes "Telework for SMEs", "Telework for public administrations" and "OnForTe : Online Forum Telework" together with ework pilot projects in various ministries, a knock-on effect has been achieved and no further actions are required. Accordingly, no specific support or R&D programmes to support ework implementation exist.

The situation is similar at the Federal state level. Only some few activities exist in regions such as Hessen and Rheinland-Pfalz. These programmes have a special focus and in Hessen for instance concentrate on pilot projects to improve the work-family balance through eworking. Many other Federal States which have been active in this field in the past have finished their programmes on eworking support.

The activity "Anwenderplattform Telearbeit" in Baden Wuerttemberg, where industry, ministries and trade unions have come together to start a series of events aimed at the motivation of industry and businesses to become familiar with ework and get some guidance for implementation has been continued. As already mentioned in the previous eWork report it offers an interesting online service which is trying to also locate ework in the wider context of eWork and new ways of working. This initiative has set up *COALA the virtual competence centre for online work environments* including information and guidance on subjects like eworking, new self-employment, skills and qualification, e-business to name just a few (website: www.gewerkschaftshaus.de, click on "COALA Arbeitswelten).

In addition, the ework online service and call centre OnForTe targeted at employees and self-employed with questions relating to ework has received further funding and continues to operate. This initiave was set up by some German

trade unions with funding from the Federal Ministry of Economics and Technology (cf. above) and Deutsche Telekom.

When looking at the presence of eworking in the press it becomes apparent that it has lost a prominent place in the media, while e-commerce, e-government and e-learning have become the topics with highest priorities.

eWorking as a means to improve the work-family balance and to counter other negative developments

Against the background of a rapidly ageing society and the resulting problems associated with the traditional social security systems coupled with the lack of qualified workers in specific areas, a public discussion has started in Germany dealing with new forms of work organisation, family-friendly work and work places as a means to counter the negative implications of the above developments. The discussion has been boosted by promises made by the different political parties in the current election campaign in Germany (the next Federal elections are due in September 2002) which together could act as a further stimulus to eworking and other forms of eWork. However, it remains to be seen whether these will continue to be topics and put into practice after the election.

Legislative developments

A leading decision by the Finance Court Rheinland-Pfalz has led to clarification about the taxation of privately used ework-related ICT and telecommunications. It has become possible to deduct a share of expenses on private computer equipment from taxable income. This decision is bound to have a positive impact on the take-up of ework. Moreover, taxation guidelines have been modified in 2001 to make it possible for employers to leave PCs and other ICT equipment to their employees for (amongst others) further education purposes, without this being regarded as a non-cash benefit subject to taxation. Companies like Bertelsmann and Ford have issued plans to hand out PCs to all of their staff members. However, there is no information available as to possible followers of this activity in industry and public administration. The current recession and problems of companies in Germany may have had an impact here. For example, for reasons of cost reduction Ford stopped its world-wide programme in October 2001 before large scale roll-out in Germany could begin.

ICT-related developments

The ICT-related framework conditions for eworking in Germany are positive and have received further improvements. For the first time there are more mobile phones in use in Germany than fixed-net access points. The roll-out of ADSL is making good progress and the number of subscribers has reached more than 2 million with already 2.2 million ADSL users being Telekom customers. However, the ADSL service is still restricted to specific urban areas only. Customers in peripheral regions will have to wait for some time to be able to make use of this service.

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Greece

During the last five years, the size of the IT infrastructure and e-work in Greece has grown at a fast pace, although it is still behind E.U. standards. Major obstacles are to be confronted such us the high cost of IT technology, low per capita investment, insufficient training up to recently, lack of skilled workforce and non existing legislation concerning ework.

The rapid take-up of IT and Internet

Most recent data for the usage of internet and PC's is derived by VPRC, a private research firm (ordered on behalf of the Research and Technology National Network), and shows a promising environment for future development in these fields. According to the same estimations, one out of ten Greeks is surfing through internet, while one out of five is using a PC. Within the next two years, internet penetration is expected to rise up to the 33% of the population, compared to an average of 66% in the case of European Union countries.

Place of Internet access
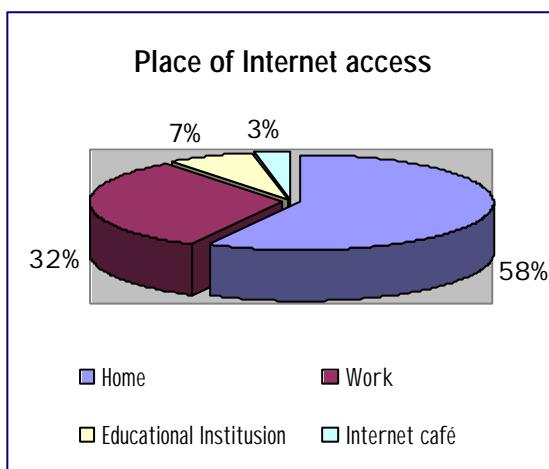
In the beginning of 2001, internet users in Greece are estimated to be 892,220 persons in a total population of about 11 million people. Fifty eight per cent of these persons where using internet at home, 32% at work, 7% through educational institutions, and 3% at internet cafes.

Twenty five per cent of the population is using a PC, 44% of them at home, 23% at work while 19% at both places. Seventy one per cent of PC users where involved with it during the last 5 years and 75% of these users where involved with internet for the past two years.

Twenty three per cent of men are using PC's compared to 17.4% of women. The percentage of men using internet reaches 12% while the percentage for women is 8.3%. The average usage of internet for the beginning of 2001 for the E.U countries was 40.5% and 28.5% respectively. Information technologies, as it may be expected, are by far more spread through high-income population, as well amongst the younger generation. In the ages between 15 and 17, the usage of PC's reaches 46.7% and of internet 20.2%. Between 15 and 24 years old, the usage of internet is 25.8%, while for people over 55 old of age, the respective figures are 4.3% and 1.4%.

Citizen's interest for PC's and internet technology differs considerably among geographical regions. In urban areas, the usage of PC's reaches 26.7%, and in rural areas 9.5%. Internet usage is 13.9%, and 4.3% respectively. At the northern part of the metropolitan area of Athens (occupied by high income population), the percentage for internet users reaches its highest rate of 33%. In the usage of PC's and of internet, the services sector is by far ahead of agriculture and of industry. It is interesting to note that, the use of PC's in small and medium size enterprises with 11-50 employees is a little higher (29.1%), when compared to the case of larger enterprises with over 500 employees (26.7%).

Distribution of PC users among economic branches

Branch	Value
Total	22,9
Agriculture / Fishery / Stock-raising	3,5
	17,2
Constructions / Public works	19
	24,8
Restaurants / Hotels	17,2
	41
Energy / water supply	10
	22,8
Public Administration	30,3
	51,3
Health	27,2
	38,2
Didn't know / haven't answer	20,5
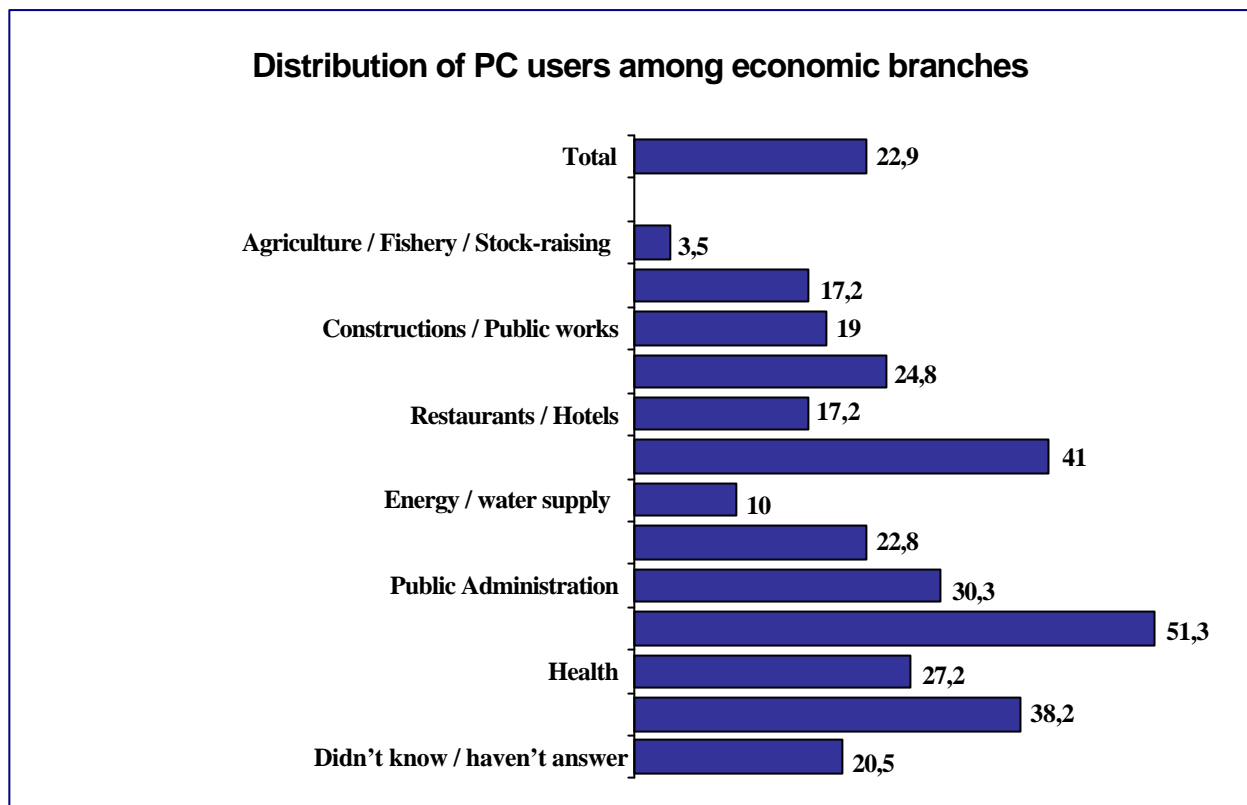
The Case of eWork

eWork in Greece, in its pure form, shows a rather moderate growth at least up to the present, despite the fact that there is a considerable discussion and public interest about this new work phenomenon. During the last three or four years, several pilot ework programs have been developed by some computer oriented private firms, with the financial aid of European Union special funds. These programs were mainly involved with e-learning and partly with an effort to develop a national network of eworkers. University establishments also originated certain forms of distance learning and e-conferences and this is expected to be largely expanded through generous funding by new European Union and Government funds. Recently, it was officially announced that by the end of 2002, most Universities and higher educational institutions will be equipped with e-learning facilities.

Pilot tele-medicine programs also were developed during the last years by the connection of remote islands with central hospitals in Athens. Various private firms appear to be involved in this particularly promising field, if the isolated morphology of parts of the country is to be considered.

E-commerce has been developed up to now mainly in the sphere of books, CD's, personal computers, as trade items sold through the internet network. A rather large tele-market exists which is being promoted through television networks, but this may not be considered strictly as an e-commerce business. A certain number of persons are involved with internet work, employed in several internet portals which during the last four years have spread vigorously. However, high expectations in the same area were confounded later on and this resulted in a considerable number of dismissals by the beginning of 2002. In banking, ework and internet procedures have rather limited applications at least up to recently.

In fact, the larger number of active e-workers are involved with the editing and translating of texts and of journalism. In general, the actual number of eworkers in Greece is rather unknown, although according to some non-official estimations, they reach approximately 50,000 persons, which is 1.14% of the labor force of 4.4 million people. Nevertheless, if the morphology of the country structured by many isolated islands and mountainous places is to be

considered, e-work and internet networks are a most appropriate economic and working tool expected to be developed in the not very distant future in Greece.

Highlights of a special program by the Ministry of Development concerning the usage of Internet and of IT by SMEs in Greece

The Ministry of Development is implementing four actions for the development of small SMEs (1-10 persons) in the fields of PC and Internet usage :

- For the entrance of small and medium SMEs into the digital economy :
  * The program "Net Now" addresses enterprises of all sectors of the economy aiming for Internet access of 50.000 enterprises by the end of 2004
  * The program "Train to Net" targets familiarization in the enterprising usage of Internet.
- For the usage of ICT in SMEs and the development of e commerce :
  The program "Enterprise Electronically" aims to accelerate the implementation of ICT and e-commerce practices of Greek SMEs through the introduction of enterprise tools (Enterprise resource planning systems, Customer Relationship management, Call Centers, Supply chain management, Portals, E-procurement etc.)
- For the acceleration of new technologies penetration in higher learning :
  Collaboration of Ministry of Education and Universities and Technological Institutions for the increase of Internet access from 10% to 50% in the next three years
- For the appreciation and the encouragement of ICT in enterprises :
  * e-business forum
  * development of collective infrastructure for e commerce
  * development of Enterprise and Technological centers
  * development of e information for enterprises
  * computerization of state supplies

EU in its annual report (2001 Best procedure report) places these initiatives as example of best practices at the European level in the field of e enterprising.

Future Trends

IT technologies and e-work are expected to achieve a higher rate of growth in Greece stimulated by several ambitious state and EU programs leading towards the so-called "information society". The spending of large funds aided by the EU for the introduction of IT in primary, secondary and tertiary education was announced by the Ministry of Education. With similar programs, the Ministry of Development is trying to introduce or broaden the use of IT to private companies, while several similar programs are running in the wider public sector. Recently, it was announced that taxation and social insurance would be processed through the internet network. Nevertheless, some skepticism also exists as to the timing and the extent to which all these good will efforts and announcements will be enforced.

There is no doubt that IT and ework in Greece may be developed to a satisfactory level, provided that existing obstacles mentioned above be removed and state bureaucracy will not hinder expected progress. Given the morphology of the country and the existence of many top level IT scientists of Greek origins, such expectations are hoped to come true.

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Ireland

Background

According to the latest Mid-Term Review by the Economic and Social Research Institute (www.esri.ie), the Irish economy is estimated to have grown by 6.6% in real GDP and 4.7% in real GNP terms in 2001. The ESRI forecast growth in 2002 for real GDP and real GNP is 3.0% and 2.1% respectively. Unemployment in 2001 averaged 3.8%, well below the EU average of 7.7%, but is forecast to exceed 5% during 2002, averaging 4.7% for the year. The outlook for the Irish economy depends upon the speed of recovery in the international economies about which considerable uncertainties remain. However, it still has the potential to grow rapidly in the mid-term, achieving an average growth of 4.5% per year during the period of 2000-2010.

The rapid growth in the Irish economy in recent years has resulted in pressures on infrastructure and the availability of labour, and the analysis in the Review suggests that these constraints may prevent the economy achieving its potential growth rate. It is only through further increasing participation or immigration that the constraint on labour supply growth can be relaxed. The latest FAS/ESRI Manpower Forecasting Study for the period 2000-2015 predicts an increase of 45% (206,000) in managerial/professional employment and a 42% (130,000) increase in sales/services employment, if these constraints can be overcome.

While these challenges are being addressed, e-work also has a role to play. eWork is recognised for its potential to contribute to more balanced regional development and reduce traffic congestion, thus easing the pressures on housing and traffic infrastructure, as well as to increase participation in the labour market and attract and retain the highly skilled people needed for Ireland to prosper in the knowledge economy.

This report describes the progress being made in realising this potential, the current status of eworking in Ireland, as well as some of the barriers that need yet to be overcome.

Trends in eWorking - results of recent surveys

The latest ework survey undertaken by MRBI on behalf Enterprise Ireland's ework awareness campaign in October 2001 shows some encouraging developments, compared to the survey carried out the previous year :

- Between 2000 and 2001, the proportion of Irish businesses with one or more employee eworking increased from 10% to 12%
- The number of employees in those companies who ework also increased, from 4.5 employees to an average of 6 employees
- 40% of businesses have increased their number of eworkers since 2000, only 3% have less
- 93% 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 one quarter of all eworkers have had training provided.

Companies currently using eworking are predominantly :

- Operating in the non-distribution service sector, mainly IT, financial and sales and marketing employees (33% in Computer/IT sector)
- Located in Dublin
- Companies with 50+ employees – 36% as compared to the national average of 12%
- Companies supported by Enterprise Ireland - also above average, at 19%.

A separate survey by Deloitte & Touche, carried out in conjunction with Enterprise Ireland in mid-2001, also shows a positive trend with 43% of Ireland's Top 1000 employers claiming that they are in favour of allowing employees to ework from home. The survey found that 39% of companies expect to increase the percentage of eworking staff over the next three years, while 53% of companies said that they have considered allowing employees to work from home.

In early 2002, the EMERGENCE project (*www.emergence.nu*) undertook a survey of Irish SMEs with less than 50 employees in the knowledge sector on behalf of the eWork Action Forum. EMERGENCE measures the supply and demand of eWorking and charts emerging trends for the location of information processing activities on an EU and global level, and already surveyed companies of more than 50 employees in all sectors internationally.

Key findings of the survey

Taking into account all the different forms of eWorking surveyed, larger Irish firms in the knowledege sector are at present consistently below the EU average for both supply (23%) and demand (43%) of eWorking. However, SMEs with less than 50 employees in the knowledge sector show much stronger supply (57%) and demand (46%).

The figures for Irish small firms can presently only be benchmarked against the same survey undertaken by EMERGENCE in Denmark, and not surprisingly, Irish figures are lower in almost all categories of eWork, both supply and demand. The notable exception is the supply of design, editorial and creative services, where Irish small firms exceed Danish figures.

Use of individual e-lancers

Large Irish companies in the knowledge sector report 8% using e-lancers compared to a European average of 15%. Large Irish companies outside the knowledge sector report just 3% using e-lancers compared to a European average of 11%. Among small companies, 13% of Irish companies in the knowledge sector use e-lancers compared to 16% in Denmark.

Use of e-outsourcing to companies

Again, the Irish level of demand in large firms in the knowledge sector (33%) is lower than the European average (40%). The level is lower again for large Irish firms not in the knowledge sector (23%). For small companies, 33% of the Irish sample report e-outsourcing to other companies, while the Danish sample report 46% e-outsourcing. Irish companies in the knowledge sector, both large (11%) and small (19%), are more likely than their European (7%) and Danish (9%) counterparts to choose to source eWork from other countries.

Future trends

Despite starting from a low base, it seems likely on demographic grounds that individual forms of eWorking will grow at a faster rate in Ireland than in some other European countries. Ireland has a young population and respectable ratio of PCs to students in schools. The proportion of the population that receives tertiary education is rapidly rising. The rate of female participation in the labour force is rising. The percentage of the economy that is in the service sector is also rising. Household sizes are falling, but not sizes of houses, providing more space for home offices.
The results of the EMERGENCE survey suggest some productive areas where this high level of interest might be channelled. Ireland has a substantial financial services sector where the average establishment size is large. This sector should provide opportunities to increase individual forms of eworking and e-outsourcing.

Small companies in the knowledge sector in Ireland also appear to have considerable possibilities to provide export services through e-outsourcing in three areas :
- Design/editorial/creative services
- Software development and technical support
- Customer services

Government Initiatives related to eWorking

eWork Action Forum

The Irish Government focus on eworking is ongoing. 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. Both NACT and the forum were established by Noel Treacy TD, Minister of State for Science, Technology and Commerce in the Department of Enterprise, Trade and Employment. The forum's work will continue until at least the end of 2002.

The work of the Forum in 2001 built on the considerable progress that had been achieved in its first year of operation, in particular :

- The introduction of the ework Business Awareness Campaign
- The endorsement of the Code of Practice on eworking by the social partners. In November 2000 the Code of Practice won an EU ework award as the "Best Framework Agreement".

The Forum continued to progress the recommendations in the NACT Report, in line with its priorities for 2001, and the 2001 Annual Report details the considerable progress that has been made with all of these.

Continuation of eWork Business Awareness Campaign

- A national radio and press advertising campaign
- Repeat of November 2000 survey in October 2001 to monitor ework practices in Irish businesses
- Continuation of an ework helpdesk, reprint and dissemination of ework literature, and upgrade and maintenance of the ework website : *www.e-work.ie*

Implementation of eWork options in Government Departments

The National Advisory Council on Teleworking recommended that all Government Departments should be required to introduce eworking options into their mainstream working and, additionally, that all publicly funded organisations should formulate an eworking policy for implementation in 2002. The ework Action Forum attaches a particular importance to the introduction of ework into the Civil Service as it believes that the Government should lead by example in encouraging the take up of ework.

A number of Departments/Offices, in separate initiatives, have instituted or are in the process of instituting pilot projects.

For example :

- 12 month Pilot Project in the Houses of the Oireachtas since March 2002, expanding to include 9 staff
- 6 month Pilot Project in the Health and Safety Authority, with 11 staff, completed in March 2002. Due to the positive outcomes of the pilot, it is intended to introduce a formal eworking policy into the organisation
- Current Pilot Project in the Department of Enterprise, Trade and Employment with 11 staff, to be formally reviewed at the end of 2002.

Statement of Practice on tax implications of eWorking

Uncertainty surrounding taxation issues had been identified as a barrier to the take up of eworking in Ireland in a report commissioned by the eWork Action Forum in 2000 from KPMG. Following consultations and negotiations, the Revenue Commissioners (*www.revenue.ie*) 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* : the employer may provide a computer, ancillary equipment such as printers, software, scanners etc., and office equipment such as furniture to enable an employee to work at home. Where the provision of such items is primarily for business use, a benefit in kind charge will not be imposed on the employee in respect of incidental private use.

- *Home Expenses* : the Revenue Commissioners are prepared to allow employers to make payments of up to €3.20 per day to employees without deducting tax and PRSI to cover expenses such as additional heat and light arising from the performance of their duties at home.
- *Other Expenses* : in relation to the tax treatment of mileage and subsistence expenses, Revenue have clarified that, if an employee work part time at home and part time in the office, the base is the office.
- *Capital Gains Tax* : where an employee uses any part of his or her home for ework purposes, the capital gains tax exemption for Principal Private Residence will not be restricted.

Engagement with the Central Statistics Office (CSO) regarding statistics on eWork

The lack of national statistics on ework in Ireland makes it very difficult to monitor, in any comprehensive fashion, the incidence of ework. After discussions with the Forum, the CSO has agreed to include some short questions relating to ework in the the Quarterly National Household Survey (QNHS) for autumn 2002. The results, due for release during the first quarter of 2003, should provide information on the age, gender, occupation, sector, region, employment status and education level of those who are eworking at or from home. The Forum has also made an application to the National Statistics Board for an "add-on" module on eworking to be included in a QNHS in 2003, which would provide more detailed information.

The CSO is participating in a research project, funded jointly by Eurostat and the European Commission's IST Programme. This project, entitled STILE, aims to provide innovative methodologies and content for the statistical monitoring of the European labour market in the eEconomy. STILE has set up a user group to advise on the development of appropriate statistical indicators for ework. This user group includes representatives of IBEC, ICTU, the Forum, the CSO and a number of academic researchers working in the area.

eWork Training

During 2001, the eWork Action Forum investigated a number of options for the provision of an ework training course, that would be available nation wide and with appropriate certification. A syllabus has been agreed, and development is continuing in 2002 in association with FÁS, the national training and employment authority.

The eWork Action Forum Work Programme for 2002 :

- Continuation of eWork Business Awareness Campaign being conducted by Enterprise Ireland (*www.e-work.ie*)
- Continued pursuit of the implementation of ework options in Government Departments
- Continuing engagement with the Central Statistics Office on improving the availability of statistics on ework
- Further development of a certified training course for eworkers.

The NACT Report, the eWAF Annual Reports, as well as the Irish Code of Practice on eWorking are available for download from *www.entemp.ie/e-work* and *www.e-work.ie*.
The leaflet "eWorking and Taxation" (Ref IT69) can be downloaded from the publications section of *www.revenue.ie*

The full MRBI surveys can be downloaded from *www.e-work.ie*, and a presentation on the 2001 survey (including audio) at the Telework Ireland 9th Annual Conference can be viewed at *www.telework.ie*.
In addition to the work of the eWAF, there is also an ongoing Government focus on Family Friendly Working Arrangements, and eWork is highlighted as one of the measures to achieve a better work/life balance. (*www.familyfriendly.ie*).

Information Society

The Irish Government launched New Connections, the second Government Action Plan on the Information Society, on April 9th 2002.

New Connections sets out the Government's strategy to ensure that Ireland establishes itself as a world leading location for e-business and knowledge-based economic activity, and for an inclusive Information Society. It assesses progress to date, reviews priorities, and puts in place a new strategic framework to drive the Information Society agenda.

Key infrastructures addressed :

- telecommunications infrastructure
- legal and regulatory framework
- egovernment

Supporting frameworks :

- eBusiness
- R&D
- lifelong learning
- eInclusion

The Irish Government has also approved the establishment of a new Information Society Fund for the period 2003-2005 to enable realisation of the objectives set out in the Action Plan.

Under eInclusion, the CAIT Initiative (Community Application of Information Technology) is proving very successful and CAIT II was launched on 28th February 2002. Several eworking projects are included.

The full New Connections action plan is available on *www.irlgov.ie/taoiseach/publication/*

The Information Society website is *www.isc.ie*

The CAIT Initiative website is *www.irlgov.ie/tec/cait/*

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)

eWork Ireland

TWI, the professional 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 eworking helpline, a monthly ezine for members and a frequently updated, comprehensive website, as well as liaising with Government and organisations with similar interests, such as the Irish Internet Association (*www.iia.ie*). Telework Ireland is represented on the eWork Action Forum.

TWI held its 9th National Conference in November 2001, entitled "Making eWork Work". Based on TWI's extensive experience, the conference aimed to highlight 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.

In the afternoon, focus groups were hosted on the same themes. Delegates representing a broad range of organisations and interests had the opportunity to exchange views and experiences on a series of structured questions, and a report on the findings was produced and is available from *info@telework.ie*. Conference presentations in Powerpoint can be downloaded at *www.telework.ie* and most presentations are also avaliable with streamed audio from the site.

eWork Ireland gratefully acknowledges the financial support given to this conference by the eWork Action Forum, through the Department of Enterprise, Trade and Employment.

Plans for the 10th Annual Conference to take place in November 2002 are in progress.

The TWI CAIT project, which is training carers in IT, Teleworking and eBusiness Development skills is progressing very well, and results will be published on the Telework Ireland website in autumn 2002.

Technical background

According to the FLASH EUROBAROMETER 112 survey report of January 2002, the number of households connected to the Internet has increased from 36% in October 2000 to 48% in November 2001, higher that the EU15 average of 38%, but lower than the leading EU15 countries at over 60%.

The percentage of the Irish population using the internet has grown from 46% in October 2000 to 56%, again higher than the EU15 average of 48%, but below the leading EU15 countries - Sweden 68%, Netherlands 69%, and Denmark 70%.

While Ireland is well placed in terms of Internet usage and eGoverment development, access to broadband is still poor, especially outside the large centres of population. The following table, extracted from the same Eurobarometer survey, exemplifies the situation at the end of 2001 in terms of connectivity of Irish households to the Internet compared to some of the more advanced EU15 countries :

Country	Standard line (%)	ISDN (%)	ADSL (%)	Cabl (%)	Mobile/Wireless (%)
Ireland	91.1	5.1	0.3	3.6	1.3
Belgium	64.5	9.4	17.9	24.5	5.4
Germany	48.5	45.6	13.5	7.8	10.7
Denmark	61.4	19.2	11.1	7.2	0.1
Luxembourg	49.5	48.5	1.2	4	0.1

An OECD survey examining broadband access availability and use, undertaken in November 2001, placed Ireland 27th out of 30 OECD countries. (*Source : The Development of Broadband Access in OECD Countries, OECD, November 2001*)

This was the situation up to April 2002, despite the progress being made since 1998 in introducing competition in the domestic market, the significant increase in Ireland's international capacity and the government's considerable co-investment in targeted regional broadband infrastructure projects in recent years. Delays in agreeing LLU pricing between the Office of the Director of Telecommunications Regulations (ODTR) and the incumbent telecoms operator, eircom, held back ADSL developments.

In April 2002, LLU pricing was resolved, and eircom launched its wholesale and retail ADSL products. Cost are still high compared to charges in most EU15 countries at €49 wholesale and approximately €90 retail, but at the same time represent a significant improvement, in terms of cost and speed of internet access. It does, however, remain to be seen how quickly ADSL will become available on a wide scale.

There is 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, including the following :

- 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"
- Forfás, the National Policy and Advisory Board for Enterprise, Trade, Science, Technology & Innovation in Ireland: the Competitiveness Challenge 2001   *www.forfas.ie/ncc/reports/ncc_annual_01.htm*

Broadband Investment in Ireland: Review of Progress and Key Policy Requirements, update 2002 *www.forfas.ie/pubs_index.htm*

- Department of Public Enterprise - March 2002 : the Minister for Public Enterprise announced a major drive to bring high speed Internet access to 67 towns around the country. Two phases of a regional broadband programme will see €160 million invested in each of the 26 counties. Phase one of the broadband programme will see 19 towns, many in the Border, Midlands and West (BMW) region targeted immediately (*www.irlgov.ie/tec/communications/*)

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Italy

Introduction

Until only a few years ago, Italy could be considered as being in a 'pre-technological' stage of development. In 1995, the country had only 300,000 Internet users; a large majority (about 70%) of small companies had very little familiarity or contact with new technological tools. Internet, intranets and e-mail were virtually unknown.

In 1996-99, however, stimuli from the world economy, renewed interest in new technology and, above all, the advent of the New Economy, created favourable conditions for an economic recovery which - with some stops and starts - has continued to the present day. One of the results has been the creation of a fertile terrain for the expansion of ework among Italian companies and institutions.

The current state of ICT in Italy

Even though the data for 2001 show a slight reversal in the trends observed in previous years, the Italian market for Information and Telecommunications is expanding rapidly (see Table 1). The small fall of 0.3% in 2001 was very probably caused by the slowing down of the world economy, following the American recession, and in particular by the crisis of the "dot coms" and the resulting cut-back in investment in the New Economy.

Table - Total IT expenditure in Italy (€000,000)

2000	20.660	8,90%
2001	22.499	8,60%
2002	**24.434**	**11,40%**
2003	27.219	12,60%
2004	30.646	

Source : Federcomin/IDC, 2001.

The end of 2001 brought a revision of ICT market growth expectations compared to the beginning of the year. This drop, however, does not seem to have affected the optimistic outlook of businessmen and analysts, and is not expected to cause a significant slowing down of the current trend towards expansion both nationally and globally. In spite of an overall decrease in IT market demand compared to the year 2000, Italy and Europe continue to show a positive rate of growth.

This overall slowing down affected the Italian telecommunications market (see Figure 1). The overall rate of growth, estimated at 9.2% in the year 2000, dropped by about two points between 2000 and 2001, to 7.1% (€27,932 million in 2000 and €30,501 million in 2001).

Figure1 : the Italian telecommunication market
Source : Federcomin/IDC, 2001
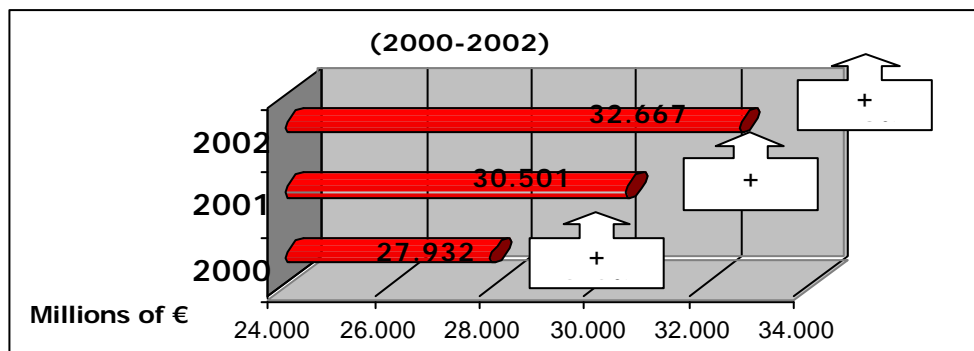
Current short-term estimates for the industry (Federcomin/IDC, 2001) predict a return to a high rate of growth, especially from 2003 on. In 2002, overall business in the telecommunications market is expected to reach €32,667 million, with an increase of about 0.7% compare to the growth rate of the previous year (7.2% in 2001, 7.8% in 2000).

Once again, the Italian telecommunications market succeeded in maintaining very positive growth, at a rate higher than the rest of the world, all this at a time when the slowing down of global economy had halved growth in Europe and elsewhere (see table 2).

Table 2 : growth in the Italian, European and world telecommunications markets (1998-2001)

	1999/98	2000/99	2001/00
ITALY	**14.6%**	**12.9%**	**8.5%**
EUROPE	11.3%	13.3%	6.3%
WORLD	12.3%	14.4%	7.1%

Source : Assinform/Netcousulting, 2002

The broader ICT market also showed a net gain, confirming that Italy is continuing to develop rapidly, closing the gap of the early 1990s.

Table 3 : ICT as a share of Italian and world GDP (1998-2000)

	1998	1999	2000	2001
ITALY	**4.5%**	**5.0%**	**5.5%**	**5.9%**
WORLD	5.7%	6.2%	6.6%	7.1%

Source : Assinform/Netconsulting, 2002.

The data presented in Tables 2 and 3 also shows that Italy has not suffered significantly from the world recession. While the Italian business world continues to show confidence in the current recovery, it is apparent that entrepreneurs, and especially medium and large sized companies, have finally understood ICT's full potential and strategic significance.

Significantly, interest in new technologies and their use is growing faster among medium and large sized companies than among smaller ones. The presence of Internet in the Italian business world, while constantly growing since the mid 1990s, continues to be tied to company size, measured by number of employees (see Figure 2)

While almost all medium and large sized companies (with more than 50 employees) have Internet access, this percentage drops to 83% for small firms (with less than 50 employees). This is one of many significant indicators of a critical delay affecting what should be considered one of the major strategic focal points of the Italian economy. Small companies are the backbone and most powerful driving force in the Italian business structure; yet, as they continue to fall behind, they represent a cause of imbalance in the wider context of the country's current economic recovery.

To strengthen the economic recovery it is essential that the growth we observe in major companies should spread to smaller firms and that the latter should be rapidly integrated within the circuits and markets which power the net economy.

Figure 2 : use of Internet in Italian firms
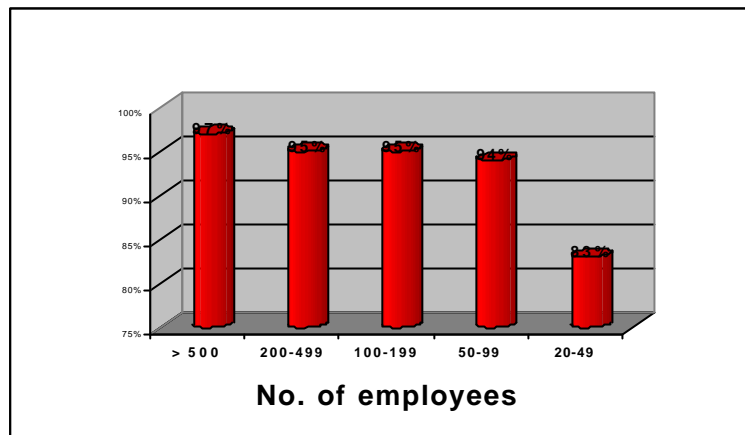
The consumer market

Consumption data up to the end of 2001 (Federcomin, 2001) shows a growing propensity for households to purchase and use new technologies. The economic slow-down has had only a small effect on consumer behaviour in this sector. One might say that, despite the fears generated by recent international crises, 'technological demand' among Italian consumers has been growing for some time and continues to grow fairly rapidly. This is an important development: widespread familiarity with new technology and the willingness to use it, during work and leisure time, provides fertile soil for the future development of ework.

A number of key trends are of particular importance :

- Wireless telephony and PC/internet penetration are very high
- The use of innovative platforms by Italian households is in line with trends in the main European countries (cfr. Table 3)
- Technology has become an important item of expenditure in 8 million Italian families (Federcomin, 2002)

Table 4 : platform penetration (%) in Italy, France, Germany, United Kingdom, USA (2001)

	ITALY	FRANCE	GERMANY	U.K.	USA
PERSONAL COMMUNICATIONS	150	110	130	135	110
PC	41	38	40	43	54
INTERNET	25	19	24	31	45
PAY TV	14	34	7	40	82

Source : Federcomin, 2001.

Technology penetration in Italian households (Fig. 3) continues to grow. This trend has probably been encouraged by the spread of free internet access from the spring of 1999 onwards. Even disregarding internet, however, there has been steady growth in purchases of PCs, mobile telephony devices and peripherals such as CD-ROM and DVD readers, printers, etc.

Figure 3 : new platform penetration (%) in Italian families (1995-2001)

Mobile phone - PC - Internet - Satellite - TV/PayTV - Multimedial families
Source : Federcomin, 2001
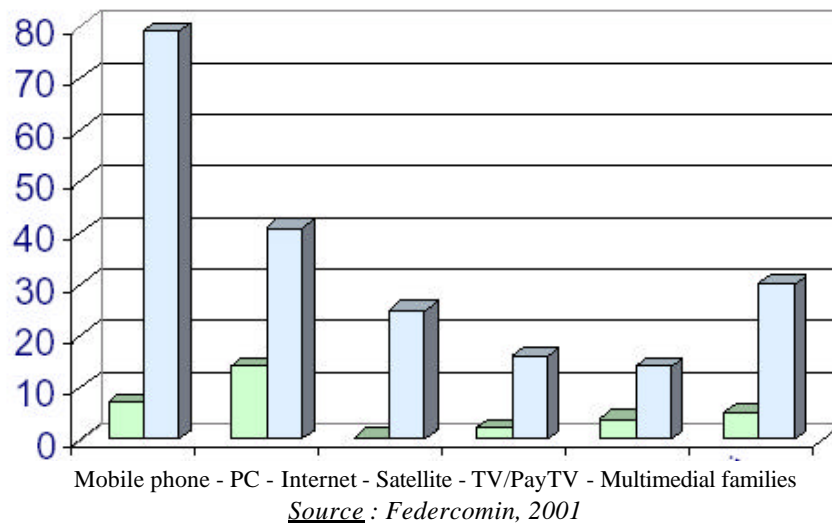
In the years between 1995 and 1999, PC penetration in Italian households rose at a rate of 3-4% per year. These rates (4%, or 750,000 households) were maintained in 2000 and 2001. 200,000 households owned a second PC. Rates of penetration for CD and DVD readers rose by 8% per year, 3% more than printers. Penentration of recently introduced peripherals such as CD-writers and scanners also grew rapidly increasing by 3% (about 550,000 households) per year.

Figure 4 : PC Penetration by geographical area

North West - North East - Central Italy - Southern Italy and the Islands - Italy
Source : Federcomin, 2001
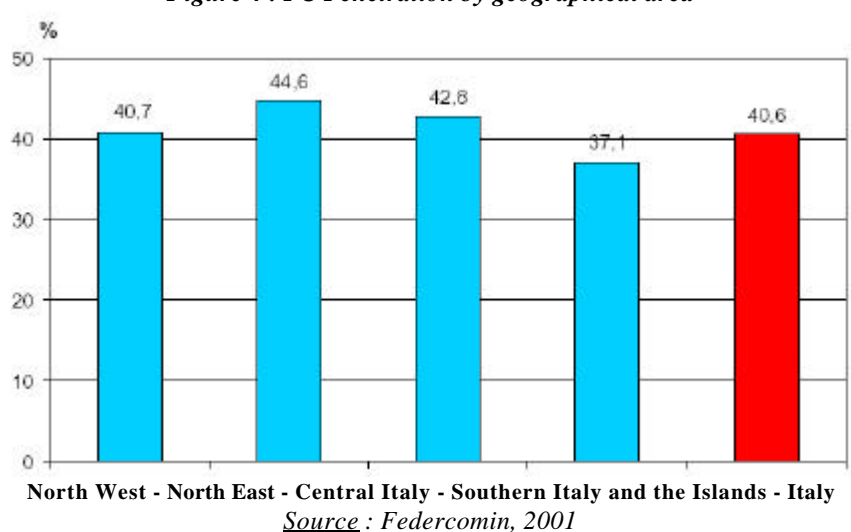
Platform penetration remains strongly segmented by geographical area, reaching a maximum of 44.6% of households in the North-Eastern Italy, and a minimum of 37.1% in the South.

eWork in Italy

In 1999, there were about 720,000 eworkers in Italy. According to provisional estimates this figure rose to about 1.5 million in 2000. If the figure is confirmed, we would be faced by a striking growth with good prospects for the future. What is clear, in any case, is that ework is slowly spreading. Even if only relatively few projects are up and running they demonstrate growing confidence that ework is possible, credible and practicable.

In qualitative terms, studies have shown that, until a few years ago, practical experiments in formalised eworking were limited primarily to employees in communications and IT companies. In many cases, ework was a response to company reorganisation schemes involving the outsourcing of goods and services and the downsizing of internal activities. The result was the creation of offices in external locations with computer and telecommunications links to the main office. These offices were used by independent contractors, consultants or companies working under contract. In all these cases, the change was dictated by the need to remain close to the market and customers, to recover efficiency and to maintain or win back competitive advantage.

Alteretto: Italy's first Glocal Village

Alteretto, a small mediaeval town in Val di Susa, near Turin, is located at an altitude of 850 meters, surrounded by mountains with slopes covered by dense vegetation. Sixty years ago, despite the area's natural attractions, the population of the area began to decline. The majority of the inhabitants left the area to seek work in Italy's great cities or elsewhere in the world.

The project to turn Alteretto into Italy's first Glocal Village was designed to attract back and consolidate the population of a town that was on the verge of being abandoned. In particular, the goal was to rejuvenate the mediaeval part of the town making it into the center of an environmentally aware community, which uses new technology and advanced telecommunications to maintain contacts throughout the world.

The project's main objectives include the installation of shared eworking facilities where the inhabitants can perform a broad range of professional activities.

The main characteristics of the project include :

- the use of IT and multimedia technology to enable the inhabitants of Alteretto to pursue their professional activities through ework
- the supply of facilities and equipment to support IT training
- the use of the environmental and ecological resources of the area to promote energy production, tourism, sport and health
- the creation of an integrated system of services and initiatives targeting individuals, households and companies and supporting the development of an open community with close links to the outside world.

The project included both general and specialist training focussing on the effective needs of the inhabitants and the firms where they work or intend to work. The training provided will be based on e-learning enabling a fruitful exchange of information with the rest of Italy, Europe and the world.

Source : C. Ciacia, P. Di Nicola, www.sitonline.org <http://www.sitonline.org/>, 2002

The development of a eWork culture in Italy

In the light of the developments just described and of more general socio-economic changes since the early 1990s, we can describe two main phases in the development of a ework culture in Italy.

Phase One dates back to 1993-97, when ework was still considered as an experimental form of work. The key characteristics of this phase can be summed up as follows :

- generic studies of the advantages and disadvantages of ework, often using very small samples
- broad academic interest, contrasting with a lack of interest from business
- limited interest in ework on the part of political and strategic decision-makers
- a predominance of stereotypes such as ework as an exclusively female activity
- short-term EU funding for experiments in ework
- ework as a solution to short term business problems, rather than as a long-term organizational solution

Phase Two began in 1998 and has lasted up to the present day. During this period ework came to be considered, for the first time, as a business opportunity. New links were forged with e-commerce, group-ware, e-learning, tele-cooperation, etc. :

- new modes of ework were introduced: these included ework centers, mobile working, remote work, call centres etc.
- firms began to introduce ework projects which no longer depended on EU funding
- the government sector began to experiment with ework
- firms - especially newly created companies - began to experiment with the virtual enterprise concept
- ework was now seen in a strategic, and not just a short term perspective - as an opportunity for broadening

companies' international prospects and for economy-wide job creation

- new, broad-ranging proposals were put forward for legislation to regulate ework; national union agreements began to make specific provision for eworking
- the debate on ework in the academic, business and financial communities acquired a new focus

As these trends suggest, this new strategic vision of ework no longer involves just the academic and business worlds but also Italy's political institutions. The backwardness, which for many years hindered the development of ework in Italy, is gradually giving way to a process of cultural change. This process is encouraged both by high-tech industry and by the increasing interest of the public sector, which has finally realized the enormous opportunities which digital technology offers for new applications and infrastructure.

A case of ework in provincial Lombardy

Dimensione EDP is a small company based in the province of Alessandria. Since 1986, the company has been producing management software for SMEs and for the mechanical, chemical and textile industries. The firm has two divisions : the HW & Networking division designs and installs a broad range of different kinds of network and data infrastructure; the software division designs, installs and manages software solutions for industrial SMEs. The development of the market for new technology and internet solutions has led the company to offer its customers Customer Relations Management (CRM) and Supply Chain Management (SCM) packages. The CRM package provides effective management of marketing information and of every phase in the relationship with the customer, SCM helps companies to optimize their logistics.

Dimensione EDP decided to experiment with ework both as a solution for software projects requiring expertise which was not available in-house, and to increase productivity in the software division during peaks of work. To further this end the company created a special ework section on its Web site where it could coordinate and develop the project.

Workers who wish to participate in the project register, receiving an identification number which they can use to request one of the 'open', i.e unfinished, jobs published on the site. Each job consists of a programming task, described in a specification sheet containing the technical information needed for completion of the task. Each job is associated with a Word document containing a detailed analysis of the functions which have to be implemented. Having performed any analysis which might be necessary, the programmer who is assigned a job has five working days to say whether he can do it or whether he prefers to withdraw. In the former case, the job is marked as having been assigned, and no-one else can request it; otherwise, it is re-published on the open jobs list.

Once the job is complete, it is sent to whoever is in charge of the project, who checks that it has been completed according to specifications and that it is error-free. Once these checks are complete, the job is considered closed and the worker receives the agreed payment for the job.

The overall results of the experiment have been extremely positive. According to Dimensione EDP, the majority of completed jobs have been of high quality, particularly considering the complexity of the work requested and the limited time available for completion. The workers involved expressed a high degree of job satisfaction. As a result the company plans to publish numerous other jobs on its job board, channelling a good part of its internal production and software translation work into ework. There are also plans to extend the project by allowing software SMEs to publish their own jobs on the site.

Source : C. Ciacia, P. Di Nicola, www.sitonline.org <http://www.sitonline.org/>, 2002

The new technology will make a huge contribution to Italy's competitiveness and to Italians' quality of life. It is likely to exert a positive effect on every sector of economic and social life including education and culture. In recent years, there has been an abundance of legislation and other government initiatives - following international and Community guidelines - aimed at reducing Italy's "digital gap" with respect to the more advanced European countries. The government's economic and financial planning document for the period 2002-2006, (approved in July 2001), clearly points to this integrated strategic approach, defining plans to :

- develop major broadband infrastructure and to completely liberalize telecommunications services
- to improve computer awareness and skills among students and teaching staff in schools
- to use tax and other incentives to promote electronic commerce, especially in small and medium enterprises
- to computerize - and radically simplify procedures in - the public administration, thereby achieving significant savings and offering improved services to individuals and companies[51].

Telekottage Asiago

Telekottage Asiago, is a company financed by a mix of public and private capital. The company operates an ework center in the province of Vicenza, an area with one of the lowest unemployment levels in Italy. The ework centre lies, however, in a zone on a high plateau where the social, economic and environmental situation has deteriorated seriously. During the 1970s, emigration lead to a steep decline in population. This was made worse by the fact that many local residents with job were forced to travel long distances to work.

It was in these circumstances that the local government (the *Comunità Montagna)* and Keycom Italia decided to set up an ework center offering ework facilities as well as support and training facilities for entrepreneurs wishing to set up businesses based on new technologies which needed professional skills not readily available in the area.

Since 1999 the company has created :

- a ework centre with facilities open to the public; the center offers training courses for companies and individuals, with special emphasis on tourism and on services such as translations and video-conferencing
- a call-centre to handle user and customer relations for companies and public bodies that have contracted the center to manage reservations and customer support, help desks, telephone sales and telemarketing.

Although it has only been open for a short time, the ework center has already won a number of customer care contracts with public bodies and private companies. It has also organized important internet advertising campaigns for the promotion of local sporting and cultural events, and has begun using video-conferencing, as a way of handling projects with countries outside Europe. The latter include Australia, where the center has handled activities involving emigrants of Italian origin. The center has created new jobs and professional activities and has contributed, if only to a minor degree, to reversing the area's social and economic decline.

Given the positive response, future developments include a virtual call centre which will soon be set up in the Padua area. The call center will have on-line links to Telekottage Asiago. The two call-centres will be able to transfer calls to each other, using both IP (internet or intranet) and dial-up connections, and producing significant savings in the fixed costs involved in installating a call center.

Source : C. Ciacia, P. Di Nicola, www.sitonline.org <http://www.sitonline.org/>, 2002

One of the most important of these initiatives is the recent "E-government" program. With this program the government aims to bring Italy into line with the standards of the most advanced countries. At the same time Italy has expressed its support for the use of ICT technology in the developing countries, lending its weight to a series of World Bank initiatives[52]. During the International Conference on e-Government for development, the Italian government signed an agreement to become a founder member - together with the World Bank - of the Development Gateway Foundation - a recently created, independent organization, in which public and private partners cooperate to promote the use of ICT for sustainable development.

Italy will also contribute to the development of the World Bank Institute's Global Distance Learning Network (GDLN). In this setting Italy will create two new Learning Centers which will join GDLN's existing 32 centers. These centers currently offer videoconference and online learning facilities for development workers. The first Italian Center, in Rome, will offer programs on : governance, legal reform and e-government. The second Center, in Milan will use new technology to contribute to the development of the private sector in the transition economies,

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[51]   *Ministry for Innovation and Technologies, www.innovazione.gov.it;www.pianogov.it, 2002*
[52]   *Ministry for Innovation and Technologies, www.palermoconference2002.org.it, 2002*

building on Italy's long experience in promoting small and medium-sized firms.

Once again it should be pointed out that ework lies at the heart of a complex, integrated system of interactions involving e-commerce, e-government, e-learning, e-business etc. These activities are tightly meshed and the boundaries separating them are not always clearly defined. It is this system that will feed the future development of ework.

Home ework with Telecom Italia's *Servizio 12*

Servizio 12, Telecom's directory enquiries number, was originally created as a public service and is today one of the most important Italian call centres, supplying the phone numbers and addresses of in-directory customers 24 hours a day. In addition *Servizio 12* offers a broad range of additional information, running from weather updates and traffic information to stock market and sports reports. The agents who run *Servizio 12* are scattered throughout Italy and work on a complex, continuous shift system, specially designed to handle different demand peaks for different categories of customer and in different geographical areas and to allow for the work pauses mandated by health regulations for video-terminal workers.

Introducing ework to *Servizio 12*

eWork was first introduced to *Servizio 12* on July 1, 1998, when Telecom and the unions signed a "framework agreement" regulating the new mode of work. The agreement came into effect about nine months later. The beginning of the experimental phase coincided with the launch of a research project, commissioned by the company's personnel department, to monitor the effects of ework on employees private and working lives as well as on their families and superiors.

Results of the experiment

The service was monitored for over a year. The study made it possible to achieve an in-depth view of workers' perceptions of the experiment, identifying both benefits and problems. The new eworkers were immediately enthusiastic about the system. This satisfaction was reflected in the way in which they perceived their bosses and the company. There were also positive effects on the attitudes of the employees who continued to work at the office, who had initially been rather unwilling to accept the new mode of work - seen as a first step towards unemployment.

The biggest benefits were a large reduction in commuter travel, which had previously made it difficult for workers to find a satisfactory balance between working and private life. eWork produced significant savings for workers who no longer had to pay travelling costs, rent for apartments near the office, etc. It was found that ework increased workers' sense of independence and responsibility, compensating at least in part for the monotony and low professional content of the job. At the same time, however, the year-long experiment threw up a series of problems and open issues. Of particular concern was the tendency of workers to develop a sense of organizational (rather than social) isolation.

The overall results of the experiment were extremely positive and have convinced management to implement and adopt ework as a permanent feature of *Servizio 12*'s organisational structure. As a result the number of eworkers working for *Servizio 12* is growing continuously and now amounts to about 25% of the workforce. (see Fig.5).

Figure 5 : number of eworkers working for Telecom Italia's Servizio 12

IN HOUSE WORKERS
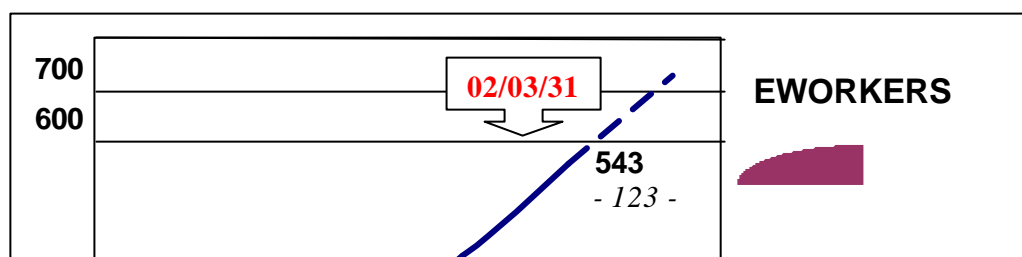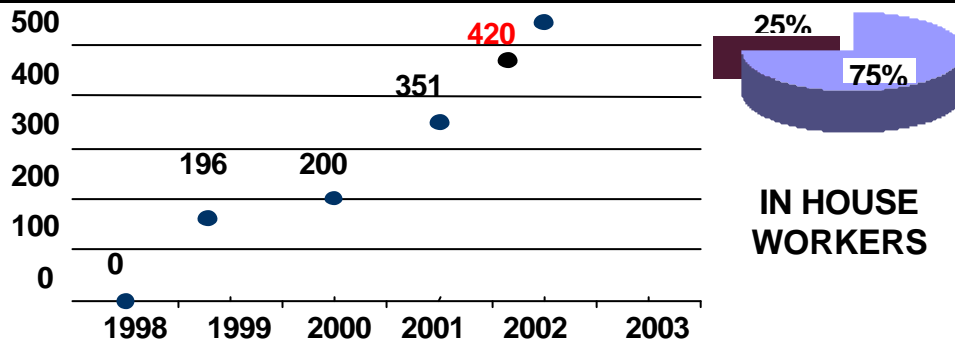
Source : Marcella Logli, head of Info 12, Telecom Ita

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Luxembourg

The Information Society in the Greater Luxembourg Region[53] : networks, key factors of original integration

The Greater Luxembourg Region is a laboratory for European integration. It has four sovereign states; five political authorities, and six administrative entities. Three national languages (Français/Allemand/Luxembourgeois), 12 million inhabitants with an average GDP per capita counting among the highest in the world. It is in the centre of a circle 500 km in diameter accounting for more than 50% of the European GDP. It is a financial centre (with more than 190 banks in the Grand-Duchy alone), and has economic and industrial activity of a considerable weight. If this greater regional constituted an independent state, it would be without any doubt the most prosperous and the most advanced technologically and economically of the European Union.

New technologies and research are the greatest source of employment in the Region. The "Technopoles" in France (Metz 2000 and Nancy-Brabois); the German Centres of Innovation and Technology (Saarbrucken, Trêves and Kaiserslautern), and the Luxembourg centres of research (Henri Tudor and Gabriel Lippmann) make the Greater Region one of the principal zones of research and technological innovation in the world. The penetration rate of information technology in companies and the homes, as well as the rate of connection to the Internet, also are among the highest in Europe, and in the world. The combination of these factors, together with the density of transport routes and the importance of the cross-border exchanges of resources and manpower, make this socio-economic entity a genuine laboratory of European integration. It is trans-national in nature and of interregional in its co-operation. With the launch of the action eEurope 2005 plan, the Greater Region can and must contribute to the development of the European Union towards the Information Society, in respect of human and cultural diversities, and with the permanent requirement to reduce divisions (social, technological and economic), to strengthen the citizen's role and guarantee sustainable development.

The Greater Luxembourg Region is a laboratory for the Information Society. It is one of the most unique socio-economic zones in the European Union. It has one of the most powerful industrial sectors, but which accounts for only about 30% of jobs: Tertiary activities employ at least two out of three people (67%). This reflects the importance of the public and administrative sector in employment, and the financial resources devoted to the management of the public services and to the fight against inequalities and exclusion. The high level of tertiary employment also reflects the dynamism of the various service companies of the Region: financial services, transport, tourism and the hotel trade and consultancy. Finally, research and teaching are strong in the socio-economic structure of the Grand region. It has prestigious universities like those of Metz, Trier or Liège, as well as specialised educational establishments, notably in languages, new technologies and environmental sciences.

Tertiary activities produces mainly immaterial assets: financial services, Pensions and benefits management of pensions, health-care and teaching services. All are easy to manage and diffuse in a digital form, but for their optimisation, networks based on solid computer logistics is essential. A society where the tertiary sector dominates is one of the conditions *sine qua non* to the development of the Information Society. The other conditions being a sufficiently advanced economic development level and important penetration of information technology and of the communication networks in the socio-economic fabric. All three conditions are satisfied in the Greater Luxembourg Region, even if important local disparities make even more necessary co-operation and the development of complementarities between its members.

Networks are the essence of an the Information Society. They exist at two levels: the physical support for the exchange of data - i.e. the "pipes" which convey the information - and all the entities connected between them. Networks must relflect the Internet Fabric as a whole. Networks are communities of persons exchanging information or *working together in a normal way* by means of the Internet. A network is not all persons consulting occasionally a given Internet site, or a list of advertisement recipients. For there to be a network, there must be reciprocity in the transfers of data, and joint work for one or more common objectives. They therefore relate closely to concepts such

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[53]   *The Grand Region comprises : Région Wallonne (B), Communauté Germanophone (B), Grand Duché de Luxembourg (L), Land de la Sarre (D), Land de Rhénanie-Palatinat (D), and Région Lorraine (FR).*

as that of téléactivities or of ework. It is in this sense in the Greater Luxembourg Region, that the debate on the "new forms of work" has the greatest interest, and in which the principal legal and social measures have been put forward.

Networks, in this broader meaning, have always existed: Persons working together on a joint project in different places, and exchanging information even by mail. However, the use of the computers and of the Internet (or of any other connection) gives such Networks several additional dimensions : almost unlimited capacity for storage of information, incomparable speed of data transfer and processing, "multimedia" capabilities, and the possibility of unlimited geographical extension. The obstacles to the extension of a network are technical, financial, and administrative. While it is easy technically to communicate with cross-border neighbours, it is difficult, often impossible, to become a member of a "national" network if the regulatory and administrative provisions are not made. This situation is particularly prejudicial to the extension of training networks, to collaboration between centres of research and teaching, and more generally to access to services reserved for the nationals or residents a country.

The Greater Luxembourg Region has all the characteristics favourable for Information society development: The computer penetration; the communication networks, the strength of tertiary activities, and numerous competence centres. It also has both high-density settlement areas and areas with very low population density; a high-level of daily cross-border manpower movements, and the need to redeploy new activity in the areas where traditional activities have declined. These are all elements favourable to the development of the téléactivities.

It also has a common will to accommodate this development and to frame it by the appropriate regulatory, administrative and budgetary provisions. Apart from the linguistic barrier - which constitutes a specific problem that the extension of the networks cannot on its own solve - the two principal obstacles to cross-border development of the networks and to the optimisation of their activity in the service of the Grand Region are administrative inertia and too low a level of information on what has already been achieved. The reduction of the administrative barriers falls within the authorities' competence, and therefore ultimately within the political choices of the citizens and of their representatives.

On the other hand, the problems of the identification of appropriate information are not solved. The multiplication of databases drowns us in a parasitic information ocean. Moreover, the anarchistic expansion of networks has led to the creation of many organisations which deal with the same subject, for the same public, without having any link between them, or even knowledge of their existence. A typical local case is the existence of at least two official sites presenting the Greater Luxembourg Region, with no reporting between themselves. This is above all due to the national character of the majority of the initiatives and the insufficient information and communication between them. Yet common initiatives are not missing. Numerous bilateral or multilateral achievements have been set up in the Region: in the framework of eRegio or the Interreg programmes; inter-University cooperation or between centres of research; in cross-border development areas, or in collaboration between professional branches. The question is how to go further to benefit all citizens.

The development of networks has its own dynamics, and which transcends existing institutional and administrative barriers. The progress of new technologies, the liberalisation of telecommunications, the regular growth of computer-use and the rise of electronic trade all contribute to the development of networks. The increasing influence of new technologies in teaching also helps. However, the practical advantages offered by work in networks (speed, higher capacity of activity, multimedia character, etc...) constitute only one of the aspects of development of an Information Society. In parallel, the multiplication of networks and their interconnection have significant repercussions on work practices, on the structure of chains of responsibility and on the interdependence of the various actors in a network. Analysis of the consequences of new technologies on working methods, methods of behaviour and career prospects is still only in its infancy. The Internet is only ten years old. GSM is even younger; and broadband access, new generation Internet services and third generation mobile-communication have not yet penetrated the socio-economic fabric sufficiently so that one can take stock of their influence on the organisation of work and methods of behaviour. This reflection remains to be done.

However, work in networks already shows specific characteristics. Among these are the horizontal nature of development and of the operation of the networks, which is opposed to the vertical character of the company and of traditional institutions. Work in networks tends to substitute for the binary, univocal logic of hierarchical relations, a

multi-polar, distributive and associative logic. In network structures, each member can address themselves to any other, whatever their function, level (and even availability). This explains the resistance of employers and of decision-makers to the extension of networks, whether they are internal or external: they calling into question authority in work. Within a network, people can communicate directly with the highest levels of the structure, and, more importantly, can work collectively with any member of the network without passing through the traditional official channels.

With such repercussions of new technologies on working methods, the impact of networks on organisation structures remains to be analysed. In this, we can learn some lessons applicable to the Greater Luxembourg Region and its development. The desire of greater integration, the natural logic of cross-border co-operation, the economic and development, the action of the European Union and the local authorities, all contribute to a consolidation of the Region and to better co-operation between its members. However, these influences still obey too often the binary and vertical logic of traditional hierarchical structures. These structures, in which each layer of hierarchy is by need forced to fight to preserve its prerogatives and its advantages, now constitute a brake to the integration of the Region, and an obstacle to the opening on the neighbouring structures.

Networks based on co-responsibility, rather than on the weight of authority and control of information, can allows a greater opening to others and their needs, and strengthens the feeling of belonging to a community. The awareness of new opportunities is growing, the technological and economic conditions are satisfied, and the orientation of the policies, whether they are Community or national, reflects this integration and transnational co-operation requirement which will make it possible really to develop the Region. The development and interconnection of networks beyond administrative and geographical borders can give the construction of the Greater Region a major cohesion factor, the means of a strengthening of its identity. In addition to the economic and social advantages that its inhabitants will draw from increased co-operation, the cross-border deployment of networks will advance the knowledge of the neighbours, the respect of its cultural and human characteristics, and the conscience of need to work jointly, within democratic frameworks. If the political, administrative and organisational steps are now taken, the citizens of the Greater Luxembourg Region will build it and will strengthen its cohesion.

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Portugal

The ework base in Portugal is estimated to be in excess of 100,000, showing the growing importance of ework and ework. The activities of the Association for Telework Development (APDT), operating since 1997, have succeeded in attracting the attention of many potential eworkers. The interest of the media (press, radio, television), has been strategically important in bringing to the attention of the whole of society the benefits of ework as a new way of working and improving the quality of life. All this has laid a solid platform for the strong development of ework in Portugal, and also has the potential of linking to more than 200 million Portuguese speakers around the world.

This non-profit Association promotes ework, giving support to its associates by supplying information, interchanging experiences (i.e. linking the various associates and companies), and training in the new communication technologies. It also supports and promotes local, regional or national initiatives in the field of ework and Information Technologies. APDT is a founding partner of the Digital Economy Confederation, the main think-tank and Government partner for the new economy.

As a Portuguese language follow-up to the successful Telework 98 conference in Lisbon, last April APDT organised REDEScoberta 2000 in Rio de Janeiro, Brazil, in the framework of America Telecom. This was the first of a series of events with the aim of building an infrastructure for the development of ework and new ways of working in the Portuguese-speaking communities worldwide.
The main objectives of APDT up to 2004 are :

- Creation and development of an associative basis for the development of the ework concepts for all Portuguese-speaking individuals and countries - SAGRES VIRTUAL
- Development of a virtual infrastructure to favour and foster application of the networking model for professionals in Portuguese-speaking countries
- Become the expansion element of the language identity frontiers Elemento de expansão das fronteiras da identidade linguística.

APDT is currently running the trans-national EU funded Flexwork project, with the aim of producing methodologies and other products, which could help SME's in remote and rural areas to implement flexible schemes of work. APDT is also involved on the Equal Community Initiative Programme, working on the **E-M@GINE** project that aims at the creation and implementation of an E-Learning platform, in which the users of the various partners benefit from the broadcast of technical knowledge under the coordination of this platform.

Macroeconomic Data

The national economic structure, supported by European funds and by the convergence of efforts on the promotion of quality, design and diversification, has had in the recent years an evolution akin to the majority of the European countries, becoming much more service-oriented. These restructuring efforts ranged across several economic sectors, with an emphasis in industry, commerce, logistics and distribution, and financial services. The service sector of the economy represents 52% in terms of active population, and 66% of the gross value-added.

IT and Electronics

Digital Economy

The business value of the digital economy national market, comprising telecommunications, IT, audiovisuals and related services with these sectors, has been growing at high rates in the last few years, going from 5 billion €in 1994 to over 10 billion €in the year 2000. This represents about 10% of Portugal's GDP.
It is estimated that the growth of revenues in the digital economy in the last years of the nineties has been around 25% per year on average, with a tendency to maintain these high growth levels. This is due to higher Internet penetration rates, development of e-commerce and higher utilization of data communication over appropriate networks.

As far as activities of this sector, excluding telecommunications, there are approximately 1 300 companies, the large majority being SMEs (circa 98%), employing 40 000 persons and with na annual income of 4 billion €and exporting around 1.7 billion €

Electronic Commerce

Electronic commerce reached a value of 110 million € and is expected to total 1.4 billion €in 2002 (1,35% of the GDP) and 2.1 billion €in 2003, according to IDC data. The same source indicates a value of 16 million €in 1999 for associated services which are expected to each 150 million €in 2004.

Employment status

Thousands of Individuals	2000
Self-employed	**1,136.1**
With employees	288.2
Without employees	847.9
Employed in companies	**3,585.5**
With permanent contract	2,853.7
Without permanent contract	731.8
Others	**186.9**
TOTAL	**4,908.5**

Active rate: male 58.1%, female 45.5%, global 51.6% (estimates based on population census data 1991)

Internet Access Service Customers

(Unless otherwise stated, the source for the data in this sector is ANACOM, ICP-ANACOM National Communications Authority - *http://www.anacom.pt*).
By the end of 2001, the total number of customers of the Internet Access Service rose to around 3,459,000 - 13.4% growth on the previous quarter. The growth of the total number of the service's customers in comparison with the same quarter of the previous year was around 64%.

Free-of-charge access (see note 3 below) continues to be the preferred form of access for individual users at the end of 2001, representing around 92% of the total number of customers for the service. In the same period of the previous year free-of-charge access represented around 88% of the total customers.

In terms of broadband Internet access, cable-modem access recorded growth of around 33.4% in the number of customers between the third and fourth quarters, attaining 94,000 customers at the end of 2001. This corresponds to annual growth of 273%. It should be noted that this form of access first began to gain significant presence in 2000.

In the 4th quarter of 2001, Internet access service via cable-modem represented around 2.7% of the total number of customers (paid and free-of-charge access), whereas of the number of paid access customers it is around 34%.

Also in terms of broadband Internet access, ADSL rose to 2,474 accesses, equivalent to growth of around 98% on the previous quarter. It should be noted that this type of access was launched in 2001. By the end of 2001, this option represented around 1% of all paid accesses.

Internet Access Service Customers

	1997	1998	1999[1]	2000
Total Number of Customers	88,670	172,698	645,146	2,110,828
Free-of-charge access customers (Dial up)[3]	n.a.	n.a.	400,265	1,860,694

Business customers: paid access	16,469	28,588	19,089	28,656
Individual customers: paid access	72,201	144,110	225,495	196,324
Cable access customers	n.a.	n.a.	297	25,154

	2001[2]			
	1st Qtr	**2nd Qtr**	**3rd Qtr**	**4th Qtr**
Total Number of Customers	**2,602,108**	**2,976,423**	**3,051,404**	**3,459,419**
Free-of-charge access customers (Dial up)[3]	2,371,467	2,725,452	2,797,446	3,184,020
Business customers : paid access	25,099	26,223	22,721	25,767
Individual customers : paid access	168,377	169,447	160,900	155,796
Cable access customers	37,165	55,301	70,337	93,836

[1] The launch of provision of free-of-charge access by ISPs during the 3rd quarter, 1999, led to division of the customer indicator between "free-of-charge access customer" and "paid-access customer". As a result of this new service modality there is a certain discontinuity in the evolution of the number of customers between 1999 and 2000.

[2] The number of customers for the 1st and 2nd quarters, 2001, include estimates for one provider in activity (that did not send information), based upon the market growth rate recorded in the quarter, compared to the previous quarter, on the basis of the elements that were actually received from providers (The estimated value represents around 7.8% of the total market effectively accounted for). The amount for the 3rd quarter was corrected on the basis of information received in the meantime from one provider that had previously failed to send data, as well as corrections to previous data, supplied by one provider.

[3] The designation "free-of-charge access" is now commonly used for situations in which the user only bears the cost associated to a telephone call to his FTS provider (fixed telephone service). This designation is maintained, for ease of understanding, in order to describe situations in which users pay for access, where the price is determined by the ISP in the framework of the new rules defined by ICP in 2001. In this context, the number of Internet access service customers may be over-estimated, to the extent that it is likely that there are situations in which users make use of more than one ISP.

Market Penetration Rate for the Internet Access Service

| | 1997 | 1998 | 1999 | 2000 |
| No. of customers/100 Inhabitants | 0.90% | 1.70% | 6.50% | 21.10% |

	2001			
	1st Qtr	**2nd Qtr**	**3rd Qtr**	**4th Qtr**
No. of customers/100 Inhabitants	25.20%	28.80%	29.60%	33.50%
Note : The penetration rate is calculated on the basis of the total number of customers for any type of access - paid or free-of-charge.				

eWork activities 2001

APDT was very actively involved in the promotion of ework inside and outside Portugal, through participation in countless seminars, conferences and public sessions where ework was the topic for discussion. This reflects growing interest from all sides of society in ework. Major newspapers wrote more than 60 articles directly related to ework, still discussing basic concepts but nevertheless attracting the attention of large numbers of people. Television was widely used to raise awareness of ework possibilities, with in all the Portuguese channels, over 12 programs and interviews regarding this subject.

APDT organized a conference on "Flexibility in the Workplace" held at the auditorium of the Oeiras Municipal Library, with 90 attendants, among them individual workers, company managing directors, and professional associations.

A conference on the same theme was held in the Azores - island of St. Michael (Ponta Delgada). It was supported by the Azores Regional Government - Regional Secretary of Science and Technology , Regional Secretary of Employment, Youth and Social Security, as well as from several local companies: EDA - Electricity of Azores, RDP (radio network), Portugal Telecom (Azores), RDA (regional TV channel), Açoriano Oriental (major regional newspaper), TSF (radio network), Capelas Professional School, among others. This event was attended by several practioners, students of the professional schools, managers of the island major companies and representatives of most regional associations. It was clearly shown that eworking is an essential tool to combat isolation and insularity. The presentations focused on several aspects of eworking and its importance for the development of the region, possibly the most peripheric of the EU. The full report of this event is available on *http://www.apdt.org*.

The Flexwork Project

Flexwork is a trans-national EU funded project, with the aim of producing methodologies and other products, which help SME's in remote and rural areas to implement Flexible schemes of work. APDT initiated this project in February 2001.

What is "flexible working" ?

Flexible Working is being able to work with customers, suppliers and employees independently of distance and time barriers. You can overcome the problems of isolation in rural and remote regions through effective use and management of the latest computer and telecommunications methods. Flexible working can enable companies, wherever they are located, to be competitive with those located in urban areas.

How can this project help workers ?

The Flexwork Project will offer, free of charge, a set of publications giving practical guidance for small companies in rural and remote regions to adopt new ways of flexible working. These publications are <u>intended primarily for advisors of small business who will then advise individual companies. They are equally useful for user companies themselves</u>. They are created by experts with a wealth of experience in advising on the adoption of flexible working. They address managerial issues as well as the whole range of technologies from computer applications to telecommunications. We can also help <u>Regional Development bodies and regional Internet Service Providers</u> to plan for the introduction of flexible working methods, and for development of the necessary high speed, flexible telecommunications infrastructure, and give presentations at conferences and workshops.

What exactly does this project offer?
- Seminars and conference presentations at regional conferences and workshops
- Handbook of Flexible Working - solutions designed to overcome the problems faced by small companies in rural regions
- Guides to Flexible Working - detailed checklists and case studies to guide implementation of various styles of flexible working, including home-based eworking, fully mobile working, small company networking and ework centres
- Telecoms Development in Rural Regions - a guide to development of all types of broadband and mobile telecoms infrastructure, including advice for regional Internet Service Providers and Regional Development Agencies. This guide shows how remote regions have successfully used regional development funds, in partnership with the private sector, to accelerate development of their telecoms infrastructure.

The above publications will be available in 2001 to download from our website, address below.
Flexwork is a project team of companies and research bodies having a wealth of experience in helping small businesses and their advisors to adopt flexible working methods.

The managing partner is Waterford Institute of Technology, Ireland, and the project has active partners throughout Europe. We work closely with EURADA, the European Association of Development Agencies, and national ework associations.
The FlexWork project is funded by the European Union Programme for Information Society Technologies (IST), and offers free publications.
Website : www.flexwork.eu.com
Please e-mail specific enquiries to *info@flexwork.eu.com*

The E-M@GINE Project

This project is directed towards the creation and operation of an e-learning platform, in which the users from the different partners benefit from the broadcast of technical knowledge under the supervision of this platform.

The specific objectives are :

- to promote learning in the IT domain, emphasizing the major software utilities and tools supporting the defined professional areas, and also the hardware and software infrastructure needed for this formative activity
- to promote technical apprenticeships in professional areas within the various forms of employment, including ework
- to develop in parallel a general training component, either in classrooms or via distance-learning, in which the aim is the enhancement of psycho-social and professional competences, bearing in mind that this serves as a facilitator for the full participation of individuals in the labour market
- qualification or professional requalification of the beneficiaries
- close articulation with the labour market
- study and implementation of new information processing capabilities for visually impaired people
- to identify insufficiencies and elaborate contributions to improve the actual labour legislation, especially in the regulation of part-time work and ework regime, benefiting not only the primary target population for this project, but also all other workers.

Activities include training activities and identification of insufficiencies and legal inadequacies in the employment context.

Target audiences/populations individuals in need of training and with special follow-through needs, with average or above cognitive capabilities, namely handicapped populations (behavioural, physical, organic, sensorial-physical and multi-deficiencies, and mental handicaps).

Expected Results

- Benefits obtained by the target groups : which will acquire social and professional skills and competences in professional experiences promoting their participation in the employment market, starting from adequate training / qualification capable of answering their professional deficits and respecting their personal limitations.
- Benefits obtained by local organizations : local and national organizations available to cooperate in the professional participation of this group will benefit from individuals with appropriate qualifications in the light of the employment realities, therefore framed within the existing tasks.
- Benefits obtained by the agents involved : training entities involved will benefit with the insertion in their curricula of the programmatic content designed for the needs of these populations and with the inclusion of new training methods - e-Learning - that will bring them more knowledge competence to improve their formative supply to the market.
- Contribute for systems renewal : the partner entities and the target population, as well as the potential beneficiaries of the professional training and national employment systems will benefit with the results of the contributions. These are aimed at changing the labour legislation that regulates the target population in the labour

market, improving the adequacy of existing laws or proposals to elaborate new regulations, specifically those that regulate part-time work and ework regimes.

- Training products and respective dissemination potential : the documents and contents of training courses can be distributed, via the Internet, to many other training entities across the country, ranging other target groups, with no limitations on the quantity of beneficiaries or time availability.

Founding Partners

ANFORCE - Associação Nacional de Formadores em Ciências Empresariais
CEERDL - Centro de Educação Especial Rainha D. Leonor
TELEMANutenção - Assistência Remota a Computadores, SA
APDT - Associação Portuguesa para o Desenvolvimento do Teletrabalho

Events scheduled for 2002 in Portuguese-speaking countries

Second Information Society Week, Rio de Janeiro (Brazil).

Between May 5-10 2002, APDT hosted another conference under the theme "2nd. Information Society Week". The event that will kick-start the week on May 6th is the Interministerial Conference on Knowledge and on the Information Society, which took place over satellite links, with the objective of widening the vision of the application of new information and communication technologies to develop quality of life with sustainability.

This event had attendees from all over Europe and Latin-American countries and was coordinated by Brazilian and Portuguese Ministeries of Labour and Science and Technology, covering a wide agenda of European and Latin-American interest, with government officials, South America and Europe, CEOs of public and private companies and MDs of state-owned organizations, diplomatic service officials, government technicians, municipal representatives, and other international guests. On the same day, the Telework 2002 Conference on New Ways of Working started, with a schedule directed to all economic and social segments. This event had exhibitors and speakers from all over the world that have been implementing innovative forms of working maintaining and enhancing quality of life. Simultaneously, the event **Rehab.BR**, dealing with the subject of insertion and integration of handicapped people in the labour markets, and the **Telemedicina** event took place on the second day of the conference and was directed at the usage of information technologies in medicine and medical counselling.

On May 8th, the **Sagres Virtual** event took place, dedicated to education and knowledge and generation of scientific content, its possible applications and contributions to prevent the digital divide. At the same time, at the National Library, the conference on Digital Libraries occured, polarising the countless initiatives directed at training and access to content for cultural and education purposes. The conference on Electronic Commerce - **Virtual Trading**, took place on May 9th and gathered at the Rio de Janeiro Commercial Association the major players in this field, widening the debate on the use of tools and IT for the development of commerce and the integration of companies in the virtual marketplace.

On May 10th the **E-GOV** event dealt with electronic government issues, accessibility and democracy and gathered the major players around the proposal of democratic management, presenting the best national and international practices, mobilizing managers, public services administrators and the civil society. On the same day the event **Digital Cities of the Twenty-First Century**, debated the creation of competitive cities and their due global role through Information Technolgy such as Geoprocessing. The closing event of the week took place in the city of Petrópolis, providing to the whole working party and other attendees a visit to the initiative Petrópolis Technopolis, an example of sound IT usage in the administration and management of municipal resources.

Mozambique

APDT will organise, in the capital city of Mozambique - Maputo, the first conference on ework, under the theme "Telework as a Strategic Factor for the Development of Mozambique" scheduled for July 11-12.
The Mozambican economy is characterised by relying heavily on natural resources. For this country to make a quantum leap towards an economy based on added value and innovation, it is urgent to promote and develop new ways of working for the market agents (companies), the government and individuals, specifically eworking, in order to allow all these agents to work globally.
eWorking will be another tool to offer and buy services in international markets. The eworkers will break the frontiers of the geographical space in which they reside, thereby becoming global workers.

Other activities

Akin to the conference held in the Azores, a conference will be organized in November 2002 in Funchal, Madeira Island during eWork week, under the theme "Telework as a strategic development factor for the Madeira Archipelago".
During 2002, APDT will organise a Job-Fair to provide a meeting point between companies and all kinds of workers, with a special emphasis on teleworkers.
In a joint initiative with CPLP, APDT will hold a distance-learning course from the training centre headquartered in Luanda - Angola, involving all the Portuguese-speaking countries belonging to the CPLP - Angola, Mozambique, Cape Verde, Portugal and Brazil.

Conclusions

Apart from several EU projects which have done much in the promotion of new ways of working in Portuguese Companies and particularly in SME's, these have not taken up ework at the level that it deserves. For ework to really to take off, large corporations and the Administration must change their organisational procedures. In Portugal, change often needs to start from the top, following a top-down approach from management. In this context, the Government should take the lead and implement its central objective of creating an Information Society for all.

The new up-coming generation of managers have already adopted these structural changes. We can expect in the coming years that a major restructuring of all the economy will take place, adopting the new organizational models and new ways of working. Undoubtedly the technological convergence and the constant developments in infrastructures, equipment and services represent new opportunities on a global market.

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Spain

Background on general economic and employment status

The year 2001 closed with Spain having more than 7.4 million Internet users, a fact that reveals that the number of users is indeed increasing but at a slower rate than other countries. Last year there were 2 million users fewer. During the last year many Internet users abandoned their semi-open rate contracts (semiplana tarifas) and signed up for ADSL services, an Internet connection that exists in over 300,000 homes, which makes up more than 75% of the bandwidth market share, whereas the remaining market share corresponds to cable connection.

The eEurope 2002 Plan of Action in Spain reveals serious delays in the development of the Information Society in Spain since the beginning of the year 2001.

The Secretary for the Estado de Telecomunicaciones and for the Sociedad de la Información recently informed that "Spain is moving towards convergence with the rest of Europe in the development of the Information Society. (...) The Internet world is advancing rapidly, particularly in the area of bandwidth which is facilitating this convergence that we are aspiring to achieve".

The Asociación de Empresas de Tecnologías de la Información (SEDISI), however, maintain that Spain is at least twelve years behind the rest of Europe and more than fifty years behind the United States. One possible explanation for this conclusion reached could be that spending on information technology per inhabitant in Spain is half that of the United Kingdom or Germany.

Furthermore, the situation in Spain does not seem very positive if we take into account the CIS September figures that reveal that 58% of Spaniards neither use nor have the least interest in using the Web. In fact, almost 20% of Spaniards do not even know what the Internet is. Neither is the rate of penetration in Spain very encouraging. According to AC Nielsen eRatings, whereas the European average is over 33%, the rate of penetration in Spain barely reaches 17%. These figures do not raise too much hope for the future.

The objectives set out in the InfoXXI Plan backed by the Administración Española for the year 2001 have not been reached. One of the main pillars of this plan was to be the macro portal of the Public Administration. After its official presentation, the avalanche of criticisms of the portal www.administracion.es was unanimous. This government portal is extremely difficult to access and has overlooked the fact that there are other languages spoken in Spain besides Castilian, and the services offered are few in number and of little use. This year was also supposed to be the year that over a million Spaniards would become digitally literate. Indeed, a budget of over €2.4 million was allocated to achieving this goal but the project remains at a standstill.

A number of plans made by the Spanish government, for example the creation of 625 centres for public Internet access, or the €54 million plan to train over 14000 unemployed people in new technologies, are still in their initial phases of development.

The web as a medium for business remains relatively recent but the year 2001 has served to put things in their proper place. Companies that have a sustainable business model have become much more consolidated and are managing to yield profits or at least forecast future profits in the coming months.

In the year 2001, there has been a freeze on investments in the market for new technologies and above all in Internet. The flow of projects has been similar to that of other years but the available capital, however, has decreased considerably.

Change in unemployment trend

The official number of people unemployed registered by the INEM in January 2002 increased by over 77,000, significantly above the average of the last few years, therefore confirming the slowing down of the creation of employment. The most recent available data available from the EPA population survey, (Encuesta población Activa) corresponding to the fourth quarter of the year 2001, reveal a change in trend of the evolution of the rate of unemployment, which rose to up to 13%, the first increase since 1996.

In the year 2005, eWork in Spain will consist of 1.4% of the working population

The new technologies have not yet managed to boost distance work, as only 0.6% of Spanish employees carry out their professional activities at home.

The annual time devoted to work has been decreasing at a very fast rate. In Spain, an employee works an annual average of 1634 hours, 342 less than in the United States. On the other hand, 52.6% of Spanish workers attach more importance to their professional lives whereas only 47.4% care more for their personal lives.

Initiatives and projects

The Valencian Economy, Treasury and Employment Regional Administration (Administración Regional de Valencia (Consellería) de Economía, Hacienda y Empleo) have given incentives of over €300,000 in order to promote new work positions in companies and projects related to I+E (innovation and employment), according to sources at the Valencian Generalitat. Other similar types of projects carried out by the Consellería include ework training projects, like the first Telework workshop in Orihuela, Spain.
On the other hand, Spain is now one of the countries in the European Union where the number of eworkers is increasing at a very fast pace, despite the fact that it is still in quite an immature state of development and there still remains considerable ground for full exploitation of this new concept.

The Balearic Government seems to have realized, more than other administrations, the importance of the role and the potential that ework centres will have in the Information Society. Indeed, they have been promoting the three centres which are located in Majorca, Ibiza and Minorca. Their main objective is to promote tourism during the low season in the hope that foreigners will visit the islands not only in summertime but also in winter where they will be able to take advantage of the mild climate and the beautiful settings.

In Catalunya, the Comissionat per a la Societat de la Informació, in its strategic plan which will run till the year 2003, claims that ework remains one of its main priorities and that their medium-term objective is, as of the year 2001, to open ten ework centres a year. The Ministry for Labour recognizes the numerous advantages that ework provides though it has not yet invested any money in launching an initiative of this kind.

Although local authorities, central and regional governments show interest in these projects, it would seem that there are very few signs of a willingness to actually invest cash in these projects. Promoters of eWork centres that grouped together in Gordexola had invested a great deal of energy in initiatives with a view to creating employment though a considerable number of the same promoters were themselves unemployed.
Despite these regional initiatives, there is a general lack of promotion of ework on the part of the various central and territorial administrations. Added to this is the fact that there is a general lack of social awareness of what an ework centre actually is and of the advantages that they can bring to the business sector and the self-employed worker as well as how present day professional activities can be combined with information and communication technologies. Therefore, these are some of the main reasons that Spain, along with some other European Union countries, does not advance at the same speed as the United States in employment matters and why, overall, the European Union does not show the capacity to generate as much employment as does the United States.

The main ework centres in Spain are the following :

TELECENTRO DE GORDEXOLA (Vizcaya). This was the first rural ework centre to be inaugurated in Spain : *http://www. gordexola.net*

TELECENTRO DE TARAMUNDI (Asturias). Asturias, the European region with the highest rate of unemployed youths, has this ework centre in one of the most depressed rural areas of Spain : *http://cfnti.net/telecentros/dicit*

TELECENTRO BIAZIPE (Navarre). This is one of the most firmly established eWork centres on the Spanish panorama : *http://www.biazipe.net*

TELECENTRO CEIN (Navarre) : *http://www.cein.es*

PROYECTO BRISA (Aragón). The aim of this project is to create a network of six telecentres : *http://www.eatur.com*

CENTRO DE RECURSOS DE TELETRABAJO (Formentera) : *http://formentera.net/pobox.htm*

CENTRO TELEMATICO RURAL EN SIERRA DE GATA (Cáceres) : *http://agatur.net*

CENTRO TEMATICO DEL BIERZO (León) : *http://infored.org*

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Sweden

The market related problems within the information and communication industries have also affected the Swedish economy. According to the government, the growth in gross national product for 2001 ended at 1.2%. Still, the employment level is pretty high. In March 2002 the total Swedish work force was 4.3 million people - employed and unemployed included. Among these, the employment rate was 78.2%. According to the Labour Market Board the total number of people in gainful employment continues to grow, but at a considerably slower pace than in the last few years. Still, expansive sectors are private and public servic es. Notices of labour reductions continue within the ICT sector, but at the same time there is an enormous demand for experts and experienced people in the industry.

In 2001, the open unemployment rate was 4% and an additional 2.5% were in training programmes and other employment measures. A bothersome problem burdening the state budget is the increase in sick-pay and costs related to illness.

Legislation and agreements

There is a long tradition in Sweden to solve problems within the labour market by negotiation. Employers and labour organisations seek consensus, common rules and collective agreements, rather than strive for legislation. This applies also for issues related to ework, which are not fully regulated by the regulations. An early example on this is the 'Letter of Understanding on Teleworking', agreed in 1998 by Swedish Union for Clerical and Technical Employees (SIF) and the employer organisation Almega.

Agreements, however, are not always a feasible way. Recently, the Salaried Employees Union (HTF) called for legislation to prevent electronic monitoring of call centre employees. The act of law on protection of personal integrity in working life (LIA) - proposed by the Swedish government - does not cover this integrity aspect. This act of law addresses employer's right to read employees' private e-mails in the employer's computer/server. The law comes into force at the earliest in January 2004.

Call centres business is a growing industry in Sweden. Statistics from the Salaried Employees Confederation say there are 360 companies defined as call centres with approximately 10,000 employees. Half of the companies have collective agreements on work conditions, whilst the other half is not associated with an employer association and the employees are not union members.
The collective agreements regarding call centres allow a certain degree of local flexibility. For example, working hours can be agreed to locally. It makes it easier for the company to meet customers' needs. The employee has the possibility to work a schedule that fits the individual situation. The collective agreement facilitates the increase of employees in the sector and part-time employees can extend their working hours. Inconvenient working hours are compensated. The agreement sets a basis for improved working life and work conditions for call centre employees. It is also a first step towards normalization of the call centre business and to facilitate employment increase within the service sector.

Broadband, ICT- use and data security

The Swedish government decided in 2000 to make the information society available to every household and enterprise by broadband access. The plan was to connect all municipalities of the country by the end of 2002. However, during 2001 broadband expansion slowed down when the telecom market decreased. Now, there is a worry that Sweden's reputation as a leading ICT nation would be harmed unless the broadband network construction is speeded up again.

It has become more difficult than expected to find financial partners to the broadband net development. Only regions which are less interesting to the commercial actors get financial support from the state. The state owned company Svenska Kraftnät (Swedish Power Net) is responsible for broadband development and about 2/3 of the total of 289 municipalities are now connected. A government investigation is now analysing the possibilities to make use of other available infrastructures for those sparsely populated municipalities which risk to be excluded from broadband access.

The 2001 statistics on computer use in Swedish homes shows an increasing trend - partly resulting from the government's home-PC implementation programme, which includes beneficial taxation rules. For example, computer reform has made it possible for 65 % of 2 million members of the Swedish Trade Union Confederation (blue-collar workers) to purchase a home computer[54]. About 30 % of the members use a computer in their work.
In addition to home-computers, more than 50 % of the members of the Swedish Trade Union Confederation (blue collar workers) and almost all members within the Swedish Confederation of Professional Associations (white-collar workers) have now access to a computer in their work[55].

Every third Swedish citizen between 16 and 64 years uses computers daily from home - 39% of men and 24% of women. Internet maturity is high in Sweden. Three out of four people are Internet users - 95% of the young between 16-19 and 56% of the people in the age of 55-64[56]. Still there are about 3 million Swedes - many of them senior citizens - who are not interested or can't afford to buy a computer. However, according to the Swedish IT-Commission, 12% of the population in the age of 65-84 years have Internet access in their homes. The IT-Commission suggests that the government should pay the costs for IT introduction among senior citizens in order to increase the number of elderly users. Every tenth household in Sweden has access to IT-infrastructure with high transmission capacity[57].

The wireless community - Stockholm Open.net

The IT-University in Kista, north of Stockholm, and Stockholm City are on the way to transform Kista to a wireless borough. Students and employees at the IT-University have for a couple of years had access to a wireless LAN for working and learning. In the next step companies, administration, schools of Kista and the public are offered fast and cheap wireless communication facilities. The technology used is operator-independent. This will increase competition and force communication costs down considerably. Wireless communication will speed up processes within organisations, improve communication between individuals and make services to the public more efficient. Objectives of the project are also to facilitate technology literacy and to bridge the IT-gap between individuals.

The project will also provide a test-bed for new products and services. Among important tasks is the need to solve security issues for wireless working. Many microelectronic companies are located in Kista - sometimes called Wireless Valley.

Information Society of Sweden

The early adoption of innovative new technologies and the large scale uptake of the technology by businesses, schools and households have contributed to Sweden's strong position in the field of information technologies. IDC ranks Sweden number one IT nation in the World for the third year in a row. The Information Society Index[58] used by IDC includes 23 indicators measuring the ability of nations to access and absorb information and the capacity to exchange information internally and externally. Sweden has the highest percentage of mobile phone use in Europe, the cheapest broadband service, the highest broadband penetration and the lowest telecom rates in Europe. According to IDC, Sweden has the world's largest cluster of telematics companies and is leading research country on wireless communication technologies.

Carelink - Medicine practiced at a distance

The Carelink[59] was established in December 2000. The aim is to improve health and care by a national information infrastructure between all county councils which are responsible for health care in Sweden. The Internet based network includes also pharmacies, private care suppliers and 60 municipalities. Using 'telemedicine' and 'telecare'

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[54]   *www.lo.se*
[55]   *Facts about information and communications technology in Sweden 2002. www.sika-institute.se*
[56]   *SCB*
[57]   *Facts about information and communications technology in Sweden 2002. www.sika-institute.se*
[58]   *www.worldpaper.com/2002/feb02/isi.jpg*
[59]   *www.carelink.se*

facilities the primary health services and local medical care services are able to communicate with hospitals, clinical specialists and various experts.

In Norrland - 'the northern half on Sweden' - telemedicine is becoming a very useful method to bridge across the long distances. The University Hospital of Norrland in Umeå is gradually expanding its telemedicine services to the regional hospitals in a range of medical areas.

Today, regular consultations and diagnostics take place in the fields of bacteriology, haematology, occupational medicine, gynaecology, skin diseases, kidney pathology, jaw surgery and geriatrics.

As well as the University Hospital the regional hospitals are very satisfied with the telemedicine applications - and of course the patients who receive improved medical treatment. The Carelink system is used also for co-operation within management and administration and training and knowledge development in the care sector.

eWork in Sweden

eWorking from home is not a hot debate topic in Sweden any longer. Also the interest from politicians has cooled down. eWork researchers at Linköping Universty argue, that the number of eworkers is about the same from year to year. Many new eworkers appear, but as many goes back to traditional working. Despite good technological prerequisites various technical problems may still have a hampering effect. Other explanations are that employees' life-situation or working tasks change, which makes eworking less attractive.

Also the interest for statistics and estimates of the number of eworkers seems to have declined and it is not easy to find fresh information. However, SIKA-institute[60] has made some investigations on current status of eworking. Defining ework as 'work that is performed partly from another place than the ordinary place', they found that 6% of the work force was eworking during 1999/2000. The distance between home and the workplace for eworkers was 54 km compared to 12 km for other employees. The households of eworkers had a higher degree than others of access to computers and other ICT equipment. More than 90% of eworkers used computers, about 70% were connected to Internet and about 60% had connection to the workplace net. The typical eworker turned out to be a well educated male in the age range of 35-54 years. eWork is more common among households with children.

On average eworkers work remotely 2 days a week - most of them from home.

According to statistics from Invest in Sweden Agency the number of full time employees at call centres has increased from 45,000 to 55,000 in one year. At February 2002 there were 1,250 call centres in Sweden (including in- house units), of which 143 are out-sourced entities, with 10,000 employees[61].

Though lacking statistics, also other modes of eworking are increasing in Sweden. There seems to be a 'silent movement' to mobile working supported by wireless technologies. In future almost all professionals will be equipped with lap tops and wireless communication facilities. A discussion is going on whether companies are ready to change their management styles in order to facilitate the information requirements of mobile workers. Security aspects are even more crucial in wireless applications than in traditional communication networks.

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[60]   *Facts about information and communications technology in Sweden 2002. www.sika-institute.se*
[61]   *Invest in Sweden Agency*

The Netherlands

Summary

The Netherlands has a very successful trading economy, with per capita international trade around twice that of Germany, France or the UK; it also has the highest proportion of employment in services of any EU economy. With an overall high take up of ICTs and progressive labour market policies, together with well-developed language skills, the country is among the best placed in Europe to gain from the emergence of a global networked economy. It is not surprising that the Netherlands is one of the European countries where ework is most widespread. Also the education level of the workforce is the highest in Europe (23% of the workforce have medium and higher education) CPB Netherlands Bureau for Economic Policy Analysis expects the Dutch economy to grow by 2.75% in 2001 and in 2002. By international standards these growth rates remain respectable. Th e 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 continues to grow rapidly. Employment growth outpaces additional labour supply. The Telewerk Forum supported by a cross section of industry and the ministry of Transport is pursuing both awareness raising and policy development programme, which resulted in a higher rate of eworkers.

Involvement of the Dutch government

Issues include a relatively low level of ICT deployment in schools and among smaller firms. There are skill shortages, especially in high-technology jobs. The Ministry of Social affairs and Employment started a stimulation program for a better balance between work and life and a lot of the pilot projects in this program are related to ework.

The Government is also investing in high speed connectivity, together with private companies, a total investment of about 100 million Euro .

The program knowledge-neighbourhood will offer in Eindhoven a hi-speed network for 80,000 citizens with services like teleshopping and ework.

eWork background and take-up of ICTs

General background :

- The Netherlands economy is characterised by a high proportion of employment in services (highest in Europe); and an overall level of use of ICTs that ranks it among Europe's highest on the main measures :

	% employment in services, 1996	ICT investment, 1998		PC usage, 1997		Internet users per 1000 inhabitants, 1997
		as % of GDP	per capita (ECU)	per 100 white collars	per 100 population	
First	Netherlands	Sweden	Denmark	Sweden	Sweden	Sweden
Second	Sweden	UK	Sweden	Ireland	Denmark	Finland
Third	UK	Netherlands	UK	Netherlands	Netherlands	Denmark
Fourth	France	Denmark	Netherlands	Denmark	Finland	UK
Fifth	Belgium	Finland	France	Finland	UK	Netherlands

- In terms of the population as a whole with an Internet connection, this was 6% in 1996, rising to 13% in 1998, and in November 1998 15%. In 1999 34% of all households had their own internet connection. Five mobile telephone providers are active in the Netherlands, which is now driving prices down.
- The Netherlands is very much a trading nation, with pro rata twice as high a participation in world trade as (for example) Germany :

	Population, 1997	% of world trade	trade/population ratio
Netherlands	15.6	3.49	22.4
France	58.3	6.92	11.8
Germany	82.2	9.62	11.7
UK	58.7	6.37	10.9
Italy	57.2	4.59	8.0

- Living standards are also very high and the country has progressive labour market policies, with a strongly analytical and innovative approach to addressing labour market issues.

Driving factors :

- The Transport Ministry has a long-standing interest in ework, and it is now widely seen as part of the solution to the country's endemic road congestion problems - the 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 environmental damage aspects
- Following some years of effort by individuals and the Nederlands Telewerk Forum, there is now political as well as commercial attention on ework. The Transport Ministry did define several major programs together with the Telewerk Forum to stimulate ework, but did not take any decisions to start the program in 2001. This is because of the fact that the new government will be installed this year
- A scenario- study about the effect on mobility, social environment, ICT usage and the work and home environment will be one of the programs, as well as seminars for SME's to create awareness about the possibilities of ework. Research (Heliview report 2000) showed that telework is less implemented in SME's
- Four political parties had ework in their programs. It is too early to say that the new government will take actions to further stimulate ICT usage and ework
- The lack of qualified employees is still a major driving factor and companies are offering ework as secondary labour condition. KPN is mentioning ework in the collective labour agreement
- The union FNV did research with ICT personnel and 66% of the ICT workforce prefer ework
- The Telewerk Forum organises every year a seminar about ework and a prize is awarded to companies who play a leading role on this theme.

Telewerk prize: Solvision BV

Solvision is a consultancy organisation and part of The Vision Web, a network company without a hierarchical structure. It was founded in 1996. The employees are organised in teams according to projects and they define their own labour conditions. Only 18 employees, out of 500 employees have a fixed workplace. In Delft Dordrecht, Groningen en Veldhoven are grand-café 's as meeting places for employees and customers. Intranet is the core of the business and supports the work environment and the maintenance of personal contacts. Solvision is leading with this new business model and has had much press coverage. They won the teleworkprice 2001 because of the creativity and the good business example, as well as the good presscoverage. Also the fact that Solvison has mainly eworkers was crucial in the decision.

eWork aspect prize : Annie Connect

Annie Connect is a call center supporting companies with telephone services. It is special in that all call centre employees work from home and that 80% of the employees are reintegrated (they were unsuited to labour due to illness). A lot of attention is paid to personal contacts and training. Annie Connect developed the technical infrastructure needed for ework. The employees and the customers have direct access to all relevant information. Annie Connect gave an important impulse to the reintegration of people not fit for labour by giving them an ework opportunity.

- The Electronic Highway Platform organisation is working with Isoc.nl and gives seminars and information about all e-related subjects
- The Institute for Public and Politics issues a newsletter on new media containing a lot of information about relevant websites, political online chat fora and initiatives to stimulate the use of the Internet (*www.publiek-politiek.nl/nmbb*)
- A tax regulation allows employers to pay a limited tax-free sum to compensate employed eworkers for costs associated with working at home up to 350 Euros per year
- Other forms of flexible working, such as part time jobs and job sharing are well accepted and there is a general consensus about the need for continuing innovation in working methods
- A successful economy has led to skill shortages, providing the motivation for companies to embrace new methods
- The Netherlands has an open and caring society and is becoming established as a centre of competence in the use of ICTs for social inclusion, notably ICT training and ework as a means of access to work opportunities for people with mobility problems. A new initiative is a school project which supports the elderly to learn about and use internet and this program has a lot of success.

Constraints :

- 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 are 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
- 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 ICTs to optimise information and journey planning for citizens.

eWork activities and results :

- The Telewerk Forum has supported more than 50 seminars in 2001 addressed to both awareness raising and advice giving. The website has more than 1 million hits per year, and 1 in 5 companies have ework projects. Two television programs were broadcast on the subject of ework in 2001 and there was also radio coverage. More than 800 articles were written by the press about ework
- The Unions have published information on their web sites (CFO and FNV)
- Collective labour agreements have ework as a part of their content (KPN) and the government has ework as part of their labour conditions
- The Telewerk Forum has developed a comprehensive database of surveys which already numbers some 260 items. Five major case studies are published on the website
- The annual Telewerk Award will be organised in November 2002 for the ninth time. There are a number of web sites presenting employment and contract work opportunities, including a proportion of eworkable tasks.

Conclusions

IDC estimates that formal eworkers number 300,000. Taking the broad definition of ework, including informal ework and the use of ICTs for mobile working, team working, call centre work, etc., the number goes up to about 1,200,00 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 Dutch Government sees itself as a "launch customer" for Information Society applications and further positive actions could bring rapid take off. All the enablers are there in The Netherlands - pressure from traffic congestion, a flexible labour force, skill shortages and a generally high level of ICT take up. Concerns include low use of ICTs 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.

Information about seminars, Faq's, studies etc can be found at :

Nederlands TelewerkForum
www.telewerkforum.nl
contact : info@telewerkforum.nl

Contact

kitty.de.bruin@telewerkforum.nl

United Kingdom

One British worker in 16 is now an eWorker

Latest results from the UK's Labour Force Survey show a continuing steady increase in eworking. In Spring, 2001, almost 1.7 million people worked at or from home in the UK for at least one full day per week in their main job, using a computer and a telephone. This represents 6.1% of the workforce compared to 5.5% last year and is an 8% rise in the absolute number of people doing some form of eworking.

The definition used here covers only people who could not work at/from home without the aid of a computer and telephone. It includes both people who work at/from home all the time in their main job and those who worked at home at least one full day in the reference week in their main job.

If we look only at people who work mainly at home (and exclude the occasional homeworkers) the number of eworkers drops to 1.1 million or 4.2% of the workforce. Essentially there are three styles of eworking :

- eWorkers who spend most of their time working at home; these make up a fifth of all eworkers
- Mobile workers who use home as a base; this group represent almost half of all eworkers
- People who work at home or from home occasionally (eg one day a week); these make up almost a third of eworkers

Over half of these eworkers - 56% - are employees. And men outnumber women by two to one, making up 67% of all eworkers. Compared with earlier years, this represents a slight growth in the proportions of eworkers who are employees, and in those who are women. One eworker in eight (12.5%) is disabled (compared with 11.75% in the workforce as a whole).

What work are they doing?

The occupations fall into two main groups. First, there are the managerial, professional, administrative, secretarial and sales occupations, in which employees outnumber the self-employed eworkers. These categories could be regarded as dominated by genuinely 'new' forms of eworking where employers have taken core office functions and transformed them into home-based or multilocational work using the new technologies. Then there are the skilled trades, craft and manual occupations which are dominated by self-employed people. These could be regarded as traditional small businesses based in the home which have adopted the new technologies to make themselves more efficient. The 'associated professional and technical' category occupies an intermediate position, undoubtedly including a large number of freelance technicians.

Table 1 shows the breakdown of this eworking workforce by occupation and employment status.

Table 1 : occupations of UK eworkers in 2001[62]

	all	employee	self-employed
Managers and senior officials	424,111	328,988	90,989
Professional occupations	378,666	242,011	135,841
Associated profess & technical	365,532	169,451	193,531
Administrative and secretarial	132,170	79,512	36,314
Skilled Trades	230,379	48,102	181,526
Personal services	31,620	17,382	13,921
Sales and customer services	39,580	24,591	14,139
Process, plant and mechanical ops	27,578	2,033	25,545
Elementary Occupations	23,104	5,367	16,106

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[62]   *Source : UK Labour Force Survey, Spring 2001, Office of National Statistics, Analysis by IES*

Compared with the rest of the workforce, UK eworkers are a highly qualified bunch, as can be seen from table 2. They are more than twice as likely to be graduates, with 36.5% having a university degree or equivalent compared with only 15.1% of the total workforce, and only 4.8% having no formal qualifications (compared with 16.26% of the workforce as a whole).

Table 2 : qualifications of UK eworkers[63]

	workforce	eworkers
University Degree or equivalent	15.13%	36.50%
Higher education	8.26%	12.71%
GCE A Level or equiv	23.87%	24.07%
GCSE grades A-C or equiv	22.16%	14.56%
Other qualifications	13.64%	7.03%
No qualification	16.26%	4.82%

Public Sector moves into eWork

The UK public sector has traditionally been at the forefront of applying conventional flexible working practices such as flexitime, job-sharing, term-time working, part-time jobs and so on. This is often because it has to attract and retain staff in competition with the private sector, which tends to pay more.

In part spurred on by e-government targets, and by "Best Value" review processes, there is growing interest and developing practice in new ways of working in the public sector. Local Authorities such as Surrey and Cambridgeshire have implemented e-work accompanied by innovative office redesign including touch-down points and effective remote working technologies, while others such as East Riding of Yorkshire have implemented home-based working in data processing to improve employee retention.

Central Government is perhaps moving more slowly, but pilots are running in most departments, stimulated by Travel Plans and moves towards Work-Life Balance. OFSTED, the education inspectorate, has implemented home-based working for its pre-school inspectors.

eWork theme for the new IPF e-Government Forum

Following the launch of the Institute of Public Finance's e-Government Forum in late 2001, it announced a focus on 'new ways of working' as one of its key themes. With a particular concern for the public sector, the Forum will look at different aspects of creating new organisational structures and working practices that exploit the opportunities presented by Information Society technologies. The first event on this theme was set for 21 May 2002 in London on *'The e-enabled workforce: improving efficiency and flexibility in public sector working'*.

Together with consultants from BT (industry affiliates to the e-Government Forum), workshops will be run in England and Scotland in June 2002 on the topic of *Building the e-Office*.

DTLR begins research into transport effects of eWork, e-commerce and other ICT applications

The Department of Transport, Local Government and the Regions took its first foray into researching the transport effects of using the new information and communication technologies (ICT) for several years. It commissioned an extensive Literature Review, to begin the process of establishing a comprehensive knowledge base to underpin future transport analysis, forecasting and policy-making. The review was undertaken by flexible work specialists HOP Associates and the Transportation Research Group of the University of Southampton.

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[63]   *Source : UK Labour Force Survey, Spring 2001, Office of National Statistics, Analysis by IES*

The study took a structured approach to evaluating research in this field, with a particular premium placed on robust empirical research. In summary, the literature review concluded that :

- there is a considerable weight of evidence that two forms of eworking, home-based and centre-based, do have a significant travel reduction effect

- other forms of eworking (e.g. mobile) have not been sufficiently studied to draw firm conclusions
- there is almost no robust data to support the conjecture that these (or other) forms of ework generate significant amounts of other travel as "rebound effects". This does not mean that there are no such effects, but that the often repeated warnings about negative effects are almost entirely speculative
- there is no robust data to support the conjecture that ework contributes to urban sprawl or decisions by eworkers to move further away from the workplace
- there is a great deal of theorising about the effects of e-commerce - but there are almost no studies that use data beyond extrapolation from figures of current supermarket visits
- many opportunities are being missed to measure the transport impacts of new e-commerce and e-services projects.

In many respects, it is too early to say what the effects will be. The "positive" conclusion is that telecommuting - using new ways of working to replace commute travel - clearly contributes to travel reduction, even when other trips by the telecommuter and household members are taken into account. A clear message for European ICT-based projects - on e-business, e-work, e-government and e-services - is that there is a clear need to measure the transport effects in order to gain a clearer picture of the impacts of new technologies in the context of sustainability.

Further details are available at *www.hop.co.uk/ict2002*

Work-Life Balance movement

The government-backed campaign to promote improved Work-Life Balance has made considerable progress over the past year, and has been a key factor in helping to spread the concept of flexible work in areas where there was formerly considerable resistance. Funds have been made available for organisations to develop work-life balance practices, including consultancy to develop flexible work. Further details can be found at the government's website *www.dti.gov.uk/work-lifebalance* and the *Flexibility* website *www.flexibility.co.uk/issues/WLB/index.htm.*
The issue has spurred a major rethink in the trade union movement, which has for the most part been hitherto hostile to flexible work, associating it with insecurity and exploitation. A new report for the Trades Union Congress grudgingly concedes there may be value in flexible work arrangements (*Telework – The New Industrial Revolution? www.tuc.org.uk/work_life/tuc-3664-f0.cfm*). The new view is much more positively promoted in recent TUC publications, but the flexible location is still regarded with suspicion, while flexible time options are heavily promoted (e.g. in the TUC website *Changing Times*, *www.tuc.org.uk/changingtimes*). Individual unions, however, such as Unison and IPMS have developed useful and practical guides to home-based working/teleworking, and have been involved in negotiating numerous agreements and promoting best practice.

Wired Communities and Rural Broadband Projects

The Wired up Communities initiative is investing £10 million of government funding to assess how individual access to the Internet can transform opportunities for people living in the most disadvantaged communities. 14,000 homes in 7 communities - 2 rural, 5 urban - are piloting this initiative to test how making ICT accessible by putting it straight into people's homes can help to overcome the digital divide. Some of these communities are developing eworking facilities and support. In Scotland, the equivalent is the Digital Communities project, providing £3.5 million from the Scottish Executive to "wire up" 2 pilot communities.
Another central government initiative is a £30m fund to promote the roll-out of broadband into rural areas through a series of regional projects. There is growing concern that rural areas are missing out on the digital revolution through a lack of suitable infrastructure and, where it is available, higher costs than the cities.

It is hoped that the lessons learned from these projects will inform subsequent government initiatives to provide broadband connectivity and overcome the digital divide.

DTLR promotes ework through Travel Plans

The UK Department for Transport, Local Government and the Regions (DTLR) and the Energy Efficiency Best Practice Programme have been producing a series of guides to help organisations develop Travel Plans (also known as Green Transport Plans, etc). The guides promote the use of alternative transport modes to the (single occupancy) car. One of the modes now being promoted is the "no travel" or "virtual mobility" option. *Travel Plans: The Role of Human Resources Staff and Trades Union Representatives in Supporting Travel Plans* includes outline guidance on introducing flexible working to reduce the need to travel, and a further guide called *Travel Plans: New Business Opportunities for Suppliers of Information and Communication Technologies* takes an indirect approach to promoting flexible work by encouraging the private sector to promote ework as a means to reduce commuting and business travel.

The guides are available via the Energy efficiency Best Practice Programme website *www.energy-efficiency.gov.uk*

Focus on central London

Continuing pressure on public transport and disruption to services, coupled with the proposed introduction of a £5 charge for driving into central London, are causing many employers to consider alternative locations. This is giving ework a boost, often in the context of a relocation and a radical overhaul of business processes. For example two of the UK's largest banks are relocating out of the City of London to the new Docklands business district and are actively considering new ways of working in the process.

Flexibility wins eWeek award

The UK-based online journal *Flexibility* (*www.flexibility.co.uk*) received a European eweek award for "Best Contribution to Public Awareness" of ework.

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Other countries

Estonia

Background information

We, Estonians, are small in numbers but not in mind :

Surface area : 45 000 square km.

Population : 1.37 million with the share of urban population about 67% and the density of 30 inhabitants per square km.

The capital of the Republic of Estonia is Tallinn (400,000 inhabitants).

Estonia is a green land in the true meaning of the word with half of the territory covered by forests. Estonia is also a coastal region of the Baltic Sea with a total number of more than fifteen hundred Islands.

Basic facts about the state of the ework in Estonia

- About half of the population use mobile phones
- 29% of the households are provided with computers
- 32% of the population rely on Internet bank services
- 39% of the entire population are regular Internet users
- 25% of the population take advantage of the state provided e-services
- All Estonian schools are connected to the Internet
- There are about 200 Public Internet Access Terminals in Estonia
- The number of Estonian web-sites exceeds one million
- 2.5% of the employees work on the ICT field
- 56% of home-located computers are connected to the Internet
- State budget expenditures can be traced through Internet on real time basis
- 95% of the Estonian public employees have a computerised workstation

Internet penetration into every day life

The breakdown of Internet users by age groups :

Age group 15-74 : 39% of the population.
Age group 6-14 : 44% of the population.

According to the RIPE, Estonia has the highest number of the Internet connected households per capita in Central and Eastern Europe and this figure is higher than its counterpart in most of the European Union member states. 6% of the population use Internet for the declaration of their income.

INTERNET CONNECTED HOUSEHOLDS PER 10,000 INHABITANTS

Country	Value
Iceland	1866
Finland	1650
Sweden	830
Switzerland	719
United Kingdom	371
Estonia	356
Belgium	347
Ireland	329
Germany	294
Italy	146
France	139
Poland	131
Latvia	102
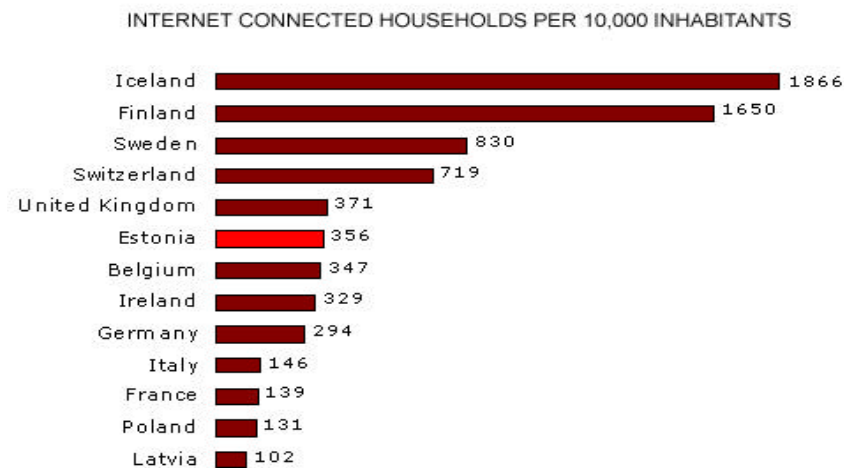
eWork popularity in Estonia

The current percentage of eworkers is 3.5% and the percentage of people that during some period of the last decade have practised ework is 8.3% of the entire adult population. During the last decade, up to 22% of the enterprises in Estonia have practised ework.

The breakdown of eworkers by profession shows that almost half of them (49%) are sales clerks and in the second place are customer support staff (35%). Unfortunately, the creative intellectuals (art, literature, and science) are at the bottom of the list with only a marginal 3% share.

The breakdown of eworkers by education level shows that among men 33% of them has a higher education, 13% applied higher and 54% secondary. Among women, the respective figures are 26%, 27% and 46%.

To evaluate different professions for their fitness as eworkers, then the breakdown favours planning and design work (44%) and creative intellectual work (art, literature, science) (38%), followed by information technology (34%), data collection and its initial processing (31%), bookkeeping (29%), consultant service (24%), text processing (23%), info-service providers (21%) and client service (16%) bringing the list to its end.

Opinion polls show that 35% of those interviewed think in positive terms about the increasing impact of ework on employment and only 6% are convinced that ework has a decreasing employment influence for the future. 71% of eworkers are employed only in one company and 85% of eworkers are doing it on the initiative of the employers. Almost all the necessary tools for ework are owned by the eworkers. The share of ework tools provided by the employers is the highest in special computer software (48%).

The breakdown by gender shows that 63% of eworkers are men and 37% women. Concerning ICT, 27% of those interviewed are convinced of its positive influence on employment and 17% have the opposite view on the subject.

Special ICT projects - Government initiatives

E-Government project: In 2000, the Government of Estonia, as a world pioneer, reformed the Cabinet meetings into paperless sessions, using a web-based document system. Ministers now peruse draft bills and regulations, make comments and suggestions and vote entirely online at computer terminals. The new system, coupled with the use of digital signatures, eliminates the need to send tons of paper between ministries for consultation. It gives the ministers a possibility to attend a parliamentary session without depending on their whereabouts. The system, created by Estonian IT companies, saves approximately 192000 EUR a year in paper and copying costs.

In 2001, the Government opened a web site *Today I am in the driving seat*. Ministers upload this site with all their draft bills and amendments to give the citizens of Estonia a chance for contributing to the legislative process through their comments and proposals.

In 1997-1999, the *Tiger Leap programme* was implemented. This project resulted with every school in Estonia connected to the Internet.

The Estonian ID-Card programme (1998-2001) is targeted at the development of personal electronic identification cards for the citizens. In addition to many security features, the card has an ICT readable code and two security certificates (long number series), to verify the individual and supply digital signatures. Possible future uses of the card include integration of ID cards, banking cards and various access cards.

Legal acts concerning ICT

Public Information Act (2001) : this act guarantees citizens' constitutional right for access to information; regulates the information on the administrative apparatus and its activities available to the public and ensures that all information is accessible also through the Internet.

Digital Signatures Act (2000) : this act is for the introduction of digital signatures in public sector organisations from June 1, 2001 onward. The digital signature infrastructure is developed through the co-operation of the public sector and private sector organisations, such as banks and ICT vendors.

Telecommunications Act (2000) : this act is targeted with creating favourable conditions for telecommunication development and to give the needed protective guarantees for the users of telecommunication services through ensuring unbiased fair competition.

Round up

Estonia has in a short time lived up to the developed countries in terms of ICT and its use among the population. Trends in favour of ICT, innovative thinking and progressive ICT entrepreneurship have developed a strong technological infrastructure in Estonia. These factors combined with a sustainable economy make a favourable basis for the targeted sustainable information society.

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Hungary

In 2001 Hungary's economy was influenced by opposing forces. Given its open economy, the country suffered from the recession-like situation in the OECD-countries where about 80% of its export goes. Hungary's GDP growth rate decreased, but it was still 3.8%. The government intended to boost domestic demand through fiscal policy, which led to a budget deficit of 413 billion HUF (1,68 billion euros, 3.3% of the GDP). At the same time, the growth rate of the internal use of GDP dropped to 2.1%, less than half of what it was in 2000, with a 4% growth in private consumption and only a 3.1% growth in investments. Although the growth rate of both export and import decreased, exports grew by 9.1% and imports by 6.3%, as a result of which the foreign trade deficit dropped to 2,265 billion euros. The current account deficit was 1,248 billion euros, which may be explained partly by the inflow of 1,082 billion euros in foreign direct investments. Inflation for the whole year was 9.2%, but by the end of the year it was below 7%. Unemployment rate was 5.7%, employment rose only slightly compared to the previous year. But telework is not likely to reduce unemployment, due to the professional structure of the unemployed.

No regular obligatory data collection on ework or telework is carried out in Hungary. However, there are various surveys aimed at establishing the ratio of teleworkers among the working population, but their results vary greatly, from 0.4% to 2.6%. This dispersion may be due, among others, to definition problems. The most frequent activities carried on as telework are: accounting, advertising, bookkeeping, counselling, data entry, data processing, designing, editing, education, electronic consumer service, electronic trade, management tasks, planning, public relations, press monitoring, research, remote diagnostics, remote supervision, software development, translation. In view of the fact that some of these surveys are not nationally representative and their methodology has not yet been fully developed, it is hard to tell just how reliable the findings are. The number of both PCs and Internet subscribers have increased, but these fall still below the EU average. The relatively high cost of Internet access also hinders its spread. But this is only the equipment side of the preconditions. The question of attitude towards telework is no less important. Despite the possibility of more flexible human resource management and the lower costs of setting up a home-based workstation compared to a conventional office workstation, about half of the Hungarian employers surveyed are reluctant to employ eworkers.

eWork related forms of activities are regulated by different laws and decrees. For example, subcontracting is regulated by a government decree (24/1994.II.25), whereas the maintenance and termination of this form of employment are regulated in the Civil Code which contains the regulations concerning entrepreneurial contracts. Under the terms of such a contract the contractor undertakes some work and the commissioning party agrees to accept and pay for this work as specified in the contract, in case of satisfactory performance. The contractor carries out the work at his/her own expense and the commission fee must also include all work-related costs of the contractor. Contracts of service are regulated in the Labour Code. Such a contract must specify the employee's sphere of activity, his/her place of work and wage. The place of work is not necessarily the employer's premises, it may be the employee's home or some other place (e.g. a telecentre or telecottage). According to the Labour Code, the two parties must agree on many questions, but usually it is the employer who is in a stronger position and can thus enforce his/her interests more easily. To sum up, ework can be carried out under the present conditions, albeit it would be much better if this work form were regulated comprehensively in the Labour Code only. Some telework forms also raise social security and other technical questions that need to be resolved, for example, the right to payment in case of accident or sickness, to maternity benefit, to paid vacation; the questions of responsibility, data management, etc.

It was the task of a non-profit company, set up at the initiative of the Ministry of Labour at the beginning of 1998, to encourage the popularisation and market-based spread of telework in Hungary. It was to be financed from state resources. But the new government that took power in May 1998 seemed unwilling to support the company, and, thus, following a long agony, it went bankrupt in 2000. In the course of its activity it set up and operated a national support network based on its own data base, job brokerage and a call centre. It presented its services at conferences and various professional fairs. Nearly 14,000 people were registered at this company as potential teleworkers, 66.3% of whom were women, 33.7% men, most of them aged between 20 and 39; 25% had higher, 65% secondary education; 57.7% of them had some command of a foreign language. Following the bankruptcy of the company, there was no state-supported institution to deal with these tasks until September 2001, when the Prime Minister's Office set up

another non-profit company. This new institution is now in the process of organising its work and elaborating its programmes.

Hungary, mainly via the Institute of Sociology of the Hungarian Academy of Sciences, is participating in several EU-projects concerned with ework, or telework. One of them is the EMERGENCE project which investigates the spread of ework in 18 European countries. Its employers' survey shows that no special requirements are formulated in the case of teleworkers. They have to meet the same requirements as those working at the head office, namely, an ability to adjust to tasks, to do independent work, co-operativeness, flexibility, meeting of deadlines, problem-solving skills. Most of the teleworkers employed are not new employees, but recruited from among the company's personnel. They are paid about the same as the regular employees, plus a lump sum to cover their extra expenses. The employers usually provide their teleworkers with a computer and/or a mobile phone. Another project, Telework 2000-2001, launched in 2000, is being carried out by the Information Society and Trend Research unit of the Budapest Technical and Economic University. The aim of this research is to lay the ground for employment policy in this field. The E3Work EU-project, with the participation of the St. Stephen University in Hungary, intends to map the situation in the field of ework in the Central and Eastern European region. Last, launched in November 2001, another EU-project called STILE, with the participation of the Institute of Sociology of the Hungarian Academy of Sciences, aims to standardise the statistical indicators on the labour market in the e-economy on an all-European scale. If it proves successful, the measurement of ework will be made much easier and comparable.

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Literature

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Poland

In November 2000 (according to research conducted by TNS OBOB Interbus) 16.2% of respondents declared they have access to the Internet, that adds up to 5,000,000 people in the whole population of Poland. From among the total number of persons who have access to the Internet 70.5% actually use it. From among the total number of persons who have no access to the Internet, 4.3% plan to have it in the near future. Internauts, i.e. persons who use the Internet at least once a month make up 88.7% of all the users of the Web. Of course the name Internaut has not yet been clearly defined, so it may result in discrepancies between various studies. Occasional users of the Internet (persons who use the Internet less frequently than once every two weeks) make up 30% of all users. On the other hand 21.6% of the users get connected to the Internet every day (approximately 1,000,000 Poles). 52% of Internet users are able to send and receive electronic mail. The IDC analysis includes the number of active, free e-mail boxes (900,000).
Optimistic estimations of CDM Pekao say that in 2005 10,000,000 people in Poland will use Internet.

Currently 31% of Polish Internauts have access to the Internet at home, only 4% have Internet access at work. The majority of Polish users of the Internet are young people (60% are aged between 15 and 30). Additionally, a typical Polish Internaut is better educated than an average Pole, lives in a big city and is a white-collar worker.

Results of a study conducted by Grant Thornton as part of the European Business Questionnaire 2001 indicate the fact that only 17% of Polish SMEs have a strategy for developing their sales and marketing through the Internet. This shows that we are much delayed in relation to other countries. This means that less than one fifth of SMEs realise the great influence the Internet will have on the way they shall do business in the future.

Still approximately 50% of respondents - owners of small companies with no access to the Internet - do not feel any need to use the Web, as was demonstrated by a recent study conducted by Demoskop. Owners of enterprises believe that investments they would have to make would be too high in relation to potential profits. Approximately 20% of SMEs covered by that study have access to the Internet. Their number will certainly increase once it becomes obligatory to submit monthly social insurance forms in an electronic form. However, active use of the Internet by small enterprises is still rare.

Still, markets entering the more advanced phase of IT development, and Poland is considered to be one of these countries, can enjoy both the challenges and benefits of young and dynamic economies. Furthermore, their IT infrastructures place them in a privileged position and make their quick development possible as they have not inherited old, outdated IT structures, which is often the case for West - European companies. In these markets a shift towards relatively inexpensive Internet models such as outsourcing services, is relatively easy and it does not require major investments.

Awareness and education are the decisive factors for the development of the Internet based economy. A change in the model of functioning of an enterprise should begin with training employees and with preparing them to use new tools such as the Internet. It is particularly important due to the speed and the universality of this medium. In view of the above mentioned interrelations it is not a coincidence that the greatest demand for employees specialising in IT is observed in Warsaw, Lódz and Poznan as well as in Wroclaw and Cracow - and to a lesser extent in Gdansk-Gdynia-Sopot agglomeration. This is influenced by the presence of universities educating in IT related subjects and by the high concentration of Internet related companies around these cities. These are the locations where at the moment conditions are the most favourable for companies to apply ework.

The most important factors influencing the slow development of ework in Poland (based on the report of Polish Market Review published in August 2000) are as follows :

- The fact that only 10.2 % of households have computers (PCs)
- Poorly developed telecommunications infrastructure - in Poland 26 out of 100 persons have fixed telephone line (the average for Europe is 36). At the same time we observe a dynamic growth in the number of mobile

telephones which can influence the development of certain types of ework, for example nomadic (mobile) ework. At the end of 2000 the number of mobile phones in Poland reached 6.8 million (17 % of the overall population)

- High costs of the Internet access
- Low safety of servers, in Poland there is 2.5 so called safe servers per 1,000,000 people (in the USA - 190)
- Lack of necessary legal regulations - still there are no regulations regarding electronic signatures and procedures for coding
- The low level of education of Polish society.

Due to its limitations as far as the type of work is concerned (not every type of work can be carried out in this form) and due to accessibility of IT and because of qualifications needed to undertake such work, ework is not yet a frequently applied form of organisation of work in Poland. It is however becoming complementary to traditional types of work and its scope will increase in parallel with the development of the information society. In the European Union 6% of employed persons carried out ework, although there are major differences in this field between individual member states. Currently Polish enterprises are initiating their experience with ework. Studies conducted among SMEs show that they perceive the introduction of ework in the near future as an opportunity, and in some cases as a necessity.

In March 2001 Polsat Digital Television Channel initiated a television course preparing young people to pass their matriculation exams (final exams of secondary schools). That programme was the start of operations for **Teleuniversity**, the most modern, interactive form of distance learning.
In order to learn at Teleuniversity a person needs to have a telephone line, a decoder of Polsat Digital Television Channel and a special remote control which makes it possible for persons with no access to the Internet to communicate with lecturers during classes and to use a special portal with training materials and tests.
Polsat announced that in June they will initiate computer courses and programmes for persons trying to gain admission to universities. After the summer vacations they will introduce language courses and driving lessons.

From Autumn 2001 the first courses will begin at university level. Polsat Television Channel cooperates with the following universities and higher education institutions: Cracow Polytechnics, Kozminski School of Entrepreneurship and Management in Warsaw, Higher School of Humanities in Pultusk, higher School of Business in Nowy Sacz. These universities will award their degrees to students of Teleuniversity. They will perform exams, organise meetings, prepare training materials. They are currently preparing special curricula.

After the summer vacations Polish Public Television will start its own Television Open University (which will be competition for Polsat). The Polish Academy of Sciences and the Foundation for Promotion of Knowledge are partners in this project. The Polish Academy of Sciences will supervise the educational side of the project. Polish Public Television together with the Academy of Sciences plan to create an educational platform in regional channels of public television. Two universities will provide adult education programmes through regional channels of public television: Warsaw University and Bialystok University. Open University will award Bachelor's Degrees and later Master's degrees. Courses are planned also for specialised professional groups. There will be language courses and advisory programmes. Proposed programmes are to focus on professional retraining, computer skills, healthy living. Polish Public Television addresses its Open University to young people in small towns and rural areas, and to persons who cannot afford to study in big cities. It is also aiming at these professional groups for whom continuous education is essential, e.g at teachers.

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Slovenia

Summary

The emphasis in this year's report is put on following analysis of data that was gathered within the RIS telephone survey in June 2001. A new specialized telephone survey was conducted in February 2002. The questionnaire 2002 is based on a methodological frame of ECaTT (Empirica, 1999). This is a direct approach in measuring ework, where the phenomenon of ework is explained to the respondent in one or two sentences and then this person is asked directly whether he/she eworks. In RIS 2001 a different, indirect approach was used. In this approach the respondent was asked a set of questions that refer to the location and extent of work as well as the use of ICT. Then we constructed several categories of ework.

Socio-economic background - General economic and deployment background

For relevant information on socio–economic background please visit the web site of the Institute of Macroeconomic Analysis and Development *http://www.gov.si/umar/*.

For relevant information on e.g. Internet access rates in Slovenia, figures on digital divide, eGovernment services, Strategic documents,… visit the following web-sites : *http://www.ris.org/indexuk.html* (RIS - Research on Internet in Slovenia), *http://www2.gov.si/mid/mideng.nsf* (Ministry of Information Society) or contact the author of this report.

How to define eWork

In an indirect approach the exact definition of ework is crucial. The RIS 2002 direct approach compared to 2001 data showed that the structure of different types of eworkers changes. The phenomenon is extremely sensitive to the methodological approach. Even when using a similar approach but a different questionnaire, variations can appear. This was shown by comparing international results from ECaTT and Eurobarometer which both use the direct approach.

The 2001 survey (n=300) showed, that in extreme cases the evaluation might vary from 20,000 up to 290,000 depending on the definition we use. In labor force (1 mio) there were around 50,000 or 5% of persons that do some paid work at home and also use the Internet. But that is only a part of the ework population.
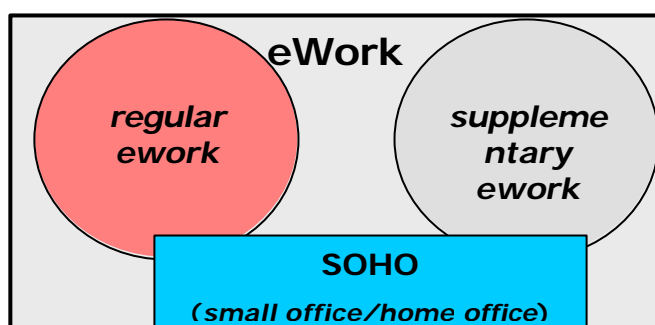
In RIS 2002 (n=1181) they took ECaTT definitions. eWork is work done on a computer and is conducted outside the traditional office environment, usually at home or the location is independent. The results of such work are then transmitted through telecommunication technologies like fax machines, internet or similar. Two basic groups of eworkers were classified :

- Regular eworkers; ework is performed one full working day or more in a typical working week

- Supplementary eworkers; ework is performed less than one full working day in a typical working week
- Included in the first two groups there are SOHO (small office/home offic e) eworkers including self employed persons, independent businessmen and company owners. The category is not entirely comparable to the ECaTT definition.

How many eWorkers

In Slovenia, 4.7% of labor force are eworkers. Here we are losing some forms of mobile ework and therefore we estimate that the final percentage is higher. Regular ework is performed by 3.1% of the labor force and

supplementary ework is performed by 1.6% of the labor force. In absolute numbers there are 46,500 eworkers in Slovenia, 30,000 regular and 16,000 supplementary eworkers.

There is also 1.4% of the labour force that are SOHO eworkers. That is around 13,500 SOHO eworkers. SOHO eworkers that are also regular eworkers represent 0.8% of the Slovenian labor force. That is 8,000 active persons. In most cases SOHO eworkers are independent businessmen, in some cases they are self-employed experts and company owners.

- The majority of eworkers are Internet users (www, ftp, e-mail or wap), that is 91%. Others use other means to transfer their work results to the employer or customer. This other means are fax machines or a direct electronic connection to the company that is not based on TCP/IP.
- In Slovenia eworkers are mostly male. 82% of supplementary eworkers and 63% of regular eworkers are male. Even two thirds of SOHO are male.
- Most eworkers have a university education. In the survey there were no eworkers that would have lower than high school education (secondary school in Slovenia). A majority of eworkers has university degree or more.
- Also a majority of eworkers come from the central region of Slovenia (44%). 20% eworkers come from the eastern parts of Slovenia. Most eworkers are located around bigger Slovenian towns : Ljubljana (central Slovenia), Maribor (eastern Slovenia) and Celje (mid-east Slovenia).

We also present some findings from other research projects that correlate with ework :

- The research project Home, Work and Flexibility (Sicherl and Remec, 2001) shows, that around 6% of persons in employment works at home. Further there are 5% of persons in employment that use a combination of home and other place of work.
- The national labor survey (SURS, 2002) shows that almost 7% of persons in employment work at home in their apartments. A little less than 5% are home-based eworkers.
- Results from the international CraNet survey (Svetlik et al., 2001) among large Slovenian organizations (more than 200 employees) show that Slovenia is behind the EU average in introducing flexible forms of work. Slovenia is also behind compared to transitional countries. But on the other hand the RIS 2000/2001 survey in organizations shows a significant increase in eworkability in small organizations, which are excluded from the CraNet sample.

The methodological approach of Empirica includes a large proportion of eworkers but some marginal forms slip away. Mobile eworkers who work less than ten hours per week are excluded and also parts of supplementary home-based ework because of the direct approach. Workers, who do not identify themselves as eworkers, will be excluded. Our estimates show that in Slovenia we loose at least 2% of the labor force that use ework. Estimates of the indirect approach are therefore higher than those of the direct approach. The data from the national workforce survey show that almost 5% of persons in employment ework at home in their apartments. The structure of basic categories of home-based ework in the national survey matches with the RIS 2001. Therefore we believe that the results from 2001 RIS were overestimated due to a small sample size (n=300).

General estimation on THE amount of eWork

Based on the results of all three surveys (RIS 2001, RIS 2002 and SURS 2002) we estimate, that in Slovenia 10% of people who are engaged in some sort of employment use some kind of ework. Here are the estimated categories :
- Between 5% and 6% of persons in employment (PIE) use ework regularly. Around 2% of PIE are mainly home-based eworkers, also 2% are only mobile eworkers and around 1% are SOHO eworkers.
- Between 4% and 5% of PIE are supplementary eworkers. Supplementary eworkers are mainly home-based, that is more than 2%. Less than 2% of PIE are mobile workers, who work less then 10 hours per week on road or field. Less than 0.5% of PIE are self-employed eworkers.
- eWork in Slovenia is mainly informal. The RIS 2000/2001 survey in organizations showed that only 2% of the labor force are eworkers. More than 80% of ework in Slovenia is informal.

EWork Projects

A.L.P. PECA is currently co-ordinating the national ework project, one of the projects within the Operational Programme for implementation of home based business and Telework (*www.delodoma.net*).

One of the objectives is to establish the network of eCentres as a necessary infrastructure for ework development. eCentres are considered as focus points for integration of local economy into global networked economy. eCentres will be designed to meet the activities written in eEurope+ :

eEurope+ Action	*The role of eCentres*
Give the labour force the chance to become digitally literate through life-long learning	• preparing special training courses for specific target groups to enhance social cohesion and promote equal opportunities • informing / animating the employers
Significant increase of information technology training places and courses and promote gender equality in such courses (both in work and educational institutions)	• establishing a network of training places • preparing programmes for digital jobs • preparing vocational training courses for existing professions • preparing special training ework courses
Encourage the dissemination of a European diploma for basic information technology skills	• introduction of ECDL
Support greater flexibility in the workplace	• establishing the national system of business consultancy • special internal training courses for introduction of flexibility in the workplace • assistance to companies • preparing the infrastructure for ework development in rural areas • joining the EU initiatives
Promote a network of learning and training centres for demand-driven information and communication technology	• special training courses for managers of future eCentres • identification of local / regional initiatives already present in Slovenia • preparation of a system of national / state incentives for more successful introduction of ework
Set up public Internet access points in public spaces and establish multimedia Tele-centres in communities providing access to training and e-work facilities	• developing instruments for establishing of local / regional ework schemes • market assessment for special ework niches • enhancing different types of ework: e.g. telecommuting, footloose telework,… • upgrading of successful regional projects with eContent • incorporating ework as a new paradigm into Regional development plans

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• *Web sites: http://www.gov.si/umar/ (Institute of Macroeconomic Analysis and Development)., http://www.ris.org/indexuk.html (RIS - Research on Internet in Slovenia), http://www2.gov.si/mid/mideng.nsf (Ministry of Information Society) http://www.delodoma.net (Official web-site of Operational Programme for the Implementation of Home Based Business and Telework)*

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. The literacy rate of persons between the age of 15 and 59 years was 50.8% according to 1991 census[64]. 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. A new spirit of economic freedom is now stirring in the country, with a series of ambitious economic reforms aimed at deregulating governmental procedures and stimulating foreign investment. The present economic efforts of the government are aimed at broadening and deepening economic reforms. While the focus is on disinvestment of Public Sector Units, attempts are also being directed at modernising tax administration and labour reforms for industrial resurgence.

Present economic growth[65] of the country is estimated at 5.4% (4% in 2000-2001) with the fiscal deficit increasing to 5.1%. While the agricultural sector has grown at 5.7% in 2001-2002 from a negative growth rate of 0.2% last year, industrial growth continued to be low at 2.3% in April-December 2001, lowest during the last ten years. The average annual growth rate during the ninth five year plan (1997-2002) is estimated at 5.4%, lower than plan target of 6.5%. Inflation, in terms of Wholesale Price Index (WPI), touched its lowest in the last two decades 1.3% by the end of January 2002. Foreign exchange reserves reached a record level of 50 billion US dollar at the end of January 2002. The services sector in India is estimated to grow at 6.5% compared to 4.8% in 2001[66]. The balance of payment of the country is comfortable and the current account deficit has reduced to about 0.5% in 2000-2001 from 1.1% in 1999-2000. Trade deficit narrowed to 3.1% of GDP in 2000-01 from 4% in 1999-2000. Total organised sector employment at 27.96 million at end-March 2000 was somewhat lower than in March 1997 when it was 28.24 million.[67] Approximately 18% of people are employed in the service sector.

Key factors affecting eWork development in India

Recognising the potential for India 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. Indicators of internet and PC penetration in India record a slowdown this year[68]. While the telecom sector is being opened up to competition, the international bandwidth rates have also lowered in India by 35-40 % last year. India had 1.2 gigabytes per second of international bandwidth in October 2001, but its use by internet Service Providers was much lower, according to National Association of Software and Services Companies' (NASSCOM)[69] strategic review of the information technology sector for 2002. There were 470 licensed Internet Service Providers in India in 2001. India had 1.1 million internet subscribers in 2001 and the number has been expected to grow to 1.5 million by March 2002. The internet connections in India grew from 1.5 million in 2000 to 5.5 million in 2002 [70]. 80% of the PC owning households subscribe to Internet. The PC penetration was recorded at 12%, in all towns having population in excess of 500 thousand, in Socio Economic Class A&B [71].

There are several reasons for western companies outsourcing work to India. India has about a 50 million English-speaking workforce to conduct the outsourced work coming to India. The service quality of ework in India is also meeting international standards. A study of cases by the EMERGENCE project in India shows that Indian eworkers, generally college graduates, outperform western workers in similar jobs because they treat them as serious careers and also because they are better educated than their counterparts who are often college drop-outs. Yet another

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[64]   *www.censusindia.net*
[65]   *Economic Survey, 2002, Ministry of Finance, Government of India.*
[66]   *Indian service sector contributes 51% to the country's GDP, with the most promising sector being software export. This sector grew @40-50 percent every year during 1990s. (www.outsource2India.com)*
[67]   *Current Statistics, Economic And Political Weekly, March 23, 2002*
[68]   *Internet Services Providers Association of India (ISPAI)*
[69]   *National Association of Software and Services Companies (NASSCOM) is the driving force behind promotion of e-work in India*
[70]   *http://itfriend.mit.gov.in/adavantageindia/anx1.pdf*
[71]   *http://www.idcindia.com/Pressrel/20Jun2001.html*

rationale for IT enabled services is that it allows companies to capitalise on time zone differences and to provide round-the-clock services, every day of the week on (24 x 7) model.

Some of the threats to eworking quality arose from the state of infrastructure support to the Information Technology (IT) sector in the country. The sector is getting more professional and is planning well to overcome this problem. The eworkers are investing a lot in assuring uninterrupted power supplies and back-up support to telecom breakdowns. An increasing number of training institutes have been set up recently to provide training for working as medical transcriptionists, call operators or any other ework.

A convergent network is being created by the intertwining of the ISP, Telecom, VSAT, Cellular and networking sectors. India's large business houses and Public Sector Units are working towards creating greater bandwidth availability.

India and Ireland emerge as particularly attractive locations for IT Enabled Services.
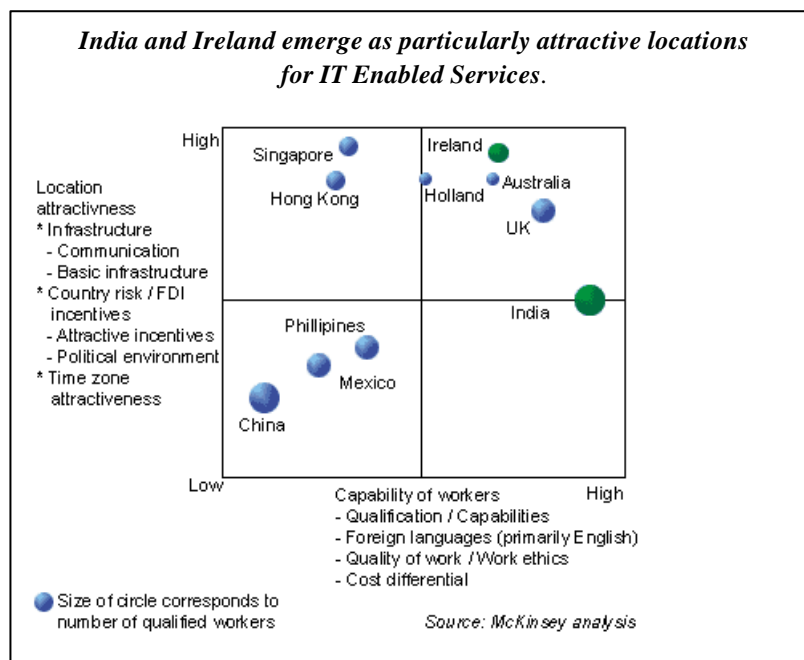
Development of eWork in India

Though the organisational environment does not seem to be set to introduce telecommuting as a work form in India, ework is spreading beyond expectations through the provision of what NASSCOM calls IT-enabled services. 82% of American companies ranked India as the first choice for software outsourcing. During 2000-2001, IT-enabled services sector revenue touched 0.8 US dollar, growing by 70% over 1999-2000.[72] For the year 2001-2002, 54% growth, achieving revenues of 1.3 US dollar, was estimated.

eWork in India is being done at two level: One is 'captive' operations of big western companies looking to reduce back-office costs without outsourcing. GE Capital Services runs India's biggest call centre with more than 5000 people employed[73]. Some other companies having call centres in India include Swiss Air, British Airways, and American Express. By shifting work to India, these companies' savings range between 40 to 50%.

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[72]   *NASSCOM predicts India will employ over 1 million people and earn $17 billion from IT - enabled services by 2008. (Boom before the Backlash. IT-enabled Services, Computers Today; July 1-15, 2001.*

[73]   *The jobs of employees range from relatively simple tasks as collecting money from delinquent credit-card users to such complex ones as data- mining. Backoffice of the World, The Economist, 3 May 2001*

Besides the large companies, a very large number of independent eworking outfits are providing IT enabled services on arrangements between western clients and sub contractors in India. The spectrum of these services mainly include five categories, in ascending order of value :

- Data entry and conversion, which includes medical transcription
- Rule-set processing, in which a worker makes judgments based on rules set by the customer. He might decide, for example, whether, under an airline's rules, a passenger is allowed an upgrade to business class
- Problem-solving, in which the eworker has more discretion - for example, to decide if an insurance claim should be paid
- Direct customer interaction, in which the eworker handles more elaborate transactions with the client's customers. Collecting delinquent payments from credit-card customers is one example, resolving computer related problems is another
- Expert "knowledge services", which require specialists (with the help of a database). For example, an eworker may predict how credit-card users' behaviour will change if their credit rating improves
- At relatively smaller levels knowledge workers from various fields in India are eworking, such as animators, lawyers, accountants, engineers and architects.

Offshore assignments coming to India are now moving up the value chain, from data entry to large and complex turnkey projects of 200 to 300 person years. The primary industry targets include Insurance, Banking, Financial Institutions, Hospitality, large Hospitals, consortiums of Legal Firms, Software/Hi-Tech companies that have to provide 24-hour helplines, large manufacturing companies, Airlines and Utilities. Though data on source countries is not available, the service providers focus more on outsourcing from USA followed by developed countries in Europe.

Government Initiatives for Telecommuting

The Government's efforts towards promotion of telecommuting is presently gender and industry specific in India. To encourage the worldwide trend of employment of women in the IT Sector, the following promotional measures have been outlined in the National IT Policy:

- Telecommuting will be allowed to professionally qualified women in IT to facilitate their continued association with their work place in case they are not in a position to attend to the job in office on a regular basis due to family constraints. Such women will be offered special loans/financial grants by the companies to set up infrastructure at their homes to be able to telecommute.
- Virtual institutes will evolve special HRD programs to help educated women to enter the field of IT-enabled services.
- Banks and Finantial Institutions will offer special financial packages on a pro-active basis to support enterprising and professionally qualified women to set up home based IT services in various areas of IT-led economic activities.

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eWork Legislative Development

The background to legislative development in ework 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[74]. 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 exported. Various incentives to promote ework include :

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[74]   *http://it-taskforce.nic.in/vsit-taskforce/actplan3/*

- Tax holiday for a period of 5 continuous years in the first 8 years from the year of commencement of production
- Exemption from taxes on export earnings even after the period of tax holiday
- Exemption from central and state taxes on production and sale
- Permission to install machinery on lease
- Freedom to borrow self-liquidating foreign currency loans at the prime rate of interest
- Inter-unit transfers of finished goods among exporting units.

The Information Technology Bill passed in 2000, now notified as IT Act 2000, provides legal recognition for transactions carried out by means of electronic data interchange and other means of electronic communication. This facilitates electronic filing of documents with the Government agencies and amends the Indian Penal Code, the Indian Evidence Act, 1872, the Bankers' Books Evidence Act, 1891 and the Reserve Bank of India Act, 1934 and for matters connected therewith or incidental thereto. The IT Bill brings E-commerce within the purview of law and accords stringent punishments to "cyber criminals". With this, India has joined a select band of 12 nations that have cyber laws.

IT Professionals' Forum

Software professionals and computer programmers are now taking the first steps in organising a collective voice to defend their interests. The move, unusual among India's office workers, has led to the creation of IT professionals' fora in Bangalore and Hyderabad, two of the country's leading centres for IT. The Hyderabad forum attracted about 250 people to a public meeting in January this year. It has just opened an office in the city, supported by a grant from a Swedish trade union. Several hundred kilometres to the south-west, the Bangalore forum has about 300 members and hopes to establish an office later this year.

The fora in both cities have been launched with the assistance of Union Network International, the global trade union federation based in Switzerland. However, as befits a young industry with a young workforce - the average age is about 26 - the fora look forward to new types of organisation as much as they look back to traditional unionism. Talk is of "professionals" rather than "workers" and of seeking co-operation with employers. The venture comes as the International Labour Organisation has begun to look more closely at the Indian IT sector. The ILO is organising a national tripartite seminar in Delhi in April next year to look at the employment and policy issues arising from the growth of the sector.

Source : Bibby A.., Indian IT's new union mould, Financial Times - 26 February, 2002.

Development of eWork centres

Software Technology Parks of India (STPI)[75] acts as a front-end to the Software Industry for government policies and approvals. It establishes and provides data communication facilities, computer facilities and world class Infrastructure facilities like office space and general amenities. STPI and private STPs can host IT-enabled Service export ventures for which all facilities, concessions, procedures and policies applicable to Software export will be equally applicable. STPI maintains internal engineering resources to provide consulting, training and implementation services covering network design, system integration, installation, operations and maintenance of application networks and facilities in varied areas ranging from VSATs to ATM based networks. STPIs offer various incentives and concessions to encourage foreign investment and promote software development in India. The 15 STPI centres and 4 sub- centres spread across India offer various monetary and non-monetary incentives including import duty exemption, complete tax holiday, decentralized "single window clearance," etc.

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[75]   *Software Technology Parks of India (STPI), is a society set up by the Ministry of Information Technology, Government of India in 1991, with the objective of encouraging, promoting and boosting Software Exports from India. www.soft.net*

In 2001, STPI planned to build a 40,000 square feet, fully equipped cyberpark with a private partner. The facilities of the park would be extended to small and medium enterprises, entrepreneurs and academics implementing innovative IT ideas[76].

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[76]   *'STPI finalises partner for cyberpark', The Hindu, Bangalore, April 18, 2001*

Japan

eWork in Japan

Of the many issues facing the Japanese government, unemployment remains a key one. Maintaining its historically high level, unemployment shows no sign of easing, and as such, a flurry of job creation related legislation has emerged in the past year. Some examples include the amendment of the Employment Countermeasures Act to encompass all workers not just industries in recession; a revamping of the Basic Plan for the Promotion of Occupational Skill Development; temporary measures for the reemployment of older workers; and preparing the systemic groundwork for more employment contracts of limited duration.

Elsewhere, on the flexible work arrangement front, the latest buzzword is worksharing. This is being mooted quite enthusiastically by policy, management and union representatives alike as a promising alternative to socially unacceptable, large-scale layoffs. Whether worksharing will be successfully adopted remains to be seen, especially since the current debate emphasises compulsory worksharing in mainly blue-collar occupations rather than the more pro-active diversification of white-collar workstyles.

In the SOHO area, a major development was the March 2002 launch of an electronic SOHO Directory, sponsored by the Japan Productivity Centre for Socio-Economic Development in conjunction with the Ministry of Health, Labor and Welfare[77]. The Homepage allows both SOHO entrepreneurs and prospective outsourcers to match jobs and skills. As the incidence of home-based work scams has increased during the past year, the existence of a reputable matching service is invaluable.

According to Wendy Spinks[78], no new official populations statistics were published in 2001, although the Ministry of Land, Infrastructure and Transport plans to conduct a population survey in 2002. It will try to capture not only eworking employees but also independent workers using ework arrangements, the first Japanese population survey to attempt this.

Main developments in Japanese eworking over the last year include:

The Japan SOHO Association[79] continues to act as a major lobbying force for entrepreneurial eworkers. It now has an independent branch operating in the Kansai region with its own Homepage.

The Japan Telework Society (J@TS)[80] launched a fully refereed academic journal in March and held its fourth research congress in July 2002. Its Homepage is also hosting the full archives of the International Flexwork Forum's newsletters, which ran from 1991 to 1999. The archive should be a welcome resource for researchers of ework in Japan.

The Japan Telework Association[81] implemented its third round of Telework Promotion Awards. Winners are to be announced on July 5th. Winners last year included Dade Behring, Digital Worker Coop[82], Fuji Xerox, NEC Soft, and Oki Electric. As part of its profile raising activities, it sponsored an essay competition for female SOHO entrepreneurs in conjunction with the Ministry for Land, Infastructure and Transport in December 2001. Elsewhere, it has close relations with the Micro Business Conference, another body aimed at supporting the use of IT in small businesses, a specific area of activity being an online work mediation site[83].

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[77]   *http://www.soho-t.org (Japanese language only)*
[78]   *Tokyo University of Science, Director, Japan Telework Society. spinks@ms.kagu.tus.ac.jp*
[79]   *http://www.j-soho.or.jp (Japanese language only)*
[80]   *http://jats.rcast.u-tokyo.ac.jp/tw/*
[81]   *http://www.japan-telework.or.jp/english/english_index.html*
[82]   *http://www.digital.or.jp/english/introduction_e.html*
[83]   *http://www.10-8chu.com (Japanese language only)*

Several new facilities to support individual SOHO entrepreneurs have been established in various regional centres. Prominent examples include Shizuoka Prefecture with three centres in Shizuoka City, Mishima and Hamamatsu[84] and plans for a fourth in Iwata City[85], Fukuoka[86], Kita Kyushu[87], Hiroshima City[88], Okayama City[89] and Sumida Ward in Tokyo[90].

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[84]   *http://www.soho-t.org (Japanese language only)*
[85]   *http://www.city.iwata.shizuoka.jp/whatsnew/soho/bosyu.htm (Japanese language only)*
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[89]   *http://www.bio.gr.jp (Japanese language only)*
[90]   *http://www.city.sumida.tokyo.jp/english/index.html*

USA

Although the US economy entered a mild recession in 2001, the rate of acceptance and number of variations of ework continued to expand, particularly after the destruction of the World Trade Center in New York on 11 September 2001. This growth seemed to be relatively impervious to the "dot-com" crash that began in 2000.

Pre 11th September

As evidence of that growth, the Telework America-sponsored 2001 national survey of eworkers concluded that there were as many as 28 million regular eworkers in midsummer 2001[91]. The survey included mobile workers for the first time in the Telework America survey series. As a result of adding that additional group to the category of eworkers, the 2001 survey estimated that 21.2% of the US workforce was eworking. That number is reduced to 15.7% of the workforce if the mobile-only eworkers are removed from the count. This compares to a total of 12.2% of the workforce in the Telework America 2000 survey.

Table 1: Types of eWorkers covered in the 2000 and 2001 national US surveys

eWork mode	Estimated number of US eWorkers (millions)	
	July 2000	**August 2001**
Home-based only	13.8	6.1
Telework center-based only	1.8	3.3
Mobile-only	NA	6.7
Multiple forms	0.9	11.9
Total	**16.5**	**28.0**

Excluding the mobile-only eworkers, the 2001 results imply a 29% annual growth rate in non-mobile eworkers, far larger than was anticipated in 2000. Additionally, there appears to have been a major shift in ework modes from solely home-based to multiple forms of ework[92]. All of this relates to the situation before the terrorist attacks on the World Trade Center and the Pentagon.

The demographic characteristics of the eworkers surveyed in 2001 are similar to those in the 2000 survey. There were proportionally higher populations of eworkers in the Northeast and the Western states. eWorkers are generally more educated and higher paid than non-eworkers, with median annual incomes of $40,000 for eworkers and $25,000 for non-eworkers (as contrasted to the lower $50,000 range and the lower $30,000 range, respectively, in 2000). Males are in the majority in the home-only eworker category while females outnumber the males eworking at various types of telework centers. The 2001 survey distinguished between generic telework centers and satellite offices (that is, telework centers comprising employees solely from one employer). The center-only eworkers were split into 2.1 million at generic telework centers and 1.2 million at satellite offices.

The results of previous surveys of the impacts of ework appear to be upheld by the 2001 survey. eWorkers continue to perceive themselves as less stressed - or better able to cope with stress - than non-eworkers. Almost 70% of the eworkers reported being satisfied or quite satisfied with their jobs - and almost 80% saying that they were quite or very committed to their employers - good news for employers of eworkers. Home-based eworkers are particularly expressive of their job satisfaction and commitment to their employers.

As we have forecast from our previous evaluations of individual ework programs, the frequency of eworking slowly increases with experience and/or improved technology. The 2001 survey found that home-based eworkers averaged 3.6 days (28.6 hours) per week, slightly higher than the 3.4 days per week reported in 2000. eWorkers engaged in the other modes of ework tended to do them essentially full time, more than 4 days per week.

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[91]   *http://www.telecommute.org/. The 2001 Telework America National Telework Survey was managed by Old Dominion University for the International Telework Association and Council (ITAC).*

[92]   *Unlike the case for the 2000 survey, many details of the 2001 survey were not made available to this author or to the members of the International Telework Association and Council - so it is difficult to make other than general comparisons.*

Almost 34% of the home-only eworkers have been eworking one year or less, as compared with about 17% in 2000. This is all the more surprising when there appears to be a 56% reduction from the 2000 survey results in the total number of home-only eworkers. Conceivably many of the more experienced home-only eworkers have expanded their eworking modes to include mobile and/or center-based eworking.

One of the possibilities that have concerned us since the early 1970s is that ework might act as an enabler of increased urban sprawl. Consequently, since 1990 we have tested for any net migration of eworkers' households away from their employers' central workplaces.[93] The Telework America 2000 survey showed no effect and the 2001 survey comes to the same conclusion; on the contrary, those few eworkers who said that they had moved claim to have moved closer to their employers' locations.

Post 11th September

All of the above relates to the situation in the US prior to the catastrophes of 11 September 2001 in which, in addition to the loss of 3,000+ lives, more than 100,000 square meters of prime central office property were reduced to dust. On 12 September 2001 the US had many more "instant" eworkers. Although there is little reliable information as to the exact numbers, it seems clear that the aftermath was similar to that observed after two major earthquakes in California (in 1987 and 1994).

Specifically, in such disasters the physical infrastructure in the affected communities is severely impaired or destroyed. Recovery of the infrastructure typically takes months or even years. However, the electronic/telecommunications infrastructure recovers within hours. Consequently, eworking remains a feasible and suddenly more attractive option while traditional working - involving commuting - becomes impossible. In the case of the World Trade Center the prior workplaces ceased to exist.

The ensuing months witnessed a frantic scramble for office space in the surrounding communities. The more innovative organizations immediately adopted telecommuting as a primary means of business survival. One of the more obvious manifestations of this was a sudden increase in demand for videoconferencing technology. Some estimates place this increase at 50 percent or more. Similar increases in interest in telecommuting were experienced after the California earthquakes, although the costs of the videoconferencing at the time discouraged any major increase in demand for that option.

However, once the world reaches a more normal appearance, business tends to return to normal and the number of eworkers declines. Still, the number of eworkers remains significantly higher than would have been the case otherwise. The forceful conversion to ework typically continues voluntarily once management and the eworkers have experienced success at this new way to work. Still, many firms suddenly relocated by the WTC events reportedly have no plans to move back to lower Manhattan, instead continuing operations from newly found multiple sites.

Furthermore, the experiences in New York and in Washington, D.C, have caused repercussions around the rest of the country. In addition to the general increase in concern for physical security there has been an increased willingness to adopt ework as a relatively standard work option even in areas not thought to be in danger of terrorist attacks. As a result, we expect to see a slight acceleration in the adoption rate of ework over the next year or two. Figure 1 shows our new forecast, revised from the 2000 forecast (also shown), for telework in the US.

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[93]   *For example, see Jack M. Nilles; Telecommuting and urban sprawl: mitigator or inciter? Transportation* **18** : *411-432, 1991*

Figure 1 : eWork forecasts for the USA

* excluding mobile eworkers. Source: JALA International, Inc.
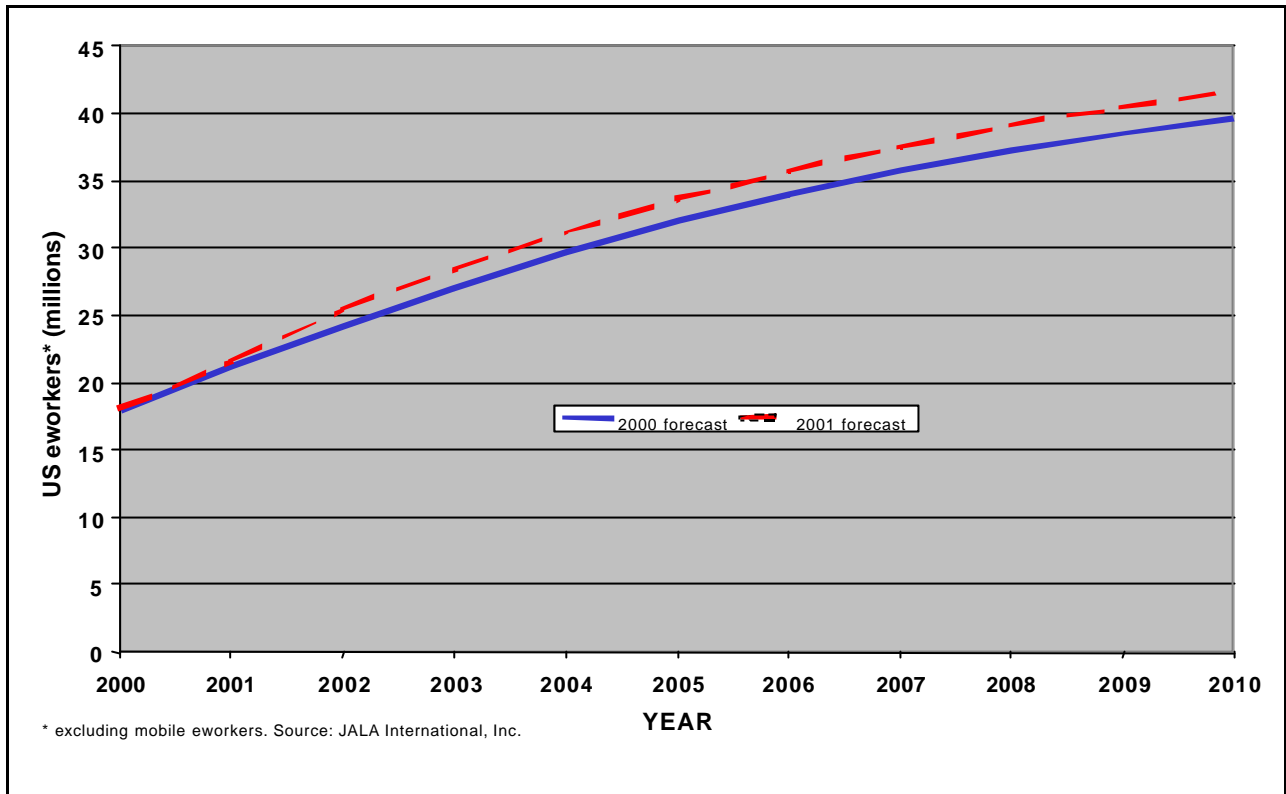
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5   New Directions for Research and Technology Development

5.1   New EU research projects

In 2002, European research related to eWork development is well established within the 2nd Key Action of the Information Society Technology programme of the 5th EU Framework for RTD.

The European research underway falls into 4 main categories, related to the further development of mobile communications, to new opportunities for workplace design, to continuing technology development for dispersed teamwork, and the social and economic research about the transition to a knowledge economy. The main research projects in each category are identified in the following sections, and are described in Annex 2.

Mobile eWork

Mobile communications is increasingly dominating the new generation of eCommerce and eWork systems. To stimulate take-up of new mobile eWork opportunities, the **IWOP** project will make 8 trial implementations of mobile and teleworking in SMEs with different profiles, with subsequent replication into at least 2000 SMEs in the EU and eastern Europe. The emerging WAP, GPRS and UMTS platforms will be of major importance in the near future, and one of the new Action Lines in the 2000 Workprogramme was therefore focussed on mobile eWork and eCommerce.

Sustainable workplace design

From the 1999 work Programme, the emphasis on the workplace design has evolved to focus more tightly on multidisciplinary RTD for sustainable workplace design, including the architectural and resource-efficiency issues. This work will continue to address multidisciplinary development for workplace and office design and will extend its focus, *inter alia*, to social inclusion and regional development issues in response to the recent eEurope initiative. The inclusion of all people who might be marginalized by the digital divide is becoming more prominent. In

> *Objectives*
>
> *To integrate emerging technologies such as wireless, multimodal, wearable, or embedded ones with innovative office and workplace designs to create and demonstrate creative work environments and practices suitable for all.*

addition, the link with the new ways of working is extremely strong. These activities will enhance sustainability through providing the platforms and tools needed in future dynamic, satisfying, safe, secure, mobile and distributed workplaces. They may also open new paths to improved resource use efficiency in the workplace and built environment, e.g. through replacing physical prototyping by virtual prototyping or establishing highly utilized offices in the vicinity where people live.

The projects address Virtual Environment issues, flexible and collaborative working practices, location independent approaches, and incorporate emerging technologies into new workplace and teamwork concepts. They cover multidisciplinary development through bringing in expertise from architecture, psychology, ergonomics or mental health and are concerned with human and social issues of work organization and innovative interface use.

Three proposals were selected as complementary and constitute a "critical mass" of work in this area., four projects addressed the *Virtual* dimension in **"Workplace design"**. Two of the most innovative proposals {**TOWER** (1st call KAII) and **STAR-MATE** (1st call KAII)} address user-interface and Virtual Environment issues in the context of workplace design. The **DIVERCITY** (1st call KAII) proposal covers workplace design issues specifically for the construction industry. **ANGELO** (1st call KAII) specifically addresses physiological and psychological issues in the specific context of call-center employment.

All projects involve end users to assess usability and to reflect user-centered design principles. They involve companies in the automotive, space and agricultural machinery industries (**VIEW of the future** (3rd call KAII), business services {**SANE** (3rd call KAII) and **UNITE** (3rd call KAII)}, the maritime sector (**WINGS-for-SHIPS** (6th call KAII)), and the furniture industry with **HUMANTEC** (5th call KAII) and **IDIA** (6th call KAII). **AVATAR-Conference** (3rd call KAII) will design a scalable, co-operative work system, with multi-media multi-user real-time communication, speech and voice recognition, on-line translation and user representation through 3D avatars. **VIEW of the future** (3rd call KAII) will research and develop methodologies, tools, guidelines, and products to design workplaces utilizing Virtual Environments (VE). The project will take a user centered approach, for which the strong ergonomics/human factors/psychology background across the consortium will be vital, and will also draw firmly from the needs, contexts and previous experience of its strong set of industrial partners. **UNITE** (3rd call KAII) will offer project teams with highly efficient co-operative workplaces, incorporating the concepts of Ambient intelligence. The results will have potential for a wider application across branches, in large companies and SMEs. Targeted applications concern product development and design involving 3D user interfaces {**VIEW of the future** (3rd call KAII)} and, more generally, team-oriented knowledge work integrating a range of Internet and mobile technologies and providing unified interconnection interfaces. **HUMANTEC** (5th call KAII) will study and analysis the concept of office space, no longer interpreting it as an aggregation of separate functions, but as a series of social and productive interrelations. **WINGS-for-SHIPS** (6th call KAII) aims to develop, demonstrate and validate a new maritime intelligent workplace based weather information system and decision support for maritime transport and other applications.

eWork

The move from "teleworking" towards "e-working" represents a new phase for the European workforce. Better working environment, better working conditions, and a better reconciliation of work and personal life are the objectives. Research activities within KAII reflect these requirements.

> ### *Objectives*
>
> *To develop and demonstrate reference models, architectures and technologies that enable teams to work together across different locations and time zones.*

Projects present both highly innovative technology developments for networked co-operative working in virtual shared environments {**TOWER** (1st call KAII)}, sector-specific co-operative working system developments in hospitals {**TEAM-HOS** (1st call KAII) and **VIDEOCOM** (2nd call KAII) will incorporate a novel tactile and icon-based User Interface with the smart card identification and authentication technology, for multimedia transfer in a commercially available videoconference platform in order to construct an innovative and easy to access PC-based video communication workplace for medical staff}, Media **MULTIPRO** (1st call KAII), construction **DIVERCITY** (1st call KAII), design consultancy **DYNOCA**(1st call KAII), as well as more general system developments for mobile team-work **LEAP** (1st call KAII), maintenance of complex equipment (**STAR-MATE** (1st call KAII), distributed manufacturing **MOTION** (1st call KAII), and SMEs **OSMOS** (1st call KAII). **E-NTRY** (1st call KAII) is addressing an e-commerce system for public procurement, and **INTERDEV-NRM** (1st call KAII) is developing a co-operative web-based information system on natural resources management involving organizations working on international development cooperation.

Several Take-up measures are related to this Area :

THINK (2nd call KAII) is concerned with integration of the disabled into the knowledge economy; **ATTRACT** (2nd call KAII) concerns new working practices in the insurance sector, and **PROTELEUSES** (2nd call KAII) will foster the introduction of teleworking in SMEs in the services sector, while **JEWEL** (2nd call KAII) will stimulate new working practices in networks of small businesses in the jewelry sector. **CAPERS** (2nd call KAII) will transfer and deploy best working practices in postal services to "Accession countries". **SABARECO** (2nd call KAII) will trial satellite-based information systems for the construction industry; IWOP (2nd call KAII) will make eight trial implementations of mobile and teleworking in SMEs with different profiles, with subsequent replication into at least 2000 SMEs in the EU and eastern Europe.

In addition **WISTCIS** (1st call KAII) will support networked employment development in the Confederation of Independent States and the **FLEXWORK** (3rd call KAII) project supports developments of eWork in Europe's regions and in the Accession Countries. **TEAMWORK** (4th call KAII) will provide a complete solution (integrating Technology, Methodology and Skills) for e-working teams operating in a distributed, multi-cultural environment. **TELEMARA** (4th call KAII) will 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.

New perspectives for work and business : economic, legal and social research

The Work Programme for Key Action II stresses that successful development will *"require a strong interplay between the technical, economic, social and legal issues. Integrated socio-economic and technological research is therefore necessary to monitor and assess the development and impact of new technologies and in particular of the work done in this Key Action itself"*. In fact, a strong base already existed in socio-economic research projects initiated under the Fourth Framework Programme. These offered a significant experience in integrating socio-economic with technological research.

> *Objectives*
>
> *To develop, quantify, and demonstrate evolution scenarios and the potential social, economic, industrial and environmental implications of novel technologies for work and business and, in the process, provide guidance to other activities in this Key Action as well as to related legal and policy activities.*

Most projects have significant socio-economic research embedded within them. About 40% of RTD projects have at least one work-package exclusively dedicated to economic, legal, social or policy related research necessary to guide and optimize the project's results and impact. Among these, 50% are performing economic and market analyses, 25% legal studies, 10% social research, and 10% make explicit contributions to EU policy developments.

These projects cluster around two distinct fields : *shaping factors* of the emerging new ways of work and business and *helping to contribute to major EU policies.*

VIP will help in the development of a Code of Practice for Corporate Social Responsibility among international companies when establishing and carrying out IST-enabled work across national borders. The **ASSIST** project has analysed opportunities for sustainable consumption in a Knowledge economy and **RISESI** will explore the relationship between technological innovation and the resulting social and economic transformations. **TELESOL** shapes the way business and research is contacted in CIS countries through the introduction of teleWork practices. The quality and efficiency of work in call-centres has been improved by the technology developments in the **ANGELO** project and a major survey of working conditions in Call centres has been completed in the **TOSCA** project. The **FAMILIES** project has analysed key interactions between families and the new ICT-based work methods and has developed recommendations for future policy and RTD. The **ATTRACT** project has developed and verified two major evolution scenarios related to the insurance sector, and the **SUSTEL** project is examining the ecological and social benefits of teleworking.

Eight projects provide support to EU policy development in relation to eWork.

The **STAR** project examines new technologies and services and their impact 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 and their drivers and barriers. **TERRA2000** (3rd call CPA7) examines the technological and social changes known as the "New Economy" and the challenges posed to sustainable development, economic competitiveness, civil society, and quality of life. **e-LIVING** (3rd call CPA7) will use a co-ordinated set of pan-European longitudinal household panel surveys to explain, model and forecast the changing patterns of uptake and usage of IS technologies across Europe. **BEEP** (3rd call CPA7) is concerned with analyzing and exploiting socio-economic best practice in four domains of the e-Europe initiative: employment and skills; digital SMEs; social

exclusion and regional cohesion; and the important cross-themes relating to these issues. **DEESD** (4th call KAII) is concerned with e-commerce, e-work and sustainable development and will define a policy framework for sustainable electronic markets; **KISEIS** (4th call KAII) addresses policy solutions to promote sustainable employment and to integrate disadvantaged groups in the information society and **PIDSS** (4th call KAII) will assess the impact of IST on postal operators' core business and working places. In addition, the project **JANUS** (6th call CPA7) intends to bring together a core of socio-economic research projects in order to help develop a better picture of the past, the dynamics and the possible futures by consolidating issues shared throughout the IST, including the projects **TERRA2000, EMERGENCE, BEEP, STAR, SIBIS,** and **PRISMA.**

The **FLEXWORK** project promotes the adoption of innovative ways of flexible working, using IST technologies, by users in outlying or technologically disadvantaged regions of Europe, with special emphasis on SMEs, while its extension, **FLEXWORK** addresses the accession countries' SMEs needs.

5.2   Research in support of the eEurope Action Plan

eEurope indicators and benchmarking

The open method of co-operation between the EU Member States depends on consistent measurements of progress in implementing the eEurope Action Plan. To assist member States in comparing progress, three levels of indicators are used :
- **EUROSTAT**[94] indicators of macro-economic trends and employment
- **EUROBAROMETER**[95] surveys for a selection of indicators of Internet use
- In-depth research into structural changes induced by eBusiness and eWork.

Key Action II contributes significantly to RTD carried out under the IST Cross Programme Actions on indicators and socio-economic research.

Benchmarking foreseen under eEurope aims at assessing the improvements made by all stakeholders in progressing eEurope (Private Sector, Member States, Commission). It is thus more than simply measuring progress. By monitoring developments which are indicative of what is happening in the Information Society, *e*Europe will enable us to understand where we are and take informed decisions for the future.

The facts and figures obtained through the benchmarking exercise will be used :
- To evaluate the net overall impact of *e*Europe and the Information Society
- To demonstrate the status of activities in key areas
- To shape future policy, by informing policy-makers in Europe.

Seventeen KAII projects will contribute information and analysis directly linked to the eEurope benchmarking exercise.

ECATT (funded under the 4th FP - ACTS & ESPRIT) has completed a benchmarking of e-commerce and telework developments in ten countries. Analysis was completed in July 2000, and the final report was very well received and provides a valuable "baseline" against which e-Europe initiatives can be compared. The full final report is available on the web[96]. A follow-up to **ECATT** project, will continue the benchmarking of e-business and e-work take-up, reflecting e-Europe priorities.

EMERGENCE (1st call KAII) looks at the relocation of work as e-business activities develop, and started producing additional quantitative results on the employment re-location of tele-mediated work. It conducts substantial surveys of

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e-business developments in most EU countries and the USA. First results were presented at the WEDGE conference in October 2000.

A number of Cross-Programme Actions (CPA) and KAII projects address statistical indicators and socio-economic analyses thus providing further benchmarking data. **NEWKIND** (2nd call CPA4) will develop indicators of the accumulation of intangible capital; e-commerce infrastructures, and "performance/efficiency gain", **SIBIS** (3rd call CPA8) is devoted to the benchmarking of the eEurope Action Plan via 30 new indicators. **ERMIS** (2nd call CPA4) will develop indicators for measuring the growth of consumer consumer-oriented electronic commerce, using intelligent agents, **EICSTES** (2nd call CPA4) will develop indicators of impact of the new economy on innovation; **STING** (2nd call CPA4) will develop indicators of technology innovation based on patent data.

FAMILIES (2nd call KAII) will analyze impacts of work on families, associated with changes in information society related work organization, **STAR** (2nd call KAII) will develop indicators and analyze emerging patterns of development of the digital economy, the skills gap, the new ways to work, e-payments and smart card use, and e-government, **BEEP** (3rd call CPA7) will carry out meta-data analysis and case-studies focused on e-Europe priorities; social inclusion; regional development and SMEs. In addition, the **TERRA2000** (3rd call CPA7) will focus on macro-economic impacts and **e-LIVING** (3rd call CPA7) on lifestyle impacts. **STILE** (5th call CPA8) will develop innovative methodologies for monitoring the labor market in the e-economy. **INDIC@TOR** (5th call CPA7) will carry out a psychometrically sound survey of "employability" for software engineers working in SMEs, and **NEWTIME** (4th call KAII) will investigate the migration of micro-businesses to broadband networking. **MUTEIS** (5th call CPA7) will assess macro-economic and urban trends in the information society and **LAW** (6th call CPA7) addresses labor market changes and welfare perspectives.

5.3   The 6th Framework Programme (2003-2006)

The Council and Parliament has adopted a new structure, priorities and implementation system for European research for the period from January 2003 to the end of 2006. It will better focus recources on key priorities and help to better integrate research within the European Area.

There are seven main priorities, and further research related to eWork and the knowledge economy developments are addressed in two : The priority theme on Information Society Technologies, and that on «Citizens and Governance in the knowledge economy».

Information Society technologies

Information society technologies (IST) are transforming the economy and society. Not only are they creating new ways of work and business, but they have far reaching implications on our everyday life. They provide solutions to major societal challenges such as healthcare, environment, safety, mobility and employment. The IST sector is now one the most important of the economy, with an annual turnover of EUR 2000 billion, offering employment for more than 12 million people in Europe, a number that is steadily rising.

This thematic priority will contribute directly to realising European policies for the knowledge society as agreed at the Lisbon Council of 2000, the Stockholm Council of 2001 and reflected in the *e*Europe Action Plans. It will ensure European leadership in the generic and applied technologies at the heart of the knowledge economy. It aims to increase innovation and competitiveness in European businesses and industry and to contribute to greater benefits for all European citizens.

One of the four main themes is proposed to concern research addressing work and business challenges

The objective is to provide businesses, individuals, public administrations, and other organisations with the means to fully contribute to, and benefit from the development of a trusted knowledge-based economy, whilst at the same time improving the quality of work and working life. Research will include life-long continuous learning, and improving work skills. In this *Research into **eWork** systems will focus on new workplace designs incorporating innovative technologies to facilitate creativity and collaboration, on increasing resource-use efficiency and on extending work opportunities to all in local communities. Work on **eLearning** will enable personalised and tailored*

access to learning at home, at work or on the move and build advanced learning schemes at school, university and in the workplace that take advantage of the development of ambient intelligence.

To help orient the development of proposals for Integrated projects and Networks of excellence related to the new "eWork" challenges, the Commissions has highlighted the following themes in the report of the Reflection group on work and business challenges :

- *Future workplaces for the knowledge society*

  Multi-disciplinary research into the integration of new broadband, wireless and wearable interfaces with new "knowledge management" facilities and innovative "office" designs to enhance creativity and productivity, and improve health, safety and the quality of working life. This research will need to involve research on innovative use of building and "facilities management" as well as in office equipment and furniture design, and in human psychology and interactions.

- *Sustainable working practices for the knowledge society*

  Research into methods of work organisation which can increase participation in work, notably by women, the disabled and older workers, and in remote and rural areas, and at the same time increase "resource productivity" in relation to work, notably in the use of transport, land and energy resources. This research will need to include a wider vision of work in sustainable cities and communities.

- *Flexibility and mobility on work in a knowledge society*

  Research into person-centred adaptability, flexibility and development throughout working life, to ensure that individuals retain their employability and ability for self-expression and creativity through the continuous changes likely in the transition to a networked knowledge society. This will involve a close integration between work and learning systems, and the development of new network-based, but person-centred career-development.

In addition, research on **Knowledge and interface technologies** is proposed to improve usability of IST applications and services in order to encourage their wider adoption and faster deployment and to provide tools for knowledge handling that enable not only to access knowledge easily but also to make the best out of the meanings and concepts that it encompasses. The objective is to provide automated solutions for creating, managing and interacting with complex knowledge spaces, in ways that are intuitive for all. *Work will focus on technologies to automate the process of **acquiring and modelling, representing and visualising, interpreting and sharing knowledge**. This will be associated with research on **Intelligent surfaces and interfaces** in which the objective is to provide more effective ways of accessing ubiquitous information and easy and natural interaction modes with dynamic knowledge. Research will focus on natural, adaptive and multi-sensorial, for an ambient landscape that is aware of our presence, personality and needs, and which is capable of responding intelligently to speech or gesture. The aim is to hide the complexity of technology by supporting a seamless human interaction with devices, virtual and physical objects, in a variety of environments (home, work, mobile, etc.).*

Citizens and Governance in the European Knowledge-based society

The Lisbon European Council recognised that the transition towards a European knowledge based society will affect every aspect of people's lives. The overall objective is to provide a sound knowledge base for the management of this transition, which will be conditioned by national, regional and local policies, programmes and actions, as well as informed decision making by individual citizens, families and other societal units.

Given the complexity, breadth and interdependence of these challenges and the issues involved, the research approach adopted must be based on greatly enhanced research integration, multi- and trans-disciplinary cooperation, and on the mobilisation of the social sciences, economics and humanities research communities in Europe in addressing them. Activities will also facilitate the identification of medium- to long-term societal challenges and will ensure the active participation of key societal stakeholders and the targeted dissemination of the work carried out.

The building of a European knowledge society is a clear political objective for the European Union and its Member States. The research aims to provide the basis of understanding needed to ensure this takes place in a manner which accords with specific European conditions and aspirations.

The priorities are proposed to be :

- *Improving the generation, distribution and use of knowledge and its impact on economic and social development* : the objective is to improve significantly understanding of the economic characteristics of knowledge and its functioning as a public and private good, and to provide the bases for policy formulation and decision making in the context of globally networked business.

- *Options and choices for the development of a knowledge-based society serving the EU objectives set at the Lisbon summit* : the objective is to develop an integrated understanding of how a knowledge-based society can be developed taking into account European social models, including the societal objectives of sustainable development, social cohesion and improved quality of life. Particular attention will be given to the digital divide, and skills gap.

- *The variety of paths towards a knowledge society* : the objective is to provide comparative perspectives across Europe and thus provide an improved basis for the formulation and implementation of economic transition strategies towards a knowledge society at the national and regional levels.

6   eWork Agenda - Major Activities in 2001 and 2002

6.1   *eWork 2001 Conference*   *12/14   September (Helsinki)*

The 8th European Assembly on New Ways to Work

New ways of organising work in the knowledge-based and sustainable economy was the core subject of the ework 2001 conference that was held on 12-14 September, 2001, in Helsinki. The conference was the annual main event covering European ework and new ways to work, and it was attended by 450 participants from 30 countries.

During the past decade, the concept of ework has undergone a major change. Instead of working in one place away from the office, we now focus on distributed and mobile work at various locations during flexible working hours. Nowadays, the activities are mediated by increasingly sophisticated communications technologies. eWork is becoming increasingly common as a result of general economic, technological and organisational progress. It is based on expanding information networks, through which one's own working community is today integrated with those of clients and reference groups. For a large number of employees and entrepreneurs, the information network already is a very natural working environment. The slogan of the conference, "Connected presence - Working together on the net", referred specifically to working within such information networks.

The premise of the conference was that ework needs to be discussed in the broader context of social and economic change in Europe. The programme of the conference was seeking for an answer to the question of how information and communications technologies could enable the realisation of economically, socially and regionally sustainable solutions in the organisation of work and business activities. As a fresh viewpoint, the programmatic development of working life was added to the traditional programme of the Telework conferences. The conference programme also had an academic section, which looked into the trust and the social and intellectual capital as a base for successful implementation of ework

Half the presentations during the conference were given by speakers of organisations in the private sector and half by those in the public sector. The conference proved highly successful in its attempt to have the representatives of the public, private and academic sectors come together. It was a forum that brought together the lines of thought on the European knowledge society, employment and regional policy, the experiences of those involved in concrete developmental work and business activities, and good practices, as well as the results of both theoretical and empirical studies. The event contributed to European knowledge society policy, the application of new ways of work and organisational development in Europe, as well as the understanding of the current state of the subject matter among the different parties involved. There was also a general review of the situation regarding e-work in Central and Eastern Europe.

eWork 2001 was a cooperative effort of the Finnish Ministry of Labour and the University of Tampere, and part of the organising was carried out as e-work. The event was realised in cooperation with the European Commission DG Information Society and many other partners, most notable of which were Elisa Communications Oy, Workplace Development Programme Finland and the National Telework Theme Group. Professor Reima Suomi of Turku School of Economics and Business Administration organised the academic stream of the conference.

The conference website : *http://www.telework2001.fi* provides documentation of the presentations.

6.2   *EPRI Conference*   *11/12 September 2001 (Helsinki &*
Tallinn)

THE FOURTH

The Fourth EPRI Conference of Members of National Parliaments took place in Finland (Helsinki) and Estonia (Tallinn) on the 11 and 12 September 2001, just before the eWork 2001 Conference on 'New Ways to Work', as both Conferences are thematically linked.

The EPRI Conference aims to keep MPs updated on European information society issues and enable them to exchange their experience on the use of Information and Communication Technologies in a parliamentary environment. It was first launched by the EPRI Watch project (AC 097) on the occasion of the Telework 1998 Conference in Lisbon, where a number of Members of national Parliaments expressed interest in such concertation meetings. Since then, four EPRI Conferences have been held. The first took place in Paris (Assemblée Nationale) in March 1999 under the presidency of Mr. Laurent Fabius; the second in Athens (Greek Parliament) in February 2000 under the presidency of Mr. Apostolos Kaklamanis; and the third in London (House of Commons) in September 2000, on the invitation of the Speaker of the House of Commons and under the presidency of Mr. Andrew Miller, alongside the Telework 2000 Conference. This fourth EPRI Conference was focused particularly on the more effective use of ICT to improve parliamentary democracy.

The eWork Conference of the 12-14 September 2001 in Helsinki was built around the themes of the new economy, new technology and more specifically the new ways of working. One purpose of the eWork Conference was to address and resolve issues regarding the organisation and restructuring of the business and working environment with the use of ICT. In the concluding session of eWork 2001 a report of the EPRI Conference was presented by Mr Jouni Backman, Member of the Finnish Parliament and of the Committee of the Future.

Organisation and Preparation of the EPRI Conference

The EPRI Conference was prepared in co-operation between the Committee of the Future of the Finnish Parliament, the Estonian Parliament and the EPRI Office in Brussels.
Before the Conference, a briefing paper about eEurope and related policies and issues on the European level was prepared and sent to all delegates registered. Finally, the EPRI Office also drafted a statement to be agreed upon during the Conference and addressing the Ministerial Meeting at the eGovernment Conference at the end of November 2001 in Brussels.

Participants

The Conference was attended by a high number of delegates from different national Parliaments. Around 70 people participated in this two day event from twenty European and newly accessing countries. The participants were national MPs or Senators specialised in information society issues but also active members of IT or 'development' committees of their Parliaments. Apart from the MPs, a few staff members and advisers of the parliamentary IT departments were also present.

The Sessions

At the beginning of the two day-sessions, the hosting Parliaments (Finland and Estonia) opened the discussion with a presentation of their parliamentary IT system. The sessions were also chaired and co-ordinated by members of the respective parliaments. During the two days, most of the delegates gave presentations regarding the use of ICT in

their national Parliaments, showed the latest developments and discussed possible routes of development. Some of the most ICT advanced parliaments with the most effective parliamentary infrastructures were proposed as 'best practices' for other parliaments in less advanced countries.

The Parliamentarians exchanged their opinions on the use of ICT technologies and the impediments with respect to the implementation of ICT on a national basis.

The two days sessions and the presentations were based on three basic thematic axes, which were:
How Parliaments can use ICT to legislate more effectively?
How can Parliaments use ICT to increase their control over Governments?
How can Parliaments use ICT to communicate more effectively with their citizens?

The first thematic axis targeted the improvement of access to information in the Parliaments and on the proposal of ways of linkage between the current, past and future European legislation. ICT is expected to enable all European citizens to increase their awareness on legislation and contact with laws in one or another way.

The second theme of discussion examined best practices for access to data regarding the policy-making procedures of the Parliaments and especially the ways for better and more effective control of the results of governmental work by its citizens via questions or mailing lists.

As for the third issue, the participants should invent better ways of communication between the citizens and governments with the help of ICT and reconsider the mediation role of parliamentarians.

Further details can be found at : *www.epri.org*

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6.3   *European eWeek 2001*   *31 October 2001-7 November 2001*

European eWork Awards 2001

Topping out European eWeek - organised since 1995 in the first week of November - the eWork Awards 2001 have been distributed on 12th November during a conference held in Sodehotel La Woluwe in Brussels.

Category 1 : Best Example of eInnovation in a Large Enterprise

This category is for large - generally viewed as most "traditional" - organisations, commercial and public, where innovative use of information and communication technologies (ICT), internally (e-work) and/or externally (e-business, e-governance), has led to significantly improved performance.

Criteria to be considered : breadth of uptake, level of innovation, clarity of objectives and measured achievements (e.g. marketing and/or financial results, user satisfaction, personnel management, costs of administration, logistics, infrastructure, etc.).

Category 2 : Best Example of eInnovation in a Small or Medium Enterprise

Candidates in this category are SMEs using various forms of business practice and organisation, through internal (e-work) and external (e-business) electronic networking, in order to reduce both their investment and operational costs and their time-to-market.

Criteria to be considered : integration of technology use in business process, level of innovation, clarity of objectives and measured achievements (e.g. width of markets and networks in which the enterprise operates).

Category 3 : Best Initiative Supporting Inclusion of Individuals

Such initiatives have as an objective to use ICT to support productive inclusion of disadvantaged groups. These include equal work opportunities for disabled and elderly people with reduced mobility, as well as for women or for ethnic and other minorities.

Criteria to be considered : measured impact, as well as the potential impact to stimulate the social inclusion, applicability to other people groups or groups in other regions.

Category 4 : Best Initiative Supporting Regional Development

Such initiatives aim to use ICT to support the inclusion of remote or underdeveloped regions in the national, European or global economic circuits.

Criteria to be considered : measured impact, as well as the potential impact to stimulate the economic growth, applicability to other regions.

Category 5 : Best Contribution to Public Awareness

Candidates in this category are media, news, advertising agencies or their clients, etc. A single or multiple advertisement campaign, article or broadcast, periodical publication, website, major event, relating to the promotion of uptake of ePractice, all these and more are eligible.

Criteria to be considered : originality, reach and effectiveness.

Category 6 : Best Supporting Technology or Service

New technologies and services are coming on the market every day. In this category, there are only winners, although there is just one first prize; all nominees will grasp the attention of authorities, enterprises and individuals who promote new methods of work and business organisation, in Europe and beyond, and tune in for the eWeek Awards.

The audience votes are counted, and merged with those having been cast via the Internet prior to the ceremony, and those expressed by the expert panel.
The Awards were presented in person, by their designer, the French sculptress - Liliane Caumont.

The winners were :

Category 1 :	Belgacom (BE)	http://www.belgacom.be
Category 2 :	No award was given.	
Category 3 :	Leonard Cheshire (UK)	http://www.leonard-cheshire.org/
Category 4 :	Kuusamo Town (Fi)	http://www.kuusamo.fi/eng/index.htm
Category 5 :	Flexibility.co.uk (UK)	http://www.flexibility.co.uk/index.htm
Category 6 :	TeleworkWhere (NL/IT)	http://www.teleworkwhere.com
Category 7 :	Leonard Cheshire (UK)	http://www.leonard-cheshire.org/

Special Award

This was given to the nominee that the judges present felt would best benefit from the award, and would make best use of it to advance their activities.
The audience gave full approval to this.

Cyberhandiwork (F)   http://www.cyberhandiwork.com/

Etw.org website

The etw website continues to draw significant traffic with a monthly average of 50,000 hits on the site, corresponding to 8000 visitors from over 60 countries around the world. Increasingly the site will transform itself from a focus on eWeek and the awards into a broader gateway to key European issues related to the information society.

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6.4   *eWork 2002 Conference*   *25-27 September 2002 (Paris)*

*e*Work in Europe is the 9th annual European conference on teleworking and new ways to work, and is being organised by the AFTT, the Ministry of Economy, Finance and Industry and the Ministry for the Social affairs, Work and Solidarity with the support of the European Commission and the City of Paris.

Since 1994, well-known international specialists in innovative methods of work get together, during 3 days, to talk about best practices, listen to the pioneers in enterprise, discover the technologies of tomorrow and think about the new questions.

These days of testimony, reflection and intensive exchanges represent a unique opportunity for those executives, concerned about their company's performance and the profitability of their business, to discover the example or the practical case that might help in their decision-making process.

In 2002, this meeting will take place in Paris - 25-27 September - at the Conference Centre Pierre Mendès France.

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 *e*Work Assembly will provide 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, will be an appropriate time to learn and to exchange views.

The selected topics will :

- demonstrate how *e*Work can improve competitiveness
- establish the relationship between *e*Work and corporate social responsibility
- choose the technologies best fitted to the different *e*Work activities
- discuss legal aspects linked to the implementation of *e*Work and the rating of performances
- understand the potential contribution of *e*Work to the health sector
- compare and exchange best practices between companies of different countries
- hear about social negotiations at the European level
- stimulate new cooperation in Europe
- motivate European actors to co-operate to the research projects of the 6th framework programme

Themes

Four themes have been chosen to focus participants' attention on the economic challenge of *e*Work and its social impact. The four key themes are :

eWork and competitiveness
The intensity of worldwide competition is forcing companies to adapt their organisation to the market requirements. *e*Work 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 *e*Work 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 2002	**Thursday, 26 September 2002**	**Friday, 27 September 2002**
Opening of the Assembly Plenary session Cocktail and Exhibition	4 Parallel sessions - *e*Work and competitiveness - *e*Work and corporate social responsibility - *e*Work, legislation and industrial relations - Technology for *e*Work Gala Dinner at the Paris City Hall	Plenary session Summary of the parallel sessions *e*Work European Awards Ceremony

Target group

Corporate executives, politicians and civil servants from public administrations and territorial organisations concerned about attracting and keeping the best talents in a performing and reacting organisation, pleasant to live. Personnel managers, trade unions and legal experts will debate on existing solutions in other countries. Researchers, developers and specialists will meet their international colleagues. All those with an interest in *e*Work and mobile work will find answers to their questions.

Contact

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6.5   eWeek 2002
27 September 2002-4 October 2002

What is eWeek 2002?

eWeek 2002 (**eW2002**) builds on the successful foundation of ework Week, running since 1995 and supported by the European Commission. New paradigms in business and administration now show that work and business processes need to change rapidly to match the opportunities being brought about by the emerging Information Society.

These changes are more profound than the simple relocation of work suggested by the terms telework, or changes in business practice connected to e-Commerce, hence the broader scope of eWeek in comparison to previous years.

eW2002 aims to reach out to the broadest population of European citizens, and help them understand this process of change, helping to accelerate adoption of new methods and changing attitudes to their implementation. This is achieved through focussed events held across Europe.

These events are typically held, not only in the large cities, but also in the regions where individuals have less opportunity to attend events. The events may take the form of discussions, workshops, open-days, and seminars. In addition other forms of event may take place virtually across the Internet, or through phone-in on local radio, etc.

The topics covered in these events can also be wide ranging with some of the possible topics outlined below:
- The social impacts of working in the Information Society
- New working practices to help the integration of the disadvantaged into work
- Impact of new working practices on work legislation
- Developing a competitive edge by introducing e-practices

Organisers of events are encouraged to network and use the branding of eW2002 to maximise their local impact, and draw on resources that might not be usually available to them.

eW2002 will actively contribute to European Union policy objectives, outlined in the eEurope initiative, the "Strategy for Jobs in the Knowledge Economy".

History

TeleWeek was launched in 1995, and has run every year since then. During this time there have been:
- Over 500 events, attended by over 60,000 people
- Over 1000 press articles, published in national, regional, and specialist publications
- Programs and interviews about telework, broadcast on national, regional and international TV and Radio

Each year several million Europeans have been helped to understand the processes and issues of the information society. Largely this has been achieved with low budgets and a lot of goodwill from local organisers.

The Objectives

For Europe and its citizens to continue to enjoy improving living standards and quality of life they need to adapt to the rapid change that is confronting them. The primary objective of **eW2002** is to accelerate the processes that help businesses, administrations and individuals adapt to the changing business and working environments.

A second objective is to extend previous activities to include the new accession countries, helping to align their economies with those of the current members.

The Targets

- Organisations exploring and implementing new business practices
- Individuals, working for or managing, these organisations
- Strategists and policy makers shaping the Information Society
- The broad public via press and media

More information about events in eWeek 2002 will be found on **www.etw.org**

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6.6   **_Infobalt 2002 Conference_**   **_21/23   October   2002_**
(Vilnius)

9th International Exhibition "INFOBALT 2002"

4th International Conference on Information Society "Develop an Innovative Trade and Work Area" and League of Investors "Partnership and Funding"

On October 21-23 2002, Lithuania's capital city of Vilnius is hosting 4th International Conference on Information Society 2002 which is organised by the INFOBALT Association of Lithuanian information technologies, telecommunications and office equipment together with the European Committee under the Government of the Republic of Lithuania, Committee on Information Society Development at the Government of the Republic of Lithuania and State Data Protection Inspectorate of the Government of Lithuania.

The topic of the conference - **the impact of development of information technologies, telecommunications and electronics industry to the innovative trade and work methods in information**: international colaboration possibilities, know how transfer and development cooperating with European partners, export and investments, e-business, internet and mobility, knowledge economics, future companies and technologies, information protection and the legal environment.

The conference is to serve the following goals :

- **Present to the public** key trends of development in the fields of new information technologies, telecommunications, electronics (ITTE) and industry of new technologies and discuss on new trade and work methods in the countries of Central and Eastern Europe and CIS.
- **Answer the question of the digital age** as to how export and investment development is to facilitate a more active involvement and cooperation of the countries and citisens of Central and Eastern Europe and CIS, and stimulate the breakdown of social, political and economic barriers.
- **Realise** advantages and stimula provided by information society, ITTE industry, new technologies and knowledge economics, attract investments to joint projects of the EU countries and countries of Central and Eastern Europe and CIS and stimulate their partnership.
- **Introduce** ITTE related EU programmes already opened and also opening for Baltic States and CEEC and changes in participation conditions from 2003; introduce possible fields of common activities for ITTE industries from different European states; through the programmes' presentation introduce key directions of EU activities in ITTE field; disseminate key objectives of eEurope and eEurope + action plans.

Invited and to be to attend the conference Information Society 2002 are ministers and vice-ministers of economy and trade of the countries of Central and Eastern Europe and CIS, managers of ITTE and new technologies companies, specialists, representatives of e-business, e-banking, international organisations, politicians and scientists, investors, representatives of European ITTE related programmes and their local representatives.

The conference consist of general discussion on the topics of the forum during the pleneray sessions, League of Investors **"Partnership and Funding", Multimedia League,** workshop **"Individual in the World of Information Technologies - Possibilities and Risks**", workshop **"EU Programmes: Cooperation and Creation of Common Trade and Work Area"** that will be followed by **"Match making"** during the workshop and then transferred to the 9th International Exhibition INFOBALT 2002.

Parallel Session "Future Telecommunications" will concentrate on the issues of the telecommunication market liberalization in Baltic States and CEEC, application of broadband connection to the internet, last mile issue, possibilities for cheaper Internet in the region. Also project "Internet house and public access points for citizens" driven by leading Lithuanian ITT companies will be presented for the session.

The session also focuses on mobile communications and mobile systems, optical networks and impact of web services on networks.

Infobalt Association together with State Data Protection Inspectorate organises the workshop "**Individual in the World of Information Technologies - Possibilities and Risks**" during the conference, which will take place in Vilnius, 20-21 October. During this session will be discussed the main data protection issues with which we confront nowadays.

The issues are following: the requirements of EU for the safe information society, freedom of information and data protection, expectancy of privacy using internet, public registers and data on the creditworthiness of data subject, codes of conducts, activities of personal data protection and IT security officials, videosurveillance, fight against organised crime and control of personal data, smart cards and other issues related to the data protection and IT development.

The **speakers** are invited to take part in this session from European Commission (Internal Market Directorate-General, Information Society Directorate-General), Sweden, Hungary, Germany, Poland, Czech Republic, Estonia.

League of Investors "Partnership and Funding" will be devoted for the possibilities of the ICT business culture development in the Baltic region. New high technologies, knowledge management, scientific research, investment accumulation and new e-economy are the basics of business culture quality and efficiency.

League of Investors will be focusing on the discussion of the trends of target investments into SME e-business projects as well as investment into e-business infrastructure projects and ICT business incubators.

League of Investors 2002 will last for one day and be based on the principles of success, partnership, knowledge and investment. It will serve as a forum for the leading information society technology service and new economy companies in which they can introduce themselves and their projects, attract attention and meet potential investors and partners.

The event will show how new and most successful Baltic ICT companies develop technologies and install innovations.

Workshop **"EU Programmes: Cooperation and Creation of Common Trade and Work Area" (October 22-23)** pursue the goal to introduce European programmes devoted to the development of information society in the European scale. Currently these programmes change participation conditions for the entities from Baltic states and CEEC. Joining them accession countries join the activities and trends described as priority directions in EU. To facilitate this process workshop will concentrate on introduction of few European programmes by the their representatives. This should lead to face-to-face discussion of (i) programmes representatives and possible and actual participants and (ii) also the discussion of parties interested in future cooperation in the ITTE field or extension of collaboration.

Workshop intends to gather all interested parties from all European countries. This process will facilitate "the distributed attraction of participants" – the interested parties will invite possible partners, which will find more possibilities and contacts in the conference for further development of collaboration and new partners inclusion. FP6, IST, IDA, TEN-Telecom, etc. to be introduced.

During the workshop **"Match Making" (October 22-26)** process will start. It is devoted for establishing of concrete contacts between potential and actual participants in these programmes. This process will be continued during the exhibition INFOBALT 2002 (October 23-26), where will be organized "EU Programmes" stand. It will provide place for business contacts and meetings of different organizations and enterprises interested in collaboration under umbrella of EU programmes. By the way all the parties will have

occasion to get acquainted to the ITTE sector that will be represented by approximately 200 participants of INFOBALT 2002 Trade Fair - the largest ITTE devoted exhibition in Baltic States. **"Match Making"** will be forwarded by large-scale promotion and advertising campaign, contacting current projects holders and advertising using all means accessible to INFOBALT and other organizers and partners. **"Match Making"** will be supported by virtual contact place in the INFOBALT web site, which enable to find partners in the area of common interests. This service will opened three months prior the Forum and will stay on line as permanent meeting place and interests generation environment for common projects in future.

Telebalt Conference : "Teleworkgin for Business, Education, Research and eCommerce"

Organised by INFOBALT - Association of Information Technologies, Telecommunications and Office Equipment of Lithuania in the frame of the project **TELEBALT** (*Teleworking as a Tool for Information Society Technologies Programme Promotion to Baltic States)* funded by Information Society Programme of the European Union. The conference is organized in co-operation with "Earth Data Networks for Education and Scientific Exchange" (EDNES), France, public foundation Open Latvia, and Information Society Development Committee under the Government of the Republic of Lithuania.

The "Teleworking for Business, Education, Research and e-Commerce" conference aims at strengthening the scientific and technological co-operation between the European Union and the Newly Associated States (NAS), in particular the Baltic countries in the field of IT application to new methods of work, business, education, research, e-commerce, medicine, regional development and social integration using IT.

The TELEBALT conference will be organised during the same week as the yearly forum INFOBALT 2002 (21-26 October) and is stated as a parallel event to this forum. The INFOBALT 2002 forum will be held, along with the fourth Information Society Conference "Develop an Innovative Trade and Work Area for Information Society". Another events in Vilnius at the same period of time are League of Investors, the Baltic Sea and CEEC Data Protection and Information Security Workshop and the 9th International Exhibition INFOBALT of Information Society Technologies. The information society technologies sector has been defined by the most countries as a powerful engine in their economic development. Lithuania pursues the creation of optimally favourable conditions for the growth of the ITT industry, which would be of benefit to the population, public sector and business world in the improvement of the quality of life.
Participants of TELEBALT conference will have special access to participate in the INFOBALT 2002 forum.

All projects, research institutions and companies involved in IST are encouraged to participate in the conference and submit papers for presentation of their activities. The abstracts and presentations of the conference will be published electronically and in hardcopies before the conference.
INFOBALT 2002 forum and TELEBALT conference promote ideas of the modern world focusing at the Information Society technologies. They are open for all representatives of internationals organizations, professionals, business and science representatives and individuals. We strongly believe that it is our common efforts that can facilitate integration into global processes of development.

Topics of Interest

European IST Programme and 6FP, Teleworking and e-WORK projects under 5FP, Teleworking/telecommuting/e-Work history and review, Teleworking cons and pro, advantages, benefits and disadvantages, barriers and pitfalls in business area, Telework/e-Work/telecommuting ontology, taxonomy, glossary, Teleworking social, cultural, psychological, ethic and legal issues, E -Work and Semantic Web, Management of teleworking, Teleworking SWOT analysis, Teleworking for e-commerce, Teletrade, telebusiness, Teleeducation, Telemedicine, Teleresearch, Telematic software system, Teleworking and public institutions (including e-Government), Teleworking and regional development, Teleworking and mass media, Teleworking and culture, Teleworking and social integration for disabled people, Mobile teleworking, Flexible work, Remote work, Distant work, Distributed work, Virtual office, Alternative officing and satellite office, Hotelling, Home office, Telework national and international organizations, Telework, e-Work and tradeunions, Telework, e-Work business policy, Collaboration, cooperation, telecooperation, Teamwork, groupware, Learning organization.

Special session of the conference will be devoted to presentation of TELEBALT training courses.
IST and connected European projects invited to the conference
Eastern Europe E-work (E3Work)
Towards a European E-Commerce Ambient in the Craft Sector (EASYCRAFT)
European Knowledge Platform (EKP)
Estimation and Mapping of Employment Relocation in a Global Economy in the New Communications Environment (Emergence)
Demonstrating and promoting the take-up of new ways of FLEXIBLE WORKING among outlying regions and SMEs (FlexWork)
Open Network for Tourism (ONTOUR)
Personalised Access to Local Information and services for tourists (PALIO)
Small and Medium Sized Enterprises Alliance through Research in Tourism (SmartUp)
Technology Exploitation and Adaptable Methodologies (TEAM) offering new Organisational Models and Practices for e-Working Teams (TEAMwork)
Telework Solutions for Promotion of EU Cooperation in Business and Research with the Commonwealth of Independent States (TELESOL)
Towards Handicap Integration Negotiating Knowledge (THINK)
Virtual Presence System (VPS)
New Methods of Working for Information Society Technologies Programme Promotion to Commonwealth of Independent States (WISTCIS)

For more information

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Annex 1:   **EUROPEAN eWORK**
AWARDS

The European eWeek greatly extends the outreach and awareness activities for new methods of carrying out work and business, throughout Europe and into the new accession states, building on the formula of local events, and media coverage of these events and best practice drawn from local communities. The best practice element has been highlighted in the European Telework Awards which were launched in 1997. Since then, about 200 examples from industry and administrations around Europe have been submitted as candidates for the awards and are acknowledged to bring significant benefits to the participants.

This year the awards will be held at the 9th European Assembly on ework in Paris, with the support of the Beep project.

www.ework-in-europe.com

www.beep-eu.org

Award Categories

Work and Skills

This category is for organisations, projects and programmes, commercial and public, where the use of modern information and communication technologies (ICT) has contributed to the achievement of one or more of the following objectives.

- Improving skills and competencies : 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.

The Digital SME

Competing in this category are Small or Medium Enterprises (SME) which demonstrate 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 organisation (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.

Social Inclusion

Candidates in this category are 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.

Regional Development

Candidates in this category are 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.

Procedures and Deadlines for Candidates

The dossier should be either posted on the candidate's web site and the URL communicated, or sent to the organisers for display on the eWeek 2002 website (*http://www.etw.org*).

The dossier should be e-mailed to cvanasbroeck@martech-intl.com by **Wednesday, July 31st. 17:00 CET.**

Guidelines for the dossier contents

- Outline of the nomination entry (5 to 10, A4 pages), and attachments as required (articles, papers, videos, posters, advertisements, etc.)
- Translation or transcript in English if necessary
- PowerPoint and/or video presentation (Optional in initial submission - required if shortlisted)
- Permission to make copies for evaluation purposes, and for public display (incl. www)

Outline of 5 to 10 pages should include

- Title of the activity, initiative, or project
- Short description of the activity - 200 words (suitable for press releases etc.)
- Participants in the activity, companies, groups, associations, etc.
- Target groups - industry, private, disadvantaged, etc.
- Objectives - why has the activity been initiated, what did it hope to achieve
- Achievements - what has the activity achieved with as much quantification as possible
- Detailed description of activity
- Assessment of impact, quantified where possible.
- Links to web-sites etc.

Selection of Three Nominees per Category

This will be done by an Expert Panel; nominees will be announced on **Thursday August 15th** on the eWeek 2002 website.

Election of One Winner per Category

The public will be allowed to vote for the Winners in each category, from August 15th until September 15th, via the eWeek 2002 website. The attendees and the Expert Panel will vote at the Awards Ceremony in Paris and the Winners will be announced.

Final evaluation

- Expert Panel: relative weight 1
- Public voting: relative weight 0.5
- Audience voting: relative weight 0.5

European eWeek Awards Ceremony

The ceremony will be held in Paris in the afternoon of Friday, September 27th, at the beginning of eWeek 2002.

The eWeek Awards

Each of the 4 Awards is a numbered copy moulded from a unique sculpture by French sculptress **Liliane Caumont,** symbolising the role of man and woman working in a global environment.

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www.etw.org

Annex 2:   EUROPEAN PROJECTS (in alphabetical order)

ACCESS-maints	Advanced Cross-Communication Environment providing Support Services to dispersed MAINtenance and Technical Support engineers	IST Programme IST-1999-11763

The purpose of the Project is the architectural design, implementation and experimentation of an Innovative Integrated Communication and Delivery Platform to collect, manage, share and transfer Corporate Knowledge to experienced technicians and to young professionals for engineering activity support in geographically dispersed sites. The project is based on an in-depth assessment of the user needs and an early identification of usability barriers that nowadays make hard the effective access to valuable Corporate Knowledge in manufacturing industries. Different types of European environments were chosen for project validation: the Aerospace Division of a large European aerospace industry, a small machinery manufacturer operating in the context of supple to automotive industries and an academic environment for industrial training.

The main objective is the implementation of a Corporate Knowledge (CK) Management and Delivery Platform that will permit experienced technicians and young professionals (working in geographically dispersed sites for large companies or for SMEs) to receive appropriate support for their engineering activity. A second objective is the definition of methodologies, rules and tools which will permit to collect and share those parts of CK having direct impacts on the specific industrial areas. This CK does not belong to one company but it is usually distributed throughout the full chain provider-integrator-client. Another objective is measuring the cost/effectiveness (mainly for SMEs) of an operational environment for off-site maintenance based on different speed INTERNET connections and Satellite Communications. A final objective of the project is the definition of a preliminary list of suggestions for possible extensions of the Platform concepts for future aerospace applications.

Project period : February 2000 - January 2002 (24 months)

Contact: *Lorenzo Masera*
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ASSIST 10934	Knowledge Management for Help Desk Operators	IST Programme IST-1999-10934

The ASSIST project focuses on the need of large organisations operating help desks to provide their operators, especially remote workers, with knowledge management facilities. The benefits sought with those facilities concern: effectiveness and efficiency of work, i.e. to support help desk operators with the relevant corporate knowledge and expertise; corporate learning, i.e. to get feed-back from the help desk operators on customers problems in order to improve both operations and support material; and flexibility and scalability of operations, i.e. to involve remote workers (be they working solely remotely or combining office and home work).

 The project combines innovative technologies such as XML-based knowledge representation, advanced user interface and integration of knowledge management with operations performance measurement. The ASSIST solution will be validated through pilot integration with 2 Help Desks in the sectors of Telecommunication and Postal services. The

approach of rapid prototyping will be applied in the project and three successive versions of the system. This will allow a progressive validation of the ASSIST tools from a controlled environment to fully operational Help Desks. Particular emphasis will be put during the validation phase on (a) the assessment of the business benefit for the enterprises managing the Help Desks, and on (b) the satisfaction of Help Desk operators and customers.

Project period : February 2000 - January 2002 (24 months)

Contact: *Teixeira-Guerra*
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ASSIST 29044	Achieving Sustainability by using Substitutive Information Society Technologies	IST Programme IST-1999-29044

ASSIST is a study addressing a key issue in the contribution of IST to sustainability, that of the potential for the substitution of IST analogs for material consumption (virtualisation or immaterialisation). Most consumption is unrelated to basic needs but is to satisfy non-material needs (place in society, individuality, etc). Consumption substitution by IST thus offers a powerful route to sustainability. However, design of substitution techniques necessitates both a good knowledge of the reasons for consumption and of, inter alia, the sensory and ontological aspects of IST. ASSIST's objective is to contribute to IST by surveying existing multi and cross-disciplinary work in the area, and making recommendations for future work and proposing new parameters for product and service design (www.ecoplan.org/assist).

Project period : November 2000 - February 2002 (16 months)

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ATTRACT	Advanced Teleworking Techniques and Tele-services for Insurance Agents and Customers	IST Programme IST-1999-20960

The ATTRACT project aims to transform the traditional working environment that exists in the Insurance sector to an advanced occupational tele-business environment, based on networked organizational structures, introducing new methods of work for the insurance agents. Additionally, the project aims to set up new business opportunities for vendors, acting in content related complementary markets, introducing new methods of interaction with the potential customers and new models for providing services to citizens (personalized on & off line cybermediation). Finally, ATTRACT will provide a set of value added tele-services to insurance customers, aiming to increase customer satisfaction as well as to gain customer loyalty. The above aims will be achieved through the development of an integrated environment, using value added technologies and tested business practices.

Project period : November 2000 - October 2002 (24 months)

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                                                     www.cyberce.gr/attract

AUDIOTAIN	Empowering audio content providers through ework and interactivity management to exploit audio knowledge bases in the market for interactive audio entertainment	IST Programme IST-2000-29302

AUDIOTAIN will enable 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 will lead to new intra- and inter-organizational processes and, in particular, to new methods and models of ework and e-commerce in the respective organizations employing the Audiotain technology and beyond. The technology development will result 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 will be validated and demonstrated in three different next generation interactive audio applications in: interactive news and current affairs infotainment, interactive music entertainment, and interactive science & technology edutainment.

Project period : September 2001 - September 2003 (24 months)

Contact: *Reiner Raestrup*
Sender Freies Berlin   *Tel.: +49 30 3031 3227*
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Masurenallee 8/14   *E-mail : reiner.raestrup@sfb.de*
D - 14057 Berlin   *www.audiotain.com*

AVATAR CONFERENCE	**Avatar-based Conferencing in Virtual Worlds for Business Purposes** **IST Programme**	**IST Programme** **IST-2000-26173**

AVATAR-Conference project aims to develop a toolkit for the set-up and administration of virtual online conferences in which users are represented as avatars, i.e. as animated 3D figures. The system will be designed as a scalable, modular application, offering a large number of supportive functions: - multimedia multi-user real-time communication, speech and voice recognition facilities combined with online translation services, connection to B2B E-Commerce enterprise data, user representation through 3D avatars within virtual worlds, multi-user 3D manipulation and whiteboard, clients on PC and other multimedia devices, application-sharing facilities. The AVATAR-Conference system will also provide the means for spontaneous, intuitive and intense communication between project partners. The system will especially be characterised by its high usability.

Project period : January 2001 - December 2002 (24 months)

Contact: *Heidi Schmid*
Fraunhofer Institut für Arbeitswirtschaft und Organisation *Tel.: +49 711 970 2318*
Nobelstr. 12   *Fax: +49 711 970 2300*
D - 70569 Stuttgart   *E-mail : heidi.schmid@iao.fhg.de*
                                                            http://www.3xodus.com/avatar_conference/

A/VPACK	**Adoption and Enhancement of open frameworks for converged** **Audio/Video/TV provision for the home user**	**IST Programme** **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.

Project Period : (18 months)

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BALTPORTS-IT	Simulation and IT-Solutions : Applications in the Baltic Ports´ Areas of the Newly Associated States	IST Programme IST-2001-33030

The first steps are directed to establish the necessary organisational 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 organisations 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.

Project period : August 2001 - July 2003 (24 months)

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BANCA	Biometric Access Control for Networked and e-Commerce Applications	IST Programme IST-1999-11159

The project will develop and implement a complete secured system with enhanced identification, authentication and access control schemes for Internet applications such as teleworking 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 area of teleworking, web-banking, and biometric ATMs (Automatic Teller Machines).

In the first phase, real condition databases for image and speech will be collected using pre-defined hardware to form a common and meaningful basis for algorithm evaluation and refinement. Detailed specifications will ensure compatibility and usability of the acquired data. This database will be used to evaluate biometric technologies suitable to user needs for the envisaged applications. Concurrently, a pilot demonstrator will be 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 teleworking, web-banking and biometrics ATMs will be built and tested at developer sites. Final field tests will be conducted for all three applications by providers and end-users.

Project period : June 2000 - January 2003 (32 months)

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BEATRICE-SME	**Best Entreprise practice using Advanced Technologies in Recycling Industries for e-Commerce and E-business in Small and Medium-sized Entreprises**	**IST Programme IST-2001-35054**

The overall objective of BEATRICE-SME is to explore and introduce new forms of smart organisation of work of SMEs in the recycling domain and identify and implement appropriate advanced IST solutions to support such new forms of organisations, aiming at optimal achievement for both economic and ecological goals of the recycling chains. The application of the common methodology will enable 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 will address 5 different forms of collaboration among the SMEs in recycling area. The solutions to be 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.

Project Period : April 2002 - September 2003 (18 months)

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BEEP	**BesteEuropePractices**	**IST Programme IST-2000-26224**

The BEEP project is concerned with analysing and exploiting 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 will be used, most of which are not widely used and few are interlinked, though there is a great need for understanding and exploiting available knowledge at a European level. BEEP will also update this best practice knowledge in line with on-going developments, especially by closely supporting RTD projects and taking up their results. Data will be analysed qualitatively and quantitatively to draw out socio-economic best practice and provide benchmarking standards. Results will be widely disseminated in the programme and produce three fully developed services: socio-economic best practice, benchmarking, and linked knowledge (data) bases. These services will comprise a comprehensive set of tools available interactively on a user-friendly web-site which organisations and individuals will be able to easily exploit.

Project Period : January 2001 - June 2003 (30 months)

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BEEP-NAS	Best eEurope Practices – NAS	IST Programme IST-2001-37444

BEEP is an existing Cross Programme Action whose overall aim is to develop, test and implement a methodology linking best practice, benchmarking and knowledge management which has wide applicability across Europe and the IST programme, as well as providing a sustainable service package in the longer term having commercial potential. BEEP is providing access to over 300 well documented cases from the EU with about 10% from North America, covering the domains of work and skills, the digital SME, social inclusion and regional cohesion. BEEP's comprehensive knowledge base, accessed via the Internet, will be usable by anyone to: - survey who has done what in the 4 domains - benchmark (i.e. measure and compare) themselves against the best examples in the 4 domains - investigate what constitutes best practice in the 4 domains using actual examples of real practical achievements - access a variety of up-to-date surveys and analyses of best practice in the 4 domains In this proposed project extension with nine NAS partners, full coverage of NAS countries will be obtained by the inclusion of 180 additional cases and dissemination and marketing throughout Europe.

Project period : (12 months)

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CAPERS	Computer Aided Post for EasteRn States	IST Programme IST-1999-20733

CAPERS will transfer and deploy BEST PRACTICES and supporting technologies to enable pre-accession countries to operate postal services to the required European standards. CAPERS brings together a group of organisations uniquely qualified to provide the experience and abilities needed to achieve the project objectives. The main partners, PostEurop and IPC, are non-profit making organisations established by national postal operators for the exclusive purpose of supporting and adding value to international postal operations. These partners will 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 will identify how the functionality of new track and trace systems will be allocated in each of the User countries. Each participant will analyse which specific functions are already performed today and how, and will identify the sources of information that must be provided to the new system. The planning step will translate the analysis results into definitions and acquisitions; will define interfaces to the track and trace system and define technology aspects for required data capture. New local operational procedures and supporting material will be defined and developed. Implementation will take the system to readiness for live operation. Project experiences including development business practices will be documented and packaged to support dissemination to further countries.

Project Period : January 2001 - June 2002 (18 months)

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CAPERS-Extension	**Computer Aided Post for EasteRn States (Extension)**	**IST Programme IST-2001-39221**

CAPERS (NAS) Extension is an extension to IST-1999-20733.It considerably strengthens the original project and adds value by transferring Best Practice to more Posts from Newly Associated States. The added value comes because postal networks are inherently interdependent.Spreading the best practice of CAPERS in East Europe can remove undesirable patchiness in the Pan-European Postal network.Furtherrnore having neighbouring states join is a basis for valuable regional imp acts. European Posts have made considerable investments in open-standard technology and caused significant and measurable improvements to the quality of service of trans-European mail .Much of this was funded by the EU Framework programmes. CAPERS (NAS) Extension exploits the expertise developed under CAPERS and framework programmes and progresses new way of working by focussing on e-management of Postal regional networks.

Project Period : July 2002 - April 2003 (9 months)

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DEESD	**Digital Europe : e-business and sustainable development**	**IST Programme IST-2000-28606**

DEESD aims to identify the crucial role that e-commerce and ework can play in creating an information society that is more user friendly, socially inclusive and environmentally sustainable. The project will build a convincing "business case" for the contribution that can be made by e-commerce and ework to sustainable development, including a policy framework for "sustainable electronic markets" and make 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 will provide 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 will include 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 will be a central component of the research. Eight sectors have been selected: financial services, music, food retailing, paper and pulp, auto-manufacturing, books, PCs and second-hand goods.

Project Period : July 2001 - June 2003 (24 months)

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DIVERCITY	**Distributed Virtual Workspace for Enhancing Communication within the Construction Industry**	**IST Programme IST-1999-13365**

The project primarily addresses Workplace Design by developing, integrating and evaluating innovative workplace technologies for creating innovative and new workplace environments in the building industry sector. It aims to improve the process of building design and construction by enabling the user groups to operate both more efficiently and with better interaction. The project addresses the three key building construction phases : **Client-Briefing,** which requires detailed interaction with the client, **Design Review,** which requires detailed input from multidisciplinary teams of architects, engineers, and designers, and **Construction,** whose function is to fabricate and/or refurbish the building/s. The objective is to produce a prototype virtual workspace that will enable the three key phases to be visualised and

manipulated, thus enabling better design and planning through greater interaction between all stakeholders. This will result in improved productivity and design; lower building costs with reduced waste, and improved safety both in the final building and also the construction process. The key milestones are the development of three modules for construction workspaces and their integration into the prototype system.

<u>Project period</u> : January 2000 - June 2002 (30 months)

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DUNES	**Dialogic and argUmentative Negotiation Educational Software**	**IST Programme 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)

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DYNOCA	**A System to Realise Dynamic Networked Organisations on Heterogeneous Networks in the Consultancy/Agency Sector**	**IST Programme IST-1999-11065**

The project will support distributed working teams (in different cultural areas and time zones) in planning and executing media projects in the consulting/agency sector combining: customer, main contractor, sub-contractors and suppliers. The work includes the development of organisation and software models and the implementation and evaluation of a software system within a real case scenario. This system will be extended using emerging Internet standards to realise inter-organisational information flow and management by a rapid prototyping approach.

The objective is to enable European SMEs to increase their competitiveness in the global marketplace, specifically for the consultancy/agency sector by overcoming constraints in working methods and organisation imposed by distance and time. The project will also develop reference models for inter-organisational business processes and software for project life-cycle in media/design and consultancy. The work is broken down into : requirements analysis and consolidation, development of reference models and pilot scenarios, specification and implementation of prototype systems based emerging standards (XML, digital signatures, SSL secure transmission, Java Beans, Jini), piloting of prototypes in real case pilot scenarios, exploitation and dissemination, through the Web, scientific journals, conferences and workshops.

<u>Project period</u> : January 2000 - December 2001 (24 months) + extension till February 2002

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E3 WORK	eWork in Eastern Europe	IST Programme IST-2001-33536

The E3WORK project aims to promote the use of telework and best practices of eWork 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 eWork projects will be launched in each country, training of trainers organised, and pilot teams of teleworkers hosted by industry, set up and monitored to formalise specific rules and overpass local obstacles, in relation with industry, law, local authorities and unions.

A project's Virtual Community on the web will become for the 5 countries member 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 R&D Programmes. The address of the virtual community is : *http://www.mayeticvillage.com/E3WORK*

E3WORK will, in each of the five countries, organise training and dissemination events, and local survey, and identify the specific issues to be overpassed.

Project period : October 2001 - September 2003 (24 months)

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E-COGNOS	Methodology, tools and architectures for electronic consistent knowledge management across projects and between enterprises in the construction domain.	IST Programme 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 will rely on a deep understanding of knowledge management activities of European construction companies. The analysis of the semantics within and across documents will lead onto the development of ontologies and adaptive mechanisms that can organise documents according to their contents and interdependencies. The web-based infrastructure will include services allowing to create, capture, index, retrieve and disseminate knowledge. It will also favour the integration of proprietary tools. The e-COGNOS approach will be tested and evaluated through a series of field trials. This will be followed by the delivery of business recommendations regarding the deployment of e-COGNOS in the construction sector.

Project period : July 2001 - June 2003 (24 months)

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E-COLLEG	Advanced Infrastructure for Pan-European Collaborative Engineering	IST Programme IST-1999-11746

E-Colleg will make use of enabling technologies (e.g. Jini, CORBA, RMI) for collaborative engineering based on advanced infrastructures. The work will augment existing integration technologies by scaleable, platform-independent services for dynamic configuration of infrastructure with secure access management for distributed teams, services and data, to support multi-site and multi-platform and dynamic tool integration on the basis of novel agent technology. The feasibility of this approach will be demonstrated through pan-European collaborative engineering showcases for image processing and telecommunication systems.

The objectives of E-Colleg are: to provide enabling technology for collaborative engineering based on an advanced infrastructure; to develop generic collaborative services, such as dynamic team building, that support the collaborative exploration of design trade-offs involving multiple fields of expertise during the design of complex systems; to demonstrate feasibility of the pan-European collaborative engineering by development of two industrial applications; to augment existing integration technologies by scaleable, platform-independent services for dynamic configuration of the infrastructure; to handle security and access management for distributed teams, services and data; to provide a solution for multi-site and multi-platform tool integration; to develop a technique for dynamic tool integration based on novel agent technology and to provide transparent data access by self-describing data formats based on Internet standards such as XML.

The final phase of the project will validate the extended infrastructure through its use in two distributed engineering tasks. The resulting infrastructure with its advanced services will be able to support complex distributed engineering tasks.

Project period : January 2000 - December 2002 (36 months)

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E-GAP	e-society Gap Assessment Project	IST Programme IST-2001-35179

Surveys confirm that e-work is taking place on a significant scale in Europe (e-Work Report, 2001), 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 penetration of ework between companies according to their size. The results are significantly lower among SME (ECATT Report, 2000). Another criterion is the political support in the countries. With the strong will to contribute to a better use of e-work at the levels of work people and policies frames, 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 the Community legislation taking into account regional contexts. So, the aim is to contribute to better conditions conducive to sustainable development(Göteborg, 2001).

Project Period : July 2002 - July 2004 (24 months)

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E-LIVING	Life in a Digital Europe	IST Programme IST-2000-25409

Through the use of a coordinated set of pan-European longitudinal household panel surveys this project will describe, explain, model and forecast 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 will examine the causal relationships between changes in IST usage and any subsequent changes in individual's life-styles and life experiences. The knowledge thus generated will be of significant interest to policy and strategic decision makers in both the public and commercial sectors and will be 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.

Project period : January 2001 - December 2003 (36 months)

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E-LOCUS	For a Larger Integration of the Individual at Workplace	IST Programme IST-2001-38790

E-locus aims to cluster IST projects working in the area of warkspace design, respecting the objectives of each specific type of project and action line and facilitating sinergy between them. From a larger integration of the individual point of view, it intends to interchange information and forge links between R&D teams working already in the workspace design field all around Europe. Taking the person as a whole, the person integrated at workplace and how to improve that integration incorporating innovative technologies to the process as the start point, research areas such as workplace design, organisational internal communication, organisational knowledge management, emotional intelligence and team work management will be explored, thus conforming a holistic vie of the integration of the person at workplace.

Project Period : (16 months)

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EMERGENCE	Estimation and mapping of employment relocation in a global economy in the new communications environment	IST Programme IST-1999-13420

The EMERGENCE project aims to provide reliable information both qualitative and quantitative, on delocalised telemediated work. An interdisciplinary team (plus associates in North America and Australasia) will carry out a statistical overview, develop analytical models, conduct an international survey and carry out comparative case studies to map, quantify and forecast the new international division of labour in information processing. It will make recommendations to official statistical bodies. It will dissemination information interactively, for use as a resource for research, benchmarking against global comparators, regional development, employment creation, equal opportunities and other policies.
The work includes a critical overview of the changing division of labour, an international survey of about 8000 employers in 15 EU countries and 3 EU applicant countries, (with a further approx. 2,000 in North America and Australasia), development of research instruments for comparative analysis of case studies in an international context, 60 case studies of relocated telemediated employment, both in 'source' areas and 'destination' ones, analysis of results, including their implications for social exclusion and marginalisation, for gender equality, for supply and demand for skills and for regional development, development of analytical models, on economic development toolkit for use at a regional level, an interrogable database and web-site for dissemination of results to researchers, social partners and policy makers, and a variety of other dissemination activities including seminars, workshops and presentations.

Project period : January 2000 - December 2002 (36 months)

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EU-CHINA	EU-China IST initiative in the field of e-commerce and ework	IST Programme IST-2000-29215

The central objective of the e-EUCHINA project is to promote scientific and technological collaboration between the EU and China in the field of electronic commerce and new methods of work. This initiative will encourage joint proposal submission of the European and Chinese actors under the 5th Framework Programme and the IST Programme in particular. An international conference devoted to e-commerce and ework will be organised under the umbrella of the EC and IST programme in particular. The conference Proceedings will be produced. A Trend Mapping study will be developed, which will identify the state of e-commerce and ework in China. The preliminary findings will be presented at the conference. The follow-ups of the conference will be included into the final version of the study. The project will also result in an established informative reference Web-site, which will disseminate information about the project activities and partnerships opportunities in the EU and China.

Project period : 15 June 2001 - 14 June 2002 (12 months)

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EXTERNAL	Extended Enterprise Resources, Network Architecture and Learning	IST Programme IST-1999-10091

The EXTERNAL project addresses the challenges met when forming an extended enterprise (EE), characterised by a dynamic and time-limited collaboration between business partners. The goal is to provide solutions that make this collaboration effective and repeatable. The objectives involve developing methodology, infrastructure/tools and business solutions for EE modelling, analysis, engineering and operation. The process learning, deployment of open knowledge-sharing infrastructures and validation of results will also be addressed. Three usage cases, will integrate and test the approach, the methodology, and the tools. They concern EE deployment in SMEs, EE consultancy services and the project itself. The results of the project will increase the competitiveness of European enterprises and provide new ways of knowledge-work collaboration.

The following activities will be undertaken : development of a methodology for EE engineering and operation, development of tools for application of EE methodology, supporting process learning at the level of individuals, teams and organisations, development and deployment of an open knowledge sharing EE infrastructure, developing business solutions from the EE methodology and infrastructure, validating EE methodology and EE infrastructure and Ensuring early and continuous exploitation and dissemination of results.

EXTERNAL will support process collaboration with embedded knowledge and change management : creating, sharing, harvesting, and re-activating knowledge. The project thus targets the integration and convergence of currently fragmented business process technologies. Using EXTERNAL results, companies can transform and extend their operations through a propose open infrastructure. This allows for the interoperability of participating dynamic networked partners.

Project period : January 2000 - December 2002 (36 months)

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FAMILIES	Families, Work and IST: A study of the interactions between family trends and new work methods in the Information Society	IST Programme IST-1999-14115

Families are central to the adoption of new ICT-based work methods and, conversely, the new work methods can impact on families for better or worse. The FAMILIES study will provide the first comprehensive and focused investigation of this area. It will analyse the key interactions between families and the new ICT-based work methods, empirically investigate these interactions as they arise for real families , define the policy and RTD implications , and disseminate the results inside and outside the programne. The results will help the RTD programme and projects to address the requirements for "family-friendly" systems and services, and contribute to the achievement of EC policy objectives in employment, equal opportunities, information society and other fields.

Project period : September 2000 - February 2002 (18 months)

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FLEXWORK	Demonstrating and Promoting the Take-up of New Ways of Flexible Working among Outlying Regions and SMEs	IST Programme IST-2000-26367

The aim of Flexwork is to promote the adoption of innovative ways of flexible working, using technologies from IST, by users in outlying or technologically disadvantaged regions of Europe, with special emphasis on SMEs. Flexwork will co-operate closely with EURADA (European Association of Regional Development Agencies), ADAPT (European Employment Network) and Telework organisations. "Innovative ways of flexible working" means the use of a new generation of technologies that enable individuals and companies to work with each other, independently of location and time differences. Flexwork will create and promote Services Deployment Templates (detailed procedures to enable SMEs to make sure of existing technologies and new technologies emerging from IST). The project will put IST projects and clusters in touch with the market requirements for flexible working technologies in these regions.

Project period : January 2001 - December 2002 (24 months) + extension to eastern countries

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FUTURE-WORKSPACES	A Strategic Roadmap for Defining Distributed Engineering Workspaces of the Future	IST Programme IST-2001-38346

Future-WorkSpaces will bring 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 will reach   consensus regarding business demands, human factors issues and technological challenges involved in implementing the vision. The resulting roadrnap for future development will define (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 will be the aerospace, automotive and construction industries and Future-WorkSpaces will define an indicative list of research projects required to satisfy the needs of these sectors. The final element of Future-WorkSpaces will be the development of a framework for an Integrated Project to span all or part of the roadmap.

Project Period : July 2002 - July 2003 (12 months)

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GEM-EUROPE	Global Education in Manufacturing - Europe	IST Programme IST-2001-32059

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 is an activity that will be carried out in parallel in different GEM projects in several IMS regions (f. ex 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 workshops with industrial participation. It will be published on web and documented in a booklet.

Project period : February 2002 - August 2004 (30 months)

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GEM-NAS	Global Education in Manufacturing - Europe	IST Programme IST-2001-39178

The manufacturing industry is a key industry. To be competitive on the global market the industry is forced to meet new challenges in - ways of operation, e-work, digital business, e-commerce, extended products etc. GEM-NAS will in cooperation with the industry define the needs for education and training of engineers to meet this challenges. A new curriculum for Manufacturing strategy based on ICT tools, modem pedagogic and delivery mechanisms will be developed. The curriculum will contain 7 main modules. GEM-NAS will in co-operation with GEM-EUROPE (IST-2001-32059) 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.

Project Period : July 2002 - August 2004 (25 months)

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HARMONY	Coping with the Complexity of Business Innovation	Esprit Programme EP29700

HARMONY is a four year Intelligent Manufacturing Systems (IMS) project. The overall objective of the project is to develop an internet based support system for start-ups, innovation support institutions and investors that will help to increase the yield of innovation projects. The focus of this project is on start-ups operating in or servicing the manufacturing industry.
Harmony evolved from the clearly identified need for an efficient and effective support for start-ups at both the company level, as well as at the level of the whole economy. Therefore, the vision shared by all partners is to set up internationally accepted practices for the support of start-ups based on multimedia and internet technologies. This integrated support, based on a holistic approach, is planned to be of high quality, easy to use, complete and internationally accepted.

Project period : October 1998 - October 2002 (48 months)

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HUMANTEC	**Design for Humanization of Technologies**	**IST Programme** **IST-2000-31046**

The Humantec project aims to make 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 are 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.

Project period : October 2001 - April 2003 (18 months)

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ICCI	**Innovation co-ordination, transfer and deployment through networked co-operation in the Construction industry**	**IST Programme** **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.

Project period : September 2001 - December 2003 (28 months)

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IDIA	**Inclusive Design and Intelligente Technology for Accessible Workplace**	**IST Programme** **IST-2001-33205**

In the knowledge-based economy the workplace is anywhere : irregardless of the individual location when intellectual work is underway. By including information and communication technologies 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 will establish a multidisciplinary project team, coordinated by the IDIA Scientific Committee that will carry 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 will produce a number of exploitable

results: - Guidelines and prospective scenarios related to the uptake of a Europe-wide 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.

Project Period : February 2002 - July 2003 (18 months)

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IMAP	**An innovative Interactive Mobile Advertising Platform**	**IST Programme** **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.

Project Period : April 2002 - April 2004 (24 months)

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INDIC@TO R	**A Cross Cultural Study on the Measurement and Enhancement of Employability in Small and Medium Sized ICT Companies**	**IST Programme** **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 organisation) the enhancement of job-related expertise and professional growth.
In this project, seven European countries will provide psychometrally 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.

Project period : September 2001 - September 2004 (36 months)

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INSPIRE	**Intelligent Support for People-Oriented Process Re-Engineering and Change Management**	**IST Programme** **IST-1999-10387**

The INSPIRE project will create an intelligent support tool to increase the success-rate of Business Process Reengineering by providing real help in process modelling, design and implementation, and by explicitly taking the human factor into account at all stages. It uses formal models of business processes to represent the knowledge needed to reason about them. It will encourage participation in BPR by supplying simple icon-based process modelling schemes, animation of performance simulation, qualitative performance indicators, and real help and intelligent advice,

all easily understood by non-experts. The project will build a toolset comprising a base of IDEF-type process views, automatic workflow generation, dynamic simulation and quantitative performance indicators, into which will be built a number of innovative features designed to render the BPR process accessible to non-experts and to support the implementation of re-designed processes. A natural language front end will be built and Iconic process representations will be used to make formal diagrams more intuitively understandable. The simulation module will feature fuzzy, qualitative performance indicators besides standard numeric ones. Dynamic simulation of processes will be animated to make them comprehensible to non-specialists. At the core of the tool, generic formal process models will used to allow coherence between different views to be enforced, and supporting diagnosis and explanation features. An implementation planner will be developed to support the change process, built on a case based reasoning engine and a library of BPR best practice. This module will provide explicit information about the skills and personnel available and required for the change, set realistic milestones and targets for the changeover period, as well as provide criteria for the evaluation of a newly implemented business process. The first period covers software specifications and user requirements. Thereafter software prototypes are built taking account of the results. Once the requirements and specifications are drawn up and agreed, system integration will take place. As soon as a useably stable prototype can be released, the first pilot BPR initiatives begin and run for 6 months. These comprise real BPR activities using the INSPIRE tool and approach in both manufacturing end user sites, each supported by a consultancy. The second field trials will be longer and more extensive reflecting the advanced development status of and improved end user expertise with the tool. There will be a constant cycle between end users and software partners of feedback and successive new releases of the tool. The end users will produce a User Manual for the tool.

Project period : March 2000 - September 2002 (30 months)

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INTELCITY	Towards Intelligent Sustainabl e Cities	IST Programme IST-2001-37373

The thematic network will contribute to the IST 2002 Work programme Key Action II : New Methods of Work and Electronic Commerce, Action Line II 1.2, strategic Roadmaps for Applied Research. It 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 sustinable urban development, beyond FPS. It will bring a wide together a wide range of European stakeholder interests & experience of planning I property development & management, utilities, urban transport, organisational knowledge management, e-business, e-governance urban modelling and scenario building in a consultative process. The network will explore user needs and expectations of ICTs in terms of newways 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 .

Project period : July 2002 - July 2003 (12 months)

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ISTforCE	Intelligent Services and Tools for Concurrent Engineering	IST Programme IST-1999-11508

The project will develop a novel, user-centred services platform for concurrent engineering in building construction. The platform will a) allow multi-project participation, b) provide servers with task-oriented engineering and system knowledge, c) provide information logistics and multi-project workflow support, d) provide services and tools for e-commerce, multi-media and e-signature, e) provide a framework to support legally binding work results and an audit trailer, f) can be connected to any server and virtual enterprise as long as these servers fulfil some specifications

developed in the project, g) and will provide a language interoperability service. The services platform will also shield the user from the heterogeneity of the outside concurrent engineering world.

The services are focused on the needs of the individual user. They provide him with task-oriented knowledge, allow him to access knowledge (repositories) and engineering services available on the net and they provide the necessary e-commerce tools including e-payment, data security and e-signature. Data storage will be outsourced. Services for interoperability support the user in attaching any kind of data and transform them into his individual unified data format. A personal workflow service allows him to interlink the workflow of the different projects and an information logistics component helps keep track of information flows. The project will combine engineering design with e-commerce and business engineering, improve collaborative working, enhance the human's working capability, and strengthen the role of SMEs on the global market.

Project period : January 2000 - March 2002 (27 months)

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IWOP	Best Practice Pilot for the implantation of Integrated Internet Based Remote Working Places for Virtual Teams developing their work at SMEs	IST Programme IST-1999-21148

IWOP is a Best Practice Pilot for European Small and Medium sized Enterprises belonging to industrial sectors (such as metal-mechanics, wood/furniture, etc). IWOP deals with the implementation of mature information technologies, oriented to solve communication problems originated at different departments in the company that usually work remotely (post-sales services, maintenance services, commercial delegations, etc). The pilot will be carried out at 8 SMEs, from Germany, Spain and Bulgary, that have to meet the issue IWOP takes up with in implementing teleworking and mobile working solutions. This pilot will be supported by three catalyst companies from these 3 countries which will analyze SMEs' requirements on teleworking and mobile working, analyze existing IT solutions, choosing the solution that best fits the SMEs' requirements and co-ordinate the implementation of the chosen solution.

Project period : October 2000 - Mars 2002 (18 months)

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KISEIS	Key Interventions for Sustainable Employment in the Information Society for Disadvantaged Groups	IST Programme IST-2000-28333

The project will begin with desk research, reviewing EU-level IS and employment policy to identify socio-economic hypotheses leading to programme intervention, and continue 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 will be identified and a framework of interventions will be developed. In month five, the qualitative field research will begin in the four EU countries, to identify and study indicators of success in interventions. The study will include 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 will be case studies of mainstreaming initiatives - programmes and projects delivering innovative initiatives that support the transition of individuals from disadvantaged groups into sustainable IS employment. The field research will end in month 15. The final phase of the research will begin in month 16 with a feedback mechanism on the draft research results. Guidelines and models of best practice will be developed, aimed at groups, organisations and policy-makers working on interventions for sustainable IS employment for disadvantaged groups. This phase will also identify and analyse ways to strengthen future EU policy and research areas, ending with the report in month 20.

Project period : July 2001 - February 2003 (20 months)

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KNOWCOAT	Neural knowledge management solutions for the coating market value chain	IST Programme 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.

Project Period : January 2002 - January 2004 (24 months)

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LAW	Labour market changes and welfare perspectives in Europe	IST Programme 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, tele-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 organised at this purpose. The project outcome will be addressed to the institutions involved in the preparation and actuation of policies supporting employment and social protection, both at national and European level.

Project Period : March 2002 - March 2004 (24 months)

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LEAP	Lightweight Extensible Agent Platform	IST Programme IST-1999-10211

LEAP is addressing the need for open infrastructures and services which support dynamic, mobile enterprises. It will develop agent-based services supporting three requirements of a mobile enterprise workforce : Knowledge management (anticipating individual knowledge requirements), decentralised work co-ordination (empowering individuals, co-ordinating and trading jobs), travel management (planning and co-ordinating individual travel needs). It will develop a reference Lightweight Extensible Agent Platform responding to the communication and co-operation needs of mobile teams, based on standards and capable running on advanced phones or mobile devices. The project will comprise two phases: in the first Phase, a feasibility study of 12 months, the project will define application requirements as well as reviewing current FIPA and WAP standards. The design of the Lightweight Extensible Agent Platform will be based on the development of an innovative, scaleable and "operating system agnostic" architecture for devices ranging from PDAs to phones to desktop systems. This architecture and a initial version of the LEAP application will be integrated and deployed in lab trials. In Phase 2, the Mobile team management applications will be deployed in the real world, in two Field Trials, over a one month time period, and covering large geographical areas. The field trials will evaluate both the scientific and usability aspects of the technology, showing how the technology is adapted and adopted by users in a dynamic networked organisation in a ubiquitous environment.

Project period : January 2000 - June 2002 (30 months)

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MIRROR	Mirror World Communities of Practice for Learning and Innovation in Natural Science	IST Programme IST-2001-32504

The objective of the proposed 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 will be 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.

Project period : February 2002 - January 2004 (24 months)

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MOTION	Mobile Teamwork Infrastructure for Organisations Networking	IST Programme IST-1999-11400

MOTION will design, develop and validate a novel multi-service business architecture to support teamwork within distributed enterprises. Manufacturing companies increasingly need geographically distributed product development: products are built up of components developed by units located in different cities or countries. MOTION addresses this need with the objective of developing and validating a multi-service business architecture for supporting Team Work and distributed working methods, both for cooperative product design and for business management. The project will : define a novel, distributed communication services infrastructure, identify and develop a core set of services based on such infrastructure, use such core set of services to build up two specific business applications. The architecture will allow end-users to implement new methods of working and achieve business process improvements in terms of improved product design, improved productivity and reduced time to market. Based on distributed object technology standards, it will integrate intelligent and mobile agents, information push and event-based communication. These will be used in the context of a global information infrastructure supporting mobile working through the integration of *hand-held devices*. Such techniques will allow configuring and operating a consistent set of *Team Work Assistants* required in the different sites of an application and supporting engineering teams working across the sites in a variety of tasks. MOTION will validate the achieved end products in two industrial environments: household appliances and mobile phones production.

Project period : January 2000 - June 2002 (30 months)

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MULTIPRO	A Publishing and Management System for Cross-media Teamwork at Remote, Mobile and Heterogeneous Workplaces in Multimedia Broadcast Organisations	IST Programme IST-1999-12032

The MULTIPRO project is concerned with digital media archive technologies and asset management systems for the TV industry. It will deliver technologies necessary for the evolution from digital television production towards the collaborative production of cross-media and web services. These will enable teamworking and more effective remote collaboration between in-house and out-sourced production, including distributed information management across different time zones and in real-time, event-related crossmedia editing and production. The project will develop a distributed management system for rich media services (video, audio, text/graphics) based on (1) an enhanced media archive system, (2) a crossmedia glueware/broadband personalisation tool, (3) an automated content audio management tool for distributed audio archives. These will be applied in (1) cross-media, mobile, teamwork based workplace publishing, (2) multi-disciplinary team publishing for personalised broadband, (3) heterogeneous crossmedia content publishing.

Project period : January 2000 - December 2001 (24 months) + extension till March 2002

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MUTEIS	Macro-Economic and Urban Trends in Europe's Information Society	IST Programme IST-2000-30117

The present proposal brings together two strands of research : First of all, a comparative, in-depth analysis of the macro-economic growth performance within the framework of the new emerging digital environment of the European growth success stories of the 90's, second, a detailed, more qualitative analysis of the most important regional and urban developments in each of these countries, whether the result of private "natural" growth agglomeration effects or public initiatives, and focussing again on the particular role of ISTs in such developments. In a later stage of the project, this analysis will be extended to a European comparative urban development analysis. This stage is explicitly aimed at diffusing information and practical experience emerging from the possible "best-practice" urban development cases studied under part two of this project.

Project period : Subject to contract (30 months)

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NESKEY	**New Partnerships for Sustainable Development in the Knowledge Economy**	**IST Programme 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 publing the results together facilitates the development of EU models and scenarios for sustainable development and the knowledge economy .

Project Period : (12 months)

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NEWTIME	**New Ework Techniques In Micro-Enterprises**	**IST Programme 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.

Project period : July 2001 - June 2003 (24 months)

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OSMOS	**Open System for Inter-enterprise Information Management in Dynamic Virtual Environments**	**IST Programme IST-1999-10491**

The OSMOS project will enhance the capabilities of construction enterprises, including SMEs, to act and collaborate effectively on projects by setting up and promoting value-added Internet-based flexible services that support team work in the dynamic networks of the European construction industry. It will specify Internet-based services for collaboration between dissimilar construction applications and semantic cross-referencing between the information they manipulate, specify Internet-based services allowing the co-ordination of interactions between individuals and teams in a Construction virtual enterprise, specify a model-based environment where the release of, and access to, any shared information (including documents) produced by actors participating in projects is secure, tracked, and managed transparently, provide low entry level tools (cheap and user-friendly) to small enterprises to act and participate in construction virtual enterprises, and set up two prototype team work services, and ensure their take-up as commercial offers after the completion of the project. The work will be structured and carried out in five work packages, with a sixth forming the project management : Team Work Analysis and Requirements Capture, Architecture Definition and Specification, Infrastructure Implementation, Testing and Evaluation, Dissemination and Exploitation, and Project Management.

Project period : January 2000 - March 2002 (27 months)

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PIDSS	Postal IT Directions Strategic Study	IST Programme IST-2000-28721

The PIDSS project will deliver a study on how the new technologies applied to the Post operators may transform our lives in the broadest sense. In fact Postal operators can play a crucial role in the improvement of the interaction between people and digital services and to 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 citizen.
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.

Project period : January 2002 - January 2003 (12 months)

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PIKON	Personal Information and Knowledge Organiser Network	IST Programme IST-2001-33487

The PIKON Project will develop 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 will comprise : an ontology and case-based method for information and knowledge managemen, a personal information and knowledge organiser, 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 teleworkers and flexible teams. The solution combines both organisational and technical perspectives which have equal weight.

Project period : February 2002 - February 2004 (24 months)

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PLANET II	**Network of Excellence in AI Planning**	**IST Programme** **IST-2000-29656**

The Planet2 project is a network of excellence in the field of Artificial Intelligence planning and scheduling. The project will undertake a variety of activities to support both the development of new directions in R&D and the exploitation of the technology -- in particular with regard to the emerging ework 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 II 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 is covering 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 having about 50 members in 13 countries, aims to effectively pool these skills.

Project period : August 2001 - August 2003 (24 months)

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PROMODAS	**Professional mobile data service**	**IST Programme** **IST-2001-36025**

Maintenance service engineers and also medical experts are working outside the stationary working place more and more. To organise their work and to serve end- customers and patients better, the flexible, mobile and remote working methods will be taken in use at least in 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 organisations are going to trial and build the infrastructure for that purpose. Also new integrated service concepts will be taken in use and exploited to the organisations in different countries. The trial will be one of the most advanced mWorkforce trials during next years and will be continuous demonstrator of new working methods and serving systems in maintenance and medical care in Europe.

Project Period : June 2002 - December 2003 (18 months)

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PROTELEUSES	**Best Practice Pilot for the Promotion and Implantation of Teleworking Tools at European SMEs of the Services Sector**	**IST Programme** **IST-1999-20852**

PROTELEUSES is a Best Practice project, whose aim is to foster the introduction of teleworking tools in 7 European SMEs from the services sector. These firms will be able to benefit from the use that quoted tools offer. Such as intercommunication between branches and headquarter, remote working staff with on line information provision, on line connection with staff working at customer facilities, teleworkers developing their tasks from their own homes,...
PROTELEUSES will be carried out at 7 SMEs, from Germany, Bulgaria and Spain, belonging to the services sector. There will be one catalyzer per country, which main task will be to steer quoted IT incorporation. This steering will consist on the identification of requirements, existing teleworking tools analysis, selection of best solution to be introduced by each SME, co-ordinate the implementation of the chosen solution, assess the results coming from such incorporation.

Project period : November 2000 - April 2002 (18 months)

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PSIM	Participative Simulation environment for Integral Manufacturing enterprise renewal	IST Programme IST-1999-60004

In today's competitive and global market place, manufacturing companies are forced to optimize their production at an ever increasing rate. However, it is still common practice that specialized staff groups improve only one aspect (for instance technology). This will cause suboptimal results. Therefore, a faster, more participative, and more integral approach is developed. This 'Participative Simulation environment for Intelligent Manufacturing' (PSIM) is a software environment for use in assembly operations. PSIM uses a Participative improvement process involving specialized staff, management and production personnel. PSIM is an Integral renewal, which means that technological, organizational and human factors are all concerned in optimization. It is focused on intelligent manufacturing to assist human and technological creativity. Activities are grouped into 7 work packages: (1) Pilot : three companies define their needs (FIAT, Volvo and Finnish Post) during a first assembly optimization participative simulation, using available instruments. (2) Ontology : existing and new software packages will be studied and (a new) one will be selected for further test. (3) Sociotechnical and ergonomic design tool : two essential tools will be developed. Tool 1 : sociotechnical knowledge to help developing an optimal organizational structure. Tool 2 : ergonomics to help developing optimal man-machine interactions. (4) The "navigator", needed to make the PSIM system usable for different participants, is developed. (5) Integration and field test. (6) Validation : at the pilot sites and (7) Project co-ordination and exploitation.

Project period : April 2000 - March 2002 (24 months)

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ROADCON	Strategic Roadmap towards Knowledge-Driven "Sustainable" Construction	IST Programme IST-2001-37278

ROADCON is a proposed Accompanying Measure to develop 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.

Project Period : June 2002 - May 2003 (12 months)

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SABARECO	**Satellite-Based Remote Multi-Project Reporting and Controlling in the Construction Industry**	**IST Programme IST-1999-20488**

The project is a trial of remote multi-project reporting and control in the construction industry. The problem of construction sites reporting progress to headquarters and the re-scheduling of a project with implications on other projects is difficult when the information flow is slow. Satellite based links will be used for communication. In the headquarters, an integrated system of enterprise resource planning, project management, etc is implemented. Remote sites will be able to browse and update this information using normal WWW browsers and special software clients. The global objectives of the project are: to enable European construction enterprises including SMEs to increase their competitiveness in the global marketplace by deploying innovative satellite based information browsing and updating facilities, which enhance multi-project scheduling, management and control; to deploy satellite based links using standard protocols to enable information sharing between world wide distributed teams. An integrated hard- and software system is specified, implemented, trialed and evaluated at the participating end-user sites.

Project Period : December 2000 - May 2002 (18 months)

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SANE	**Sustainable Accomodation in the New Economy**	**IST Programme IST-2000-25257**

Current workplace design activities are focussed on single work locations. SANE will be 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 will develop a unified framework for the design of a sustainable workplace. This will generate designs that empower distributed organisations to take full account of advances in location independent computing and ubiquitous networking. To assist the validation of the framework, a limited set of ICT tools will be specified, prototyped and developed, the emphasis being on the innovative application of emerging technologies and services rather than the development of new ones. The project will also specify communication interface requirements of technology products and services.

Project period : January 2001 - December 2002 (24 months)

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SASKIA	**Strategic Action for a Sustainable Knowledge and Information Age**	**IST Programme 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.

Project period : July 2002 - July 2003 (12 months)

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SMART-UP	Small and Medium Sized Enterprise Alliance through Research in Toursim - Take up	IST Programme IST-2001-34184

SMART-UP provides small and medium sized tourism enterprise (SMEs) 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 integreated into each learning module. The contents are complemented by constantly updated benchmarking solutions, and chat facilities. The use of an information technoligy system as a learning tool ensures a fast and cheap know-how transfer amongst tourism SMEs and knwo-how producers (e.g. universities) throught Europe.

Project Period : April 2002 - September 2003 (18 months)

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SOL-EU-NET	Data Mining and decision support for business competitiveness: Solomon European Virtual Enterprise	IST Programme IST-1999-11495

The goal is to enhance competitiveness and find new business opportunities in the global IT market by establishing a virtual European enterprise composed of companies and research laboratories with highly specialised expertise in data mining and decision support. The Sol-Eu-Net enterprise will be organised as a flexible business structure made of cross-organisational, time-focused, task-driven work teams. It will work towards enhanced usage of data mining and decision support in industry, businesses and public services, contributing to improved quality, efficiency and effectiveness of their operations. This will be achieved through specific solutions to end-user problems, prototype project workshops, project monitoring and consulting, collaborative work and combination of problem solutions, as well as through education, training and spreading information Web-based information source.

There are three main objectives. (1) A business model of a virtual European enterprise composed of companies and research laboratories will be developed, to synergistically merge European expertise in data mining and decision support. This will result in an operational international IT network enterprise, boosted by this project, employing new technologies and new internet-based methods of collaborative work. (2) New educational and training methods will be developed, for end-user and expert team training, including specialised problem-oriented seminars and prototype project workshops. (3) Research advances in data mining and decision support will be achieved through partners' involvement in collaborative problem solving of end-users problems. Methods for combining problem solutions and consensus building will be developed and successful approaches will be analysed and disseminated, thus contributing to the better understanding of generic methodologies.

Project period : January 2000 - December 2002 (36 months)

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STAR	Socio Economic Assessment Trends for the Digital Revolution	IST Programme 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).

Project period : September 2000 - Août 2003 (36 months)

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STARMATE	**System Using Augmented Reality for Maintenance, Assembly, Training and Education**	**IST Programme IST-1999-10202**

The STARMATE project will specify, design, develop, and demonstrate a product dedicated to computer guided maintenance of complex mechanical elements. The system will provide two complementary functionalities: user assistance for achieving assembly/de-assembly and maintenance procedures, workforce training to assembly/de-assembly and maintenance procedures. The system will rely on augmented reality technology to provide more flexibility in working methods while preserving user mobility in context where access to conventional documentation is cumbersome. It will improve work environment user-friendliness. It will allow user-to-access full documentation and manuals directly registered to his working environment. Visual and audio augmentation will be used to guide the user through the right procedure to apply. The system will be controlled through both speech and a pointing device system. Work will be achieved according to ISO certification of implied industrials. Each partner will be responsible for providing well-circumscribed elements of the system. The system will be developed from off-the-shelf SW and HW where possible. In particular, display devices and voice recognition system will be purchased on the market. The product will be developed into several releases of incremental functionalities. Hence, several integration phases are foreseen in the project. Applications of the product will take place in a variety of real work situations. During the project it will be used in three different contexts, optronics and aeronautics construction, and nuclear maintenance. Moreover, its overall design will be made in order to reach a high degree of generality allowing to widen the range of applications after the project.

Project period : January 2000 - December 2002 (36 months)

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STILE	**Statistics and indicators on the labour market in the e-economy**	**IST Programme IST-2000-31099**

STILE aims to support the statistical requirements of the IST Programme by providing innovative methodologies and content on the statistical monitoring of the labour market in the e-economy. This includes the finetuning of statistics to match the e-economy and the monitoring of ICT-related work patterns. The projects involves users systematically. Nine expert partners will carry out the exploration to extent the coding used in national LFS on ework; the finetuning of NACE and ISCO classification; the construction of an international comparable module on telework for LFS; a methodology benchmark and module to cover ICT in organisational panel surveys; the measuring of sectoral mobility in ICT; the construction of ICT occupational profiles and benchmarking the profiling methodology; the developing of dissemination tools and the organisation of concluding European conference on these issues.

Project period : Subject to contract (36 months)

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TEAM-HOS	Methodology and Tools for World-best Teamwork in Hospitals	IST Programme IST-1999-11567

The modern health care system imposes high requirements upon hospitals: they have to ensure the highest quality of services to their patients, with the ongoing aim of minimizing risk and costs for citizens. The objective of the project is to develop and verify an innovative methodology and a set of tools for the analysis of the hospital's requirements to specify, design, select and implement adequate ICT solutions which will support the development and introduction of new types of ICT supported team work organisations in hospitals. The new methodology will bring benefits to the hospitals in terms of savings in efforts/costs for the introduction of new ICT supported team work organisations by a minimum of 40% and a reduction of risks by a minimum of 95%. The project will develop technologies and systems for resource sharing, real-time team co-ordination, innovative workplace design, knowledge sharing within teams and team inter-communication. The development of business cases will cover at least 60-80% of the general problems and needs in hospitals in the different countries and medical fields. The methodology will be tested at 5 hospitals from 3 different countries operating in a wide range of medical fields.

Project period : January 2000 - December 2002 (36 months)

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TEAMWORK	Technology Exploitation and Adaptable Methodologies offering new Organisational Models and Practices for eworking Teams	IST Programme IST-2000-28162

TEAMwork sets out to provide a novel, 'complete' solution (integrating Technology, Methodology and Skills) for eworking 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 Organisations and Research Networks. TEAMwork will offer these organisations the 'complete solution' for managing dispersed 'narrow-competence' teams and for effective decision-making in a virtual, multi-cultural environment. The TEAMwork solution represents a major advance on currently-available solutions 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. Exploitation is also foreseen.

Project period : July 2001 - February 2003 (18 months)

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TELEBALT	**Teleworking as a Tool for Information Society Technologies Programme Promotion to Baltic States**	**IST Programme IST-2001-33041**

TELEBALT project will advertise and promote IST Programme to three Baltic countries (Latvia, Lithuania and Estonia) by fast and efficient dissemination and awareness actions targeted on Baltic countries as the states newly associated to European Union. This objective will be fulfilled using new methods of team work, such as teleworking, virtual laboratories, etc. EU and Baltic states interested parties will be encouraged to work together for benefits of joint Europe. The project will do technologies studies of the present situation with IST development in three Baltic countries and will formulate appropriate recommendations to EU research and marketing communities as far as prospectives of potential Baltic market is concerned. TELEBALT will deploy and further develop a system of Information Demonstration Centres (IDCs) in Latvia, Lithuania and Estonia. Basing on this system the project will organize kick-off planning meeting and workshop in Riga, TELEBALT major conference in Vilnius and outlook workshop in Tallinn devoted to IST Programme objectives and opportunities for EC newly associated states. TELEBALT will introduce new methods of team work to develop project focal points in participating countries capable to operate in modern Information Society at high level. The project will provide training measures (distant and face-to-face) to promote dissemination of IST Programme and future relevant EC programmes to Baltic states. TELEBALT will encourage submission of new project proposals to EC.

Training courses will describe EC, DGs, Fifth Framework and IST Programmes. CoBrow collaborative browsing virtual presence toolkit and PL@ZA groupware developed by IST will be introduced for EU-Baltic states team work. TELEBALT will present IST results to Baltic countries telematic, business, research and unemployment prevailors communities emphasizing the major tendencies of the European telematics activities.

Project period : August 2001 - July 2003 (24 months)

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TELEMARA	**Telematic Management For Ready-to-wear Satellite Workshops**	**IST Programme IST-2000-28404**

TELEMARA is a project directed 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, still some submerged work virtually no application of management techniques and finally, rudimentary communication system between central company and satellites.

Project period : September 2001 - February 2003 (18 months)

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TELESOL	**Telework solutions for promotion of EU cooperation in business and research with the Commonwealth of Independent States**	**IST Programme IST-1999-29038**

Project TELESOL will promote telework in business and research areas between EU and the eight countries of CIS (Kazakhstan, Kyrgystan, Uzbekistan, Azerbaijan, Armenia, Georgia, Ukraine, Russia). TELESOL will use a system of Information Demonstration Centres, deployed by EC TAP project STACCIS in 1996-1999 in European CIS countries and create on this base, a system of Telework Competence Centres (TCCs). Core TCC will be set up in Russia. TELESOL will create in the CIS countries pilot fully operational online telework systems between EU and CIS participants in business and research areas. First telework systems will be set up around Core TCC, further development in new methods of work will follow the development of local TCCs in Central Asian and European countries of CIS. TCCs will be the focal points of collecting relevant telework information, training, exchange of experience, establishing contacts with interested parties in EU. Such role of the TCCs will generate new telework systems. TELESOL will organize technology kick-off conference, Central Asian regional workshop and local planning/evaluation meetings and teleworkshops, will develop curriculum on technology and on management aspects of new methods of work between EU and CIS. By these training and dissemination actions, TELESOL will create telework awareness in EU and CIS countries, and will help them to overcome barriers to networking and to successful teleworking projects between EU and CIS countries.

Project period : January 2002 - December 2004 (36 months)

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TERRA 2000	**Terra 2000**	**IST Programme 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 will provide 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 will produce 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.

Project period : January 2001 - December 2003 (36 months)

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                                                             www.terra-2000.org

THINK	**Towards Handicap Integration Negotiating Knowledge**	**IST Programme 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 will be done through telework. With the experience obtained from the successful pilot project in Portugal , TELEMAN wants to create and implement a tecnological, organisational and social model that can be adapted to the particularities of each participating country. A monitoring and support structure will be build to provide the teleworkers with the necessary tools to develop highly professional services to the final client, which are large and medium sized companies. In a short term, 500 disabled people will be integrated in areas like accounting, programming, technical assistance to computer systems, etc.

Project period : September 2000 - June 2002 (22 months) + extention Baltic countries = 36 months

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TOSCA	Social Observation Table of Call Centres	IST Programme IST-1999-12646

The objective is to draw up a social observation table of call centres, bringing out what characterises work in them, on the basis of a functional typology of such centres. It will be based on the problem area, which includes call centres, not only as players, but as "exemplary" cases of on-going changes in the field of work and, consequently, industrial and social relations, which the latter establishes. Therefore, it is also appropriate to question the pertinence of analytical tools used and, through this original study, contribute to their renewal. It is a matter of facilitating player's understanding - and with their indispensable co-operation of the issues and social consequences of the current tremendous increase in importance of information and communications technology in the productive process, of which call centres already seem to be one of the most outstanding achievements.

Research on call centres will essentially focus on a quantitative approach. On the basis of an inventory of call centres in partnership countries, a representative sample will be establis hed, which will define the scope of field work. The work will establish a typology of jobs in these centres on the basis of a detailed study of functions carried out, a study of work situations of a significant sample of operators, and an analysis of industrial and social relations in call centres.

Project period : June 2000 - May 2002 (24 months)

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TOWER	Theatre of Work Enabling Relationships	IST Programme IST-1999-10846

The objective is to draw up a social observation table of call centres, bringing out what characterises work in them, on the basis of a functional typology of such centres. It will be based on the problem area, which includes call centres, not only as players, but as "exemplary" cases of on-going changes in the field of work and, consequently, industrial and social relations, which the latter establishes. Therefore, it is also appropriate to question the pertinence of analytical tools used and, through this original study, contribute to their renewal. It is a matter of facilitating player's understanding - and with their indispensable co-operation - of the issues and social consequences of the current tremendous increase in importance of information and communications technology in the productive process, of which call centres already seem to be one of the most outstanding achievements.

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Project period : May 2000 - May 2002 (30 months)

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UNITE	Ubiquitous and Integrated Teamwork Environment	IST Programme 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 organisation. UNITE will offer 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 will remain wholly on the project. UNITE will capture the requirements, develop the paradigm of Co-operative workplaces, a suitable platform through prototypes, validate its approach with real operating teams, disseminate, and exploit 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.

Project Period : January 2001 - December 2002 (24 months)

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                                                                     http://www.unite-project.org/

USABILITYNET	Usability Support Network	IST Programme 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 will provide a web site and support network to assist organisaitons with usability, user centred design and process improvement. The network will disseminate information to purchasers, developers and EU projects, tailored to meet local and sector needs. Needs for certification and standardisation will be identified, and the use of a Common Industry Format for usability laboratory test reports will be promoted. Dissemination will include organisation of high profile European conferences for usability professionals, and setting up a European Usability Professionals Association to institutionalise good practice.

Project period : February 2001 - January 2004 (36 months)

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UWA	Ubiquitous Web Applications	IST Programme IST-2000-25131

The objective of the UWA project is to improve the design process for web applications. The goal is twofold: improving the quality (for the users)of the applications being designed and improving the efficiency of the design process, and, as a consequence, the efficiency of the implementation process.
The project will develop a comprehensive methodology, covering all the aspects of design from requirements, down to detailed design; a companion of the methodology will be a set of tools supporting the different aspects of design. The tools will be able to export design documents in XML, allowing interchange of design pieces across the different tools of the project and also with "outside" tools. Two applications (e-commerce and e-banking), for relevant user organisations, will be designed and developed within the project.

Project Period : January 2001 - December 2002 (24 months)

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VIDEOCOM	Video Communication Workplace	IST Programme IST-1999-20971

This project aims at investigating the integration of video communication and document transfer facilities in the PC environment in order to design a workplace for medical staff. Additionally, an integrated User Interface (called Access Pad) will be developed with the aim of ensuring easy and efficient Man Machine Interaction, which will also ensure the identification and authentication of the participants to the teleconference by using innovative Smart Card technologies. The VideoCom workplace will be installed in 10 hospitals and validated by their medical staff.

Project period : December 2000 - May 2002 (18 months)

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                           http://www.cancer-network.de/videocom

VIEW OF THE FUTURE	Virtual and Interactive Environments for Workplaces of the Future	IST Programme IST-2000-26089

VIEW will perform research and produce 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 will be 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.

Project Period : January 2001 - December 2003 (36 months)

Contact: *John Wilson*
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VIP	Voluntary Industrial Code of Practice for IST-enabled work across national borders	IST Programme 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 on IST-enabled work across national borders. The project invites large international companies to take part in the shaping of a humane 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 for 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 endorsement of the VIP-Code by 100 international companies. The research identifies value systems and clarifies linkages to business ethics and strategies, develops tools for analysis and consensus building, and provides a knowledge base from existing codes and agreements for VIP code formulation, in co-operation and dialogue with industry.

Project period : January 2001 - December 2002 (24 months)

Contact: Vivianne Wennersten
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                                              www.unomondo.org

WHALES	Web-Linking Heterogeneous Applications for Large Scale Engineering and Services	IST Programme IST-1999-12538

The main objective is to provide a planning and management infrastructure for complex distributed organisations working as networks on large scale engineering projects. Members of such a network may be big and medium to small enterprises as well taking into account workers, management, the organisations itself and the consumers, who are integrated as external business partners. The goals are to design and develop a set of software components supporting integrated planning, deployment and monitoring of large projects in multi-site, multi-enterprise organisations and to demonstrate the applicability and benefits of the developed software composed through analysis, implementation and experimental usage on pilot business cases presented by users in the consortium. The project contains five technical Workpackages devoted to the study and development of the ICT architecture and software components that are going to support the WHALES network organisation model. Each Workpackage includes the fundamental activities of a quality-based software development process: requirements, analysis and design, implementation, test and deployment. A sixth Workpackage provides a common development infrastructure for the teams working on each component, dealing with : methodology and tools to be used, selection of existing re-usable components, co-ordination of joint developments, maintenance of a technical data repository, configuration and change management.

In parallel, the proposed organisation model and tools will be introduced and applied on four business cases in different industrial sectors. Each business case includes the fundamental activities of business case analysis, experiment selection and preparation, experiment implementation and results assessment. The final Workpackage co-ordinates all business cases, dealing with application of common methodologies, metrics and best practices, and ensuring uniformity, comparison and joint evaluation of results produced by each business case.

Project period : March 2000 - October 2002 (30 months)

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                                              E-mail : richard.stevens@formula.it
                                              http://www.gformula.com

WINGS-FOR-SHIPS	Maritime Intelligent Workplace for Weather Information - Network, Guidance and Supervision onboard ships	IST Programme 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 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, freights and the environment both on board ship and inland. The new and intelligent approach in WINGS-FOR-SHIPS is a decision-support tool looking at forces and stresses on the ship as 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 user-friendly in a familiar 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.

Project period : January 2002 - August 2004 (30 months)

Contact: *Carmine Giuseppe Biancardi*
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WISTCIS	**New Methods of Working for Information Society Technologies Programme Promotion to Commonwealth of Independent States**	**IST Programme IST-1999-14106**

WISTCIS project will promote IST to seven European CIS countries (Armenia, Azerbaijan, Belarus, Georgia, Moldova, Russia, Ukraine) by dissemination actions and teleworking targeted outside of IST, basing on new methods of team work between EU and the CIS interested parties. WISTCIS will develop further the system of Information Demonstration Centres deployed in seven CIS countries by TAP project STACCIS. Basing on this system WISTCIS 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. WISTCIS will encourage submission of new proposals to IST. 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 tendencies of the European telematics activities.

Project period : November 2000 - October 2003 (36 months)

Contact: *Jean Bonnin*
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F - 67000 Strasbourg   *E-mail : bonnin@selene.u-strasbg.fr*
                                             www.ednes.org/wistcis/main_e.htm

WWW-ICT	**Widening Women's Work in Information and Communication Technology**	**IST Programme IST-2001-34520**

The project will provide a focused investigation of the gender gap in ICT professions and to propose some pathways to improve equal opportunitites, 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 will implement 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 will be developed with extended reference to the state of the art of existing research. The project will focus 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 also include an inventory of good practices. Policy recommendations will be developed in the following areas: education and vocational training models, employment strategies and work organisation patterns, and institutional frameworks. The dissemination of results targets agents of change in human resource management, professional orientation, organisation of training and policy making.

Project Period : May 2002 - May 2004 (24 months)

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Annex 3:   ON LINE EUROPEAN eWORK
SITES

eWork Association Sites

Austria	Österreichische Telearbeitsvereinigung (ÖTA) Austrian Telework Association	www.oeta.at
Belgium	The Belgian Teleworking Association (BTA) - French and Dutch	www.bta.be
France	Association Française du Télétravail et des Téléactivités (AFTT)	www.aftt.asso.fr
Ireland	Telework Ireland	www.telework.ie
Italy	Telelavoro Web Italia	www.telelavoro.rassegna.it
	Societa'Italiana Telelavoro (SIT)	www.societaitalianatelelavoro.it
Luxembourg	Association Luxembourgeoise des Télé-Activités (ALTA)	www.alta.lu
Netherlands	Netherlands Telewerk Forum (Stichting Nederlands Telewerk Forum)	www.telewerkforum.nl
Portugal	Associacao Portuguesa para o Desenvolvimento do Teletrabalho (APDT)	www.apdt.org
	Associacao Portuguesa de Teletrabalho	www.teletrabalho.com
Spain	Asociación Española de Teletrabajo	www.aet-es.org
Sweden	Distansforum	www.distansforum.se
UK	The Telework Telecottage and Telecentre Association (TCA)	www.tca.org.uk/
	Scottish Teleworking Association (STA)	www.cali.co.uk/sta/
	Telefythynnad Cymru (Telecottages Wales)	www.telecottages.org

Other European Country Specific or Local Language Sites

Austria	Austrian Telework Website (German)	www.telearbeit.at/ www.euro-telework.org
Belgium	Televillage initiative	www.televillage.be www.telework.televillage.be (dutch) www.alcatel.be/telework
Bulgaria	European Telework *Online* Bulgaria	www.eto.org.uk/nat/bg/
Central and Eastern Europe	European Telework *Online* Central and Eastern Europe	www.eto.org.uk/nat/eec/
Denmark	Distancearbejde (Danish Retail and Office Workers Union, HK)	www.distancearbejde.dk
	Digital Denmark national programme	www.detdigitaledanmark.dk/english
	Freelancers service	www.freelancer.dk
Finland	National Telework Theme Group	www.ework.fi/english/index.htm
	The Finnish Work Environment fund	www.tyosuojelurahasto.fi/english/
	Statistics Finland	www.tilastokeskus.fi/index_en.html
	Ministry of the Labour	www.mol.fi/english/index.html
	Workplace Development Programme	www.mol.fi/tyke/new/english/index.htm
	eWork projects with ESF funding	www.ework.fi/esrraportti/frame_index.html

France	Council of IT (CSTI)	www.csti.pm.gouv.fr
	eAdministration	www.service-public.fr
Germany	OnForTe (best practice in Telework)	www.onforte.de
	Internet Telework Job Exchange	www.telejobservice.de
	Teleworking Germany: job offers	www.go-teleworking.de
	TA Telearbeit	www.ta-telearbeit.de
Greece	European Telework *Online* Greece	www.eto.org.uk/nat/gr/
	Teleworking Greece	www.teleworking.gr
Hungary	European Telework *Online* Hungary	www.eto.org.uk/nat/hu/
Ireland	eWork Business Awareness Campaign	www.ework.ie
	Teleworking jobs online	www.exp.ie
	Family Friendly working arrangements	www.familyfriendly.ie
	Dept Enterprise Trade and Employment	www.entemp.ie
	Irish Internet Association	*www.iia.ie*
Italy	INPS	www.inps.it
	Ministry of Labour	www.minwelfare.it
	CENSIS Foundation	www.censis.it
	IT Companies Association	www.assinform.it
	Federation Confindustria	www.federcomin.it
Japan	Japan Soho Association	www.j-soho.or.jp
Latvia	European Telework *Online* Latvia	www.eto.org.uk/nat/lv/
Luxembourg	European Telework *Online* Luxembourg	www.eto.org.uk/nat/lu/
Mediterranean countries	European Telework *Online* Mediterranean Countries (MED)	www.eto.org.uk/nat/med/
Moldova	European Telework *Online* Moldova	www.eto.org.uk/nat/md/
Netherlands	Institute for Public and Politics (new media newsletter)	
Norway	Project Telework	www.ementor.no/fjernarbeid/index.asp
	European Telework *Online*	www.eto.org.uk/nat/no/
Romania	European Telework *Online* Romania	www.eto.org.uk/nat/ro/
	Sfetcu Home Page with general information on teleworking	www.geocities.com/eureka/park/3622
Russia	European Telework *Online* Russia	www.eto.org.uk/nat/ru
	In Russian	http://ieie.nsc.ru/~eto/
Spain	Spanish Chamber of Commerce	www.camerdata.es
Slovenia	Research on Internet	www.ris.org/indexuk.html
	eWork Action Plan	www.alppeca.si
	Implementation of home based business and ework	www.delodoma.net
	Institute of Macroeconomic Analysis and Development	www.gov.si/umar
Sweden	Facts on ICT	www.sika-institute.se
Switzerland	Telework Unlimited	www.telework.ch
UK	UK OnLine initiative	www.dfee.gov.uk/ukonlinecentres
	UK Teleworkers Web Site	http://members.aol.com/telwebsite/
	Institue of Employment Studies	www.employment-studies.co.uk
	eGovernment	www.dti.gov.uk

General eWork Sites

European Commission IST programme	www.cordis.lu/ist
IST Key Action on New Methods of Work and Electronic Commerce	www.cordis.lu/ist/ka2/welcome.html
eEurope	http://europa.eu.int/information_society/eeurope/index_en.htm
Benchmarking Telework Trends in Europe	www.ecatt.com
Statistical Indicators Benchmarking for the IS	www.sibis-eu.org
European Telework Online	www.eto.org.uk
Andrew Bibby - Telework notes	www.eclipse.co.uk/pens/bibby/telework.html
British Telecom - Telework reports	www.labs.bt.com

Connected - Alan McClusky : views/links	www.connected.org
Guide to Flexible Working	www.flexibility.co.uk
Home office partnership	www.hop.co.uk
WISE forum (Work, Information Society and Employment)	www.wise-forum.org
eWork 2001 (Conference Helsinki)	www.telework2001.fi
eWork 2002 (Conference Paris)	www.ework-in-europe.com
eWeek and eWeek awards	www.etw.org
e2002 (Conference Prague)	www.ebew.net

European RTD Project Sites

ATTRACT	www.cyberce.gr/attract
AUDIOTAIN	www.audiotain.com
AVATAR	www.3xodus.com/avatar_conference
BALTPORTS	www.balports-it.com
BANCA	www.ibermatica.com
BEEP	www.beep-eu.org
CAPERS	www.posteurop.org
DIVERCITY	www.e-divercity.com
E3WORK	www.mayeticvillage.com/e3work
EMERGENCE	www.emergence.nu
EXTERNAL	www.dnu.no
FAMILIES	www.families-project.com
FLEXWORK	www.flexwork.eu.com
ICCI	http://cic.vtt.fi/projects/icci
KNOWCOAT	www.knowcoat.net
OSMOS	http://cic.vtt.fi/projects/osmos
SABARECO	www.sabareco.com
SANE	www.saneproject.com
STAR	www.databank.it/star
STARMATE	http://starmate.iff-upl.fhg.de
TELEBALT	www.telebalt.lv
TERRA2000	www.terra-2000.org
UNITE	www.unite-project.org
VIEDOCOM	www.cancer-network.de/videocom
VIP	www.unomondo.org
WHALES	www.gformula.com
WIST-CIS	www.ednes.org/main_e.htm

International Sites

Canadian Telework Association	www.ivc.ca
Japan Telework Association	www.japan-telework.or.jp/english_index
Gil Gordon - telecommuting (USA)	www.gilgordon.com
Jala International (USA)	www.jala.com
The International Telework Association (ITAC)	www.telecommute.org
Telecommuting Advisory Council (USA)	

Annex 4: DEFINITIONS & GLOSSARY

Definitions

eWork

There are many definitions of telework. This causes difficulties when trying to compare the results of different telework surveys and research. The common element across all aspects of telework is

> "the use of computers and telecommunications to
> change the accepted geography of work."

It 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" has been popularised in Europe through its use by the European Commission, which from the late 1980s and early 1990s has 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 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 organisations 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.

Nomadic (peripatetic) Telework
These teleworkers 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 (see LIW below).

Remote Office Telework
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 organisations 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 organisation (see glossary). Telecooperation entails new skills and changes to organisations. In particular the information and communications flows of traditional organisational hierarchies are undermined, and the barriers of communication across organisation boundaries are dissolved.

Glossary of Terms

ACTS (Advanced Communications Technologies and Services). A European Union research and technology programme under the Fourth Framework. ACTS is concerned with the deployment and use for economic and social benefit of advanced trans-European networks and services, such as ISDN, mobile communications, broadband and multimedia services. ACTS focus is on applications rather than the technology per se.

ADAPT is an initiative financed by the European Social Fund which aims to assist the workforce adapt to industrial change. Thus, the Information Society and advances in ICTs are looked at from the human resources development perspective, issues which are of direct relevance to telework. The Social Fund is contributing 1.6 BECU over five years and, together with Member State co-funding, this reaches 3.2 BECU

AET (Asociación Española de Teletrabajo). Spanish Telework Association.

AFTT (Association Française de Teletravail et des Téléactivités) French Telework Association.

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).

ECTF. European Community Telework/Telematics Forum.

*e***Commerce**: Sales and purchase of goods or services over telecommunications networks, notably the internet.

EDI (Electronic Data Interexchange): the exchange of structured electronic messages (such as orders or invoices) over special telecommunications networks to replace paper transactions.

*e***Europe:** An initiative by the European Union to accelerate the development of the knowledge economy.

EITO 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.

ESPRIT (European Special Programme for Research into Information Technology). A European Union research and technology programme under the Fourth Framework. Its focus is on the collaborative development of core technologies such as complex semiconductors, multimedia and expert systems.

ETD (European Telework Development). An initiative under the ACTS programme. The aim of the initiative is stimulate the beneficial uptake of telework, teletrade and telecooperation.

ETO (European Telework *Online*). The Web site on European telework (*http://www.eto.org.uk)*, supported in part by ETD. For details see Annex 3.

ETW (European Telework Week). A coordinated week of activities, such as conferences, exhibitions and open-house events to focus public and media attention on the economic and social benefits of telework. The first European Telework

Week was held from 9-16 November 1995, and has been followed by others, growing more diverse and widespread annually. European Telework Week 1998 runs from 2-9 November 1998.

*e*Work: 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 organisations, 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.) See also URL.

ICT (Information and Communications Technology). A generic 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 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 (q.v.). 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' (q.v.) 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 q.v.) since they provided the major back-bone connections between countries, and sold on bandwidth to smaller local IAPs. The term seems to be declining in use.

ISPO (Information Society Project Office). A service unit established by DGIII and DGXIII 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 and technology programme under the Fifth Framework (1999-2002). The IST Programme is 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.

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.

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. multifarious 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. Organised representatives of labour market interests such as employers associations' and trades unions.

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 and earlier definition that included enterprises less than 500 employees. It includes medium, small (less than 50 employees) and micro-enterprises (less than 10 employees).

TAP (Telematic Applications Programme). A European Union research and technology programme under the Fourth Framework. Its focus is the application of information and communications technologies in areas such as education, health, transport and libraries.

TCA (TeleCottage Association). The biggest telework association in the UK. Although its roots are in the telecottage movement its full title is The Telework, Telecottage and Telecentre Association.

Teleactivity. A generic 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). An emerging cellular 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 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 Organisation. An organisation 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	Authors	Other Details	Date
E-work 2001 Status Report on New Ways to Work in the Knowledge Economy	Peter Johnston, John Nolan	CEC, DG Information Society - Unit C1: New Methods of Work	September 2001
eMobility Report of the Conference on Mobility in the Knoweldge Economy	Peter Johnston, Leif Norlin, Erik Bohlin	CEC, DG Information Society - Unit C1: New Methods of Work	December 2001
* Overview of Activities New Methods of Work and Electronitc Commerce * Summaries of Projects statred in 1999 & 2000 (Calls 1, 2 & 3) * Summaries of Projects started in 2001 (Calls 4, 5 & 6)	Rosalie Zobel *For further information : Peter Johnston*	CEC, DG Information Society - Unit C1: New Methods of Work	December 2001
E-work 2001 Informe de Situación de los Nuevos Métodos de Trabajo en la Economía del Conocimiento	Peter Johnston, John Nolan	CEC, DG Information Society - Unit C1: New Methods of Work	April 2002

Publications obtainable from the Office for Official Publications for the European Communities, L-2985, Luxembourg.

eWork magazines

Title	Publisher/Other Details	Frequency
European Journal of Teleworking (English)	Addico Cornix 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 Brinkpoortstraat 38 7411 HS Deventer Tel.: +31.570 611044 E-mail: kene@nedernet.nl	6 per year Price FL 72,50 per year Available by subscription only
Teleworker (English)	The Telecottage Association The Other Cottage Shortwood, Nailsworth Gloucestershire, GL6 0SH Tel.: 0800 616 008	6 per year

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