Status Report on

European Telework

TELEWORK 98

Foreword

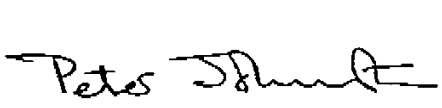
The year 1998 marks a turning point in the development of new working practices in Europe. Although definitions are very difficult in this rapidly changing field, current best estimates indicate that about 4 million Europeans[1], about 2½% of the workforce, are teleworking in one form or other. This is twice as many as 2 years ago. In addition, what we termed "telework" a couple of years ago is now considered a "normal" way of working. Telework is rapidly developing into a mainstream work practice.

The changing employment situation in Europe is driving people and organisations towards new ways of working and of organising work, and technology itself is arguably the major enabling factor. The increase in telework is a consequence of the rapid development of key technologies, such as mobile telephony (mainly GSM, currently with 85 million subscribers globally), the Internet, and the increasing use of intranets within business organisations and extranets. The technologies underpinning call centre development, for instance, have already resulted in new employment for about 400,000 Europeans.

1998 is also a turning point in terms of European support. Telework development not only benefits from support from European Research Funds, but also increasingly on contributions from the Structural Funds[2]. In 1998, for the first time the volume of financial support to telework deployment in European Structural Funds exceeds that for telework development from the Research Programme: another sign of maturity for telework. In RTD itself, the shift from the Fourth to the Fifth Framework Programme, and particularly to the Information Society Thematic Programme, is well on track for decision and implementation by the end of 1998. It is expected that the Council of Ministers and the European Parliament will agree to approximately 500 MECU of support for the Key Action on New Methods of Working and Electronic Commerce. This will give a significant financial boost to the development of more flexible working practices, as well as to the quality of working life for all working people. It represents a major effort to put Europe at the forefront of the next generation of technology development and support for new working practices and employment opportunities.

This publication includes updated information on the latest developments and initiatives, both those undertaken by Research Programmes and those supported by Structural Funds and the Trans European Network Framework. These activities, supported at European level, accompany a wide spectrum of policy debates, centred on the opportunities for new employment. These debates have been stimulated by the European Commission, and animated at the annual European Assemblies on "New Ways to Work"[3], as well as during European Telework Week[4]. The views expressed are those of the numerous contributing authors, not necessarily of the Commission itself.

The continuous participation of all parties concerned in the "telework" debate is essential in an area that will affect the future working life of millions of Europeans. Your participation is vital.



Peter Johnston Maarten Botterman

[1] According to the EITO Task Force Mid-range estimate, EITO 1998
[2] see annex 2: European projects
[3] 4th European Assembly: *Good Practice for the Future*, Stockholm, 24-26 September 1997, and 5th European Assembly *Rediscover life*, Lisbon, 23 – 25 September 1998
[4] European Telework Week: *For a Competitive and Sustainable Europe*, 2-9 November 1998.

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1. Introduction

1.1 The take off of telework

Telework, as work based on or facilitated by the networked technologies of the Information Society, is transforming the European working environment. Because of the direct benefits and opportunities it provides, telework is not an objective in itself, but a means of achieving a wide variety of ends. Thus, many organisations now see telework as a direct means of increasing productivity and flexibility; many development agencies now use telework as a tool in socio-economic development and job creation; and many individuals now incorporate telework in their daily lives in order to increase their own control of work and to achieve a better fit between work, family and personal life. The advantages telework delivers are catalysing changes across all aspects of working life, so that what we call *telework* today will simply be called *work* in the near future.

The enabling role of Information Society Technologies (ISTs) is critical to these changes. Full liberalisation of European telecommunications from the beginning of 1998 is being accompanied by tremendous market growth and diversity, and especially in dramatic price-performance improvements across the whole range of telework technologies, including the Internet, e-mail and World Wide Web applications, mobile services, on-line support and cooperative working software. Industry, the social partners, government authorities, the European Commission, as well as pioneering individuals and communities, have all contributed to this progress.

In 1997 and early 1998, telework became a significant part of the wider changes to work taking place in the Information Society, and the number of individuals teleworking in Europe rose to over 4 million[5]; almost 3% of the workforce. From being the idiosyncratic pursuit of a handful of enthusiasts and experts in the 1980s, telework developed alongside the introduction of business process re-engineering in the early 1990s but affected fewer than 1% of the workforce. Today, in the late 1990s, telework has reached a critical point of take-off where it is becoming mainstream in information-rich sectors and jobs and for skilled and high level personnel. Over the next few years, the take up of telework can be expected to spread throughout other sectors and jobs as part of the unfolding of the global networked economy and the widespread growth of virtual organisations and teams.

However, in order to maximise the benefits of this growth, significant problems remain to be tackled. Europe is following, rather than leading such developments, with North America still in the vanguard of technological and market progress. There are great variations in telework and Information Society take up between, as well as within, countries (especially marked by real north-south and west-east divides across Europe), and between different types of organisation and different social groups. Inappropriate and damaging implementation of telework, especially where it is only used as a means of cutting costs, rather than also improving quality and flexibility, or as a means to exploit and isolate the labour force rather than giving individuals greater control over work processes, still all too often grab the headlines and dominate agendas.

Lack of fully developed infrastructures, both of ISTs and of enabling facilities for telework, such as the appropriate design of dwellings and buildings and the provision of local telecentres, remains a real barrier. Employment regulation and legislation which disadvantage or do not recognise flexible work forms such as telework, both within and between member states, continue to restrain progress. The greatest barrier of all is still lack of awareness and uncertainty. For example, many in leadership positions do not understand the potential of ISTs and the advantages which teleworking can bestow, including increased flexibility, greater productivity, new and wider markets, and easier recruitment.

[5] According to the EITO Taskforce mid range estimate, presented in The European Information Technology Observatory (EITO) 1998 Yearbook, Figure 8, p.300.

Until the majority of decision-makers themselves get on-line, and encourage their colleagues and employees to do the same, this road block will remain in place.

1.2 Working where it's best

Telework in Europe in 1998 is beginning to be conceived as the potential for working where and when it's best to do so, as determined by all the parties involved, whether the employer, employee, customer, the social partners, the family, the community or wider society. Freed from constraints of place and time, work can thus fully respond to the radical changes affecting the economic, social and cultural life of Europe. These encompass:

- what work is done, as new types of work emerge including Internet, electronic commerce, multimedia and IT based work, and burgeoning employment in business services such as finance, insurance and consulting, as well as in human services such as the caring and education professions
- how work is done, through the transformation of individual competence and work practices, organisational structures and management attitudes and styles, each of which can significantly enhance the quality of working life
- the full implications of the emerging network economy, whether on a global, European or local basis, which is transforming market development and reach.

Thus, work in the Information Society, is in reality becoming "what you do" not "where you go".

The present bottleneck of European telework perception revolves around seeing it as place-specific, typically at home, with a focus on its isolating aspects at a distance from the perceived "normal" place of work at the employers' premises. Although these aspects continue to be important and have had a key role in stimulating telework in the past, they are now constraining both understanding and practice. Indeed, home-based teleworking is unlikely to remain the dominant form because the barriers here are often the greatest, including lack of space, conflict with normal home activities, and tax, legal and insurance aspects.[6] On the other hand, commuting for two to three hours a day to sit at a desk in an office where much of your work involves use of the telephone, e-mail, voice mail, information sharing via the WWW, computer-based on-line discussion and support services, etc., seems inappropriate if you could use a local satellite office, telecentre or other local facilities, or work from more convenient or appropriate customers' or colleagues' premises. In this way, working in a variety of different locations can positively facilitate new forms of work and collaboration which are not subject to geographical constraints.

Thus, where (and often when) one works is no longer very interesting compared to the what and how of work. The "mechanical" requirements for working in specific places, including technical access, physical facilities, suitable legislation, insurance, tax and security, need, of course, to be solved. However, as these enabling requirements start being met, so the what and how of work, at last freed from where and when constraints, can start to blossom both quantitatively and qualitatively.

1.3 The core characteristics of location-independent work

Telework exhibits a number of core characteristics which cluster around changes to the what and how of work, rather than around working remotely from some so-called normal location. (See Box 1.) Telework is work undertaken using electronic network technologies, so that its core characteristics are starting to become a defining feature of all work in the Information Society.

[6] The European Information Technology Observatory (EITO) 1998 Yearbook, p.286.

Box 1

The core characteristics of beneficial telework/work in the Information Society

Information Society Technologies

1. The critical use of electronic network technologies in enabling or promoting these core characteristics, thereby profoundly affecting all types of work whether or not traditionally considered as telework; telework thus has spill-over affects on all work

Place and time constraints lifted

2. Constraints on the physical location of the parties involved in work (employees, employers, colleagues, partners, customers, suppliers, etc.), are partially or totally relaxed and can be determined instead by what is best or most convenient for all concerned
3. The timing of work can be adjusted to take account of the needs of all the parties involved in work, for example the possibilities of fitting into family needs or cooperatively working across national boundaries or time zones, thereby fully exploiting the 24-hour day

Employment market extended

4. Both employers' labour markets and individuals' job markets are widened in terms of geographical extent as well as in professional range and quality

Organisational transformation

5. Work takes place in disaggregated, often dispersed, smaller organisational units displaying delayered, flatter hierarchical structures and exhibiting a large amount of delegation and horizontal communication (both within and outside the organisation)
6. Organisational boundaries and permanence tend to break down with more work performed in virtual organisations and teams set up for the duration of the task

Management and work relations

7. Management becomes more focused upon strategic development, creating appropriate work cultures, team facilitating, and measuring work by output or results, rather than upon control, detailed decision-making or measurement of time expended
8. Work relations become much more complex, multifarious and equal, with specific parties often playing more than one role (such as customer, manager, supplier, partner, colleague, work executor, etc.)
9. Greater trust becomes key to most if not all work relations, and all parties involved in work develop flexible attitudes

Work processes and tasks

10. Decisions about, and responsibilities for, work are delegated to the executors of work
11. Work becomes fully networked, covering both physical interaction as well as interaction and communication over the telecommunications network
12. Work becomes more project-like with specific goals, budgets, processes, organisation and time horizons
13. Work becomes more dynamic and flexible in response to rapidly changing market situations

The individual

14. The individual takes more responsibility for his/her own development of skills, competence and career paths
15. The individual develops the skills of working independently but also co-operatively in both physical and networked contexts; this encompasses professional expertise as well as all-round competencies such as use of ISTs, common sense, organisational, work-management, planning, human relationship and team working skills.
16. The individual's ability to integrate work with personal and family life is enhanced

It is these core characteristics of work in the emerging network economy, as defining attributes of telework, which are key and which will have a catalytic effect on all future work, including that undertaken on the employers' normal premises and in face-to-face mode. Indeed, all work, often driven by the shock-troops of telework, is starting to form around networks of multiple and simultaneous relationships with a constant churn of new markets, products, processes, tasks and skills, largely underpinned by electronic networks but also spilling over into more traditional modes.

The future holds a seamless hybrid of work in both physical and tele modes, where the term *networker* may come to be more apposite than *teleworker*. There is a sense in which the three main routes to telework (see Box 2) are already converging around these core characteristics.

Box 2

Three main routes to telework

in which each converges on the core characteristics of telework/work in the Information Society

Route 1: the traditional organisation	Route 2; new, small organisations built around networked technology	Route 3: self-employed and freelance
• Telework, typically home-based or in a satellite office, is adopted as a conscious test or trial with a limited number of employees • Achieves many benefits for both employer and employee • Benefits start to spill over on to other employees and to change the organisation, its management and its external relations • Once these benefits (the core characteristics) are visible, they start to be applied to all relevant activities of the organisation, including those taking place in the traditional workplace and not involved in the original telework trial.	• includes many SMEs and micro organisations established in last 5-10 years, often resulting from outsourced tasks from larger traditional organisations, as well as those in the IST sectors • exhibits many forms of flexible work practice and organisation, particularly telework, based on both internal and external electronic networking • methods and location of working are constantly adjusted to suit changing market needs and opportunities, including working at home, in satellite offices, in mobile mode or at any suitable workplace, whether or not owned by the organisation • the benefits (core characteristics) tend to be taken for granted as they are part of the organisation's raison d'être.	• typically the normal workplace is at or very close to the individual's home, or based here if the work is of a mobile nature • work is typified by trading relationships with a customer rather than employment relationships with an employer • can resemble route 1 when telework is consciously introduced to existing work practices to order to test the benefits (core characteristics), which can then catalyse other aspects of work • can resemble route 2 when the individual sees the opportunity to directly exploit the benefits (core characteristics) to gain immediate market or efficiency advantages.

Overall, 1998 seems to mark a turning point in European telework development as a critical mass is starting to form through the coming together of a large number of demand and supply side factors. For many years the supply-side has provided increasingly suitable and affordable technology and thrown up a large number of would-be teleworkers eager to improve the quality of their lives and those of their families and communities.

In the late 1990s, the demand for telework from the economy and from employers and customers is starting to meet this supply. This is not because telework is demanded for its own sake, but because it adds value to a task, a process, a business or an economy. This is a new situation, and although progress to date remains mixed, it is creating the conditions in which telework is becoming a mainstream tool in an increasing number of work situations across Europe. Paradoxically, as it starts to achieve widespread acceptance and a degree of normality for many, there is a sense in which telework loses its singularity and distinctiveness; it becomes routine. It becomes a major part of work in general and not a phenomenon worthy of special interest or comment by those practising it. This is a natural and welcome development and marks the take-off phase of telework.

Whilst recognising and attempting to counter barriers, problems and threats, the European Commission supports a wide range of activities to promote opportunities for beneficial telework. These include research, technology development, awareness-raising, pump-priming development initiatives, the promulgation of exemplars and good practice, and information sharing at all levels. The Commission is also a leading advocate and proposer of regulatory and legal changes in technology, social and employment fields. These are designed to provide sound frameworks for the widespread take up of low cost and high quality ISTs, and to promote fruitful social dialogue between the social partners, in order to stimulate beneficial changes to working practices, the creation of new employment opportunities, and

the achievement of a progressive balance between flexibility for the providers of work and security for the executors of work. The challenges are awareness, access and trust, not just in the organisation of work but also in the new business processes and trading practices arising out of the explosive growth of the Internet and electronic commerce. The upcoming Fifth Framework Programme for Research and Technology Development (1999-2002) includes activities to support the realisation of these ambitious but achievable goals.

1.4 Telework 98

Telework 98 provides a snapshot and overview of the status of European telework, and of European Commission activity related to telework, at mid year 1998. Following this introduction, there are four main sections, each contributing to an overall description and analysis of European telework today, as well as anticipating future developments.

Section 2 attempts to place European telework in its context, particularly in relation to the wider development of the Information Society and to the network economy. As part of this it provides a balanced overview of telework development in Europe in 1998 by assessing both opportunities and challenges. It sketches how telework is today instrumental in promoting environmental benefits, the integration of disadvantaged groups into the labour market, the harmonisation of work and family life, achieving business gains and efficiency, and integrating companies and economies into the global economy. It also pinpoints important challenges, ranging from social isolation to unsuitable employment legislation, labour market mechanisms and inhibiting tax and insurance regulations.

Section 3 provides a status review of telework throughout Europe, including the latest quantitative estimates of the take up of telework in different countries and internationally. As well as a summary assessment at European level, this section briefly examines the situation in each member state in the context of European and international developments, as well as assessing the telework status in Central and Eastern Europe and in our main competitors in order to provide an international benchmark. A round-up of major European telework events over the last year, including European Telework Week 1997 and the European Assembly in Stockholm in September 1997, is also provided.

Section 4 examines the European Commission's role and its initiatives regarding European telework, both in relation to its research agenda (particularly the upcoming Fifth Framework Programme for Research and Technology Development, 1999-2002), as well as to its overall policy frameworks including the application of structural funds. For each of the Commission's major policy areas, activities related to telework are assessed and the progress and achievements are summarised.

Section 5 looks to the immediate and medium-term future, and particularly at policy and market developments for telework and related tele-activities. Major events and initiatives for the rest of the year are highlighted, including the European Telework Agenda, the Telework Assembly in Lisbon in September 1998, and European Telework Week during the first week of November 1998.

The *annexes* include more detailed and structured information, including reports on European Telework Week 1997 and overviews of telework-related projects, resources, publications and references. This is necessary for appreciating the wide ranging nature of telework activity in Europe and the significant contribution being made by many people all over Europe, together with the European Commission.

2. European telework in context

Four years ago, a company offering disaster-recovery services for businesses was founded in the UK. Today it has 70 employees and 30,000 square feet of office space, which none of them use except for the occasional meetings and seminars. If a client of Catalyst Technology Solutions[7] is hit by fire or flood, or if computers malfunction, they can reload the company data on to the Catalyst system, temporarily move into the available office space if necessary, and continue to operate as if the crisis had never happened.

Catalyst's staff are the shock troops of the network economy who work from home, at their clients, or wherever it's convenient for them to do so. Its chief executive says of his workforce: "I trust them, that's the key." Employees working without a manager peering over their shoulder involves a high degree of trust, and typically report much greater effectiveness due to fewer distractions and enhanced commitment. "I can be in the Bahamas and still know what is happening, just by plugging in my computer."

This virtual workforce, talking to each other and clients over the network, is the key to the company's structure and enables it to keep costs lean and ahead of the competition. It is typical of new, small, but often rapidly growing, firms built around and fully exploiting the new converging technologies of computing and telecommunications. It is typical of the way businesses are considering how their organisations, markets and opportunities are changing as worldwide spending on such technologies has overtaken investment in machines and factories.[8] "Our competitors find it impossible to copy us", says the chief executive, "because they are stuck in a culture which involves people siting in offices with a manager in a glass-fronted office watching them and shouting when he wants attention."

Work in Europe, as in other advanced economies, is developing rapidly in the directions illustrated by the Catalyst example. This offers immense opportunities and poses profound challenges for everybody involved – employees, employers, the self-employed, families, communities, governments. Whether in Europe we can respond successfully, and create prosperity around new high quality work, depends upon understanding what is happening, and taking appropriate action – including necessary risks – whilst remaining true to the established European traditions of social inclusion and quality of life. Above all, it means doing so in the context of the burgeoning network economy.

2.1 European teleworking: perspective in the network economy

Sceptics argue that although companies like Catalyst might be able to exploit a competitive advantage over other businesses through the imaginative use of new technology, there has been little positive return in improved output per worker from the global hi-tech spending spree. However, this productivity paradox now seems to be changing to a productivity bonus, at least in the USA and the most advanced northern European countries, especially in areas such as business services, according to the normally cautious Alan Greenspan, the Chairman of the US Federal reserve, as well as to independent analysts, the International Data Corporation (IDC).[9]

This new situation is due to a change in the nature of the spend on, and the nature of the exploitation of, Information Society Technologies (ISTs). IDC's analysis shows that with much of the plumbing in place (infrastructures and computer hardware), the most advanced countries are now spending much more on improving the flow of information, so that the software and services markets are the fastest

[7] For more information see *http://www.catalyst-solutions.com*.
[8] *Guardian Weekly*, 31 August 1997, p. 19.
[9] *The 1998 IDC/World Times Information Society Index: Measuring Progress Towards a Digital Future*, IDC, 1998, p. 18.

growing and most dynamic. Greenspan also points out that there is always a lag between the introduction of new technology and companies fully exploiting it.[10] Changes to organisational structures, and not least to awareness and attitudes, tend to take longer than changes to technology. Wealth in the network economy flows directly from innovation, not from optimisation, and there is always a stage during which new technology is initially used to do existing things better, faster and cheaper, before sufficient awareness and experience develop to enable full exploitation of the potential of new technology for doing completely new things in innovative and creative ways.[11]

The revolution being brought about by the network economy is much more profound than the digital revolution. The grand irony of the late 1990s is that the era of stand-alone computers is over. All their major consequences have already taken place; computers have speeded up our lives a bit, and that's it.[12] What is now important is communication between computers: connections rather than computations. And since communication is the basis of wealth creation, of culture and of the way we live and work, changes here are indeed momentous. The critical technology conjunction of the network economy is the simultaneous impact of two developments: the microcosm world of the microprocessor, as computer chips become embedded in an increasing array of products; and the macrocosm world of the network as these chips relentlessly connect everything to everything else. This includes direct selling between producer and consumer through 'dis-intermediation', direct contact between organisations and firms and direct cooperation between the individuals carrying out work with colleagues and clients. This friction-free economy reduces costs and improves quality, as well as increases economies of scale and scope through the global nature of the network.

Trading on the Internet is now exploding. In 1998 it is likely to be US$20 billion, three times more than in 1997. By the year 2,000 it is expected to rise to US$1,000 billion, about one sixth of total world trade.[13] Seventy per cent of this enormous growth results from trade between companies, whilst 30% is due to direct sales to consumers.[14] Advertising on the net is also taking off, for example by 240% between 1996 and 1997, corresponding to US$1 billion.[15] If the telephone changed the economics of retail banking, the Internet is now cutting the costs of transactions even more with immense implications for all sales and distribution functions. The Internet is changing not just the shape of industries but also the way they are run.

Such changes in economic chain value are paralleled in the workplace. For example, the number of software programmers is growing enormously and the Internet itself is generating employment, such as web page designers, on-line marketers, call-centre operatives, etc. Company web-sites in the future will not be, as is now typical, an add-on, but the company's living centre. How the company's web-site works is how the company works. All this means that the workforce required is vastly different from any other in history. Typically, younger people who have grown up with the technology have the imagination and natural skills necessary.[16] These include skills that previously were strictly non-vocational, such as in the fine arts where artistic talent is needed to make web-sites appealing and intuitive, or the communication, personal relations and caring skills necessary for both electronic and physical networking. To some extent a new generation gap is growing up, so that perhaps the Internet really will liberate management from the iron grip of old style "bosses". All this is shifting power from suppliers to customers and from management to workers.[17] Consumers and workers have immediate

[10] *Guardian Weekly*, 31 August 1997, p. 19.
[11] AD-EMPLOY project no. T1010, Final Report, 1995: Employment trends related to the use of advanced communications, Jeremy Millard (Tele Danmark Consult A/S: jeremy@post4.tele.dk), for the European Commission, DGXIII.
[12] *New Rules for the New Economy*, Kevin Kelly, Wired Magazine issue 5.09 – September 1997, on http://www.wired.com/wired/5.09/newrules.htm
[13] Word Trade Organisation, 1998.
[14] Nicolas Negroponte (MIT, Media Lab), 1998.
[15] Coopers & Lybrand, 1998.
[16] Don Tapscott, *Growing Up Digital*, McGraw Hill, 1997.
[17] Chuck Martin, IBM Vice President for Publishing and Advertising, *The Digital Estate*, IBM, 1998.

access to all information via the Internet, thus spelling the death-knell of the old inward-looking, hierarchical business model and heralding a new model which looks outwards to the customer and to society and which fully integrates all workers at all levels.

Clearly, there are threats as well as benefits for Europe here, and these are surveyed in section 2.2 below. The challenge for Europe is to make the opportunities real and visible so that enterprises and individuals are encouraged to get on-line and to develop the necessary skills. The role of government at all levels is crucial here, as experience from both North America and Europe shows. For example, the US Government has long had a procurement policy that requires all tenders and communication to take place on-line. A current example from Denmark shows how a simple change in the tax laws can trigger a dramatic effect on household use of computers and the Internet, directly contributing to a large increase in telework.

In the summer of 1997 a small change in the Danish tax laws took place which meant that a computer supplied by an employer for private use in an employee's home is not subject to tax as long as it is also available to be used for work-related tasks. As a result many, especially larger, companies initiated schemes in which typically 75% of employee households are being supplied with a pentium computer, often also including a printer, modem and Internet subscription. In return, employees are required to take a so-called PC-driving license course in their own time, which includes the possibility of distance training arrangements, although the employer pays all charges.

About 35,000 Danish employees took advantage of such schemes during the second half of 1997 and about 150,000 are expected to do so in 1998. This is one of the factors which has recently pushed Denmark to the top of the world league table for the number of households with a computer at about 53% by the beginning of 1998. By the summer of 1998, about 17% of all Danish households had an Internet connection, compared with under 8% a year before.[18] These developments, in the context of the relatively low cost of ISTs in both absolute and relative terms, the highly developed educational sector and highly trained and qualified workforce, as well as the highest GDP per capita (after Luxembourg) in Europe, provide an ideal environment for telework and related tele-activities. As a result, some estimates now put the incidence of telework in Denmark as high as 15% of the workforce[19], although depending upon definitions a more realistic estimate is between 5% and 10%, compared to less than 0.4%, one of Europe's lowest, in 1994 (see also sub-section on Denmark in section 3 below).

The same country, however, also provides a lesson in how institutional inertia can block desirable developments, as Denmark presently trails most other countries in Europe (including Turkey but excluding Portugal and Luxembourg), in the use of the Internet for electronic trade, i.e. for the purchase and selling of goods and services[20]. This lowly position is mainly the result of the continuing failure amongst Danish banks, retailers' organisations and the government to agree about conditions for using the very popular Danish electronic payment-card over the Internet.

2.2 European teleworking assessment

As we have seen, the second half of the 1990s may well come to be regarded in future years as a turning point: the period in which teleworking reached critical mass in Europe. A number of factors, on both the supply and the demand side, have converged to bring about the preconditions for this.

Most obvious has been the rapid spread of new telecommunications technologies, including satellites, fibre-optics and wireless networks, which, although by no means complete, has created an infrastructure to which more and more European citizens have access. Closely associated with this has been the

[18] Danmarks Statistik, May 1998.
[19] The Danish TUC (Landsorganisation) suvey conducted by Gallup, November 1997.
[20] Lindhold, M. & Møller, K. *Slip danskerne løs*, Aschehug, 1998.

liberalisation of telecommunications leading to rapidly diminishing costs, increased consumer choice and a diversity of suppliers. There has also been a proliferation of mobile telephones and palmtop and laptop computers making it easier for people to work on the move. The reduced cost and improved infrastructure of telecommunications is at last following developments that have been going on in the IT sector, with a dramatic doubling of computer power whilst reducing the cost. Furthermore, user friendliness and interoperability have increased, as well The further growth of the Internet and, in particular, the high uptake of Intranets within Europe, has been bigger during the last year than ever before[21]. All this has contributed to the development of an 'email and network culture'.

In the meanwhile, a new generation has entered the labour market, brought up on computer games and fully technologically literate, sometimes referred to as the "Nintendo Generation". For the first time, the critical mass in terms of supply of new technologies and services, is matched by a critical mass in demand by people newly entering the labour market, having the technological and communication skills to use them.

The business environment is characterised by an ever-accelerating pace of change, in technology and in markets and a need to respond to raised customer expectations - both for improved quality and for speed of delivery. In an increasingly global competitive environment, it is also necessary to keep costs firmly under control. This has produced a need for constantly upgrading the skills of the workforce without compromising flexibility. The organisational changes which have accompanied these developments include new forms of strategic alliance and partnership, the disaggregation of large organisations into smaller units and a delayering and flattening of hierarchies.

Together, all these factors have combined to create the conditions in which telework can flourish. In this context, it is not useful to regard teleworking as a single form of working, capable of being isolated as a separate category. Rather it is more constructive to use the term to refer to any form of work freed from the constraints of time and place through the use of telecommunications and computing technologies. Because these technologies now permeate so many areas of work, across all industrial sectors and most non-manual occupations (and even a few manual ones) and affecting all grades of staff from the most senior management to the most junior data-entry clerks, it is dangerously simplistic to refer to 'teleworkers' as though they form a homogenous group. Rather, it is more appropriate that the skills of teleworking (by which is meant the generic skills required to use a combination of telecommunications and computing technologies to work effectively without direct face-to-face supervision) will increasingly be a precondition of employability for the entire European working population.

2.2.1 European telework opportunities

2.2.1.1 Environmental benefits

One of the strongest drivers for the introduction of teleworking in North America has been its expected environmental benefits. Most European governments, too, are committed to the view that teleworking offers a solution to problems of traffic congestion and environmental pollution. Surveys of teleworkers and their managers regularly show that the desire to reduce the stress of commuting and save the time which would otherwise be wasted on travelling to work are major motivators for taking up teleworking.

Whilst it is clearly the case that, at the level of the individual, teleworking definitely contributes to a sense that the quality of life has improved and that less time is wasted as a result of avoiding the daily commute to work, the real achievement of environmental benefits seems to depend upon the reasons for introducing telework and how this is done. There are several reasons for this. People may choose to live further from the city centre if they do not have to travel in to work every day. This could lead to longer

[21] Jim Clarck, President and co-founder of Netscape, at the Conference "Inventing Tomorrow", held in the European Parliament, June 1997.

journeys to work on the days when they do visit the office, but might also mean longer journeys for other purposes (such as shopping, taking children to school, social travel, etc.). There may also be a modal shift towards travel by more energy-consuming private cars and away from more environmentally-friendly mass transit systems. Finally, the prospect of emptier roads during rush hours might attract onto the roads people who would otherwise have stayed at home or used other forms of transport

Telework and 'hot-desking' may also be able to contribute to the de-materialisation of economic activity, for example by reducing the need for large, centralised office facilities and replacing these with much more modest locations designed only for meetings and as the occasional base of a nomadic and decentralised workforce. This has become an attractive business proposition for many companies, though this needs to be weighed against the materialisation of alternative infrastructures necessary to support such a workforce.

2.2.1.2 Integration of disadvantaged groups into the labour market

Teleworking enables disabled people and other groups which have in the past found it difficult to enter the full-time, on-site workforce, to work. These include prisoners[22], carers, parents of young children and people living in remote and inaccessible places. Such integration is related to wider choices in the location of work, for example by offering additional support in the form of child-care facilities, respite care, day centres and good public transport. Whilst many of the people in these groups may welcome the opportunity to spend a good portion of their working lives in the home, few wish to feel that they are imprisoned there, and the opportunity for face-to-face social interaction with colleagues forms an important part of the motivation to work.

2.2.1.3 Harmonisation of work and family life

One of the major demographic trends in Europe over the past two decades has been a dramatic growth both in the number of single-parent households and the number of two-earner households. The parent who can afford to be a full-time carer for his or her children is becoming a statistical rarity. Because of increased mobility of labour, there are also fewer households which are able to rely on the extended family (for instance grandparents) to provide childcare. This means that a majority of households with young children are now faced with the necessity to juggle work commitments with caring ones. In addition, there are also many households in which the breadwinners are having to combine paid work with caring for a sick or frail adult.

Teleworking offers a range of new possibilities for harmonising these competing demands. The possibility of 'shifting' work both in time and in space, creates a range of flexible new alternatives. It makes it possible, for instance, to switch from one type of task to another at fairly short intervals (for instance to break from work in order to greet a child returning from school, prepare a meal, or put washing in the machine). It also makes it possible to shift work to hours which would be regarded as 'unsocial' in an outside workplace - for instance to work at night, or at weekends. Such relatively seamless transitions between work and non-work activities are generally experienced positively by teleworkers. However, if the teleworker - and the other members of the teleworker's household - have not developed the skills for managing the boundaries between these activities, the teleworker's vulnerability to interruption may become a source of stress.

2.2.1.4 Improved quality of life

Because teleworking typically involves, or rapidly leads to, a de-centralised workplace and management structure, the individual needs to take more responsibility for both work tasks and processes, and thereby is able to exert greater control over the total work situation. In the best of cases, this leads to

[22] See sub-section on the United Kingdom in section 3 below.

significant enhancement of personal freedom and 'empowerment' in relation to where, when and how work is performed. This is particularly the case through the direct personal link forged with the quality of work outcomes. Herein also lies a potent source of greater satisfaction and commitment. Moreover, telework can extend the individual's job market, both in terms of content and geographically. All these factors can enhance the quality of life for the individual, as they directly contribute to improved personal enrichment and life style choices.

2.2.1.5 Developing the Information Society

The introduction of teleworking is accompanied by a dispersal of advanced information and communication technologies. Instead of being sited exclusively in offices, where they are visible only to office-workers, the new equipment is increasingly being placed 'out in the world' - in the homes of teleworkers, or carried around in their cars or briefcases. This provides an informal means of disseminating knowledge of these new technologies, and the skills to use them, to a much wider proportion of the population than any previous work-related technology. A laptop or home computer linked to the Internet may, for instance, be used by a teleworker's children to do their school homework, by a neighbour to send an urgent fax or even by a grandparent to look up a reference. Teleworkers often take on the role of IT 'barefoot doctors' in their local communities. The spread of teleworking is therefore linked in a very tangible way to the general development of the Information Society, contributing indirectly both to employability and to technological literacy. To the extent that they live in, and participate in the life of communities which include disadvantaged groups, teleworkers can thus be said to be helping to combat social exclusion.

2.2.1.6 Business efficiency

Although the benefits of teleworking at the societal and individual level are very important, it is the business benefits which are most likely to drive its future development. Unless a clear business case can made for teleworking, employers will be understandably reluctant to adopt it. In fact there are a range of different benefits which accrue to employers who adopt teleworking, including:

- increased efficiency and motivation of nomadic staff
- higher productivity (it is difficult to quantify white-collar productivity at any but the crudest quantitative level, but teleworking appears to be associated with an increase ranging from 0% to 45% depending on the circumstances. There appears to be no evidence of any cases where it has been associated with a drop in output)
- the ability to decentralise activities to get closer to the customer in both time and space and/or to take advantage of lower costs or more appropriate sites
- the ability to form, and re-form 'virtual teams' at short notice
- the ability to form telemediated alliances or outsourcing relationships with other organisations regardless of distance
- easier recruitment and retention of valued personnel
- savings on office overheads
- savings on travel costs

2.2.1.7 Participation in the global economy

Teleworking makes it possible for individuals, companies, and regions to develop their skills and offer their products and services regardless of location. It can thus make a crucial contribution to the economic development of remote regions which have in the past missed out on development opportunities because of their geographical remoteness. It can only do so, however, if the right infrastructure is available, at an affordable cost, and the right skills are available in the local population.

2.2.1.8 Local development

Telework can, under the right conditions, help to create jobs and enable localities to promote a new set of comparative advantages (which were previously of little economic importance because of lack of accessibility) to attract inward investment and relocation of economic activity. These advantages, typical of rural and remote areas, include attractive physical and man-made environments, and high quality of life, such as lack of stress, congestion, crime, etc. Although there are also many threats here (not least because of comparatively poor infrastructures and skills deficits), local areas do have a whole new set of opportunities where the crucial determinants are entrepreneurship, marketing and understanding how to exploit the innate characteristics of the area, rather than relative location.

2.2.2 European teleworking challenges

While it clearly offers a large number of opportunities, the introduction of teleworking also throws up a series of challenges. Many of these result from a mismatch between the institutions of a society designed for space-bound working and the realities of the emerging Information Society. None of these problems - which currently constitute challenges to the development of beneficial teleworking - are insurmountable, but they do need to be understood and addressed.

2.2.2.1 Social isolation

Surveys of teleworkers and their managers have fairly consistently shown that social isolation can be a major disadvantage of remote working, and a deterrent to adopting it. This is only the case, however, where workers spend all of their working time away from colleagues. Good practice in teleworking supplies opportunities for social contact in the form, for example, of a minimum number of days spent in the office, strong identification with the organisation, a supportive company culture, the provision of satellite and neighbourhood offices, etc., (for employees) or in the form of informal support networks for self-employed teleworkers.

2.2.2.2 Organisational attitudes, culture and structure

Almost every survey of the subject ever carried out has produced evidence that the single most important barrier to teleworking is perceived as 'management attitudes', sometimes couched in vaguer terms such as 'conservatism' or 'fear of change' and sometimes spelled out more explicitly as, for instance, 'fear that remote workers can't be managed effectively', 'fear that teleworking will expose weak management practices', or the fear of middle managers of a redundant role. It is tempting to respond to such evidence with an assumption that all that it is necessary to do to remove this barrier is to re-educate managers and/or wait for the older generation of conservative managers to retire and be replaced by a more progressive young generation. Such a response, however, denies a crucial reality: that attitudes are not free-floating personal attributes but are produced and reinforced (or alternatively challenged) by the institutional structures and cultures in which people are situated.

Thus workplaces in which people are rewarded on the basis of being seen to be present, rule-following, giving and receiving orders, having a large number of subordinates or performing well at committee meetings will tend to produce a greater resistance to flexible and dispersed working practices than those in which people are rewarded by results. Where the organisational culture is unsympathetic to teleworking, or managers are poorly trained, teleworkers may find themselves socially isolated, marginalised and denied access to ongoing training, full participation in decision-making, and promotion prospects. There is considerable evidence that teleworking works best where hierarchies are flat, bureaucratic rules are minimised, job descriptions are flexible and workers are encouraged to work to targets which they have negotiated with their managers or team-mates. It is also easier to introduce into organisations which already have a well-developed electronic communications culture - in which staff are already used to using voice-mail, e-mail and other forms of communication which make location

irrelevant and which facilitate asynchronicity. The introduction of intranets is currently spreading this kind of communications culture rapidly.

2.2.2.3 Human skills, abilities and knowledge

The shift from the rule-bound culture of a traditional, hierarchically structured office in which rules are externally determined to the self-managed environment of teleworking requires a considerable shift, not just in attitude but in competencies and knowledge. There is some general recognition that there is a need firstly for training managers in the management of teleworking; secondly for training potential or new teleworkers in both generic skills (such as how to use communications software) and job-specific skills; thirdly for providing ongoing training to existing teleworkers (as with office-based staff) to enable them to upgrade their skills; and finally for training for support staff and other office-based workers in the skills required in a networked organisation.

Most organisations have traditionally relied strongly on tacit, face-to-face methods to deliver a great deal of learning, both about the general skills required to carry out a particular job or the specific skills of how to get along in a particular organisation. Once the experienced staff who in the past delivered this form of training are no longer present at the core of the organisation, then they are unavailable to teach the next generation. There is therefore a need to invent new ways of learning from colleagues which do not depend on continuous co-presence in the office.

To some extent, it is possible to address this problem at the level of the individual company. At a societal level, however, an exclusively employer-based approach will leave certain groups excluded. There is also an urgent additional need for training to be made available for self-employed teleworkers and those working for small firms, and for training for the unemployed in general information skills.

At a still more general level, people need to learn how to work independently - to swap the habits of deference and rule-following which may have served them well in the traditional organisations for a new set of competencies involving self-reliance, decision-making, effective time-management, self-motivation and the ability to communicate and negotiate effectively and courteously with colleagues, clients and managers without face-to-face presence. Associated with these skills are another set, involving the ability to negotiate boundaries between work and non-work activities which make it possible to exploit the new opportunities which teleworking offers to integrate work with family life without falling into the danger of workaholism on the one-hand, or demotivated under-performance on the other.

These skills are not only useful for teleworkers, of course; they also contribute towards the general development of conscious work organisation, entrepreneurship and encouraging the unemployed or those facing redundancy to seek out and create new work opportunities.

2.2.2.4 Infrastructure availability and cost

Although it is rarely a driver of teleworking, the appropriate infrastructure is an essential prerequisite. At the most basic level, no teleworking can take place without a telephone link (fixed or mobile) which makes it possible to support speech and a modem. However there are many applications for which greater speed - and hence bandwidth - are necessary, notably those involving data-intensive applications (such as visual images, video or multimedia applications) and those for which speedy interaction is necessary in real time (such as interrogating remote databases or a variety of functions which involve dealing with customers by telephone whilst simultaneously retrieving and/or entering data, including customer service, telephone interviewing, tele-sales, etc.).

A lack of infrastructure capable of supporting data-intensive teleworking at acceptable speed, such as ISDN, xDSL, or two-way Cable, is not only a serious barrier to the uptake of teleworking in an absolute sense, it also introduces relative differences between European regions: some countries, notably on the Mediterranean fringes, lag well behind others, notably in the Nordic north, in the quality

and extent of their telecommunications networks, and, as a result, there are major disparities in access. Within countries too, there are differences, for instance between urban and rural areas. A recent study in England, for instance, found that rural areas were less likely to be covered by cellular networks, less likely to have access to ISDN, less likely to have access to cable networks and less likely to have a choice of telecommunications supplier than urban areas. Whilst Sweden, Finland, Denmark, France and Germany have made major efforts to ensure that rural areas are well-served, a similar situation does not pertain in other EU countries. The authors of the study concluded that, 'Demand is growing dramatically for access to information networks, such as the Internet. High volume users in rural areas will be disadvantaged if they cannot get access to ISDN services. As demand increases further for broadband services...it will be difficult to meet expectations in rural areas'[23].

The availability of telecommunications is not the only issue here. High costs for installation, line rental or usage can also constitute barriers to teleworking. Here too, there are major differences between European regions. However the global nature of teleworking also makes it necessary to make comparisons with other parts of the world. In the USA, for example, flat rate access seems to have boosted teleworking, as noted by Nicolas Negroponte: "It should not matter how much you use the Internet. It should be there, ready to use, with a flat rate access. As long as this is not 'normal practice' in Europe, Europe will not be able to make up for lagging behind the US."[24]

2.2.2.5 Hardware and software

Like the telecommunications infrastructure, the appropriate hardware and software are necessary prerequisites for successful teleworking. However the speed with which new products have become available in recent years, and the rapidity with which their price has fallen have meant that, with a few exceptions, they do not constitute a major obstacle to teleworking.

Nevertheless, a couple of problems do arise. Firstly, there can be significant problems of interoperability between hardware and software systems so that compliance with suitable standards continues to be an important issue. Secondly, it remains the case that much of the hardware and software currently in use is less than perfectly adapted for the purpose of teleworking. In general, the market can be left to deal with responding to consumer demand for change and producing new products.

However there remain some areas where a lack of appropriate hardware and software does represent a barrier to teleworking. Here, research and development might serve to stimulate the development of new products, including: hardware and software adapted for the needs of people with disabilities (for whom teleworking represents a major employment opportunity); software availability in minority languages, and programs to support translation to and from such languages; and software to support co-operative, interactive group-working in ways which are more subtle than the - mainly somewhat crude - groupware currently on the market.

The European Commission is already funding research and demonstrator projects in this area. This will be extended and developed further under the Fifth Framework Programme, building on the lessons from business process re-engineering and from software development and from the human aspects of team-working, on which there is a long tradition of qualitative research in Europe, especially in Scandinavia.

2.2.2.6 Employment legislation and contracts

Most European employment and social security legislation, as well as most contracts of employment, is premised on the assumption that the worker spends his or her working day on the employer's premises, carrying out a pre-defined set of tasks, during predetermined and regular hours. This is ill-adapted to

[23] Ove Arup and Partners in association with BMP International, *Telecommunications development in rural England*, Rural Development Commission, Salisbury, 1996

[24] Nicolas Negroponte at the EITC Conference in Brussels, November 1997.

meet the needs of a workforce which may be working from multiple locations (including domestic premises), working irregular hours, spread throughout the day and night, and carrying out a much wider range of tasks than was traditionally the case in workplaces with a strict and hierarchical division of labour.

Because the legislation changes markedly from one EU member state to another, it is difficult to generalise with confidence about the extent to which its terms constitute an actual barrier to teleworking. There is a general consensus among participants of the European Telework Development project (see Annex 2)[25] that special legislation to cover teleworkers is not appropriate; most of the problems which arise in relation to teleworking could be more appropriately solved by amending existing regulations, with in some cases, the allowance of a little 'breathing space' for experimentation as new forms of work emerge.

A recent, comprehensive study in the 15 member states of the EU by the European Foundation for the Improvement of Living and Working Conditions examined the treatment of teleworkers in labour law, social security law and health and safety law in each country and concluded that the main issues did not relate specifically to teleworking (which is not defined in law in any country) but to employment status[26]. Insofar as teleworking is accompanied by a change from employee to self-employed status, teleworkers may lose their rights to such things as protection against unfair dismissal, maternity, paternity or parental leave, paid holidays, sickness pay, inclusion in pension schemes, or lay-off or unemployment pay, although the precise details of this disentitlement vary from country to country. The European Commission is itself now heavily engaged in promoting fruitful dialogue on these issues amongst the social partners and others concerned[27].

In general, it is not the legislation *per se* which constitutes the barrier, since it rarely explicitly forbids homeworking or flexible working. Rather, the barrier arises from the (often legitimate) fears of workers that they will be disadvantaged by losing some of the protection which is available to on-site workers if they become teleworkers.

Measures which might contribute towards addressing these problems include:

- ensuring that health and safety legislation applies appropriately to all employees regardless of where they work
- clarifying the rules which determine whether a worker is to be defined as an employee or as self-employed and ensuring that these rules are consistently applied regardless of the place of work (in relation to tax, employment protection and entitlement to unemployment, invalidity, pension and other social benefits)
- ensuring that equal pay and sex and race discrimination legislation applies regardless of the place of work
- ensuring that minimum wage legislation includes formulae for translating time-based wage rates into rates which can be applied when workers are paid by results
- removal of the legal barriers to working from home which exist for civil servants in some member states[28].
- harmonisation across the EU of regulations determining which national law should apply in the case of cross-border teleworking

[25] Bertin, I, *Partnership for a New Organisation of Work: Telework COM(97)128,* ETD Project National Coordinators Comments, 1997

[26] see Blainpain, R., *Legal and Contractual Situation of Teleworkers in the Member States of the European Union,* European Foundation for the Improvement of Living and Working Conditions, 1995, Pennings, F., *The Social Position of Teleworkers,* Katholieke Universiteit Brabant, 1996, and various other publications at a national and European level arising from the same project

[27] See section 4.2 below on the social dimension.

[28] Birchall, D., *et al, Legal, Organisational and Management Issues in Telework,* European Commission DG XIII-B, 1997

In the longer term, a major review of the tax/benefit system in each member state should be carried out with the object of making it more appropriate to the needs of a flexible workforce, whose hours of work may vary from one week to the next and who may work for more than one employer simultaneously. At present, flexible workers are at a disadvantage, albeit in ways which vary considerably from country to country, in all member states in this respect. While this remains the case, a disincentive to taking up flexible work - which includes many forms of teleworking - will continue to exist.

2.2.2.7 Professional codes, regulations and business practices

In addition to the barriers to teleworking which arise from the inappropriateness or lack of clarity of employment legislation and collective agreements, additional obstacles sometimes arise from regulations affecting specific sectors or professional groups or from general rules for the conduct of business (whether formally agreed and enshrined in official regulations or *de facto* practices arising from past custom). These vary enormously from country to country and sector to sector and include:

- rules requiring written confirmation of verbal agreements.
- rules requiring personal signatures on documents.
- late payment practices.
- intellectual property issues.
- confidentiality and data security issues.
- prevention of fraud and breaches of national security

2.2.2.8 Planning, transport and environment

Assumptions that work will take place on the employer's premises during fixed and standard hours are so embedded in the structure of many of our social institutions that it sometimes takes a real effort of the imagination to see the extent to which these taken-for-granted structures may constitute barriers to teleworking. Examples of such barriers are:

- the design of houses and apartments which are often simply too small to accommodate home-based working. Research by CATRAL in the Ile de France region concluded that the small average size of residential units made it essential to provide telecentres if teleworking were to be adopted on a scale sufficient to have an impact on rush-hour traffic congestion[29]. There are many other regions of Europe where housing costs are too high, or availability is too low, to allow any but the richest to have a spare room. For example, it was calculated in 1995 that the average cost of an additional room in the UK was some 350-400 ECU per month[30].
- zoning regulations and/or tenancy agreements which restrict the use of residential property for business purposes
- tax regulations for the use of company cars which create incentives to use them to the maximum extent possible
- transport pricing structures (e.g. season tickets) which encourage five or six day-per-week commuting patterns

2.2.2.9 Tax, insurance and other regulations

Whilst they do not appear to constitute critical barriers to teleworking, there are a number of other regulations which constitute at best minor irritants and at worst major headaches to those setting up new teleworking schemes. Some of these, in the form of tax regulations, are imposed by public authorities. Others result from the practices of private organisations, such as insurance companies, landlords or mortgage providers.

[29] unpublished research supplied by CATRAL

[30] Huws, U., *Teleworking: an Overview of the Research*, Department of Trade and Industry, 1996

Tax regulations, whether these refer to income taxes, value-added taxes, local property taxes or other forms of taxation, are extremely complex and vary considerably between member states. In some cases, a simplification of tax regulations and procedures, or a general harmonisation across the EU, might facilitate the development of teleworking. In others, the problem arises not so much from the regulations themselves as from their complexity and a lack of understanding among the general public about how they function. In such cases, the issuing of clear guidelines to teleworkers by the appropriate authorities would be helpful.

In the case of mortgage and insurance providers, the development of codes of practice would provide a helpful first step towards eliminating the anomalies which sometimes unfairly penalise those who use their homes (or cars) for business purposes

2.3 Priorities in developing Europe's response

How well will Europe perceive and respond to the opportunities and challenges presented by the network economy? Four things are critical:

1. access by all European enterprises and individuals to high performance Information Society infrastructures at world-competitive costs, as well as to other facilities necessary for freeing work from place and time constraints
2. access is meaningless without possession of the appropriate skills
3. Europe's organisations and enterprises - especially small companies and innovative individuals - must understand the new opportunities and be able to exploit them
4. underpinning all of these, we must develop the experience and know-how that will build confidence in the opportunities instead of fear of the unknown.

These issues are important to the European agenda. They are already being addressed today in many programmes and projects, as described in this document. As section 4 demonstrates, initiatives on social and societal issues have been launched by the Commission in order to involve the social partners and the citizens of Europe in the debate and actions. Awareness activities to involve as many Europeans as possible are underway. Section 5 describes the preparation for the Fifth Framework Programme, where the focus of one specific key action will be on new ways of working and electronic commerce.

These initiatives are contributing to Europe's progress, not only at the international level, but crucially at local, regional and national levels as well, as section 3 clearly demonstrates. Much is being achieved, but much remains to be done using new approaches as well as existing mechanisms.

In particular, the global dimension is being addressed though the development of a strong network of European Telework Online websites, working both in English and in other national languages, and linked with telework websites world wide. This means that enterprises and individuals in Europe who seek information about telework are made immediately and vividly aware of the global nature of the networked economy and have direct opportunities to connect with work opportunities outside as well as within Europe. However, this resource is – by definition – available only to those who have already made the decision to 'get connected' to the networks.

A key priority for Europe is now to encourage and assist everyone in the workforce to get connected so that they can learn and understand for themselves and develop the confidence and skills needed for future success.

3. Status of European telework

3.1 European overview

The picture emerging in 1998 highlights four main trends in our understanding and use of telework. First, in Europe as a whole telework in its several different manifestations is now increasing at an accelerated rate. The 1997 report suggested that something over two million Europeans were teleworking in one form or another; today (mid-1998) they number upwards of four millions. Second, it is now more widely understood that telework methods and practices cannot be understood and applied successfully in isolation. Telework is increasingly seen in the context of, and applied in conjunction with, other key Information Society techniques - notably teletrade (using networks in the context of marketing and of customer-supplier relationships) and telecooperation (people and organisations using electronic networking methods to develop and enhance relationships). Third, the nature and role of telework vary significantly in different places and contexts. Different aspects of teleworking assume importance in rural as opposed to urban settings, in areas of high and low employment, in areas of high and low intensity of ICT penetration and use, in large bureaucratic organisations and in small, rapidly evolving ones. There are many common lessons to be learned and issues to be addressed, but also much knowledge and understanding to be gained from awareness and analysis of differences - between countries and regions as well as between organisations. And fourth, although telework is increasing, some significant barriers to progress remain, demanding attention by legislators, company executives and the social partners. Notably, the benefits of teleworking are readily understood and obtained in enterprises that are effective users of ICTs, have confident managers and employees and operate where local administrations and unions have a positive, proactive stance to innovation and change. Where some or all of these characteristics are missing, telework (along with other new working methods) is either low on the agenda or practised informally and without appropriate organisational support. This section examines each of these four trends in the context of a country-by-country review of the telework environment and activities.

A further significant conclusion arising from these trends is the importance of appropriate measurement, reporting and interpretation. This applies to factors that have always been important to national planners, politicians and multinational enterprises in the industrial society but will now be important to local planners and smaller enterprises, together with new metrics informing managers and planners about the Information Society, it's opportunities and it's requirements.

3.1.1 How many teleworkers?

Telework awareness and take-up continue to increase and current estimates suggest that some 4 million Europeans are now teleworking in some form or other. In some countries (notably the Netherlands and the United Kingdom), "informal" telecommuting - that is, working at home part of the time based on informal agreement between manager and employee, rather than in the context of an organised company scheme - has become quite commonplace and no longer a matter for special comment. This is leading to a quite rapid acceleration of take up in these countries.

A few countries have started to measure aspects of telework through adding relevant questions to established national surveys; achieving common approaches to this is an important future goal. Meanwhile different studies (both commercial and official) produce different results, and it is often difficult to obtain a full insight into their definitions and methodologies, making it impossible to compare like with like. IDC (1997)[31] estimated the number of corporate telecommuters in 11 European

[31] IDC, Remote Access Potential: Western European Mobile Workers, Telecommuters and Internet Users Forecast, 1995-2001, February 1997

Union countries based on data about use of PCs in the home for accessing corporate data, while Nilles (1997)[32] estimates the overall prevalence of teleworking based on analysis of various surveys and inputs, using a specialised socio-economic model. The ETD project has made more recent estimates for the number of teleworkers as at late 1997, based on a synthesis of local reports and in-country surveys together with the detailed local knowledge of practitioners within the countries:

Estimates of numbers of teleworkers in Europe, late 1997

	Corporate telecommuters ('000) (a)	All teleworkers ('000) (b)	ETD estimates (c)			
			Teleworkers		% of workforce	
			Formal ('000)	Total ('000)	Formal	Total
Austria	8	29	5	50	0.2	1.5
Belgium	46	30	5	200	0.1	5.3
Denmark	43	18	100	250	3.9	9.7
Finland	36	26	15	150	0.6	6.3
France	148	417	30	240	0.1	1.1
Germany	139	294	400	600	1.1	1.9
Greece	n/a	31	2	20	0.1	0.5
Italy	51	188	40	250	0.2	1.2
Ireland	n/a	51	10	50	1.2	6.1
Luxembourg	n/a	2	n/a	n/a	n/a	n/a
Netherlands	157	52	200	600	3.0	9.1
Portugal	n/a	48	3	60	0.1	1.3
Spain	9	192	5	80	0.0	0.6
Sweden	80	33	30	180	0.9	5.4
UK	307	1,199	280	1,800	1.1	7.0
Total	**1024**	**2,478**	**1,125**	**4,630**	**0.8**	**3.1**

(a) IDC, based on remote access; (b) Jala International - see text for detail

(c) The country numbers, synthesised from a range of sources to provide a common basis, do not necessarily match data from particular sources provided in individual country summaries

Definitions of telework are addressed in an Annex to this report. In this table c*orporate telecommuters* represent the narrowest definition of teleworking. The individual is an employee who would otherwise be office based; works at home or in a local telecentre on a regular basis (though not necessarily full time); and uses ICTs (typically today a computer and a modem) to access corporate networks and communicate with colleagues. A further refinement is to consider the extent to which teleworkers are supported by their employer through some kind of organised scheme; in the ETD data this is labelled "*formal*" telework. Both the Jala estimate and the ETD estimates for "total" teleworking cover a much wider spectrum of activities. They include: employees who telework by personal arrangement with their manager but without necessarily enjoying corporate support or access to corporate networks; self-employed people who are classed as teleworkers because their preferred work base is the home and they connect with customers and colleagues across networks; field-based workers who now go straight to their on-the-spot work from home, using telecommunications for their company transactions and relationships rather than starting each day at the company's offices; and customer contact staff working in centralised telecommunications-based teams instead of distributed to local High Streets or visiting customers.

Even these broad encompassing definitions of telework can overlook some types of work where the technology has profoundly influenced location, travel and working relationships. The ACTS project

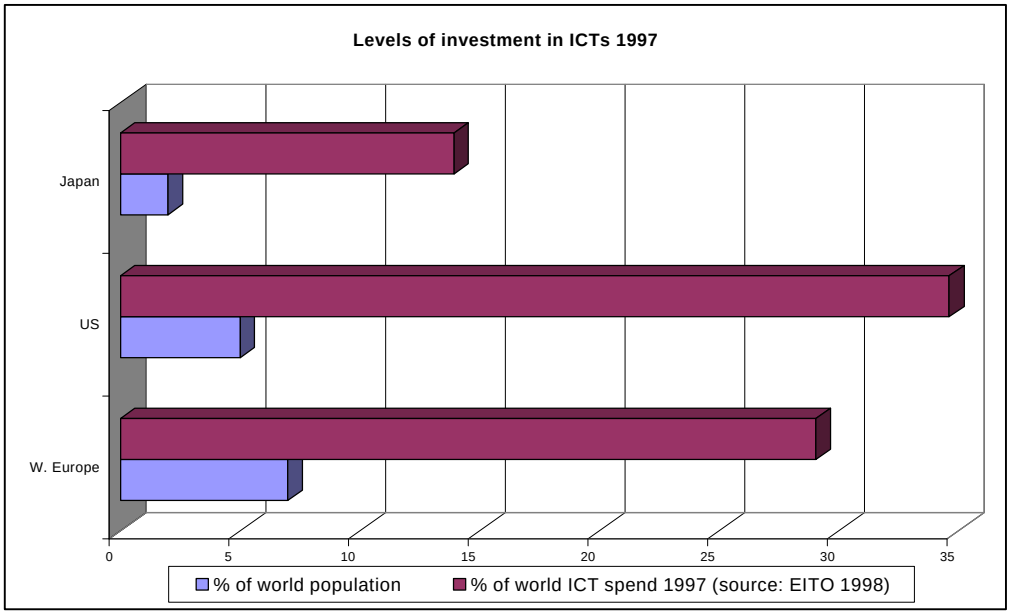
[32] JALA International, Telework in the European Union, January 1998

TECODIS evaluates methods for supporting software development teams that work together on the same project while based in widely dispersed locations. The people concerned may travel locally to work each day, so they are not telecommuters; but their main working relationships may be with people in another location a thousand miles away. The employer and the project participants regard this as a form of teleworking, but such "teleworkers" will not be detected by (for example) national labour force surveys that enquire about the use of computers for working at home.

This leads to problems particularly where attempts are made to quantify the numbers of teleworkers or the number of 'teleworkable jobs'. Different ways of collecting telework statistics are being followed in different countries, making direct comparisons extremely difficult. *In the desirable process of harmonising the collection of labour force and other data, it will be important not only to adopt common definitions but also to ensure that phrasing of questions in different countries does not yield incompatible results because of the different understanding and expectations of technology and work patterns in different cultural and economic settings* (see below). Meanwhile, the available data certainly confirms that telework is on the increase. Other patterns emerging from this data are discussed below.

3.1.2 European telework in an Information Society context

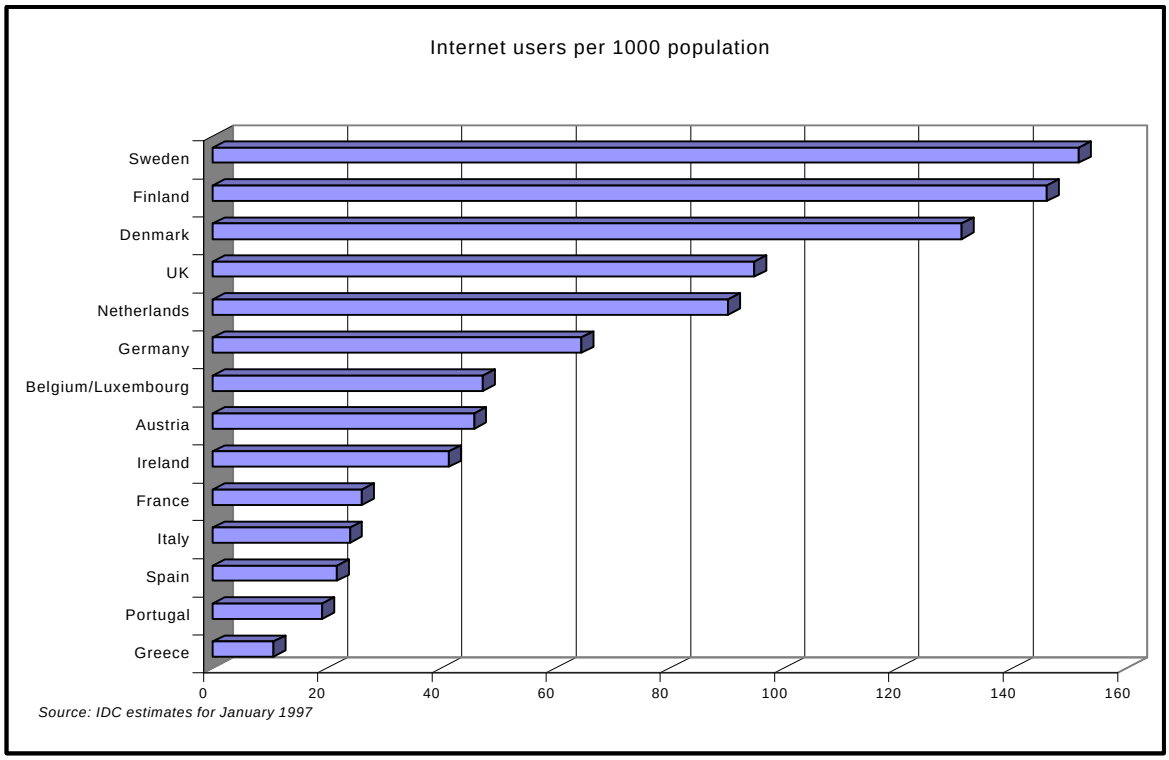
Governments across Europe - at both national and local levels - have recognised the economic and societal importance of the emergence of an Information Society and a network economy. Enterprises and individuals in both the public and private sectors are connecting to the Internet. Website and email addresses appear in advertising for cars, cutlery and cosmetics. Leading newspapers, radio programmes and TV channels routinely provide email addresses for correspondence. Email addresses appear on the business cards of managers and professionals, along with mobile phone numbers and in some cases video connection numbers. The signs of an Information Society are everywhere - widely apparent, at least to those who are looking for them. However, this masks a quite different reality. In most of Europe only a small minority of individual citizens have full personal access to the Internet either at work or privately; and in Europe as a whole only a minority of those who do have such access are actively using the Internet and Information Society applications as an inherent part of their day to day work and other activities.



Despite heightened attention to the Information Society by Governments and rapidly increasing awareness of the Internet and it's applications, Western Europe's overall investment in ICTs continues to be considerably lower per head of population than in either USA or Japan.

Overall, only one European in 20 has Internet access. Perhaps one in a hundred has begun to integrate the use of Internet technologies into their daily activities as a matter of routine. These overall averages mask very wide variations between both countries and companies:

In Sweden and Finland around 15 in 100 citizens have Internet access; in Greece and Portugal less than 2 in 100. In some multinational enterprises email, Intranets and co-operation technologies such as Lotus Notes[33] are fully implemented and used as a primary tool by everyone from the chief executive to the receptionist. In other enterprises email has been badly implemented and become regarded as much as a nuisance as a benefit. In others (in numeric terms, the majority of enterprises) few people - or no people - have computers on their desks.



There is a clear relationship between understanding and regular use of Information Society technologies and understanding and appropriate application of telework, teletrade and telecooperation. This is especially visible in the case of multinational enterprises. In an enterprise that has fully embraced electronic communications it soon becomes obvious to everyone that work activities and relationships transcend physical locations and geography. Some people have as many (or more) work relationships with colleagues in other locations as with colleagues at the next desk or in the next office. When such a person is asked to move their family a hundred or a thousand miles on reassignment to a new role it is natural to question the need to move physically; their existing main work relationships are already with people in several different locations. People with long or difficult journeys to their "functional" location find it more convenient to use desk space at their nearest location. Even more so in today's changing societal context in which many households have two, or even more, individuals with jobs. It is an obvious step from this to the idea of working some of the time at home and the rest of the time at whatever location is most convenient to the person and the task at hand. On the other hand in companies without email and other enhanced personal and group communications (or in organisations where email is badly implemented and managed), formal communication is either face to face, by written memo or by notice board. Informal communication is round the coffee machine or in the cafeteria. The suggestion that an employee might just as well work at home may well seem like a suggestion that they might just

[33] *Notes* (now owned and marketed by IBM) is an example of a class of applications that facilitate sharing and exchange of information in different forms and the development of corporate knowledge bases

as well leave the company altogether! The relative penetration and use of Information Society technologies in different companies, together with their scale and geographic structure, are key factors determining the spread of teleworking in all its forms. *Existing levels of use and understanding of the technologies need to be fully taken into account in planning Information Society applications for organisations of all sizes in both public and private sectors.*

3.1.3 Vive les differences!

Similar considerations arise when considering the differences between countries within Europe and different regions within the same country. In this case the prevalence of ICTs is one of several important factors. For some of these factors, patterns emerge at the European level; an understanding of these patterns is useful in developing common policies and strategies and in sharing experiences and learning. Other factors need to be seen in the specific context of each country (for national planning) and each region or locality (for local planning).

	People per km^2	GDP per capita (ratio)	Economic freedom index (rank in world listing)[1]	International trade propensity (ratio)[2]	Employment in services (% of total employment)
Europe's highest	371	100	7th	50	73
Europe's lowest	15	28	36th	1	55

1. Source: Economist Intelligence Unit (see text)
2. Source: ETD – relative value of participation in world trade scaled to size of country by population

Some key aspects of differentiation can be readily identified and reported, others are more subtle. Among the most clearly identifiable factors are:

Relative concentration or dispersal. For the organisation, is it a one-location enterprise serving primarily local needs, or a multi-location enterprise serving national, European or global markets? For the community (nation, city, region, village), is the population highly concentrated, with essential commercial and public services close to hand, or is widely dispersed, with long travel distances to reach (for example) specialist medical services or a wide choice of consumer products. As an example of different values, for the concentrated population teleworking may present opportunities to attract or create new office based work opportunities such as the concentrations of large and small scale tele-services centres clustered near cities like Leeds (UK) or in Belgium. For a dispersed population telework may mean increased ability to attract successful individuals to live and work in remote but attractive habitats, as well as opportunities for creating learning and work opportunities in local telecentres.

Relative prosperity and purchasing power. It is no coincidence that, overall, high intensity of ICT use in Europe is encountered in areas that have high performance economies, while low intensity is associated with areas of relatively low per capita GDP. In particular, relative spending power affects the propensity for citizens to acquire PCs and Internet access for use at home. The decision to buy a 1,000 ECUs PC or to spend 20 ECUs a month on Internet access looks quite different in a country where per capita GDP is (say) 30,000 ECUs compared to one where per capita GDP is 10,000 ECUs.

Degrees of "economic freedom", including labour market flexibility. The Economist Intelligence Unit reports on the relative attractiveness of countries for business investment according to a number of different metrics, one of which is "economic freedom" - the extent to which the state and other social mechanisms does or does not intervene in or constrain transactions between individuals[34]. In this as in the other factors, "more" does not necessarily mean better. Across Europe there are pressures for both

[34] "Individuals" in this context means both individual citizens and private sector organisations. In law a limited company is for many purposes regarded in the same way as a person; both are "legal entities".

more regulation and more freedom; we need "appropriate" regulation. Nevertheless, there is evidence that a higher degree of economic freedom encourages individualism and acts as a spur to enterprise and innovation and its results can be seen in the high levels of "informal" teleworking observed in countries like Netherlands and the UK. For companies and authorities, the main point is to be aware of this factor and its impact on the nature and pace of Information Society developments. A country with a high level of public intervention and public ownership or direction of industries and services may move faster in implementing large scale public applications of technology, but the private sector may wait for appropriate signals from government and a strong public consensus before innovative working methods can be widely adopted. In some EU countries it is noticeable that only externally owned and directed multinationals apply teleworking on an organised and fully integrated way - the "signal" comes internally from other branches of the enterprise.

Linked with economic freedom are other important variables: the *degrees of formality or informality in labour relations, employee relations and management styles*. Such factors are influenced by cultural attitudes as well as formal mechanisms; they cannot be "scaled" to make a comparative table, either among companies or countries. However their influence can clearly be seen in the extent to which in one country "informal" teleworking is widespread, unremarkable and uncontroversial while in another country the informal approach is seen as anomalous and is a source of controversy. The ETD estimates in the first table in this section 3 reflect the impact of this factor in the contrast between Germany and the UK. UK estimates suggest that alternative forms of teleworking - including a high level of informal telecommuting - engage more than six times as many people as formally supported telecommuting; the German estimate shows a higher number of people in organised schemes but a much lower proportion of people in alternative modes. The same factor can be seen at work even in organisations that might be expected to be highly bureaucratic. As long ago as the early 1990s guidelines for the civil service published by the UK Treasury Department recognised that some employees and their local managers might agree between themselves a degree of home based working instead of commuting. Common sense rather than rules were seen as the basis for such arrangements.

The issue of measurement

A major challenge of the Information Society is to understand not only how to gather reliable data but also what data to gather. This emerges clearly from attempts to reconcile different reports of telework activity. Some of the surveys analysed by the ETD project looked explicitly at "corporate telecommuting" (employees working at home or near to home instead of commuting to a more distant office), but within the same country it is easy for two carefully made estimates to arrive at different answers.
One survey asked personnel departments about the extent of teleworking in their organisations. Those organisations with organised schemes supporting telework usually have some reliable data about it's extent, since (for example) the ICT support functions have specific tasks and costs associated with technology for and support to home based staff. But many "informal" telecommuters work in organisations that have no policy at all regarding telework - the manager and the telecommuter simply agree about it; the organisation has no knowledge let alone data about this. The survey reported accurately the extent of formally supported telecommuting and (rightly) made no estimates of informal modes; but based on highly summarised media reports it's findings were generally taken to be an estimate of the whole extent of telecommuting in the country concerned.

Such misinterpretation can have profound effects. For example, if a transport ministry estimates the traffic impacts of telecommuting based on data about formally supported telecommuters, this might provide a fairly realistic view in one country but a significant underestimate in another. Research is needed to determine both what data is needed and how to collect that data, before we can understand the environmental, social and economic impact of teleworking in all its forms.

The structure of industry and the economy. The most widely known and discussed variable is between services, industry and primary (agricultural and extractive) sectors, but another important variable affecting Information Society developments is the nature and extent of international trade. Further analysis is needed before this can be presented in simple tabular form, but its impact can be seen in the contrasts between particular economies. As an example, tourism and agriculture account for some 18% of GDP in Greece compared with some 3% in Sweden. Information society applications are important in both tourism and agriculture, but the idea of working at home instead of commuting is of little

relevance. The structure of the economy affects the motivation of Information Society investment as well as the nature of developments. As an example, Sweden and the UK have fairly similar levels of per capita GDP; both have similar levels of employment in services; and both have extensive overseas trading interests. But in Sweden, exports of "visibles" (industrial or forestry products) are more than twice the value of "invisibles", while for the UK invisibles and visibles each account for about the same proportion of value. A higher proportion of UK services employment is in commercial activities such as financial services, entertainment and tourism, generating revenue and taxes, while a higher proportion of Sweden's is in public services. Commercial applications of teleworking are to do with enhanced competitiveness, while public service applications are to do with attaining the social and policy objectives of the service concerned. For example, a commercial enterprise may use telework technologies to concentrate service operations that were previously dispersed and shift from face to face customer relations to telephone or online methods; for very similar activities some local authorities are moving tasks from a previously centralised basis to place them closer to the citizen.

3.1.4 Value from difference

It should be emphasised that an understanding of these variations is important for commercial purposes as well as for public strategies and initiatives. A company adopting telework or teletrade methods needs good data about take up and use among the local customers it serves today, as well as intelligence about existing and potential competitors who are emerging in both local and wider markets. A local authority needs to understand its own local strengths and weaknesses in the context of European and world wide patterns as well as the perceived and actual needs of its own citizens and enterprises. Managers in public and private sectors need both reliable data and the background information to interpret in their own context. In marketing, considerable attention is paid to differentiation - product differentiation to make the company's product stand out from others that may be functionally similar; and differentiation in methods of approaching and serving customers.

For Europe, there is considerable potential for applying telework to capitalise on regional differences. For example, as companies learn more about teleworking they start to apply it to address problems of costs and skills. The example of companies in Silicon Valley employing or contracting software developers in India is most often quoted; a company in an area of high costs and skill shortages provides valued work opportunities for people in an area of lower costs and available skills. As ICTs become the primary tool for more and more work in every sector of the economy the economy, this approach becomes more widely applicable. Within Europe we have the opportunity to enhance the competitiveness of companies in high performance, high earnings regions, using the skills of people in lower performance, lower earnings regions to the benefit of both the company and the two regions concerned. Left to the vagaries of the market there is an equal chance that such work will be contracted outside of Europe rather than inside. But if European managers (and regional economic planners) can be provided with better and more reliable data about costs, skills and infrastructure in the other regions of Europe we increase the likelihood that they will seek and find the resources they need within the Union.[35]

This aspect of differences, and the importance of reliable measurement and reporting of differences, becomes even more significant when we consider the enlargement of Europe to include new member states that - in the main - have lower costs and lower levels of economic performance than the average of the present members. Added to this is the increasing linkage of Europe with neighbouring regions around the Mediterranean and Central and Eastern Europe. If Europe and its neighbours find good ways to capitalise on differences to our mutual benefit we will strengthen overall economic performance and enhance social cohesion. Appropriate measurement and reporting, focused on identification of "useful differentiation", will play an important role.

[35] Etude sur les Tele-activites en Saar-Lor-Lux, a report for DG XIII by Alice Stern, August 1998

3.1.5 Benefits, barriers and issues

The 1997 status report identified awareness (or rather, lack of awareness) as the most significant barrier to the spread of teleworking. A subtle but important shift seems to have occurred during 1997-1998, possibly due - at least in part - to the rapidly increased general focus on ICTs resulting from high media attention to the Internet. Current reports from those countries that have an appropriate economy and infrastructure for home based teleworking suggest that there is now very wide recognition of the term and a reasonable general understanding of what it is about (working at home instead of commuting). What is lacking now is not general awareness but more detailed *knowledge and understanding*. Most people have a rather simplistic view that telework means working at home; they don't know about or understand alternatives such as neighbourhood telecentres. Many see teleworking in plain "either-or" terms. They don't understand and appreciate that most home-based telecommuting is mixed and combined with travel to work - either some days at home and some at work or even just shifting the commute time to off peak by doing some of the day's work before leaving home. Many (perhaps most) people don't like the idea of working entirely at home. They may have homes that are unsuitable as workplaces, they may prefer the idea of being with colleagues "at work" rather than being on their own at home. The simplistic view of telework as only being about working at home instead of at *the* office has been the main focus of media coverage and considerable effort is needed by both telework consultants and the telework champions in companies to get across the message that telework provides a wide variety of options.

Here again the analysis of differences is important. While the need in countries with high levels of ICT penetration and use move from general awareness to more subtle and detailed understanding, other countries have different problems that require different solutions. Where Internet use is low, the early pioneers struggle to run websites and online discussion in the absence of a critical mass of users and supporters, or to promote Information Society techniques in new ways that fit the local environment but may - quite appropriately - be different from the examples coming from the USA or the European mainstream.

Where telework is already on the agenda, the barriers that are most frequently reported have changed little during the past year, although our understanding of the details of barriers has improved. They still include:

- restrictive taxation and regulation, or uncertainty about how tax and regulatory rules apply in particular modes of teleworking
- resistance from management who sometimes fear losing control, and especially from middle management who fear losing their rôles as organisational hierarchies are squeezed and team working is introduced
- to this can be added concerns among managers about their own ability to "manage at a distance", and sometimes a lack of confidence that employees will work effectively in the absence of hands-on supervision; this links with the degree of formality or informality in management styles in different organisations
- trades union and employee resistance when telework is seen as part of a de-stabilisation and casualisation of the labour market, for example in the context of the often close association between telework and part-time work, short-term contracts and the out-sourcing of tasks previously undertaken by permanent staff within the company
- the personal perspective on this is sometimes linked with the increase of self-employment - it is feared that moving "off site" will be the first step towards moving to self-employed status; because of both cultural and tax/regulatory differences, attitudes to self-employment vary widely in countries
- relatively under-developed ICT infrastructures and penetration in some, especially southern, European countries

- the perceived high on-cost of the necessary equipment and services, especially in companies that have not fully implemented ICTs and networking across the enterprise, and in countries with low ICT penetration and low per-capita GDP

All these barriers remain real and need to be faced and resolved in order to promote telework that is both economically and socially beneficial. In many cases the barriers connected with fears and concerns are linked with the simplistic model of working at home full time instead of commuting. The employee who teleworks part of the time but is in the usual office several days a week is more visibly part of the mainstream than one who works almost full time at home. The same barriers are also be linked with the lack of knowledge and understanding of alternative modes such as neighbourhood telecentres or company-owned work centres. When a teleworking employee still works on company premises or in premises where the employer meets the whole costs this again confirms that the employee remains part of the mainstream. There is also more confidence among managers that such employees are "at work".

Two important perspectives on these barriers are to do with confidence. There are wide variations in the confidence of managers and employees in the strength and future of their own organisation and in the strength and future of the overall economy and (especially) of the local labour market. People in a profitable company, in a growth sector, located in a prosperous and buoyant region are much more likely to see telework in purely practical terms ("will it work for me?") and much less likely to feel threatened by risks and issues. There are also wide variations in personal levels of confidence that individuals feel about their own ability to prosper and survive in an Information Society context. The person with considerable know-how and experience in Information Society technologies and techniques is confident that he or she can find enjoyable and rewarding work, whether in employment or self-employment. The person who lacks relevant experience and know-how is puzzled and confused by "all this stuff" and (quite naturally) clings to what is known and understood - in other words, the old ways. This can be observed in quite senior management as well as on the shop floor. Knowledge and competence breed confidence; ignorance and lack of experience breed fear.

An additional challenge, hardly yet appreciated, is the opportunity telework presents to re-integrate socially excluded groups, such as the unemployed and the disabled, into the labour market. A promising development in 1997-1998 has been the emergence of ISdAC, the Information Society disAbilities Challenge, which won a 1997 European Telework Award for innovation and has the explicit goal to campaign for awareness and action on wider social, educational and work inclusion of people with disabilities through the appropriate deployment and use of ICTs.

As described elsewhere in this report, considerable activity is in hand at European level and in some Member States to address these barriers and issues. More effort is still needed to improve knowledge and understanding and there is scope for applying Information Society techniques to achieve this. Active and busy websites and online discussions and information services now exist in around half of the EU member states. These have proved to be a powerful vehicle for connecting telework champions in companies to expert practitioners. They help resolve the doubts of potential teleworkers and their managers by answering their questions and bringing them into contact with people who already telework and can speak from personal experience of the benefits and how to gain them as well as the pitfalls and how to avoid them. It has also been observed that although only a relative few Europeans are actively using the Internet, each of today's active users is known to many friends and colleagues who are not yet connected; effective messages that reach the connected pioneers can be relayed by them to their colleagues. Especially in those countries with relatively low ICT penetration, the early pioneers play a key rôle in changing attitudes and stimulating action; people see them as experts and ask their advice.

This does not mean, however, that we can ignore or abandon other communications methods; even in the most intensively connected countries and communities people still get much of their information through newspapers, magazines, TV and radio and gain much of their knowledge and understanding through personal contacts at meetings, seminars and conferences. This is demonstrated by the large scale advertising campaigns on telework, electronic commerce and, a new term: e-business, bringing the two

terms together. Most telecom operators recognise the importance of a more rapid development of their markets, and set up units specifically focusing on the development of telework, as do many suppliers in the ICT sector. It is therefore not a surprise that the European Commission found partners in developing telework in Europe in companies from these sectors for its media- focused European Telework Week initiative: core partners at the time of print of this document for 1998 are France Telecom, Telecom Italia, CISCO, as well as the core partners from 1997, Toshiba and Siemens. Uptake and media attention is crucial: information and educational effort remains important across the spectrum of communications methods, backed by improved measurement, reporting and analysis.

3.2 Austria

3.2.1 Summary

For Austria 1997 was a year of significant progress towards the Information Society, with a considerable growth in activity surrounding and following the Government's *Information Society Report* (April 1997). This set a series of fundamental objectives and terms of reference for Federal Government strategy. The involvement of more than 350 experts in an Information Society Working Group means that the underlying principles are having a widespread effect beyond the Federal Government and can be expected to have a sustained impact in accelerating responses to the Information Society by businesses and citizens, employers and employees and public institutions.

The environment for telework has also advanced considerably in 1997, with a first collective agreement (in the oil industry), a model contract devised by the White Collar union, and a number of individual agreements within companies. There is however always gap between public policy and private implementation, and the innate conservatism of Austria's industrial and labour market environments is leading to a rather slow acceptance of teleworking. This may change with lower costs and increasing use of telecommunications following from liberalisation and driven by Austria's continuing role as a bridge between the European Union and Eastern Europe, where there is much readier acceptance of new methods of work and trade.

3.2.2 Telework background and take-up of ICTs

General background:

- Austria is one of Europe's wealthiest and most stable economies, closely tracking Germany, its largest trading partner, with whom it shares a common language. This relatively large "local language" market also extends to neighbouring Eastern European countries, where German is widely understood. The availability of a large "internal market", together with the relative conservatism of Austria's domestic business markets, perhaps accounts for Austria's relatively low take up of PCs, IT generally and Internet, compared with (for example) Sweden - a country of similar size in terms of population and GDP:

	Population	GDP per capita ($ US)	IT per capita (ECU)	PCs/100 white collars	Internet users/1000 population
Austria	7.9 millions	26,917	438	50	46
Sweden	8.7 millions	23,864	745	75	152

- Austria has for many years benefited from its geographic position as a bridge between East and West and stands to consolidate this role with the enlargement of the European Union. Many multinational companies choose Austria as a firm base for their Eastern European operations. There may however be competitive pressure on this role when some Eastern countries have joined the European Union and may therefore be considered by enterprises to offer a secure base at a lower cost.

- Austria's labour market has strong formalised mechanisms, with national/regional chambers of labour and trade to which employees and employers respectively are required belong, and which have legally enshrined rights of representation. Paralleling this are Union and Employer federations.

Driving factors:

- The national *Report on the Information Society*, published in April 1997, is providing a powerful blueprint for policy and actions. The report is very broad in scope, addressing the use of technology by Government and industry, telecommunications policy, research and education, and relevant legal and regulatory provisions.
- Telecommunications liberalisation has been implemented with positive objectives to ensure reliable, high-quality and low-cost services through stimulation of competition and restraint of dominant suppliers.
- The social partners (representative of employers and employees), who play a particularly important role in Austria, have started to provide model contracts and guidelines for telework.
- The education ministry is providing free-of-charge Internet access for schools, so that future new entrants to the workforce will be familiar with electronic networking methods.

Constraints:

- Austria's general take-up of Information and Communications Technologies is relatively low for a wealthy and developed economy; this means that Government initiatives and market forces have a substantial backlog to catch up.
- Relatively low unemployment, an economy bolstered by Austria's role in East-West trade, and the conservative effects of Austria's strong labour market institutions are all factors supporting the status quo and providing little motivation for higher investment in ICTs or introduction of new working practices.
- Initial Union recommendations regarding telework have tended to be prescriptive rather than enabling and have focused on avoidance of possible negative effects rather than on promoting positive benefits.
- Telecommunications pricing is high relative to

Telework activities and results

A number of important activities occurred in 1997-98:

- Austria's first collective agreement for telework was signed, covering the oil industry
- A model contract for telework was created by the white collar Union
- The Union also published a set of recommendations for telework
- The Austrian Labour Market Service (AMS) is supporting a range of training provisions with a focus on IT skills, including projects relating to the use of telework for improved inclusion of women re-entering the labour market and people with disabilities
- In a survey by Spectra, 69% of employed respondents expressed a positive attitude to the idea of teleworking; among younger respondents (aged below 30) the proportion was 77%
- The Federal Ministries of Labour and Economic Affairs supported activities in ETW´97

In the context of overall restructuring of the central Austrian Federal administration, it was originally planned to outsource the Federal Office of Metrology and Surveying with 1700 employees. However, a feasibility study showed an internal reform as the cheaper solution, which also meant that a reduction in the labour force could be managed without loss of jobs, but based on reduced replacement of retired employees.

The reform targets a reduction of the number of departments and remote office sites, and those remaining are serving as hubs for tele-cooperation also available for private users as telecentres. In 1998, 25% of the administration’s employees are expected to use their homes as offices, and a 15% increase of productivity via telework is expected. The major benefit for employees is seen in new opportunities to choose their workplace, whereby the employer provides a brokerage domain for jobs to enable the coordination of individual choice and mobility. Awareness building and information processes are considered as an important part of ‘good practice’, especially emphasising the common problem of hierarchical transformations within public administration.

Teleworking, intensified networking and data share via new technological equipment is being used for increasing customer services as well as for the creation of an Austrian digital map.

- Provincial and City administrations are supporting telework activities, including the Provincial
- Governments of Salzburg and Upper Austria and the Municipality of Vienna.

3.2.3 Conclusions

Austria presents unusual characteristics regarding telework. In most countries, demand for and interest in telework has preceded the supply of appropriate infrastructure and social arrangements; Austria appears to reverse this. There has been public support for telecentres; there are model contracts and trade union recommendations for teleworking; the Government is promoting the Information Society. Yet telework take-up to date has remained small. However, there was a much stronger response to European Telework Week in 1997, and recent opinion surveys show a positive attitude.

3.3 Belgium and Luxembourg

3.3.1 Summary

Belgium has a well-established national telework association with strong representation of major employers, particularly in the IT and telecommunications sectors, which has recently restructured to enhance its activities. In Luxembourg a telework association iss in the process of being created, with support from the Belgian Telework Association.

3.3.2 Telework background and take-up of ICTs

General background:

- Relative to its GDP and economic structure, Belgium has a relatively low level of investment and use of IT:

	Comparable economies, different levels of IT investment?				
	Population (millions)	GDP per capita ($)	IT per capita (ECU)	PCs per 100 white collars	Internet users per 1000 population
Belgium	10.1	24,747	548	51	47
Netherlands	15.4	23,966	642	66	90

- In contrast to this, Belgium is a pacesetter in at least one Information Society application, namely online banking services: telephone banking is in use by some 70,000 enterprises and 1.5 million citizens. From 1997 a new common Internet-based network, ISABEL (http://www.isabel.be) links banks with some 20,000 corporate customers, and provides email and business information services as well as banking services.
- Belgium is also a leader in the deployment of cable TV networks, with some 95% of TV-equipped households having access by cable to more than 30 TV channels. Cable companies have started offering Internet access at speeds up to 2 Megabits per second, providing an important platform for early trials of broad band services to the home.
- The three Federal Regions (Flanders, Wallonia and Brussels) are installing optical fibre backbone networks with the aim of connecting all public establishments to the Internet by early in the next decade - eg administrations, schools, hospitals, public information points etc.
- Belgium has relatively high unemployment and also a relatively low level of participation in the workforce, with low levels of part time working:

	Employment % of total population	Part time work (% of total employment)	Unemployment %
Belgium	57	22	10
Netherlands	66	37	6

This may to some extent account for the lower rates of IT investment and Internet use. Another influencing factor may be the fact that Belgium has three official languages - French, Dutch and German, reducing the opportunity and demand for centralised or "national language" online and other information based activities - for example "national" newspapers and TV channels are either French or Dutch language.

- Many public and private sector organisations at all levels have representative offices in or near Brussels, providing a source of employment and local trade, but with a strong perceived need to be "on the spot" rather than working "at a distance". Some 40% of the Brussels population are "non-Belgian".

> Implementation of the 'Shared Office Concept' in IBM Belgium/Luxembourg stated in 1994 and covers the entire working environment. Sixty per cent of the staff (1,050 employees) participate in the project, each one using portable equipment and choosing the most convenient workspace when arriving at the office. All participants also have the option to work from other locations, such as from their own home or the customer's premises.
>
> In order to ensure the effectiveness of this new way of working, changes were made to the organisation of both secretarial staff and management staff, for example the latter adapted to the new way of working by taking on a larger coaching role. All participants in the project, although having complete freedom to chose their own place of work, were asked to check into the office on a regular basis.

Driving factors:

- The active Telework Association (Belgian Teleworking Association, http://www.bta.be) was restructured towards the end of 1997, stimulating a higher level of activity.
- Belgium is the host country for many European Union activities, including events in the European Telework Agenda.
- Traffic congestion (and regularly visible resultant pollution) in and around Brussels provides motivation to reduce the use of cars and unnecessary travel.
- There is quite high public interest in telework, with a substantial range of activities and events.
- Belgium is becoming a centre for new telework-based enterprises and operations such as call centres, capitalising on its language skills, its location and its large non-Belgian population.

Constraints:

- The strongly individualistic regions, with different languages and cultures, inhibit people from one region from teleworking for companies in the other, except for the general "pull" of the capital (and third region), Brussels.
- A high proportion of city centre employment is in relatively small representative offices and in small headquarter operations of European federations and associations; the nature of the work and the small scale are not conducive to either intensive ICT use or teleworking. This may change as the use of online methods becomes more pervasive across directorates of the European Commission and especially if the Commission itself becomes an exemplar of teleworking.
- Extra costs and perceived difficulties in managing at a distance are still strong inhibitors (see IWERF study below).

Telework activities and results

- The Belgian Teleworking Association (BTA), founded in 1994, restructured towards the end of 1997, has professionalised its administrative and management activities and is extending its membership. The approximately 85 members include many major corporates, including household name non-ICT companies (for example ABB, Dow Corning) as well as local and multinational ICT players (Belgacom, Mobistar, IBM, Philips etc) and De Finacieel-Economische Tijd (the leading Flemish business and finance newspaper).
- A new law on Home Working came into force in March 1997. Although the text doesn't explicitly use the term telework, and the law affects "old style" as well as new forms of home-based working,

its provisions do apply to employed teleworkers. An English language summary will be placed online at the BTA website. The law's provisions were strongly influenced by experiences in an early pioneer telework experiment undertaken by ABB Insurances from 1992.

- Another long-standing Belgian telework programme (see panel) gained a European Telework Award in 1997, by when a small initial (and largely informal) activity had become firmly embedded in the overall company working environment.
- Innotek, a Belgian member of the European network of Business Innovation Centres, having opened a single telecentre during 1996, has now committed to one of Europe's largest telecentre deployment programmes, with plans for 20 centres across Belgium (http://www.innotek.be).
- At least 20 significant telework promotional, education, training or research activities and projects were recorded during the year.
- A study by the Institut Wallon d'Études de Récherches en Formation (IWERF) found that most people know about and have some clear perspective on telework, and 70% of those interviewed regarded the idea of telework as attractive, but that very few companies have any plans to introduce it.
- A University of Liège study, *Télétravail et handicap: étude exploratoire - rapport de recherche*, made strong recommendations for the establishment of a pilot project supporting telework as a means to integrate people with disabilities into the jobs market.
- A not-for-profit membership organisation for individual teleworkers and home based workers, Home Based Business (HBB, http://www.kmonet.be/homebasedbusiness), was formed in 1997.

Televillages is a network of tele-offices (telecottages) which has been operational since October 1 1997 and has resulted in four telecottages in each Flemish province in Belgium.

INNOTEK negotiated with over 30 Business Centres to reserve office space for teleworkers and which offer tele-services, shared hardware use, meeting rooms, etc. All the offices available in the Televillage concept are being equipped by INNOTEK with the same office design all over Belgium. INNOTEK also requires certain standards for each centre, such as minimum floor space, meeting rooms, etc.

A prospective teleworker's employer can contact the Televillage to find out the location of the closest tele-office. INNOTEK then negotiates with the Business Centres and the employer only needs to sign one contract with INNOTEK.

3.3.3 Conclusions

Further research and analysis seems appropriate to better understand Belgium's comparative position in Information Society development. Some aspects such as online banking are apparently highly advanced, but the overall investment in and use of IT, PCs and Internet is lower than might be expected for a highly industrialised economy with a high proportion of information-based work.

Belgium has been one of Europe's first countries to introduce new laws specific to home based working in the beginning of the information age. Belgium's experience, particularly employer and worker views on the usefulness and effectiveness of this law, will be of great interest in other countries and in the European policy debate.

The presence of two language/culture communities within one geographically small state makes the Belgian experience and outcomes also of great interest to assist in understanding telework in a multi-country, multi-culture environment – i.e. for the European Union as a whole.

3.4 Denmark

3.4.1 Summary

Denmark is among Europe's most highly invested user of IT and PCs, but until quite recently telework was not a topic of discussion, let alone action. 1997 saw a complete transformation, with a surge of

both interest (in the media, conferences, by government) and activity, with telework moving from below 1% to between 5%-15% of the workforce, depending on definitions and survey methods. While there have been many influences at work to bring this about, one stands out in terms of policy: the decision that a computer supplied by an employer for private use at home is not a taxable benefit so long as there is some use for work-related tasks. The fiscal impact of this on Government revenues is marginal; the value in terms of business and consumer attitudes to IT in the home is substantial.

Informed observers also report a significant and longer term socio-cultural shift in individual attitudes to society in general and work in particular: telework exemplifies this change - ten years ago it was regarded as something imposed by employers and to be resisted, today its widely regarded as a symptom of greater delegation, flexibility for the person as well as the firm, self-management and self-determination. The emphasis has shifted from a collective focus on rights, equality, hierarchy and bureaucracy to a more personal emphasis on possibilities, alternatives, decentralisation and greater independence. Relatively low unemployment, high levels of participation and a high level of part time working appear to support this change of emphasis.

At a more detailed level, Denmark is experiencing the same issues and barriers as in other countries where there is general acceptance of telework: management misunderstanding and lack of confidence, together with a short term focus on terms and conditions and immediate management issues rather than a strategic focus on the transformation of enterprises.

3.4.2 Telework background and take-up of ICTs

General background:

- Denmark vies with Sweden for top position as Europe's most intensive and highly invested use of IT, but until 1996 had relatively low take up of Internet:

	IT % of GDP	IT per capita (ECUs)	PCs/100 white collars	PCs per 100 population	Internet user/100 population
Denmark	2.87	751	64	33	2.3
Sweden	3.36	745	75	29	7.6
USA	4.08	870	103	46	10.2

- However, Internet use is thought to have accelerated sharply during 1996-1997 and continuing to grow rapidly in 1998. Recent estimates suggest some 700,000 users have access, over 13 users per 100 inhabitants. PC use is also further intensifying, bringing up overall IT investment. There are thought to be PCs in more than half of all Danish households, which would put Denmark ahead of the USA.
- Employment participation is high, as is part time working, while unemployment is low. Employment in services is among Europe's highest levels. Denmark has Europe's highest per capita GDP, other than the exceptional case of Luxembourg:

	Pop'n	GDP per capita ($)	Labour force participation (%)	Part time working % of employment	Services as % of total employment	Un-employment (%)
Denmark	5.2	29,873	80	22	69	6
Germany	81.1	27,604	70	16	59	9
Netherlands	15.4	23,966	71	37	73	6

- High prosperity plus low unemployment mean that skills development, retention of experienced people, and productivity are the key driving factors for industry.

Driving factors:

- Denmark is rapidly becoming "Information Society prepared", with high and accelerating investment in ICTs, accelerating Internet take up, a high level of Government and public awareness, and appropriate pressures on industry to address innovate.
- The removal of tax on home PCs provided by employers for personal as well as work purposes has sent a clear message to industry and consumers that the Government wants people to buy, learn about and use IT on a widespread basis. Between 20-30,000 PCs were acquired on this basis in 1997, with an expectation of around 150,000 in 1998. Many companies are stipulating that in order to qualify for a home PC, employees must agree to study for and acquire the "European PC Drivers' Licence", thereby delivering basic IT skills training on a voluntary basis.
- Trade unions are now largely positive about teleworking, subject to acceptable (to the unions) terms and conditions based on framework agreements, which are already in place in some sectors. A common position on telework, providing guidance for collective bargaining, has been drawn up between the Trades Union Congress and Employers Organisation - perhaps the first such agreement in Europe and an indicator of Denmark's rapid progress.
- A flurry of surveys and reports have produced largely positive conclusions (see examples below), and there has been a sharp increase in media coverage, events etc.
- Local and regional authorities are starting to take an interest in telework as a contributor to local economic and social development.

Constraints:

- The main barrier to progress is lack of understanding and confidence among managers, confirmed by both private and public sector studies. There is too much emphasis on immediate, short term issues and insufficient awareness of strategic opportunities and overall organisational implications.
- Public discussion (and apparently most local managerial thinking) is narrowly focused on specifics such as terms and conditions for individual teleworkers working at home, and almost the only model being considered is that of partial home-based teleworking (ie part of week at home, part in the office). This misses the much more significant (from the enterprise, economic and general social standpoints) issues and opportunities of the transformation in enterprise organisation and working methods/locations that is being enabled by information society technologies and applications and driven by globalisation and de-localisation.
- There remain some legal and regulatory issues and uncertainties.

Telework activities and results

An explosion of activity has occurred in Denmark, with far too many interesting developments to report in this summary, which can only select some highlights and aspects of wider interest.

- ***Surveys and reports***. Particularly noteworthy are studies undertaken for the Ministry of Research, the Trades Union Congress, the Business Development Council, the Danish Data Society (with PLS Consult), the Danish Transport Council and IDC. The usual lack of a consistent definition leads to wide variations in the reported results. A conservative estimate is that at least 5% of the Danish workforce already does some teleworking. Some reports using looser definitions put it as high as 15%.
- ***Socio-economic analysis***. In a 1997 paper Lars Qvortrup, a leading European researcher in telework and related fields, concludes that Denmark along with some other countries has seen a decisive social-cultural shift in recent years, with radical changes in individual attitudes to society in general and work in particular. Low cost, high performance technology enables new methods such as telework, but the extent and pace of take-up are determined by attitudes. The earlier (and quite recent) approach to work was typified by an emphasis on hierarchical authority, rights, equality, parity of treatment and bureaucratic, rule-following procedures. The new attitudes focus on delegated authority or autonomy, decentralisation, empowerment, flexibility, self-determination and local/individual decisions based on circumstances and possibilities rather than on preordained rules. These changes are conducive to the relative autonomy of location-independent teleworking, as opposed to more closely managed work in centralised offices.

- The TUC study found that teleworking is much more prevalent among non-union members compared with members. 80% of respondents were positive about the idea of teleworking and 53% would telework if the opportunity arose. 80% of those already teleworking were very positive about it, citing the freedom of choice about work location and work pattern as the biggest single benefit, followed by cost and time saved from commuting.
- An important background study by the Danish Business Development Council found that 20-25% of the 1900 enterprises studied have undergone organisational transformation in recent years, introducing such changes as flatter management structures, self-directed interdisciplinary teams, networking and value-based management styles. These companies were, on average, 30% more productive, developed two to three times as many new products, and created two to three times as many new jobs.
- Telework and organisational transformation is being led by larger, more profitable enterprises. Small firms are being much slower to respond.
- Since teleworking has only recently become widely accepted in Denmark there is a shortage of well established exemplars. The case presented is, however, typical of the Danish concern for work and the family.

The FARIN project stands for family, work and information technology, and is a project launched at the end of 1995 in the southern, peripheral part of the Danish island of Zealand and nearby smaller islands, as part of the region's business development programme. Its main goals are to support regional development by attracting settlement from Danish core areas, especially Copenhagen which is an hour or more commuting distance away, to strengthen the local society and economy and to achieve these goals through family-centred policies. Thus, the main areas of interest are to see how telework can assist in decreasing the amount of commuting and in improving the quality of life for families with children.

FARIN has shown that this can be achieved by integrating the organisation's need for Total Quality Management with the family's need for Total Life Quality Management. The basis for this is to ensure that employees have greater control over their own work situation, that management and leadership is designed to support telework, that the relevant technology is provided and that communication is maximised between all concerned (between employer and employee, between employees, and with employees' families).

3.4.3 Conclusions

From a late start (by Northern European standards), Denmark looks set to become a leading exemplar of rapid deployment of telework, particularly if the Danish Government continues to develop innovative approaches to stimulating technology take-up. The issues of management understanding and a narrow public perspective on the opportunities presented by telework are common to all countries. As a small but highly prosperous country Denmark can play a key role in furthering the understanding of telework in its wider and deeper sense.

3.5 Finland

3.5.1 Summary

With one of Europe's smallest populations distributed across its fifth largest geographic area, Finland has strong natural motivation towards both conventional and advanced telecommunications applications. This is reflected in its very rapid take-up of Internet and widespread acceptance of uses such as online banking, which is well established in Finland while still a novelty or a future possibility in many other countries. Finland also leads Europe in mobile communications, both as a user and supplier. Telework, unlike home banking or mobile telephony, involves organisational, social and behavioural changes; telework in the sense of a general new way of working has been slower to gain acceptance. Take-up has been influenced by the high unemployment rates associated with the recent recession, from which Finland is still recovering; people are concerned with getting or keeping a job rather than with how and where the work is done. Nonetheless, with something over 5% of the

workforce already using telework to some degree (depending on the definition), it can be expected to spread as unemployment rates are reduced.

In more specialist forms of telework - such as tele-medicine - a dispersed population plus a highly developed information infrastructure makes Finland a natural leader. The Government has proactive Information Society strategies and Finland is very well placed to play a significant role in Information Society developments both in Europe and globally.

3.5.2 Telework background and take-up of ICTs

General background:

- With a small population, spread across a large geographic area, Finland is Europe's most sparsely populated country:

	Population (millions)	Area ('000 km^2)	Population per km^2
Netherlands	15.4	41.5	371
Belgium/Luxembourg	10.1	30.5	331
UK	58.1	243	239
Germany	81.1	358	227
Italy	57.2	301	190
Denmark	5.2	43	121
Portugal	9.8	89	110
France	57.7	544	106
Austria	7.9	84	94
Greece	10.4	132	79
Spain	39.6	505	78
Ireland	3.5	70	50
Sweden	8.7	450	19
Finland	**5.1**	**338**	**15**
USA	267.1	9373	28
Japan	125.1	378	331

- Finland's economy has been undergoing a faster transformation than in most European countries since the collapse of Soviet Union, which accounted for between 20% to 25% of Finland's foreign trade. There has been a relatively rapid switch services employment:

	1975			
	Employment (%)		Employment (%)	
	Agric + Ind	Services	Agric + Ind	Services
Finland	51	49	36	67
Ireland	54	46	43	57
Netherlands	41	59	27	73

- Strenuous national efforts have brought Finland out of a deep recession and unemployment is now falling, though still uncomfortably high and above the European average.
- The transformation has included very rapid take up of new telecommunications methods. Finland is among the world's most intensive users of mobile phones and Internet, although the pace of growth together with difficulties in measurement and reporting mean that Internet numbers must be treated with caution:

	Mobile subscribers (% of telephone subscribers, 1996)	Internet usage (users per 1000 population, 1997)*
Sweden	28.1	152
Finland	29.1	146
Denmark	26.5	131
UK	11.6	95
Germany	6.7	65
** Source: IDC (http://www.idcresearch.com) estimate for December 1997*		

- In Nokia, Finland boasts one of the world's leaders in mobile telephony.
- Finland's small population supports two official languages (Finnish and Swedish) as well as widespread knowledge of English.

Driving factors:

- Large distances and a widely scattered population provide a motivation to explore all kinds of telematic applications, so that Finland has been among the pioneers in focused applications such as telemedicine.
- The Government is committed to a proactive information society policy and public authorities and services at all levels are actively pursuing online services. All citizens have access to the Internet at public libraries. IT and telematics training is regarded as a key national priority.
- Public acceptance of new communications applications is high: home banking for example is well established and widespread.

On national level the Finnish Ministry of Labour and the Ministry of Education are promoting, supporting and funding projects in the framework of 'Finland's National Telework Development Programme'. This programme also involves changes in the public administration and the public sector itself.

In 1995, two units of the administration of the town of Espoo, the technical centre and the department for town planning, started a telework-pilot. It emerged as a self-organising process in cooperation between senior management and staff members. Reduction of commuting time has been one of the advantages seen for the employees, and one of them with a backbone disease is now able to work full-time. In policy terms, the encouragement of an integrated employment policy, increased flexibility of labour, and traffic reduction, are all important. The cost effects of teleworking are monitored to provide potential follow-up projects with findings.

All tasks carried out at the central office are shifted for two days per week to home offices. Two teleworkers are in charge of traffic planning and related word processing. The third person involved is the project manager of the pilot, working for the technical centre. Work is restructured by team- and result-oriented management. Jointly, the unit's manager and the teleworker define the objectives up to two weeks in advance.

Constraints:

- Although telework in Finland is generally a positive personal response to the benefits of telework, high levels of unemployment have made some people reluctant to risk novel and uncertain ways of working so that telework in the form of working at home can also be seen as a response to unemployment.
- Although there have been a number of publicly supported telecentre projects designed to bring work to small, scattered communities, few have been successful in achieving sustainability without ongoing public funding.
- The normative social profile for a majority of Finns has been as wage-earners rather than entrepreneurs and marketeers; there is a need for stronger and more robust structures supporting and legitimising telework as a recognised and fully integrated part of the employment and self-employment environment before most employees will be keen to take the plunge.

- While there are no explicit legal constraints on teleworking, trade unions are not yet very positive about increasing flexibility in the organisation of work.

Telework activities and results

- Telework in Finland is both a mechanism adopted by self-employed people and participants in work-and-trade co-operatives, as well as seen as an organisational strategy by some enterprises.
- There are no legal or other insurmountable barriers to organisational telework, but neither are there particular strong driving factors or motivation to change.
- Finland has, however, established itself on the European "map" so far as telework is concerned, with substantial contributions to European discussion and understanding. In 1998 the main European conference on telework research findings and requirements is being held in Turku.

3.5.3 Conclusions

- Although home based telework for part of the working time, in conjunction with working at the ordinary workplace for most of the rest, is reasonably widespread by general European standards, it is low relative to Finland's general leadership in the use of IT and telecommunications. On the other hand, mobility at work is well established and growing fast; a majority of the workforce uses mobile phones, Internet use is well adopted, laptop computers are widely used by professionals and managers.
- The extent of teleworking can be expected to change if the economic and employment recovery is sustained, labour moves from over- to under-supply, employers have to work harder to attract and retain staff, and employees become more confident. The technological infrastructure is in place.
- Telework, with teletrade, has an important role in sustaining the more isolated Finnish communities. Success in this will require steps to be taken to widen acceptance and recognition of telework and (especially) of self-employment, for example to provide parity of treatment for employees and self employed, alongside the existing actions to promote entrepreneurship.
- The link between telework and teletrade is particularly important in Finland; Finns are natural co-operators and joiners but traditionally to a lesser extent entrepreneurs and marketeers. Given Finland's high profile in Internet use, the opportunities are there to become a proactive source of new Information Society innovations and services that can be marketed and applied world wide.

3.6 France

3.6.1 Summary

France has seen a number of significant developments affecting telework in 1997-1998. In particular the Government has established a strongly positive and assertive approach to the Information Society and the need for France to make rapid progress in using the Internet. There is also a "State Modernisation" programme, which includes telework as a mechanism. A national telework association has become established and active. The former French Festival of Teleworking has become a European Festival of Teleworking and is now part of the European Telework Agenda. Some French trade unions have telework as an agenda item for 1998. Regional authorities are embedding telework and other Information Society applications in their economic development plans.

Against this, there remain significant barriers to rapid progress. Relative to neighbours in UK, Germany and Benelux, French people are relatively unfamiliar with personal use of the Internet because some of the most obvious applications have been already available and in use through the Minitel system. France has invested quite heavily in IT generally, but penetration of PCs in homes is low. In the labour market, unemployment and preoccupation with the implementation of a 35 hours working week may make it difficult for other aspects of *travail nouveau* to gain serious management attention over the next year or two.

3.6.2 Telework background and take-up of ICTs

General background:

- France is highly invested in IT by European standards, but the pattern of use is distinctly different from that of otherwise similar countries. The pervasive availability of Minitel gave France an early world lead in public awareness and experience of online applications and networking, but has until recently inhibited take up of the Internet and the purchase of PCs by consumers for use in the home:

	IT spend as % of GDP	IT per capita (ECU)	PCs per 100 white collars	Households with PCs	Households with Internet access
				per 100 households	
France	2.41	499	56	19	1.8
Germany	2.10	490	44	21	4.2
UK	3.24	486	55	23	4.9

- The French Government has announced (January 1998) a strongly positive approach to the Information Society. This and other factors lead to expectations of strong future growth in use of PCs and Internet, but inevitably it will take some years for France to catch up and possibly overtake in terms of consumer use:

	Households with Internet access (per 100 households)				
	1997	1998	1999	2000	2001
France	1.8	3.5	5.5	8.2	16.0
Germany	4.2	7.0	11.3	16.6	24.8
UK	4.9	7.9	12.2	18.6	27.8

- A somewhat strict interpretation of France's language laws led to a court decision in 1997 that a website based in France but deriving most of its material from an overseas parent site must offer all its material in French as well as in whatever other original language might be appropriate to the company's general audiences and interests. This widely reported judgement reinforced external perceptions that France was not "Internet friendly".
- Persistently high unemployment is the most important item on the labour market agenda. Alongside initiatives to promote entrepreneurship and improve the availability of risk funding, the Government is tackling this through implementation of a 35 hours working week. Over the next two years the

France Telecom, the world's fourth largest telecommunications operator, is developing internal telecommuting along two major lines: mobile telework for salespersons and networking. The salespersons rely on office-sharing and new technologies: portable PCs, data GSM, ISDN, voice and data messaging services and Internet, and soon they will be able to access the company's intranet from any office location but also on the move during visits to customers. Networking is also growing considerably and has become crucial to France Telecom for the following reasons:

- In the context of total competition, the company's internal organization is constantly evolving in order to deliver better service to its customers, be more effective, flexible and efficient.
- The organizational units are often very scattered geographically. For example all the National Services are distributed among 5 to 15 sites.
- These units are now increasingly moving from a geography-oriented (one site = one mission) to a project-oriented organization.
- Intelligence is increasingly based on networking, and know-how and knowledge-sharing have become a major stake.
- Human resource policies give priority to skills and competence management, the company's genuine capital.
- And finally, over the last few decades it has been France Telecom's policy to ensure that jobs in the company are distributed equally over the whole of France.

Today, at France Telecom some 2,500 employees network daily, using groupware and teleconference services: videoconferences, conference calls, document-sharing. All in all, over 5,000 France Telecom staff - 3% of the payroll - apply telecommuting to their daily work.

implementation of this will preoccupy managements and unions; the ultimate effect in either encouraging or inhibiting new working methods such as telework cannot yet be forecast.
- France has a large civil service and public sector employing some 5 million people. Acceptance or otherwise of teleworking by administrations and the relevant Unions will have a particularly significant effect in France.

Driving factors:
- There is rapidly increasing interest in the Internet. With more than 200 Internet Service Providers offering competitive services and prices, and a high quality telecommunications infrastructure, both interest and use should continue to grow sharply.
- A national telework association (Association Française du Télétravail et des Télé-activités - AFTT) has become firmly established and active.
- A programme for "Modernisation of the State" forms an important part of the Governments Information Society strategy; telework is explicitly mentioned in state modernisation proposals.
- Prolonged high unemployment has increased willingness to try self-employment or to establish new small businesses using or providing ICT methods and services. The Government is acting to support investment in ICTs by small firms and to improve the supply of venture capital.
- Regional authorities are increasingly interested in telework and other Information Society approaches as a way to stimulate local enterprise and employment. There are some pioneer projects in place with more planned.

Constraints:
- There is a shortage of visible exemplars of corporate teleworking in both public and private sectors. The few private sector enterprises that have implemented telework see it as a vehicle for competitive advantage and are reluctant to publicise their activities and results.
- High unemployment makes people reluctant to take what many see as the risk of being excluded from their employer's mainstream through not being visible at the office every day. The idea that telework increases productivity may be attractive to employers but is unwelcome by unions while there is a shortage of jobs. The question of whether jobs should be created through increased labour market flexibility and new work practices, or protected through measures such as the 35-hour week, is a contentious issue in France.
- Employment contracts in France are firmly rooted in a basis of "hours worked" rather than "value delivered". There is also a distinct "social experience" aspect to "going to the office" for most French managers and professionals, in addition to the issues of managerial control and communication which are common to all countries as perceived barriers to telework.
- Non-wage costs above the European average, coupled with uncertainties about the impact of the 35 hours week, are likely to deter new forms of online, location-independent enterprises from considering France as a primary recruitment source for the new communications-intensive jobs they are creating.
- VAT at 20.6% increases the real and perceived cost of PCs and related items compared with (for example) UK (where standard VAT is 17.5%), or Denmark, where the tax regime actively encourages employers to provide PCs for employees to use at home.

Telework activities and results
- In 1997 the existing French Festival of Telework became The European Festival of Telework; the 1998 event, held as usual in the French Alps, was well attended and attracted many international speakers and delegates as well as a strong representation of politicians and policy advisers at levels up to Ministerial. (see panel)
- In March 1998 the AFTT, with a dozen other organisations, organised a *Fête de l'Internet*, which gained widespread public attention.
- There are several telework-related websites and a French language email based discussion forum. Relative to the penetration of Internet, French participants are more active than the average in international telework online forums.

- A telework handbook, *Le Guide Pratique du Télétravail*, was published.

3.6.3 Conclusions

In addition to its significance in the overall European economy, France has a profound influence in perceptions and expectations about society and the economy, not only in Europe but also in the wider world, especially in other Francophone countries and in the many regions where France has strong historical, diplomatic and trade connections. A positive, dynamic and open approach to Information Society applications, including telework, will have wide positive consequences; conversely either a slow response, or local responses that are not widely known about and understood outside France can adversely affect Europe's overall response and Europe's possibilities for a world-leading role in shaping the Information Society. Events and initiatives in late 1997 and early 1998 have established positive expectations and a considerable heightening or public awareness, but there are many difficulties to be faced and overcome. The nature and extent of follow through in both policy and implementation during the immediate future years will be of great interest both inside and outside France.

3.7 Germany

3.7.1 Summary

1997 saw important developments in Germany, including a Federal initiative promoting telework for small firms; a new International conference on *Telecollaboration*, which has become part of the European Telework Agenda; a Government-sponsored study of telework attitudes and take up; the launch of a wide circulation specialist journal and progress towards the establishment of a broadly based telework association. There are also several online activities and initiatives.

However, attitudes towards telework in Germany are rather mixed. A prolonged period of high unemployment has led to debate about the relative merits of more flexible labour markets or strengthened labour protection and security arrangements. This has coloured attitudes to telework. There are also uncertainties about the legislative and regulator environment, which create a substantial barrier to progress in the German context. The many useful and interesting telework initiatives in Germany are not sufficiently visible across the rest of Europe; hopefully one effect of a national association will be to make news of German activities more accessible to the wider world.

3.7.2 Telework background and take-up of ICTs

General background:

- Germany is Europe's largest economy, one of the world's wealthiest large economies and the world's second largest trading economy:

	% of World Exports		
	Visible trade	Invisible trade	Total
USA	11.95	16.59	13.47
Germany	10.83	7.77	9.82
Japan	8.88	10.93	9.55
France	5.59	9.66	6.92
UK	4.97	9.25	6.37
Italy	4.79	4.19	4.59

The table also shows that among the world's top six trading economies, Germany retains much the highest focus on industry (visible trade) as opposed to services. This is reflected in employment ratios:

	% Share of Total Employment		
	Services	Industry	Agriculture
Germany	61	36	3
France	69	27	5
UK	72	26	2
Italy	60	32	8
USA	73	24	3

Germany has the highest proportion of people engaged in industrial employment of any European country. This reflects both a success (in sustaining a substantial industrial base) but also a challenge (to the extent that the switch to services reflects a general trend among the developed economies and affects preparedness for an Information Society). It is noteworthy that the strong and dynamic US economy has a higher proportion of services employment and a lower level of industry employment than any European country.

- Similar factors affect Germany's investment in IT and therefore its relative preparedness for telework. For example, given its lower GDP the UK has a higher relative investment in IT and especially in PCs:

	GDP per capita ($US)	IT per capita (ECU)	PCs/1000 white collars
Germany	27604	486	44
UK	18849	490	55

- Unemployment is the main preoccupation of the German labour market. An export-led recovery in 1997 was not matched by rapid domestic employment growth. There is controversy about whether Germany's historically high investment in social protection and the strong infrastructure of trade unions and works councils is an essential bulwark against unemployment and its consequences or a factor contributing to unemployment through labour market inflexibility and inhibition of new work practices.

Driving factors:

- The size and wealth of the German economy makes it an attractive target for telecommunications suppliers. Liberalisation can therefore be expected to lead to extensive competition, driving down prices and introducing new services into an already sophisticated infrastructure.
- The Federal Government has an active Information Society programme, which is accelerating Internet awareness and use and can be expected to stimulate take up of PCs by consumers.
- Germany is among the leading countries in legal and regulatory aspects of the Information Society, particularly as regards aspects affecting electronic commerce, such as acceptance of digital signatures.
- Telework offers potential solutions to high unemployment and low levels of economic activity in the Länder of the former East Germany. It could also enable participation in the world-wide growth of ICT and services activities, providing a balance against continued dependence on new investment in manufacturing.

Constraints:

- Concerns about unemployment and/or the potential erosion of employment rights and protections underlie discussion and thinking about telework in Germany.
- There are particular concerns that the introduction of telework could be the first step towards self-employment; as in many EU countries the social protection facilities for self-employment are not comparable with those for employed or unemployed workers.
- All German employment practices are strongly linked with contractual, legal and regulatory provision. Widespread adoption of telework requires clear and positive contractual and regulatory

provisions, absence of which is a major barrier to progress. At present there are uncertainties and anomalies.

- The size and underlying strength of the German economy means there has historically been little pressure on German employers or workers and their representatives to look outwards and take note of the changes happening elsewhere. This is changing.

Telework activities and results

- Notwithstanding the above constraints, 1997 showed signs of a considerable heightening of telework interest and activity in Germany:
- A specialist Magazine, *Teleworx* achieved a large circulation and gained the European Telework Award for media coverage.
- A new International conference on Telecollaboration was staged in Berlin, with a very high focus on telework. As well as attracting an international audience and speakers it provided a platform for many telework initiatives across Germany that had not previously been known to the outside world.
- There are now several positive examples of telework agreements within individual companies.
- Several federal and regional (Bundesländer) telework initiatives have produced considerable results, especially in bringing together politicians, companies, telecom operators, IT suppliers and other telework market actors. The Federal government's *Forum Info2000*, launched in 1997, includes a telework element (http://www.forum-info2000.de). Regional initiatives include Tele@arbeit Baden-Wuerttemberg (http://www.initiative-telearbeit.de); *Landesinitiative 'media NRW'* in Northrhine-Westphalia which includes a *Task Force Telearbeit* (http://www.media.nrw.de); *Bayern Online* (http://www.bayern.de/Zukunft/BayernOnline/); *Telework in Rhineland-Palatine* (http://www.telearbeit.rpl.de) and *Telework in Schleswig-Holstein* (http://www.ttz-sh.de/ta/).
- A Federal initiative - *Telearbeit fuer den Mittelstand* (Telework for SMEs) - http://www.iid.de/telearbeit/mittelstand/ - has been launched to promote telework for small firms. Over 650 people participated in a conference and workshop held in Bonn, targeting small and medium sized enterprises. 410 companies (out of 1300 applicants) are embarking on schemes. Their experiences will be tracked and reported to provide credible data.
- Progress was made towards establishing a National Telework Association and one is expected to be formed in 1998.
- The Federal Ministry of Work and Social Affairs commissioned a study of telework attitudes and take-up.
- Some leading non-IT companies are reporting positive experience with telework schemes. Notable among these is BMW, whose experience was reported at the European Commission's ESIS (European Survey of Information Society) conference in Brussels in March 1998. Among several insurance sector pioneers of telework programmes, the most prominent example - covering about 400 teleworkers by the end of 1997 - is the insurance company LVM.
- Trade unions have become active in the debate on telework: the public services union has established a specialised website, *Telewisa* (http://www.telewisa.de).
- There is an online forum (*Online Forum Telearbeit* - http://www.onforte.de) supported by the Federal Ministry for Education, Science and Technology and Deutsche Telekom AG; the Ministry has also published a Telework Guideline (Elektronischer Leitfaden zur Telearbeit - http://www.iid.de/telearbeit/leitfaden).

The entire staff of the *Teleworx* magazine is self-employed, and all writers participating are teleworkers and freelance writers. Usually ten to twelve people are involved in editing the magazine, two of them from the Munich area, and others from Carmel California and New York City. Even the layout staff and the proof-reading editors are teleworkers.

The editorial office is organised as a virtual structure. The editor-in-chief is the only person in the editorial office, from which all activities related to *Teleworx* are coordinated. About 50% of the production process of the magazine is conducted by telephone, e-mail, data transfer via modem and partly by videoconferencing. Ninety per cent of the communication infrastructure and traffic is via ISDN.

3.7.3 Conclusions

Germany's significance as the largest European economy means that its response to applications such as telework will have a wide influence on Europe's overall response. Clear signs emerged during 1996-1997 that the Federal Government is becoming pro-active in investigating telework and the related legal and regulatory matters and there is also evidence of increasing interest among companies, unions and citizens, as well as by the Länder administrations. The successful formation of a national telework association in 1998 could play an important role in further stimulating public interest and ensuring informed debate.

Germany presents one of Europe's clearest examples of the dilemma between protection of established worker rights and labour market practices on the one hand and the need for more flexible organisational and working practices on the other. Telework is only one aspect of this issue but the debate on telework puts the issue into clear focus and how it is resolved in Germany will be important for Europe as a whole.

3.8 Greece

3.8.1 Summary

For Greece, with Europe's highest level of employment in agriculture, lowest per capita GDP and lowest proportion of information workers, the Information Society clearly has different aspects and implications than it does in (for example) Denmark or Germany. With Information workers making up only 22% of the workforce, telework in the most commonly accepted sense (working at or near home instead of commuting to an office) is not a high priority. On the other hand, cross-border teleworking and closely related applications such as teletrade and telecooperation present excellent opportunities for Greece to widen its basis of trade with the rest of Europe and internationally.

Greece also has Europe's lowest levels of investment in IT (both in absolute terms and relative to GDP) and lowest Internet usage. IT and Internet use are heavily concentrated in Government services and higher education. For young, IT- and Internet-aware Greeks, telework and related applications present opportunities to participate in the new work opportunities without needing to migrate and thereby lose the undoubted merits of the Greek life style.

3.8.2 Telework background and take-up of ICTs

General background:

- The Greek economy is characterised by an exceptionally low level of investment in IT, both as a proportion of GDP and (because per capita GDP is the lowest in Europe) in absolute terms. Internet use is proportionately low:

	IT spend as % of GDP	IT investment		Internet users per 1000 population
		per capita (ECU)	Scaled (highest 100)	
Greece	0.86	76	10	11
Portugal	1.36	117	16	19
EU mean	2.18	414	55	54
EU highest country	3.36	751	100	152

- Agriculture remains a significant source of employment. Employment in services is the lowest in Europe and includes a high public sector and a large element of tourism. Greece has Europe's highest proportion of employment in small firms and self-employment, and lowest proportion of information workers. This reflects the prominent roles of tourism and agriculture. Other than in small firms the public sector, directly and indirectly, is a major employer and a dominant influence in employment practices.

	% of employment		Enterprises per 1000 population	% of total employment		
	Agriculture	Services		SMEs	Self employed	Information workers*
Greece	21	55	101	86	34	22
Portugal	12	56	64	78	26	33
EU lowest/highest	2	73	23	56	8	54
* Jala International, quoted in EITO 1998						

- With low per capita incomes and spending power, the cost of a PC or an Internet connection appears high to the Greek citizen or small business owner - more than twice as much as for an equivalent person in USA, nearly twice as much as in Denmark (see table over)

Driving factors:

- Although there is low PC and Internet penetration, local phone call costs are low and there are now Internet Services Providers active across most of Greece, including local suppliers on some islands.
- Relative to the low overall level of Internet penetration, there is a high level of World Wide Web activity, with a particularly strong emphasis on using the Internet for telecooperation activities, especially in linking the large and widely distributed Greek diaspora.

	Per capita spending power, PPP*	Perceived relative cost of PC
Greece	43	233
Portugal	47	213
Spain	54	185
Ireland	58	172
Finland	66	152
Sweden	69	145
UK	71	141
Netherlands	74	135
Germany	74	135
Italy	74	135
France	78	128
Denmark	79	127
Austria	79	127
Belgium/Luxembourg	80	125
USA	100	100
Japan	82	122
* PPP = Purchasing Power Parity, a measure of per capita GDP adjusted to allow for different basic costs of living in different countries.		

- There is growing use of the Internet by Government, including online (WWW) presence of Greek overseas embassies, demonstrating an early awareness of the promotional and trade opportunities. Interest and online presence is also visible among city and regional administrations.
- There are examples of imaginative use of Internet in connection with tourism, an important element of trade and employment.

Constraints:

- Telecommunications liberalisation has been postponed in Greece, which has a derogation from the European directives for voice telephony until January 2001.

- The very low proportion of information work leads to a low level of interest in telework in its most commonly understood sense of working at home instead of commuting.
- Relatively low income levels mean that PC is unlikely to become a common household purchase in the near future. The Greek citizen's experience of Internet may be mainly conditioned by applications delivered through low cost devices such as enhanced TV; even this is likely to be considerably delayed compared with Northern European countries.
- Other than in Greece itself and in the Greek diaspora, the Greek language is little understood. Greek individuals and enterprises that seek to trade internationally have no choice but to sustain their online presence and deal with their customers and suppliers in at least English and preferably other languages. Since in most cases they also trade in Greece, this is a significant overhead.

> The Technological Educational Institute of Piraeus is planning a trial for the year 2000, with the detailed planning phase in 1999. The introduction of telework aims for the stimulation of distance learning and will be managed by the automation department. The main goals regarding organisational change are an expansion of services, to increase creativity at work, decentralise services to the public, and to retain experienced staff members by offering them more individual flexibility. The pilot project has been initiated by the person who is in charge for computer technologies. Training will be offered to the participants, and guidelines for the pilot will be elaborated. Equipment will be provided by the employer.

Telework activities and results

- There are several websites that either have a focus on telework or provide some telework links, including a substantial set of pages in Greek at the European Telework Online website.
- The EURO-MED programme is providing Greek companies that have Information Society interests with opportunities to link with and relate to people and firms in other countries that are more similar in their current environment than the mainstream of EU member states.

3.8.3 Conclusions

A strong focus on telework as a primary Information Society application would seem to be inappropriate as a national priority in Greece at this time. More important is the need to accelerate general awareness, use and experience of information technology and online activities. Especially important is the availability of PCs and Internet access in schools, since the low general use of ICTs cannot be dramatically increased overnight, so it is the expectations, knowledge and decisions of future decision makers, workers and managers that will be most decisive in shaping Greek's longer term participation in the Information Society.

3.9 Ireland

3.9.1 Summary

Ireland presents sharp contrasts. Relative to its size and overall economic position Ireland has been the most successful country in Europe at attracting inward investment in Information Society products and services, and is a world exemplar of how telework methods can be used to generate employment in new services such as international call centres. Against this, the overall take up and use of relevant technologies by the community as a whole and in small local enterprises remains low.

Ireland has some natural advantages as a base for Information Society activities - in particular the use of English as a primary language and strong links with the United States. Telework in its wider context is now on the agenda, with the formation by Government of a National Advisory Council on Teleworking. There is considerable know how available, with a national teleworking association and a trade union providing services specifically for teleworkers. Irish participants have been highly active in European telework debate, projects, initiatives and research. The issues and barriers are well known and

understood and if the Government sustains a proactive, business-oriented stance Ireland may well be poised to become an all-round leader in the successful practice of telework.

> The IBM customer support centre in Blanchardstown, Co. Dublin opened in November 1997. It employs 600 people and dealt with 1.2 million calls from 29 countries last year. The company uses 11 European languages, providing technical support for IBM PC products in the US and Europe, and is open 24 hours a day, 365 days a year. Call agents can expect a gross salary of £15,000 in their first year. Jerry Judge, a helpline agent, describes his work:
>
> "I'm working as a helpline agent on the US section. We help American customers who are having problems with their computers. They phone a local number and they get through to us. They think we're just around the corner. They get quite a buzz when they realise they're talking to someone in Ireland. A lot of them have family here and they like to chat."
>
> "I left school at 16 but went back to education after 23 years to do a business studies degree. Before I came to IBM three months ago I was managing a hotel. "
>
> "A friend told me about the company. I rang up, got an interview and they offered me a position on a five week training course. It's a great programme. You're given a lot of information which falls into place once you get on the job. People surprise themselves - they're amazed at what they can learn. Coming here was the best move I ever made jI played for West Ham as a schoolboy and a junior and was disciplined in the team spirit. I've missed that ever since - until I came to IBM."

3.9.2 Telework background and take-up of ICTs

General background:

- Ireland presents sharp contrasts in its economy and in Information Society development. Among its white collar workers Ireland is believed to have Europe's highest level of PC use, but employment in services is relatively low, and overall investment in IT is also low, so that PC usage among the population as a whole is low, as is take up of telephones. Ireland is the only country in Northern Europe whose existing ICT investment is well below the EU average:

	IT per capita	PCs per 100 population	PCs per 100 white collars	Internet users per 1000 population	GDP per capita	% employed in services	Main phone lines per 100 population
Ireland	292	15	78	41	14880	60	39
EU highest	751	33	Ireland	152	29873	74	68
EU lowest	76	8	34	11	8216	56	Ireland

- Ireland still has a relatively high level of agricultural employment, though in recent years there has been a substantial increase in both manufacturing and services. This has been driven by a high level of success in attracting inward investment in hi-tech activities, especially computer and electronics assembly and front office (call centre) and back office services. Call centre operations in Ireland provide sales and customer support facilities for several multinationals, including services for other European countries and for North America (see panel). Recent estimates suggest that some 6,000 people are employed in call centres, predicted to rise to 10,000 by the year 2000, but this includes people who have been recruited from other European countries to supplement local language skills.
- A high proportion of the new activities are in and around Dublin, with relatively little impact in thinly populated rural areas - at 50 people per square kilometre Ireland has Europe's third lowest population density, after Finland (15) and Sweden (19). Considering that some 1.5 million of the population are concentrated in and around Dublin, the rural population density is even lower than these figures suggest. Overall employment has been relatively high but is now falling and dropped below 10% in the first half of 1998.

- Ireland has made effective use of EU funding support, and of favourable taxation for export businesses, to the extent that there are now reports of skill shortages, wage inflation and property price escalation in and around Dublin, which also suffers from severe traffic congestion. Analysts suggest a potential problem arising from Euro implementation, which is expected to result in lower interest rates than have prevailed in Ireland for some years, combined with reduction in European structural funds support, which in future will not include the Dublin area.

Driving factors:

- A Government steering committee produced the *Information Society Ireland* report, leading to the creation of an Information Society Commission, which published its report in February 1998. The Commission is increasing both Government focus and media attention and has top level support - including from the Taoiseach (Prime Minister) who has written in the national press about his personal use of ICTs.
- Telecom liberalisation is expected to drive down the currently rather high cost of internal and international phone calls; Ireland has had a derogation from the timetable of some aspects of liberalisation - notably voice telephony - but the licensing of competitors is now expected to be introduced by year end 1998, one year ahead of previous plans. Government policy is to strengthen the powers of the regulator beyond the minimum laid down in European directives.
- Traffic congestion, rising costs and skill shortages in and around Dublin are encouraging telework and there have been reports of increasing numbers working at home for an hour or two most days to avoid peak traffic periods.
- The Internet is of particular interest as a means of strengthening "links with home" for the very large Irish diaspora. Irish descendants are very numerous and high profile in the USA, providing strong links with the world's largest and most prosperous market and the lead market for telework, electronic commerce and other Information Society activities.
- There is an established network of centres supporting the European Computer Driving Licence programme.

Constraints:

- Confusion over the distinction between paid employment and self-employment has inhibited some companies from providing work to self-employed teleworkers. In common with many countries either clarification or revision of employment and tax regulations is needed to remove some barriers to telework that reflect historical rather than future needs and circumstances.
- Other legal and regulatory barriers to telework and related activities have been highlighted in the *Information Society Ireland* report or in responses to the European Green Paper. The issues include anomalies in planning rules (technically, working at home might cause the home to be regarded as business premises, attracting additional taxes and compliance requirements), and issues about VAT and copyright.
- Historically low investment in IT includes relatively low provision in schools. A *new Schools IT2000* programme was launched in 1997 but this will take time to feed through to delivering "IT- and Internet-competent" new members for the workforce. The low level of incomes in rural areas makes it unlikely that PCs will be a commonplace consumer purchase in the immediate future, though if the Government sustains a high profile Information Society programme, purchases will increase.

Telework activities and results

- Ireland has been a prominent participant in European telework activities and in bilateral work with other countries, including co-authorship with the UK TCA of a telework handbook, which has been used as a template for handbooks in other countries and languages. The English language version is now in its second edition.
- In April 1998 the Government announced the establishment of a National Advisory Council on Teleworking, with broad representation of relevant interests.
- Telework Ireland, a not for profit association, has established links with the Irish Small Firms Association, providing a focus on the links between telework and teletrade. The association operates

"trans-border" in both the Republic and Northern Ireland and has appointed a full time development officer, enabled by funding from The Northern Ireland Special Support Programme for Peace and Reconciliation. It runs an annual conference and is represented on the National Advisory Council. The 1997 annual conference attracted both radio and TV coverage.

- The Communication Workers Union has established a "Virtual Branch" for teleworkers, focused on their particular needs, and maintains an online archive of telework news and information. The CWU has published a leaflet providing information about the benefits and issues of telework and organised a conference, *Teleworking: Sweatshop or Social Progress?* during Telework Week 1997. The CWU recruits and represents workers in Irish call centres, is negotiating a wide ranging telework agreement with Telecom Éireann, and provides advice to the Irish Congress of Trade Unions on teleworking issues.
- IBEC (the Irish Business and Employers Confederation) has produced telework guidelines for employers (available to members only). The CWU and IBEC activities are undertaken in collaboration with European Telework Development.
- Telework Ireland staged a Fifth Annual Conference in November 1997, with the theme: *Teleworking Your Business*.
- Ireland has substantial media coverage of telework, including in 1997 a fifteen minute peak time radio feature.
- The Irish Labour Force Survey has started to collect data on home workers. In 1998 questions about the use of computers in the home will be included in the Quarterly National Home Survey.
- The incumbent telecommunications operator, Telecom Éireann, has become proactive in promoting telework, including the publication of useful telework manuals for managers and teleworkers.

3.9.3 Conclusions

The Information Society in all its aspects is now high on the national agenda in Ireland. Future success depends on Ireland retaining its leadership in attracting relevant investment and balancing this with a higher level of domestic investment in infrastructure and systems, together with increased IT use and competence among local enterprises and in the workforce as a whole.

The focus and direction of the National Advisory Council, together with its effectiveness in converting ideas into action, could significantly influence the shape and extent of teleworking in Ireland for many years to come. This could be especially successful if the council takes account of the success and failure of teleworking actions in other European countries and effectively addresses barriers to local teleworking as well as job creation opportunities. At the same time it is important that independent actors such as government departments, suppliers, employers, unions and the teleworker representative bodies sustain and increase the momentum of their own actions.

3.10 Italy

3.10.1 Summary

1997 saw several important developments in Italy. The Government has identified telework as part of a major Information Society initiative and there is agreement on co-operation for Information Society developments between Government and the social partners (Trade Unions and Industry Federations). Italy has the lowest level of ICT investment and use of the four largest EU economies, but the significance of this has been recognised. Telework has attracted the attention of Parliamentarians as well as industry; telework agreements have been made in both individual companies and industry sectors. Online, the Italian telework website is the most active national site in Europe and has been the start point for several initiatives - a remarkable achievement given that Italy has low penetration of home PCs and Internet. Italy has also taken to mobile communications with enthusiasm.

Extreme variations in prosperity and employment between North and South present a long-standing national problem, for which telework and teletrade could contribute to a solution, but there must also be concern that without strongly focused attention the Information Society might simply widen the divide.

3.10.2 Telework background and take-up of ICTs

General background:

- Italy is substantially the largest and most highly developed economy in Southern Europe. Although Italy is one of the world's major trading nations, with per capita GDP near the overall European average, but its level of investment in and use of ICTs is well below that of the major Northern economies:

	GDP		IT investment	
	Total, $Bn	Per capita, ECU	As % of GDP	Per capita
Italy	1088	19021	1.44	249
France	1451	24973	2.41	499
Germany	2252	27604	2.10	486
UK	1095	18849	3.24	490
Spain	532	13434	1.34	157

- There is a significant difference in overall economic activity levels, employment, incomes and living standards between the industrialised North of Italy, which is comparable to France, and the Southern half of the country. Italy's transition from a strongly agricultural to an industrial and service economy has been compressed into a relatively short period; as recently as 1951 agriculture accounted for 44% of employment (though only about one quarter of gross national product), by 1996 this had reduced to 7% of employment. There has been substantial government involvement in this transformation.
- Unemployment is a national priority, being persistently high and recently around 12%. Within this figure there are extreme variations between the main industrial region (Lombardia-Veneto-Emilia Romagna), which has fairly full employment, the central area with average unemployment, and the South (Mezzogiorno) which has very high local levels of unemployment. Self-employment is relatively high by European standards at around 29% of the workforce. Participation rates are among the lowest in Europe, with a relatively low (but now increasing) proportion of women in the workforce. Unemployment is much higher among women than among men.
- Budgetary policy has been tight in recent years, as Italy has taken steps to qualify for participation in the Euro.
- Tourism is an important industry for Italy, the world's fourth most popular tourist destination. Italy's exceptional wealth of arts and historic sites make the cultural domain a natural focus of Information Society activities.

Driving factors:

- In September 1996 the Government established a *Forum on Industrial Society* to develop guidelines on IS. In March 1997, the Ministry of Industry presented to the Forum *a Policy and Industrial Plan for the Informatic and Telecommunications Sector*, setting out fundamental objectives and terms of reference for strategic and long-term Government decision making. This plan highlights the Italy's relatively low investment in ICTs and fixes some strategic goals to be achieved:

	PC per 100 employees	Fixed phones per 100 inhabitants	Mobile phones per 1000 inh	Internet users per 1000 inh
Italy	26	43	68	13
France	38	55	24	*79
Germany	39	55	46	50
UK	45	53	94	69
Europe	41	46	52	43
USA	68	N/a**	N/a.	140
* Assumed to include Minitel users. Source: Ministry of Industry 1997 ** Not available				

The plan defines four main "strategic areas": electronic commerce; telework and co-operative work; civic networks and services to the citizens; and multimedia for museums and culture sector. Italy is thought to be the first Government to have highlighted co-operative working as a high priority information society activity.

- Relative to overall Internet penetration there is a high level of online activity, providing a good cross section of local and other Italian language material to motivate take up and use by citizens. Consistently through 1997 the main non-English-language traffic for the European Telework Online website has been from Italy.
- Telecom liberalisation is proceeding on time. A new range of local and distance call tariff arrangements optimised for consumer Internet use has been introduced in 1998 as a result of representations from industry and user representatives through an Internet Committee supported by the Ministry of Communications. Early liberalisation has already led to very fast growth in the use of mobile phones.
- The Government has started acting to increase labour market flexibility, substantially liberalising engagement procedures.
- Parliament has approved a law on electronic signatures and detailed regulations are being implemented by the Authority for Informatics in Public Administration.

Constraints:

- Digital leased line telephone costs are among the highest in Europe, acting as a barrier to competition among Internet Service Providers through points of presence networks.
- The very low level of use of PCs and Internet in Italy - especially away from the most industrialised

Digital's telework experiment in Italy commenced in February 1996, when the company signed an agreement with the internal representatives of the Engineering Workers Union. The trial involves ten volunteering employees in the company's engineering sector , out of about 50. The chosen solution involves work at home. The company have installed the workstations, as well as the equipment necessary for linking it to the office and the company information system, including a dedicated telephone line. The teleworkers must be capable of being contacted for a period of two hours each day, agreeing the details with their direct superior, and must return to the office on at least three occasions each month, or as agreed with their superiors. The latter provision proved to be a useful instrument for ensuring flexibility, as in practice the teleworkers return to the office on average for at least one day a week.

The project forms part of a wider company design, which is known as European New Work Architecture (ENWA) and, in addition to telework from the employee's own home, also envisages the introduction of mobile telework in the Sales, Marketing, Software Support and Technical Assistance Divisions.

The new approach will have considerable repercussions as far as space rationalisation is concerned, translating itself into a saving of about 35% for these four divisions. The disappearance of individual workspaces will be compensated by the setting up of Business Centres, appropriately distributed and equipped to offer support for the mobile stations. Two of these are already in operation, one in Genoa, the other in Milan.

regions - presents a major barrier to the spread of telework, since it means there is less awareness of the potential through "first hand" experience of networking. Additionally, use of PCs in the public administration is low.

Telework activities and results:

- Trade Unions (CGIL, CISL and UIL) and the Employers' Organisations have published guidelines and recommendations for fast deployment of Electronic Commerce, Telework and Telecooperation. The social partners are now working together in the Forum on Information Society.
- The Transport Ministry has implemented a telework project, which was presented at the European Telework Assembly in Stockholm, September 1997.
- The regional government of Emilia Romagna approved a plan for the creation of nine telecentres in rural areas.
- A *Plan 1997-2000* for adoption of ICT in public administration includes telework as one of the applications to be pursued.
- A series of proposals were made to Parliament in 1996-1997, most recently Senate Proposition 2305: *Norme per la promozione e l'incentivazione del Telelavoro* (rules for promotion and encouragement of telework), now under discussion.
- Following individual agreements in a number of companies in 1996, two national agreements were signed in 1997 - for workers in the ICT and the Service & Commerce sectors. These agreements are broad in scope, covering the potential for telework at home, in telecentres and for mobile workers.
- Training for telework is beginning to happen on a quite widespread basis. As well as training for teleworkers this included some training for telecentre operators and specialists.
- The Italian Telework Website is substantially the most active national telework site in Europe, attracting 10,000 visits a month. In addition to email discussion and question answering it provides a facility for posting the CVs of teleworkers and by year end 1997 had fielded more than 100 emails from Italian firms seeking teleworkers.
- There are several positive exemplar companies prepared to make public the results of teleworking.
- The Municipality of Rome, with STET, announced ambitious plans for "cabling the city", including a network of 57 telecentres sited at the focal access points to the city.

3.10.3 Conclusions

Over the past two years the Italian telework scene has transformed from a limited amount of mainly academic research interest to become quite a hive of activity. In particular telework has got onto both the national and regional agendas, and there is growing interest among employers and unions. Italy is placing particular focus on telecentres and may well demonstrate quite a different experience than that observed with earlier activities in Northern Europe which mainly pre-dated awareness and widespread use of the Internet.

There can be little doubt that telework will now be on the increase in the Milan-Turin-Genoa triangle and in and around Rome. There are the usual barriers of management lack of awareness and resistance, together with slow progress in developing the appropriate legislative, regulatory and contractual arrangements, but the interest and will appear to be there to address these issues.

The two issues that remain are the most challenging, but they are far from unique to Italy: to address the overall low level of use and experience of ICTs by citizens, managers and workers, and to understand how ICTs can best be deployed to address the problems of the Mezzogiorno. Telework is an application that citizens can readily understand; it should play a central role.

3.11 The Netherlands

3.11.1 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 (74% by 1995). 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. An active national Telework Forum supported by a cross section of industry is pursuing both awareness raising and policy development programmes.

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

3.11.2 Telework 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	IT investment		PCs usage		Internet users per 1000 pop'n
		as % of GDP	per capita (ECU)	per 100 white collars	per 100 pop'n	
First	Netherlands	Sweden	Denmark	Ireland	Denmark	Sweden
Second	Sweden	UK	Sweden	Sweden	Sweden	Finland
Third	UK	Denmark	Netherlands	Netherlands	Netherlands	Denmark
Fourth	France	Netherlands	France	Denmark	Finland	UK
Fifth	Belgium	Finland	UK	Finland	UK	Netherlands

- It is very much a trading nation, with pro rata twice as high a participation in world trade as (for example) Germany.

	Population	% of world trade	trade/population ratio
Netherlands	15.4	3.49	22.7
France	57.7	6.92	12.0
Germany	81.1	9.62	11.9
UK	58.1	6.37	11.0
Italy	57.2	4.59	8.0

- Living standards are high - Netherlands is rated the highest country in Europe in the United Nations human development index. The country has progressive labour market policies, with a strongly analytical and innovative approach to addressing labour market issues.

Interpolis is a major Dutch insurance company which has always had a keen interest in the innovation of work. When a new office was set up recently, it was decided to do so in a new way: a flexible office concept. Except for the receptionist and support staff, nobody has a permanent desk in the newly built office in Breda which provides only 1,100 desks for a staff of 1,500. As explained by a representative of the firm “the first thing our President does when he arrives at the office, is to ask for a desk.”

Facilitated by portable PCs and mobile phones, the staff of Interpolis have become very flexible in where they work, whether within the office or outside it. The office itself is a combination of so-called cellular rooms and open planned spaces. Working at home, or on the road, is also now normal practice for about 100 employees, although this will soon rise to 400 people, each of them with a ‘telework clause’ in their work contracts.

Driving factors:

- Following some years of effort by individuals and the Netherlands Telework Forum, there is now political as well as commercial attention to telework. In the 1998 national elections three political parties referenced telework in their manifestos, focusing on transport and mobility problems and on economic development in less buoyant parties of the country.

- The Transport Ministry has a long-standing interest in telework, and it is now widely seen as part of the solution to the country's endemic road congestion problems - 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.
- A new tax regulation allows employers to pay a limited tax-free sum to compensate employed teleworkers for costs associated with working at home.
- Other forms of flexible working 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 established magazine *Telewerken* is now in its fifth year of publication.
- 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 telework as a means of access to work opportunities for people with mobility problems.

OTTO Versand is a worldwide mail order company based in Hamburg, with OTTO B.V. as the Dutch subsidiary. Using a catalogue, customers call in to place their orders which are immediately registered in the main computer system by the 'sales person', who can also check whether the ordered goods are in stock.

One of the characteristics of the mail order business is that most customers tend to call in the late afternoon or evening. In order to be able to deal with such peaks in the most effective manner, OTTO started as long as 15 years ago to use teleworking. Today, 80 people are contracted as teleworkers from their own homes using an extra telephone line and a computer with a direct line to the company's central system in Hamburg.

In order to facilitate this, the local telephone switching centre was upgraded, which means that the geographical spread of teleworkers is currently limited to people living in one neighbourhood in Tilburg. With the support of OTTO, the teleworkers themselves started to organise coffee meetings and to encourage colleagues to participate in the company's social events.

Constraints:

- The high overall level of ICT investment conceals a variable patter, with relatively lower ICT use in Government and in small firms.
- With a net shortage of IT skills, Year 2000 ICT preparedness and Euro implementation are inhibiting implementation of other applications such as remote access to company systems and services.
- "Working at home" is associated with older forms of home working (eg low paid piecework).
- Legislation and regulation is largely based in traditional home working and in some aspects inappropriate for modern teleworkers.
- "Being at home" is associated with sickness rather than with work. Women returning to the workforce want to be in the mainstream rather than remaining at home.
- As everywhere, management resistance and concerns are based on old-style "management by presence", with insufficient adoption of management by objectives and measurement on results.
- The positive pressure for telework 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.

Telework activities and results

- The Netherlands Telework Forum (NTF) has supported more than 30 seminars addressed to both awareness raising and advice giving.
- The Ministry of Economic Affairs has published brochures about telework and other Information Society applications.
- The Transport Ministry has led pilots and programmes promoting telework for employees as a means of reducing car use and traffic congestion.
- IDC has published estimates and forecasts showing:

	1996	2000		
		unchanged environment	Growth scenario	"disaster" scenario*
Mobile workers	336,000	640,000	664,000	754,000
Teleworkers	137,400	252,000	315,000	650,000
* "Growth" assumes some additional government actions to promote or enable telework. "Disaster" assumes a much more incisive set of actions triggered by (for example) a serious and prolonged traffic gridlock. The scale of difference indicates the important placed on public policy action or inaction.				

- NTF is developing a comprehensive database of case studies, exemplars, surveys etc and has already accumulated some 250 items.
- The annual conference on telework research issues was held in Amsterdam in 1997.
- There are numbers of web sites presenting employment and contract work opportunities, including a proportion of teleworkable offers.
- The Transport Ministry has led pilots and programmes promoting telework for employees as a means of reducing car use and traffic congestion, and has recently published an up-dated “Telewek Handboek” reflecting their eight years of hands-on experience.

3.11.3 Conclusions

Steady growth of telework is anticipated, but considerable acceleration could occur if all the relevant policy initiatives were to come together. 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 Holland - pressure from traffic congestion, a flexible labour force, skill shortages and a generally high level of ICTs take up. Concerns include low use of ICTs among small firms and managerial resistance to new management approaches. Continuing promotion, information provision and policy informing is needed to capitalise on the excellent opportunities.

3.12 Portugal

3.12.1 Summary

The Government of Portugal has a progressive approach to Information Society developments, reflected in the 1997 *Mission for the Information Society* Green Paper. Portugal was one of the first European countries to implement online information services for citizens, with the deployment of public information kiosks in Lisbon in 1993-1994, leading to the InfoCid (information for citizens) programme with some 400 kiosks now deployed across Portugal and a linked Internet service. Portugal has also taken a proactive approach in education, with all schools now connected to the Internet and plans for one linked computer for every classroom by 2000.

This very active approach recognises that Portugal starts from a low level of investment in and use of ICTs and, historically, little activity in Internet Society applications such as telework. During 1997-1998, however, Telework Associations have been formed and Lisbon is the host city for the European Telework Assembly in September 1998. Telework features in the Information Society strategy and incentives for employers and citizens are in place or planned. Focused applications such as telemedicine and tele-learning, with the use of technology to develop and sustain rural prosperity and jobs are higher priorities for Portugal than home-based teleworking.

3.12.2 Telework background and take-up of ICTs

General background:

- Portugal has a historically low per capita GDP and a low investment rate in terms of ICT as a percentage of GDP, leading to Europe's second from lowest density of PCs and Internet users:

	Per capita GDP	IT spend as % of GDP	IT investment		Internet users per 1000 population
			Per capita (ECU)	Scaled (highest = 100)	
Portugal	9,851	1.36	117	16	19
EU lowest country	8,216	0.86	76	10	11
EU highest country*	29,873	3.36	751	100	152
* excluding Luxembourg					

- Portugal has enjoyed relatively low unemployment, especially relative to neighbouring Spain - around 7% in the mid 1970s compared with around 20%, and below the average of the EU. A relatively low proportion of employment is in services (56%).
- Geographic and demographic considerations are important in determining Information Society strategy and development patterns. Portugal is at the edge of Europe, with long road and rail connections, but is culturally at the centre of a potential worldwide network of 200 million Portuguese speakers.

Driving factors:

- Portugal has a history of successful innovation in telecommunications based public services, for example the Multibanco programme, in which deployment of electronic purse applications has been ahead of more ICT-intensive countries like the UK, the use of networks supporting the collection of road tolls and the early computerisation and networking of Post office counter services.
- More recently, the Government's Green Paper on the Information Society in Portugal (http://futuro.missao-si.mct.pt/english/greenpaper/green.htm) has set out a comprehensive, coherent and distinctively Portuguese approach that includes telework as an important element.
- The Portuguese people are noted for their creativity and spontaneity, very positive characteristics in the context of a period of rapid technology-based change.
- The still-recent memories of revolution and constitutional development leads Portuguese political leaders to refer to the country as a "young" democracy, and there is consequently less resistance to further positive change than in countries with long-established institutions and methods.
- A world community of some 200 million Portuguese speakers provides the potential to establish critical mass for a Portuguese language and culture market at global level long before the local market within Portugal itself, and a bigger total "own language" market than for most European countries.
- Difficult terrain within much of the country, together with long distances and journey times to the main EU markets, can be expected to motivate Portuguese companies and citizens to ready acceptance of electronic networking, telework and teletrade in their dealings with the rest of the European Union as well as in the wider world.

Constraints:

- The relatively very low level of ICT use within Portugal presents a market barrier against rapid development of locally based Information Society applications, including home-based teleworking.

- It also presents learning curve and skills problems, in that fewer citizens gain experience of computers and Internet through private purchase and use of the technologies.
- The relatively low per capita GDP makes computers, telephony and Internet costs appear high to Portuguese companies and citizens compared with (for example) perceived costs in Scandinavia.
- The generally understood business rationale for teleworking is weak in Portugal compared with countries such as the Netherlands, with high salaries, high overheads, dense and congested road networks and a generally high-tech economy.

Telework activities and results

- From a more-or-less standing start in 1996, now less than two telework associations emerged during 1996-1997, reflecting rapidly increasing national attention to the Information Society.
- A number of specialist applications (of teleworking or with teleworking elements) are being piloted or implemented, including:

– University Communication Network (RCU), which provides ISDN access for students and teachers at home, is being offered more generally to higher education after successful piloting in Lisbon, Aveiro and Oporto.
– Terràvista is an exciting project to provide a global open space for communication in Portuguese.
– Awareness and familiarity for citizens is being tackled through the schools, with all schools now connected to the Internet and a target of one connected multimedia PC per classroom by 2000.
– Telemedicine applications are implemented, including remote diagnostic support and tele-radiology.

- A consortium (of Telepac and Tracy) was launched to market telework systems and is implementing pilot schemes.
- The Government announced a commitment to "frame legislation and draw up an organisational framework to recognise and promote telework" in the public administration and has recognised the need to "modernise the contractual framework of working life . . . to reconcile flexibility and security.
- In September 1998 Lisbon hosts the annual European Telework Assembly, during Expo98.

3.12.3 Conclusions

Telework in the form of working at home is not an immediate priority for Portugal, compared with focused applications of teleworking such as telemedicine and tele-learning, and policies designed to (a) accelerate ICT take up by citizens, government and industry (especially small firms) and (b) understand and implement telework and the related applications (teletrade and telecooperation) as a means of addressing the relative geographic isolation of Portugal within Europe and underpinning the prosperity and social cohesion of rural communities. In addition to capitalising on the telework and teletrade opportunities across the Portuguese-speaking world, Portugal also has a need to actively encourage positive outreach by Portuguese entrepreneurs, companies and communities to the higher-GDP countries of Europe, marketing Portuguese skills and capabilities to meet market demand rather than allowing new work opportunities to migrate outside the European Union.

3.13 Spain

3.13.1 Summary

Spain has particular national opportunities in the Information Society. A form of Spanish is the first language in some 28 countries and for close to 300 million people. Also, travel and tourism is one of the main sectors for early online activity and Spain has the highest tourism revenues pro rata among the larger EU economies. A large land mass with a thinly distributed population provides an incentive for early adoption of telework, especially in applications such as medical services. High unemployment provides another incentive to understand and use telework and teletrade methods.

Against these positive factors, Spain has the lowest level of investment in ICTs among the larger EU countries, and relatively low per capita GDP makes the technology look more expensive in relative terms.

> AET, The Spanish Teleworker Association, is attempting to stimulate demand for 'teleworkable' jobs in SMEs in the tourism sector. Most companies are either unaware or unsure about telework, so a series of focused seminars explaining the nature and the benefits as well as the problems related to telework, followed by interviews and systematic analysis of opportunities, is being carried out.
>
> SMEs interested in the pilot experiment receive technical and managerial support to introduce the tools and methods for teleworking. Simultaneously, members of AET are being trained to match the demand stimulated. A key feature of the project is the use of the GINGO (knowledge tree) Human Resource Database Management software from TriVium S.A., for matching demand, offer and competence building.

3.13.2 Telework background and take-up of ICTs

General background:

- Spain is Europe's fifth largest country in population terms. The population is more sparsely distributed than in the other large economies, because of Spain's large land mass and the dispersion of some of the population on outlying islands (Canaries and Balearics). Spain is also quite highly regionalised in its administration, being divided into 17 *comunidades autonomas* (including the Canary and Balearic island groups).

	Area, sq km (thousands)	Population (millions)	Density (people per sq km)
Spain	505	39.6	78
UK	243	58.1	239
Germany	358	81.1	227
Italy	301	57.2	190
France	544	57.7	106
Finland	338	5.1	15

- The per capita GDP is much the lowest of the larger EU countries, though substantially higher than those of Greece and Portugal. This has the effect of making ICTs appear relatively expensive for consumers and small local enterprises. Spain has a low level of investment in large-scale computer systems and in PCs per head of population, but a somewhat higher level of use of PCs relative to white-collar workers. There are significant differences in earnings levels between the main city and industrial areas and the rural hinterland.

	Per capita GDP	IT spend as % of GDP	IT investment		Internet users per 1000 population	PCs per 100 white collar workers
			Per capita (ECU)	Scaled (highest = 100)		
Spain	13,434	1.34	157	21	22	48
EU lowest country	8,216	0.86	76	10	11	34
EU highest country*	29,873	3.36	751	100	152	78
* excluding Luxembourg						

- Unemployment is the highest of any major EU country, regularly hovering around 20% in recent years. Labour laws that severely restrict flexibility have discouraged companies from hiring full time permanent employees and led to high levels of temporary or fixed term contract working.

Government spending has been significantly reduced in recent years as part of successful efforts to qualify for entry to the Euro.

- Spanish is one of the world's most widely spoken languages, after Chinese and English. A form of Spanish is the main language in some 28 countries, especially focused in South America, and there are others where Spanish is the native language for large minority populations, notably in the USA.

Language	Number of first speakers (millions)	World ranking
Chinese/Mandarin	885	1
English	322	2
Spanish	266	3
Bengali	189	4
Hindi	182	5
Portuguese	170	6
Russian	170	6
Japanese	125	8
German	98	9
French	72	13
Italian	40	27

- Within Spain itself, there are quite substantial minority language populations - Castilian Spanish 74%, Catalan 17%, Galician 7%, Basque 2%.
- Tourism is an important industry. Relative to national GDP Spain has the highest tourism earnings of any country world wide:

	GDP $US Bn	Tourist arrivals (millions)	Tourism revenues ($, millions)	Tourism % of GDP
Spain	532	41,425	28,428	5.3
Italy	1088	35,500	27,439	2.5
France	1451	61,500	28,241	1.9
UK	1095	25,800	20,415	1.9
USA	7100	44,791	64,373	0.9
Source for tourism data: Economist Intelligence Unit				

- Relative to the other large EU economies has a higher average number of persons per household. This factor reinforces others in suggesting that telecentres rather than home based teleworking is an appropriate focus for telework activities in Spain:

Average number of persons per household	
Spain	3.3
Germany	2.2

Driving factors:

- Although overall Internet use is low, there is a proportionately high level of activity among users, with active Telework websites and online discussion.
- IT take up is growing quite rapidly, with 10.5% increase in purchases in 1997, compared with the overall EU average of 8%. Further growth of 11.9% is expected for 1998.
- A study by Microsoft and Telefonica found that 53% of small firms in Spain show an interest in teleworking.
- The large world population of Spanish-speakers provides early critical mass for online activities, compared with most European countries.

Constraints:

- A high ratio of persons per home, coupled with relatively low penetration of ICTs, means that the familiar model of home based teleworking is less attractive in Spain.
- A high proportion of "hi-tech" employment in Spain is with subsidiaries of foreign-owned multinationals; these operations have limited local autonomy and tend to follow the parent company's guidance on matters such as telework, rather than innovating.
- The cultural and political strength of individual regions, while favouring local initiatives, makes it more difficult to develop and sustain national and international activities relating to Spain as a whole or the Spanish language, so that some of the value of the large Spanish speaking opportunity is diminished.
- There are signs of progressive public policy initiatives, for example in the field of electronic signatures and trusted third parties Spain has been an active protagonist.

Telework activities and results

- The Telework Association (AET) is publishing a teleworking handbook during 1998, with support from Motorola and IBM
- The association supports an active website with online discussion, Frequently Asked Questions etc
- Spain was the focus for a successful initiative to create special phone cards celebrating European Telework, which in 1997 also included telephone operators in Belgium, Denmark, France, Italy and Sweden
- Regional administrations and local authorities are building telework into their economic development and training strategies, with European support through the ADAPT initiative (see Annex 2).
- Solutions to the unemployment problem have mainly been sought on a local basis; Spain has not to date established the kind of "importing" of telework opportunities that has led to employment growth in Ireland and is beginning to take off in the Benelux countries.

3.13.3 Conclusions

Spanish institutions and enterprises are active participants in all European Union programmes, including Information Society development, but a clear and strong national vision of how telework, teletrade and telecooperation can be applied to address economic and employment growth has yet to emerge.

Spanish people are natural communicators, and Spain has a powerful world image, reinforced by history, by the worldwide use of the language, and by its popularity as a tourism destination. There is an urgent need to develop Spain's position in telework, teletrade and telecooperation through planned approaches that capitalise on Spain's strengths.

3.14 Sweden

3.14.1 Summary

A full EU member state since 1995, Sweden is one of Europe's most intensive users of Information Society technologies and was the birthplace of the telecottages concept. The Swedish population is one of the most thinly distributed; the Norrland region, with only 1.2 million inhabitants spread across 58% of Sweden's land area, has an average of less than 5 people per square kilometre. Sweden is highly industrialised, with a high proportion of world class companies relative to the size of its economy. Sweden is historically a trading nation and Swedish business travellers and holidaymakers are encountered throughout the world.

The labour market is one of the most highly organised in Europe, but since the 1970s there have been significant changes in the "Swedish social model"; labour market legislation was revised in 1997 and there is ongoing review of the regulatory impacts of technological change, include teleworking.

Telework is reasonably widespread, though still far from being a normal and fully accepted working practice. There remain some fiscal and regulatory barriers.

3.14.2 Telework background and take-up of ICTs

General background

- Sweden vies with Finland as Europe's most intensive user of Information Society technologies. It invests a higher proportion of GDP in IT than any other European country and occupies first or second place on most of the relevant metrics.

	IT spend as % of GDP	PCs per 100 white collars	PCs per 100 population	Internet users per 1000 population*
Sweden	3.36	75	29	152
EU highest	Sweden	78	33	Sweden
EU lowest	0.86	34	8	11
USA	4.08	103	46	
* Source: ETD estimates based on IDC reports, January 1998				

- Sweden is a relatively prosperous European country, with GDP per capita similar to the Netherlands, but only half the Netherlands' population spread across more than ten times the land mass. The northern part of Sweden (Norrland), with 58% of the land area, has only 14% of the population.

	GDP per capita (US $)	Population (millions)	Land mass (sq km)	Persons per sq km	Employment (%)	
					Ind'y	Svcs
Sweden	23,864	8.7	450	19	26	71
Netherlands	23,966	15.4	42	371	23	73
EU highest	29,873	81.1	544	N'lands	38	N'lands
EU lowest	8,216	3.5	43	15	N'lands	55
Norrland region		1.2	261	5		

- Although Sweden has become very much a service economy from an employment standpoint, with Europe's second highest proportion of employment in services, the manufacturing sector remains important and accounts for some 80% of exports by value. The services sector includes a high proportion of public services employment and Sweden has not yet developed a strong exporting position in services. Public agencies account for one third of all employment.
- Sweden has been a leading advocate of free trade. In manufacturing Sweden's count of home based multinationals is very high relative to the scale of the home economy, and includes several household names - Ericsson, ABB, SKF, Volvo, Saab, Atlas Copco, Scania. Swedish-owned multinational firms account for about half of total Swedish exports. In recent years Sweden has also attracted investment by foreign owned multinationals. With a long history of International trade and involvement, Sweden is internationalist in outlook - for example a high proportion of Swedish websites carry material in English as well as Swedish; many also carry material in other languages, particularly German and Russian.
- With Denmark, Sweden shares Europe's highest level of participation in the labour market; this includes a very high level of participation by women, with only four percentage points difference in participation rates between men and women. However, more women than men are in part time work or in low paid jobs and there are pressures for further steps towards equality of opportunities.
- Although unemployment in Sweden has been around the EU average this is an extremely high level relative to post-war Swedish standards (between 1970-1990 unemployment never exceeded 4%). There is controversy about how to tackle unemployment. The Government has sought to promote increased labour market flexibility so as to increase the competitiveness of Swedish industry, but

there are strong voices advocating an alternative approach based on increased stimulation of domestic demand and improved public services.

> The „Gatu och fastighetskontoret“ is in charge of maintaining and planning Stockholm's roads and buildings. The entire unit employs 1.100 people. The telework pilot was launched in 1995 with the aim of stimulating distance working and the decentralisation of ICT-based services. One of the administration's main motives has been the search for creative solutions to improve cooperation within the administration as well as with customers and suppliers.
>
> The scheme has been implemented in cooperation with relevant unions and three to four times more employees wanted to telework than could be selected by senior management. In five departments with 265 members, eleven employees work three days per week at home. The majority of these teleworkers are in managerial positions, one is an economist, two are park engineers. Further goals of the trial, namely an improved management of work and private life, have been perceived as a success as well as increased efficiency.
>
> Beneficial changes of work patterns and productivity have been noticed. Special attention is given to ergonomics, accidents and the safety of equipment.. A partnership approach and broad participation in permanent assessment seem to be major elements of this success story. Continuation and expansion of the scheme are expected.

Driving factors:

- Long distances and small, isolated communities led to Sweden becoming the birthplace of the "telecottages" concept and today encourage adoption of practical applications of Information Society technologies, for example in telemedicine.
- Government ministers in Sweden speak from personal experience of telework; at her keynote address to the European Telework Assembly (see below) the Minister for Transport and Telecommunications, Mrs Ines Uusmann, cited her own and ministerial colleagues' practical experience as teleworkers.
- The high participation of women in the workforce means that in most households both parents are in work; this motivates positive approaches to flexible working methods so as to facilitate a good balance between work and family responsibilities.
- There is an excellent telecommunications infrastructure and Sweden has been a world leader in telecommunications liberalisation. Telia (the incumbent telecommunications operator) expects to provide broadband communications to 98% of Swedish homes by 2004.
- There is an active telework practitioners' community and experts from Sweden regularly are invited to speak at international as well as European conferences.
- The strongly international flavour of the non-services sectors leads to high dependence on telecommunications and the early adoption of online working methods within companies in these sectors.

Constraints:

- There are issues and uncertainties about the treatment of employed teleworkers from both regulatory and fiscal standpoints.
- Unions assert that the law regarding representation entitles union representatives to visit teleworkers in their homes at the expense of the employer; if so this raises a significant potential cost and acts as a disincentive to encourage teleworking.
- Taxation rules appear to be restrictive as regards allowances paid by employers to reimburse teleworkers for work-related costs; strictly applied, such rules discourage teleworking. It's even possible that the employee could be taxed on the perceived benefit from personal use of equipment provided by the employer for home based use. This is in sharp contrast to neighbouring Denmark, where tax regulations have been adjusted to encourage provision of computers for use at home even by non-teleworkers.
- Continuing concerns about unemployment make employees less inclined to take the perceived risks of involvement in new working methods.

- The Swedish tradition of a highly regulated and organised labour market is expected to constrain innovation in working methods and structures and inhibit the growth of an export-oriented private services sector.

Telework activities and results

- In 1997 Sweden hosted the annual European Telework Assembly, the main venue for policy debate on telework and related topics, which attracted a large number and range of practical case studies on telework, particularly from Sweden and neighbouring countries.
- The Government has stated its intention to introduce new legislation/regulation intended to address the wider use of IT, including telework. A commission on the regulation of telework will report in September 1998.
- The Swedish Confederation of Professional Employees (TCO) has produced a booklet, *A Good Teleworkplace*, following its earlier *Working at a Distance*.
- A new support organisation *enter-by.net* has been formed in 1998, to complement the work of the established *Distansforum*. Enter-by.net focuses on self-employed teleworkers.

3.14.3 Conclusions

Two main influences strongly dominate in Sweden. On one hand Government policies and regulatory actions play a key role, because such a high proportion of all employment is in public services and because of the high level of labour market organisation. On the other hand Sweden's national revenues and a high proportion of private sector employment depend on large multinationals - both Swedish and foreign owned - who trade in an increasingly global context. The future development of telework among employed people in Sweden is therefore strongly dependent on the results of the commission on regulation of telework, and the Government's response.

Against this, self-employment is quite widespread in Sweden and there is plenty of scope for bottom-up innovation by individuals and small firms participating in the networked economy at European and International levels.

3.15 United Kingdom

3.15.1 Summary

The UK is in a period of "active Government" following the general election of May 1997, when a left-of-centre Labour government won a landslide victory over the right-of-centre Conservatives, who had been in office for seventeen years. The new administration has confirmed and reinforced a commitment to rapid adoption of Information Society methods, especially by government itself and in government's dealings with citizens and industry.

UK has the highest penetration of Internet use among the major European economies and substantially the highest take up of teleworking, with estimates of between 1-2 million people teleworking on a full or part-time basis and in a variety of modes. It also has had the fastest rate of introduction of ‘concentrative teleworking’, as banks, insurance companies and other sectors switch from High Street presence to telephone-based sales and support.

Factors promoting the adoption of Information Society methods include the early liberalisation of telecommunications, which has led to price reductions and a proliferation of competition and new services, together with a lightly regulated labour market that presents few barriers to innovation. Telework adoption has been accelerated by Europe's most well-established telework association, which has positively influenced media coverage as well as providing information services to the public.

3.15.2 Telework background and take-up of ICTs

General background:

- Among Europe's major economies, UK has a relatively low per capita GDP but a relatively high level of investment in and take up of Information Society technologies. The level of personal/household use of ICTs is remarkably high when considering the UK citizen's relatively low earnings and spending power:

	Per capita GDP	IT investment as % of GDP	PCs per 100 population	Internet users per 1000 population*	Households with Internet access, per 100 households**	GDP per head in purchasing power parity (PPP)***
UK	18,849	3.24	21	95	7.9	71.4
Germany	27,604	2.1	19	65	7.0	74.4
France	24,973	2.41	16	26	3.5	77.9
Italy	19,021	1.44	9	24	2.2	73.6

* Based on data reported by IDC, January 1998

** EITO estimate for 1998

*** PPP is derived by considering GDP per head against the local prices of a standard basket of goods and services; the figures relate to USA = 100 (Source: EIU)

EITO forecasts that by 2001 the UK will have more than 12 million Internet users, providing both a platform for teleworking and an incentive for existing enterprises to adopt

- One weakness in Information Society preparedness is UK's relatively low usage of ISDN, especially by consumers. However, the incumbent telecommunications operator (BT) has been actively promoting ISDN to consumers in 1998 and is introducing a new, low-priced offering.
- The UK social and economic environment is lightly regulated and scores high on most measures of competitiveness, economic freedom and a positive environment for business. This, together with relatively low wages, taxes and social charges, has attracted a high level of inward investment by both European and other multinationals, and UK is the European entry point for many USA and Far East multinationals.

	Economic freedom index ranking*	Global competitiveness ranking	Business environment ranking
UK	7	7	2
Germany	20	25	10
France	31	23	13
Italy	36	39	29
Netherlands	9	12	3

* "Economic freedom" assesses ten indicators of how government intervention can restrict economic relations between individuals

Source: EIU

- There is controversy within the European Union about the merits and demerits of economic freedom, especially in the spheres of labour market regulation and social protection. The UK has within the EU been the main advocate of labour market flexibility. As well as reflecting the philosophy of particular administrations, this also reflects a strong national tradition of freedom of the individual; for example proposals for identity cards, taken for granted in most European countries, are hotly contested in the UK, where it's felt the government should have no knowledge of or interest in the whereabouts, activities etc of citizens. This general attitude is reflected in the high prevalence of informal telework arrangements (see below).
- The UK was the first major European country to liberalise telecommunications and privatise the state monopoly operator. The telecommunications regulator (OFTEL) was given objectives to encourage and facilitate investment by competitors and until very recently has restricted BT's

freedom to reduce prices so as to allow scope for competitors to come in under the BT price levels while still making a profit. Even with these constraints, prices have fallen substantially; since 1984/5 the average cost of a BT daytime call to the USA has fallen by 89% in real terms. The regulator has also placed a high emphasis on easy access for new competitors to consumers and businesses, establishing stringent rules for competitor use of the BT network. This has led to a proliferation of new products and services and price competition from competitors who in some cases are reselling capacity rather than building infrastructure:

Vendor	Cheapest price in calls per minute from UK to:			
	USA	France	India	Ireland
BT	12	13	55	10
Cable & Wireless	9.6	11.6	70	8.8
First Telecom	6	12	54	12
High Street Shop	15	18	45	18
Swiftcall	9	14	50	10
Source: The Times Interface, 5 August 1998				

- There is some evidence that consumers have difficulty in understanding and capitalising on the bewildering array of alternative offers and pricing plans. The regulator is now focusing on how to ensure that consumers and businesses (especially small firms) have access to understandable information that will help them make better use of telecommunications.

Driving factors:

- There has been some Government endorsement of teleworking, notably in 1997 and 1998 through "National Car-Free Weeks". The Government as an employer has for many years taken a supportive line on teleworking, leaving it to individual Departments of State and often to local management to determine the use or otherwise of home-based teleworking by civil servants.
- Overall, UK enterprises have tended to take a relaxed rather than a formalised view of telework; for this reason it's thought there are more people teleworking through informal agreement between managers and staffs than in formal schemes. Informal teleworking appears to work well in the case of professional salaried employees and reflects the trend towards empowerment rather than supervision as a management style.
- Travel to work is becoming increasingly unattractive for many commuters. Roads are congested and recent announcements suggest a reduction rather than an increase in road building. Public transport is very variable in standards and rail services have come under increasing criticism for overcrowding, late running and cancelled services. The government is expected to introduce some road pricing measures and possibly workplace car parking taxes. All these factors will increase attention to telework as an alternative to commuting and other business travel.

> The Prison Telecentre project has been in existence since 1993 and the telecentre itself was ready to operate from mid February 1996. The aim of the Telework Programme is to provide work and work experience for the female inmates. The Telecentre is an office, or an office-like environment, within the prison, which contains computer and telecommunications equipment.
>
> The idea was that if women outside the prison could be trained to work from home this opportunity should also be given to women inmates. The concept developed to encompass more than just a training programme, but also to include a place where women could carry out skilled computer-based work. The inmates use all the equipment either for training or to carry out work for companies. Of the 20 women participating, 19 have obtained a certificate in teleworking, and were thereby better able to re-integrate into society after serving their sentence.

- UK enterprises are rapidly taking up telecommunications-based alternatives to both face to face and postal selling and support methods and there are now at least 2,500 phone-based call centres in the UK. Companies use some 90,000 linkline phone numbers. To date, with only some 8% of households having Internet access, there has been relatively little take up of online (Internet based

rather than phone based) services, but several Banks and some supermarket chains are starting to offer or at least pilot such services. BT's more positive approach to marketing ISDN to consumers, together with continued growth in Internet use, will accelerate this trend.

Constraints:

- Even in the relatively liberalised UK social and economic environment, the TCA continues to identify fiscal and regulatory issues as significant barriers to the spread of organised teleworking. For employers, there are questions about how Health and Safety responsibilities can be managed when workers are based in their own homes, as well as uncertainties about the tax treatment of allowances or cost reimbursement. For employees there are concerns that the use of one's home as a place of work could lead to punitive local taxes if part of the premises are regarded as being for business as opposed to domestic use. These issues are exacerbated by the fact that many of them are dealt with by local authorities who may not interpret national laws and guidance in consistent ways; an employer cannot be expected to negotiate with many different local authorities where his commuting employees live before embarking on a telework programme.
- Corporate culture and management concerns also continue to feature as barriers to organised telework schemes, though these constraints are reducing as more managers become familiar with the technologies (for example email), as more people have their own PC at home or a company laptop, and as technology costs continue to fall relative to commuting and premises costs.
- Another important constraint on growth is the practical matter of suitable accommodation. For many of today's commuters it's not feasible to switch to home based working; houses are too small, there are two or more workers in each home, and there are social objections - many people see work as a break from home and home as a break from work. Significant investment in infrastructure in the form of flexible working centres, distributed offices etc would be needed to allow teleworking to replace commuting on a mass scale.
- The trend for work to increasingly rely on computers and telecommunications both drives the opportunities for teleworking and raises some problems - notably the issue of technical support to widely distributed employees. Technological solutions should be forthcoming, but this also generates opportunities for new kinds of services targeting teleworkers and their employers.

Telework activities and results

- The UK has a very well established telework association, TCA. Originally the TeleCottages Association, it changed its name in 1997, becoming the Telework, Telecottage and Telecentre Association. This reflects increasing attention to employed teleworking and the potential role of shared telecentre facilities. TCA answers upwards of 5,000 calls a year from employers, the media and would-be teleworkers and has considerably influenced the development of teleworking.
- Also in 1997 TCA joined forces with other telework organisations to form a national Telework Platform, which (inter alia) lobbies Government.
- There is an annual conference, held in London during European Telework Week. An Internet Newsgroup (uk.business.telework) has replaced the UK telework discussion list formerly run at the Mailbase site.
- Government has begun collecting telework data as part of its routine Labour Force Survey. The spring 1997 survey (see panel) reported that 987,000 people (4% of those in employment) are teleworkers in their main job. 70% of these teleworkers are managers, administrators, professionals and associate professionals - telework is a middle class professional activity not primarily a clerical one.
- Another 1997 survey, for BT, found that while only 6% of organisations had any formal approach to teleworking, 49% have some kind of informal arrangements. 18% of organisations were likely to introduce some kind of scheme within the next five years. Among large organisations (employing more than 1,000 people) three-quarters now have some kind of flexible working in place - at home, on the move, or in non-conventional locations. Productivity gains, customer service improvements and cost savings are the key benefits seen by employers.

- Surveys confirm that about half of all UK teleworkers are self-employed, compared with about 13% of the total workforce in self-employment.
- There is a small but noticeable trickle of recruitment advertising that mentions that the job can be done on a telework basis or that specifically stipulates the need for teleworkers. The weekly TCA email newsletter now routinely carries a number of job opportunities. A website has been established that seeks to match telework job seekers with employers or customers.
- Direct marketing and support centres have brought significant numbers of new job opportunities, which tend to be concentrated in areas of relatively higher unemployment, but with large urban or suburban populations. Some of this employment replaces existing High Street jobs in both high and low unemployment areas, some of it represents real growth as the economic sectors concerned exploit the new product and services opportunities presented by more cost effective marketing methods. Some companies, especially in the insurance and financial services sector have completely abandoned face to face selling and support in favour of direct marketing from centres, backed in some case by home based teleworkers. In parallel with this, new financial service intermediaries have emerged, either competing with the direct organisations or offering added value through face to face and more visibly personalised services.

3.15.3 Conclusions

Attention to the Information Society in the UK will be further heightened in the coming year by the creation of a Scottish Parliament and a Welsh National Assembly, both of which are expected to embrace some aspects of "electronic democracy". Telework is expected to grow in a steady rather than a spectacular way; already it's commonplace for professionals in the UK to spend some time at home and some time at the office, often without any formal company scheme or policy. However, many companies now recognise that a more organised approach to telework will bring benefits and the proportion of employers with organised schemes is also expected to grow.

The telework community has been disappointed at the lack of attention to telework in the Government's White Paper on Transport (July 1998). However even without specific government attention a significantly reduced roads-building programme together with the possibility of roads pricing and car park taxation can be expected to encourage more people and companies to reduce commuting.

A practical barrier to telework is the proportion of homes that are appropriate (in terms of space or other constraints) as a place from regular as opposed to occasional working. The benefits of teleworking - especially in traffic congestion - would be more readily attainable if supported by investment in neighbourhood centres.

3.16 Telework outside the European Union

3.16.1 Telework in CEE

As relationships between the European Union and the countries of Central and Eastern Europe develop, and especially in the context of existing and future applicant member states, it is important to understand European telework in the overall regional context. Additionally, there are existing strong ties between European the other countries bordering the Mediterranean, reinforced today by the Euro-MED initiatives.

Just as within the European Union, it is difficult to obtain reliable and consistent data about teleworking in these regions; indeed in the past it has been difficult to obtain data about even the underlying ICT and other infrastructures. This is gradually being addressed and the 1998 EITO report provides some relevant estimates for Central and Eastern Europe:

	Population (millions)	Internet users per 100 inhabitants (1996)*	Total Internet users
Bulgaria	8.5	Less than 0.1	3,400
Czech Republic	10.3	0.2	20,600
Hungary	10.1	0.8	80,800
Poland	38.6	0.4	154,400
Romania	22.7	0.1	3,814
EU highest**		10.2	2,700,000
EU lowest		0.8	162,000
* Source EITO 1998 ** The EU highest and lowest ratios (users per hundred) and total users refer to different EU countries			

As might be expected the level of Internet use is relatively low. In terms of critical mass of potential teleworkers based on the classical telecommuter model these figures suggest that for most Central and Eastern Europe countries that approach to telework may have little relevance in the immediate time frame. However, alternative models and approaches to telework do have considerable relevance and this needs to be more thoroughly investigated and understood. In particular, many regions within Central and Eastern Europe exhibit the characteristics to support considerable opportunities for telework applications such as support centres, software factories etc: relatively low costs, good educational provision, relevant language skills, relatively high local unemployment.

It is also the case that technology developments present opportunities to rather quickly address the barriers to progress posed by historically low investment in telecommunications infrastructure. The coming ability to use wireless communications for all or most of the kinds of traffic that previously needed costly physical networks will enable communities across Central and Eastern Europe to participate in telework, teletrade and other Information Society applications more readily.

Already there are signs of growing interest in these opportunities. Bulgaria, for example, supports one of the most active national sections and links within the European Telework Online network; Russia also supports active links with the European Union's teleworking community of practitioners.

An important remaining barrier to more active engagement is the matter of costs. Although much can be achieved online, and more will be possible in future, today it is still the case that an appropriate level of information sharing and exchange of experiences and opportunities occurs most readily when people from different countries and cultures are able to meet at workshops, conferences and seminars, as well as online. For potential telework champions and practitioners in Central and Eastern Europe it is much more difficult to meet the costs of attending important meetings in the West, such as the Commission's Information Days, the Telework Assembly and other key events in the European Telework Agenda. Ahead of enlargement, and for those countries that will not be in the next enlargement round, more assistance is needed to enable innovators and practical business individuals in these countries to participate effectively in European actions.

Similar considerations arise in relationships with the Mediterranean region countries, though of course as within the Union each country is different and has different perspectives and needs. In some cases Mediterranean countries have more highly developed economies than some of those with the Union, while others are in economic terms similarly placed to neighbours in Central and Eastern Europe.

One very useful and productive development in 1997-1998 has been the establishment of a telework workshop as part of the Euro-MED series of Information Society meetings (during the Cyprus conference), followed by further interactions during a follow up conference in Istanbul. Similarly, several useful connections were established as a result of attendance from CEE countries at the European IT conference in Brussels, November 1997. The Vienna location of the November 1998 IST conference will facilitate attendance from both CEE and Mediterranean countries. European Telework has been represented at all these events in 1997-1998 and New Ways to Work is a theme for November 1998.

3.16.2 Telework in the USA

For some aspects of teleworking, notably corporate telecommuting (employees working at home), the USA has long been recognised as having a substantial lead. A study reported at Telecommute '97[36] estimated that 11.1 million USA employees now work at least part time at home, compared with 9.7 million one year earlier. This is of course considerably more than in the whole of Europe, though Europe has more workers in total than the USA. Although problems of definition and measurement provide the same issues regarding telework estimation in USA as in Europe, it is clear that the Americans are much more rapidly embracing at least the telecommuter approach to teleworking.

Reasons for this are not hard to find. The USA is considerably further down the Information Society track than Europe on almost any metric - use of ICTs generally, use of Internet, prevalence of PCs in the home, PCs per 100 white collar workers. EITO estimates that in 1997, 37 in every hundred USA households owned a PC compared with a Western Europe average of 19. Among the larger EU economies the highest penetration was the UK with 23. Closely linked with this technology factor is the USA manager's more ready acceptance of innovation and change - or at least the ready willingness to "give it a try". Where a European response to a novel suggestion about work organisation might be a desire to consider all the possible issues and problems as well as the opportunities, the USA manager is more likely to say, "Seems like a good idea, let's give it a try". A further factor of course is the USA's recent history of sustained economic growth and high levels of job creation, especially in the newer industries most closely associated with the Information Society. When employees feel secure in their jobs or confident of getting an equivalent or better job if something goes wrong in the present employer, they are less likely to be concerned about being "out of sight" or out of touch when teleworking.

According to some observers, the most significant factor is the very widespread USA penetration and use of electronic networking technologies within enterprises. For several years it has been unusual to encounter an American manager or professional who does not have an email address on their business card, whether in the private or the public sector. The USA Federal Government was putting out strong messages at Presidential level about the need for industry to "get connected", even before Europe's attention was drawn to these opportunities by the Bangemann Report.

The measurement now most commonly used in the USA as an indicator of telework preparedness is "remote access" - the provision by organisations of facilities for employees to access and work on company ICT systems from outside the organisation - at home, on the road, from a customer's premises. Recent estimates for the UK Department of Trade and Industry suggest that in 1997 half of all USA companies already had implemented remote access provisions, compared with only one third in the UK, on quarter in Germany and one in six in France. The four key reasons for telework's rapid acceptance in the USA are quoted as:

1. remote access programs increase work-force productivity; 73% of participating telecommuters in a Massachusetts study reported that they were more effective while working away from the office;
2. offering telecommuting as an option improves employee morale and helps companies retain qualified staff;
3. the government due to environmental concerns and the desire to reduce and helps auto emissions in mandating telework;
4. companies offer telecommuting to cut costs. They have found that telework can indeed save money by reducing the amount of funds paid for office space and other facilities costs.[37]

Telework in the USA is not confined as a services sector activity. The US aircraft manufacturer Boeing is reported to be planning for some 5000 telecommuters in the near term future, based on experience from a large-scale pilot programme involving 200 employees.

[36] Held annually at various US locations since 1992.

[37] Observations based on presentations and discussion at Telecommute '97 and with USA telework experts and practitioners.

Of course, Europe differs from the USA in more ways than technology penetration and speed of acceptance of change. Some factors militate against very large-scale telework in the basic "work at home model", for example across much of Europe, homes are smaller than those of equivalent workers in the USA. On the other hand, car commuting costs are very much higher in both relative and real terms for European commuters than in the USA, which should provide an additional incentive for working closer to home if not in the home itself. Europe needs to closely observe and engage with the USA experience in telework as in other Information Society applications, so as to learn from it but not necessarily copy it.

3.17 Major European telework activities in 1997-98

The year 1997-98 was marked by an increase in the number telework activities at all levels across Europe. These both reflected the growing importance of telework and were themselves instrumental in increasing understanding and beneficial take-up.

3.17.1 The European Telework Agenda

For more than four years, the European Commission has been actively pursuing a comprehensive policy designed to build the Information Society in Europe. Telecommunications policy naturally constitutes a central pillar of these efforts. Creating appropriate conditions for new business, providing continuous support for technology development and pilot projects, and raising public awareness have been other elements of this policy.

Telework has from the start been recognised as one of the main applications around which Europe should focus major activities in order exploit the changes confronting us. By making the best possible use of technology in our working lives and in conducting business we can create a competitive edge in today's global market. Making the best use of technology to avoid unnecessary travel can contribute to a more sustainable world.

In order to ensure strong outreach to Europe's citizens, DG XIII, in close collaboration with DG V and other Services of the Commission, has designed a European Telework Agenda as a series of key events spanning the spectrum of telework issues[38]. These include social, technology and policy areas, academic research, and events aimed at telework activists and practitioners. Taken as a whole, the synergy of these complementary events provides a coherent European thrust and character to the new ways of working debate and to the development of appropriate technology and services. In the following, events of the European Telework Agenda 1997-98, which have already taken place, are summarised. Forthcoming events are outlined in section 5.3 below.

3.17.2 Second International Workshop on Telework: Building actions on ideas, Amsterdam (September 1997)

This workshop followed the first international workshop, "From Telecommuting to the Virtual Organisation", held in London in the summer of 1996[39]. Building on the results of this workshop, this

[38] See *http://www.eto.org.uk/events/keyevent.cfm*.
[39] For details of the 1st International Workshop on Telework:
http://www.brunel.ac.uk/research/mmgt/telework/

second event had the theme "Building Actions on Ideas". It consisted of a series of four workgroups and culminated in a final day conference[40].

As with the 1996 workshop, the Amsterdam '97 event was designed to provide an opportunity for in-depth discussion of key contemporary issues in teleworking. Although teleworking and telecommuting have existed since the mid 1970s and a lot of work has been done, much of the discussion still tends to churn over the same old issues. Many of the concepts and issues associated with teleworking in the early days have outgrown their original technological and economic context, suggesting the need for a different approach in a broader perspective. As a consequence, the centre of gravity of the teleworking debate seems too often to be trapped in the early 1980s. The workshop was therefore convened to help re-orientate the telework agenda, in particular by drawing together the latest conceptual, theoretical and empirical work of a multi-disciplinary group of researchers and academics, and the practical experiences and problems of practitioners and policy-makers.

As with London 1996, participants reflected the genuinely global interest in these issues. Papers were received from Europe, the USA, Japan, Canada and Australia, each one contributing to discussions in one of the following workgroups:

- Workgroup A, on *Virtual Innovation and Implementation*, discussed the important issues raised by organisational changes involving virtual forms of work and what makes virtual developments 'happen'.
- Workgroup B, *New Developments and Perspectives in Telework*, examined recent, practical and conceptual developments in the field of teleworking by drawing lessons from practice and theory around the world.
- Workgroup C, *Virtual Network Dynamics*, concentrated upon those issues of virtual innovation of particular relevance to teams, networks and small businesses.
- Workgroup D considered the *Social Dynamics of Virtual Working*, in which a close examination of the issues thrown up by the three previous areas was undertaken.

The final day of the conference enabled workgroup outcomes to be shared with a wider audience, including representatives from both public and private sector, and telework activists from all over Europe.

Conclusions of the workshop were, inter alia, a need for more attention to four sets of issues in telework:

- first, improving the management of telework innovation and virtual learning
- second, promoting virtual networks as a way of linking telecentres with appropriate partners and sources of skills and advice
- third, understanding the needs of specific teleworking groups, such as the disabled
- fourth, addressing the expertise shortfall of smaller businesses in seeking to appropriate telework-like benefits from the new technologies.[41]

The workshop also showcased interesting examples, both from the Netherlands and from an international context. The success of the workshop in exploring the many ramifications of telework laid the groundwork for a third event to be held in Helsinki, Finland, in September 1998, focusing on *Telework Environments* (see section 5.3. below).

[40] For details on the 2nd International Workshop on Telework:
http://www.nedernet.nl/telework/amsterdam/

[41] Report of the Amsterdam '97 workshop; Building Actions on Ideas

3.17.3 The Fourth European Assembly on Telework and New Ways of Working: Good Practice for the Future; Stockholm (September 1997)

An unseasonably warm Stockholm brought together about 460 participants from 19 countries (including Japan and the USA) for the 4th European Assembly of Telework and New Ways of Working. The Swedish perspective was evident through the emphasis on mobile communications and the social and labour market aspects of telework. In her welcoming address, Sweden's Minister of Transport, Communications and IT, Ines Uusmann, told how she, along with other cabinet ministers, telework regularly from home, a long way from the capital. Telework, she said, can give a great boost to the quality of life, particularly for those with families. The Swedish parliament is said to be one of the most 'wired' in the world.

There were two keynote speakers from the European Commission. Allan Larsson, Director-General of DG V (Employment, Industrial Relations and Social Affairs), set the tone for the conference with a focus on the pace of change in technology, relating it to the span of working life:

- the relatively slow evolution of computers through the 1940s, 50s and 60s has become a "torrent of change", with power and capacity doubling every 18 months
- a few years ago only researcher and computer specialists had even heard of the Internet - now its use is set to grow from 67 million people in 1996 to around 200 million by 2000, one quarter of them in Europe
- in the next ten years 80% of all the technology we use today will have gone, to be replaced by new and better technology
- at that time there will be 9 million fewer young people (20-30 years old) in the workforce than today, but 12% more people between 50-60 years of age - as the technology gets younger, the workforce gets older.

Mr Larsson pointed out the skills gap that results from such rapid change. By 2005, only about 20% of the workforce will have had their education and initial training recently (within the past ten years); the remaining 80% have already completed their main education and training. This is the reason for the Commission's policy focus on Lifelong Learning.

Peter Johnston, head of Unit B in the European Commission's Directorate-General XIII (Telecommunications and Research) discussed the history and immediate future of telework, which is now in its third generation. He portrayed four generations:

1. 1980s - a few thousand teleworkers - IT experts, remote login to corporate computers, outsourced work
2. early 1990s - business reengineering - some networking - but telework affected only 1% of the work-force
3. today - telework is part of the wider shift towards distributed and networking ways of working, based on developments in global networks, the Internet and mobile telephony
4. the next 2-3 years will see the emergence of global virtual organisations, heavily dependent on Intranets.

The overall theme of the assembly was a pragmatic one - focusing on teleworking in practice. Telework applications and initiatives from all over Europe had been invited to register for the 'European Top 100 Telework Cases'. In total, one hundred good practice cases from 16 European countries were selected and invited to participate at the conference. About 40 cases were presented and about 30 participated in the poster exhibition. All these were published at the web site[42]. Cases were presented and discussed in five parallel strands:

1. **Telework in organisations – is telework good for business?**

[42] Telework´97 Assembly web-site: *http://www.nutek.se/telework97conference/*

The aim of this session was to examine the advantages and disadvantages of telework arrangements for businesses and administrative organisations. Cases were presented where reduced costs, increased work productivity, enhanced flexibility, access to new markets, recruitment and staffing advantages have been the key rationales for introducing telework. The conclusion was that it often difficult to put plans into effect, but once they get started, telework brings essential gains to the organisation.

2. **Telework and the organisation of work – is telework consistent with the ideas of good and desirable work?**

This session addressed social aspects and questions concerning work legislation, flexible work hours, work contracts, collective agreements between employers and unions, occupational health aspects, training requirements, etc. The unions' position on telework, complementary agreements on work regulation, and employees experiences of teleworking, were some of the cases presented in this session. Conclusions were that there is a need for better regulation of conditions between employees and employers if teleworking is to develop, and that a survey of the conditions under which the self-employed work is needed.

3. **Telework - our saviour? - is telework a step towards a better world and a better life?**

The aim of the session was to discuss the potential of teleworking for improving the quality of life of the individual and the quality of the environment. The cases presented focused on the reduction of time spent on commuting, energy savings, and reduced traffic chaos and pollution due to teleworking. Other cases highlighted the opportunities to achieve a better living environment, neighbourhood enrichment possibilities and new ways to create jobs in rural areas. A significant number of projects are being carried out in many of the sparsely-populated regions of Europe. This is encouraging, and in many cases telework could help create employment in these areas, but also for other disadvantaged groups. Common to all these projects was a need for funding over a long period of time if they are to be successful.

4. **Telework, innovation and new technology – does teleworking demand new technology?**

This session focused on visions and applications for the future. The latest technical solutions and innovative telework applications, such as mobile teleworking, working from trains and aircraft, and hotels and resort offices, were examined. Other cases were new technologies for making telework simpler, safer or cheaper. A number of projects were presented in which new technology is being used to improve cooperation between people working together in different places. Technology is constantly being improved, but it needs to become easier to handle if companies and users are to hazard making large investments in teleworking.

5. How to increase the number of successful applications – how can telework be supported and introduced?

At this session methods, actions and initiatives aiming to stimulate the introduction of telework were considered, as were national telework programmes and guidelines for telework implementation. Cases presented included telework applications within the public sector aiming to encourage others to follow. Both legislative measures for stimulating and facilitating telework implementation, and cooperation models – such as 'top-down/bottom-up' approaches – were discussed, as were projects for SMEs and telecottages. A strong need for external support was reported. There is not only a need for hardware and software, but also for the so-called wetware; i.e. human resources.

The final day of the conference included the youth perspective. Representatives from Sweden's Youth Council for IT presented a well thought out vision of the future of work and society: mobility, networking, creating your own job, local/global, live in a small scale environment and work in a global one. Among their concerns:

- the exclusion from the Information Society of some groups (the widening gap between the 'haves' and 'have-nots')
- an education system that does not prepare the young for the future wired world
- out of date labour market policies

- low regard for politics and politicians.

Compared to earlier assemblies, the following perspectives came to the fore:

- the disparity between North and South Europe in uptake of telework and advanced networking technologies
- the growing participation of women, particularly in the telecottage and rural development movement
- a shift in the policy debate as to how telework can contribute to competitiveness
- the belated interest of trade unions in representing teleworkers and the self-employed
- the interest of politicians wanting to 'regulate', albeit with a light hand, to ensure health and safety, social equality and non-exploitation of home workers.

The Assembly clearly demonstrated that telework is about working productively freed from the constraints of time and place, whether work is undertaken for a large corporation (e.g. in virtual teams), as part of a small business network (e.g. in a virtual corporation), or as an individual sole trader working at home. A good teleworker can serve customers in remote markets by taking advantage of the new technologies and applying the skills of an online networker. Thanks to absorbing contributions and useful experiences, the assembly provided a comprehensive illumination of telework and strong support for proceeding towards a situation in which telework will become part of normal working.

3.17.4 European Telework Week 1997 (November 1997)

European Telework Week is the focal point of many activities that go on throughout the year promoting the understanding of Telework and its considered implementation. There are many other activities that seek to attract the attention of the public and the media alike, and a focusing of telework actions into a single week enables participants to reinforce their message at several levels. It was to support industry, administrations, and other interested organisations in their activities that DGXIII launched the first European Telework Week in 1995.

3.17.4.1 ETW'97 impact

From 3-10 November 1997, telework events, both real and virtual, took place all over Europe. Particular aims of this third Telework Week were to:

- provide a focal point for grass roots organisations to co-operate in their promotional activities
- shift public, business and media perceptions of telework towards that of a normal and desirable business practice that can enhance competitiveness
- establish links between telework and the development of Electronic Commerce
- reinforce the link with sustainable development and build initial links to local network initiatives.

As well as its usual support from the European Commission, DGXIII, European Telework Week 1997 received European level sponsorship from Siemens and Toshiba. Ian Culpin, coordinator of European Telework Week, expressed general satisfaction with the results:

> *"There can be no doubt that European Telework Week in 1997 represented a major increase in telework activity and awareness across Europe, and even spilling well beyond its borders. Whilst it would be unfair to highlight any one country's contribution to ETW '97, we can observe from the table below substantial activity in terms of events across Europe.*
>
> *We also observed a broadening of the nature of events: internal seminars by companies, showing a growing maturity of the approach to telework; large scale national conferences with several hundred attendees; demonstrations of telework witnessed by millions of listeners on the radio; as*

well as hands on demonstrations of practical teleworking, and the appreciation of best practice demonstrated in local and international telework awards.

Work has already begun on European Telework Week 1998, with a focus on gaining even more attention from the media, and persuading them to focus on the real implications of telework, highlighting best practice and even those areas where telework does not fit the business or the individual concerned."

With about 30 events in Europe during its first year, 1995, ETW had over 60 events occurring across Europe in 1996, with interest generated in local, regional and national media. International focus enabled the events to benefit from additional public and media awareness, and thus reach broad audiences. In 1997 the numbers soared to 146 registered events and to 345 reported events which took place throughout Europe. All this activity directly brought together well over 10,000 citizens, as well as millions indirectly due to an even wider media coverage in most member states, through regional and national newspapers, commercial and internal magazines, TV shows, etc.

The numbers of events registered per country (excluding additional events later reported)									
Austria	10	Finland	20	Ireland	5	Netherlands	3	UK	4
Belgium	5	France	9	Italy	32	Spain	2		
Denmark	7	Germany	15	Luxembourg	5	Sweden	29	***Total***	***146***

Three pan-European activities are worthy of particular mention:

- the European Telework Awards (see next sub-section)
- European Telework Week telephone cards project in which telecom operators Telecom Italia, France Telecom, Belgacom, Telia, Cabitel (Telefonica) and Tele Danmark issued 2.5 million phone cards to commemorate ETW'97.
- the ongoing translation into several languages of a *Teleworking Handbook* first issued by the TCA in England and Ireland. ETW '97 saw the launch of the Italian version and the second edition of the English handbook. Versions for Spain, Austria/Germany and France are in preparation.

A full report on ETW'97 can be found on http://www.etw.org/. For country reports, see Annex 1.

3.17.4.2 European Telework Awards 1997

These took place in Brussels on 7th November 1997. Three nominees per category presented their cases during exciting five minute presentations to a live audience of about 100 people, as well as four sites elsewhere in Europe via video conference. The award winners were:

European competitiveness - IBM, Belgium/Luxembourg. The award recognises the significant penetration of new working practices, ensuring that telework is now the norm for 60% of their workforce. In addition they had documented and evaluated the project so that others could benefit from their experience.[43]

Runners up in this category were Interpolis, a Dutch Insurance company practising a flexible office concept in combination with teleworking for all its staff; and OTTO Versand, with a Call Centre employing teleworkers in Breda.

Sustainability - Rijkswaterstaat, (the Dutch Ministry of Transport), for their internal telework programme. The judges considered that this example, if followed elsewhere, would have a profound

[43] For more information: email: jos_goffin@ibm.be

impact on environmental and social sustainability. Productivity and quality of service had improved and 26 employees were saving 3,500 km in commuting travel each week.[44]

Runners up in this category were the Prison Telecentre project, in existence since 1993 (the aim of the Telework Programme is to provide work and work experience for the female inmates in an office-like environment, within the prison, which contains computer and telecommunications equipment); and the KITE project, which consists of a telecentre that has provided work through teleworking since 1993, with a clear focus on developing teleworking alongside adequate social support structures.

Most original telework scheme - ISdAC (the Information Society disAbilities Challenge). ISdAC are a pan European group of disabled people launching an initiative that could bring many of Europe's millions of disabled into a more productive activity. [45]

Runners up in this category were *Chaos in action*, an art project realised in Paris, Köln, Aachen, Helsinki, Cambridge, Skopje, Belgrade, Sofia, Bucharest, Istanbul, Athens, Graz and Rome, aiming to open a discussion between people in different professions and of different nationalities, and thus to stimulate the variety of art; and Televillages, a network of tele-offices (telecottages) which has been operational since 1 October 1997 and has resulted in four telecottages in each Flemish province in Belgium.

Best technological contribution - Siemens, Austria. The judges recognised the diverse application of telephony - flexible call routing and following, network independent "one number services", that are key to the successful implementation of ad hoc, periodic, and mobile telework.[46]

Runners up in this category were TLC, nominated for it's 'intelligent suitcase', a suitcase containing everything needed for a person to work and the integration with the company's system through well structured information management provisions facilitating the exchange of data between laptop and main computer with a simple click of the button.; and BinTec with VICAS, which combines a remote access router with hardfax functionality and TAPI compatibility.

Best media coverage - *Teleworx* magazine, Germany. *Teleworx* gained this award despite being new to the telework arena. It narrowly defeated its UK counterpart (*The Teleworker*) by virtue of its broader circulation, and a slight edge in portraying best practice. It reaches 25,000 - 35,000 readers and is produced by freelancers using the telework technologies of email, Internet and videoconferencing.[47]
Runners up in this category were *Teleworker* Magazine, the bi-monthly magazine of the TeleCottage Association; and a Web published case study by the ACTS[48] project, Infowin, describing the activities of Wuestenrot Insurance.

A full report can be found at http://www.etw.org.[49]

3.17.5 Launch of the European Information Technology Observatory 1998 Yearbook, Brussels (March 1998)

The European Information Technology Observatory (EITO)[50] is a broad and unique European initiative which has the objective of providing an extensive overview of the European market for information and communications technology and to render services to this industry, to users and to public authorities.

[44] For more information contact: h.j.djong@dnn.rws.minvenw.nl (Ministry web-site: http://www.minvenw.nl
[45] For more information: http://www.isdac.org
[46] For more information contact: herwig.stoekl@siemens.at
[47] For more information: http://www.iwtnet.de/teleworx
[48] Advanced Communications Technologies and Services, European RTD, managed by DG XIII directorate B
[49] European Telework Awards 1997, Brussels, August 1998
[50] For more information: http://www.fvit-eurobit.de/def-eito.htm

The EITO publishes a yearbook which presents the most comprehensive and up-to-date data including the entire information and communications technology market in Europe. The EITO is strongly supported by the Directorate General III Industry of the European Commission, and since 1995 by the Directorate for Science, Technology and Industry of the OECD in Paris. The EITO has been produced with the support of the EITO sponsors, the trade fair SYSTEMS in Munich, European Telework Development (ETD), and the EITO company sponsors Deutsche Telekom and Telecom Italia.

A press conference was held on 5 March 1998 to launch EITO'98. This latest edition of the Yearbook contains 400 pages of statistics and information, analysing ICT Markets in Europe, including Eastern Europe. For the first time in 1998 a special study on telework, its status, development and issues, was included, prepared in collaboration with the ETD project[51]. The EITO press conference was webcast (see Annex 4) over the Internet. This was achieved through cooperation between the ETD project and the TWEURO project of the Telematics Applications Programme.[52]

3.17.6 The Third European Telework Festival, Serre-Chevalier (April 1998)

The third European Telework and Tele-activities Festival was held in Serre-Chevalier (France) on April 2-4, 1998 and attracted more than 200 professional visitors and speakers from several European countries.

Over the last few years this event has become the most important on this topic in France, and because of the large involvement of non-French speakers it has now become a major event at the European level for telework and tele-activities. The wide variety of actors attending all recognise that it is important and valuable to have the opportunity to meet physically in a friendly resort like Serre-Chevalier. The opportunity to meet in such a place where open discussion is possible with researchers, industrialists, politicians, students and real teleworkers has also becomes a platform for launching new projects. This is important because the Serre-Chevalier event is much more than just a conference with good quality speakers and interesting round-table discussions with high level experts from industry and the political world. The ease of communication amongst all these actors, involved in the creation of the Information Society, has made the event unique, one which its organisers (Systemia and the local authorities) are keen to promote.

The two and a half days of the conference consisted of 15 topics built around the telework concept, virtual organisations, telework and SMEs, telework and local development, and distance learning. These ranged from very practical illustrations by activists to more theoretical and conceptual presentations by consultants and university professors. Very practical aspects were raised during the four round-tables where industrialists and politicians responded to probing questions and showed their determination to drive France into the Information Society. For example, the development of a Telework Charter for civil servants was announced by the French Minister of State Modernisation, and was reinforced by support from representatives of DG V and DG XIII of the European Commission.

Technology for the telework segment, and more generally for the implementation of the Information Society, was exhibited by the major sponsors of the Festival, in some cases not yet on the market. These included applications from France Telecom, Matra Grolier Network, Sun, Cisco, etc. Online internet coverage was organised by a start-up company, 35 Mai Production, in alliance with AOL. This was achieved from a car equipped with PCs and satellite communications. Traditional press

[51] To order EITO'98 contact: http://www.eto.org.uk/eito/index.htm. Whilst stocks last, all purchasers will also receive EITO'97 free of charge.
[52] Contact http://www.tweuro.com/tura/eito/index.htm for the webcast archive.

representatives were also part of the Festival. The French Telework Association have placed close to real time summaries of the event on their website with some live interviews[53].

3.17.7 European Telework Information Day, Brussels (May 1998)

Building upon a very successful event in 1996, a European Telework Information Day was held in Brussels on 28 May 1998. The day provided an opportunity to be updated on the European Commission's policy, information and stimulation activities with regard to telework and to preview this European Telework Status Report 1998. It marked also the official public launch of Telework Week 1998, at which ambitious plans were revealed for an even bigger and more comprehensive programme than the record-setting 1997 Telework Week (see section 5.3 below).

A very wide range of people having a constructive interest in European telework participated in the Information Day. These included Commission staff involved in telework-related activities, regional activists, European and national project participants with activities related to telework, telework national event co-ordinators from previous years, and other key actors including suppliers working at European level and relevant officials of national administrations.

The first part of the day's proceedings consisted of an update on telework and related activities in Europe in mid 1998. This consisted of an introduction to telework and the Commission's support, now and in the future; a contribution from the Information Society Forum to the employment debate; a report on the social dialogue on telework within the European policy context; an update on the Fifth Framework Programme; and some headlines from the forthcoming European Telework Status Report 1998. The main message was the need to take Information Society developments into account when planning for the future. This message was not only extended to individuals and businesses, but also to the Employment Policy makers all over Europe, by Mr. Joan Majo, on behalf of the Information Society Forum, in his presentation of the "Newark Declaration". This Declaration contains a contribution to the Employment Debate at European level.

The rest of the day focused explicitly on European Telework Week (ETW). This commenced with presentations of three of the winners of the 1997 European Telework Awards, followed by a Call for Nominations for the 1998 Telework Award, and a summary of overall results from ETW97. Focussing on ETW98, full briefing and information was given as to how to get involved, including a call for award nominations, an explanation of the ETW rationale, a review of support mechanisms, and an Invitation for Initiatives. Finally, an introduction was given to the forthcoming Fifth European Assembly on Telework and New Ways of Working to be held in Lisbon on 23-25 September 1998 (see section 5.3 below).

One of the unique and noteworthy aspects of the Telework Information Day was that it was the first European level telework event to be webcast (see Annex 4). This was achieved through cooperation between the ACTS Programme's ETD project and the TWEURO project of the Telematics Applications Programme.[54]

3.17.8 Online Collaboration Berlin (June 1998)

[53] *http://www.aftt.net*

[54] Contact http://www.tweuro.com/etw for the webcast archive. A full 20 page report on the Telework Information Day is also available on-line from http://www.eto.org.uk/agenda/telework/infoday.htm. A paper copy can be obtaining by contacting Maarten Botterman of the European Commission, DGXIII-B on Tel.: +32 2 296 6619, Fax +32 2 296 2981, Email: telework@postman.dg13.cec.be

This new conference, held in Berlin 0n 9-10 June 1998, was unique in that it brought together for the first time three complementary strands - Teleworking and Collaboration, Electronic Commerce and Electronic Markets, and Knowledge Management. Supporting strands were on telecentres, virtual organisations and the wider context of key issues for society, economy and business.[55]

The opening keynote *Work and Trade in a Changing World* by Maarten Botterman from the European Commission (DG XIII) described the challenge for Europe as "developing a society that Europeans want, whilst staying in the game in an ever more global economy". He stressed the need for continual updating of skills in order to remain employable and that skill shortage was an important factor in limiting growth in micro-enterprises (companies of less than 10 employees) that had created twice as more new jobs in the period 1993-7 as did large enterprises. He concluded with an outline and status update of the Fifth Framework Programme (see section 5.2 below).

Other talks in the plenary session set the scene for the parallel sessions. David Skyrme outlined the growing importance of knowledge as a component of corporate strategy; Scott Welch described factors that help create successful electronic communities, using conferencing software; Sharad Gandhi outlined key technological components for building an e-business; Horace Mitchell stressed the need for active participation in online collaboration to gain the necessary skills, exhorting that Europe needs to "move at a faster pace".

1. **Teleworking and Collaboration:**

Four sessions in this stream provided a useful mix of research results and case studies. The various sessions indicated the growing sophistication of teleworking. Michael Sonntag, for example, described intelligent agents as 'inevitable tools' for teleworkers in that they could help automate their email, personalise World Wide Web resources, seek out information and carry out transactions online. In the organisational dimension, Paul Jackson outline the growing benefits of virtual organisations in closing the 'innovation gap' and spelt out the issues faced by SMEs and others in making them work. In a separate session on virtual organisations, the various speakers showed how the virtual approach could expand markets and opportunities for their participants. Recurring themes were the need for effective coordination, trust and clarity on contractual matters such as intellectual property rights.

2. E-Commerce and E-markets

Four separate sessions covered a wide spectrum of topics, ranging from connecting legacy systems to the Internet and the logistics chain, from virtual call centres to online banking. The plethora of topics and viewpoints was aptly illustrated by the comments of Armin Lange who said that "there is not a single best suited approach to electronic commerce that can be universally applied as some popular publications might suggest". Commonly cited benefits were reduced time scales e.g. time from order to delivery, information exchange e.g. better customer information, and lower costs e.g. through customer self service. The biggest change was that of the customer relationship. More pro-active approaches actively engage the customer in dialogue and use technology to match their preferences to the products and services available. Jack Mark reminded the audience that whatever the technology used, it must "deliver solutions to ordinary people"; therefore, he added, "low key but functional applications" were preferable to "impressive technical solutions".

3. Knowledge Management

A new theme at this conference, as at many others, was provided by two sessions on knowledge management. These were a mix of technological biased presentations and user experiences. One of the technologies that is making its mark is 'push' technology i.e. the provision of information via Internet 'channels', pushed to the user, either as alerts or in background mode while they are working on other things. Another is intelligent agents, already mentioned in the teleworking context, but for the knowledge worker they discern concepts rather than using simple keyword searches. The case studies were of organisations who had adopted a structured approach to knowledge management, in one case through

[55] For more information: http:// www.online-work.com

mapping key areas in a way that easily lent itself to multilingual use, and another through use of knowledge related performance indicators for a virtual company. Even more so than the electronic commerce theme, this topic seems so new that coherent themes have yet to emerge, with each talk representing a quite distinctive aspect of knowledge management.

During the closing plenary and review, and just as the audience thought that things were progressing well in Europe, along came Dr Andrew Crilly of the Open Enterprise, Singapore to deliver the closing address *Asia: Millions Click into Gear*. Using multimedia and video coverage he portrayed vividly how two contrasting Far Eastern countries, Singapore and Bangladesh were determined not to be left behind in the race towards the Information Society. Crilley gave four reasons why Asia could leapfrog Europe in what he calls the next wave: "heralding the Information Society and a new age of reason, one that will be based on knowledge that grows from information":

- they are dynamic: most nations have moved from rural backwaters to industrial modernity in less than four decades
- they are addicted to modernity and change
- they are young demographically
- they continually reinvent themselves.

This was a stimulating final paper to an interesting conference. In his concluding remarks, conference chairman Dick Davies noted that discussion of many of the topics at the conference had moved "beyond the technology", and related to the skills, organisational, social and policy context. He welcomed the new streams and looked forward to greater interaction between the various strands and even more case studies at the next conference.

3.18 Major European consensus and dissemination activities

During 1996, two major European-wide activities were launched, supported by the European Commission's ACTS Programme in DGXIII (see section 4.3.1 below): the *DIPLOMAT European Charter for Telework* initiative as a consensus activity, and the *European Telework Development* initiative as a dissemination activity.

3.18.1 DIPLOMAT – the European Charter for Telework

3.18.1.1 Looking back: the development of DIPLOMAT

DIPLOMAT was put together as a consortium of partners from six countries: Austria (as coordinator), France, Ireland, Italy, Sweden and the UK. In addition Regional Contact persons from all EU Member States and 20 high level experts, representing particular expertise in several scientific areas, were contracted. The overall DIPLOMAT group was thus drawn from a great variety of countries and cultural backgrounds.[56] During the two year period from July 1996 until the formal end of the project in June 1998, major deliverables included the results of its most relevant achievements and main issues dealt with:

- Creating the DIPLOMAT data-base of 3000 potential signatories and institutions relevant for telework development in Europe.
- Conducting four surveys with different telework implementation questionnaires to different target groups of the relevant constituency in Europe: (1) a selection of potential signatories; (2) SME's and SME organisations; (3) major companies; (4) Charter signatories.

[56] For further information please see http://www.telework-forum.org/diplomat.

- Drafting the European Charter for Telework and obtaining signatures to the Charter; a minimum target number of 384 signatures was contracted.
- The formation of "Consensus Groups" to facilitate consensus building processes among representatives of the relevant interest groups concerned with telework development and telework deployment. Signatories of the Charter were invited to participate in one of the seven thematically focused groups: Politics, Labour, Fiscal Issues, Sustainability, SME's, Education, Intellectual Property Rights.
- Best practice guidelines for the implementation and dissemination of telework were drafted by the consortium under the authorship of the relevant theme coordinators, and discussed within the Consensus Groups. These guidelines are being proposed to the European Commission for inclusion in appropriate proposals under debate in European institutions.
- Collaboration with other ACTS projects working on related issues, for example with ETD in preparing a rounded assessment of telework in Europe (see section 2.2 above)
- Making provisions for continuing activities, especially concerning guidelines development and consensus building beyond the life-span of the project in a new institution or under a new umbrella organisation.

3.18.1.2 Current state: DIPLOMAT achievements

There are three major achievements of DIPLOMAT:

1. 600 signatories have supported the European Charter for Telework including Cabinet Ministers, CEOs, Board Members of major companies, and representatives of SME organisations, trade unions, and public administrations.
2. The process of guidelines development and consensus building produced seven Guidelines Reports, a short version of the guidelines, and a summary on the degree of these guidelines' acceptance and debated issues in the seven Consensus Groups. Some 500 people participate trans-nationally in these thematic groups looking at key issues in the development and deployment of telework in Europe. Most often the issue of pros and cons of regulation was discussed. In general, wide ranging agreement can be found regarding the need for labour market continuity; so that existing rules for traditional work contracts can be adjusted to also apply to telework. Teleworkers should not be treated differently with respect to work regulation, working conditions, pay rates and career possibilities, compared with their colleagues in the same business sector, country, region, and organisation.
3. The establishment of "THE W.I.S.E. FORUM on WORK, INFORMATION SOCIETY AND EMPLOYMENT" will allow a continuation of the discussion and an improvement of the guidelines, drawing on the expertise and knowledge of the signatories, Consensus Group members, the DIPLOMAT Community (Partners, Regional Contacts and Experts). In addition to this existing network, The WISE Forum includes new "Strategic Partners" (other EC projects, relevant scientific institutes, representatives of national and regional governments, the EC, and social partners).

When presenting *The European Charter for Telework* to management boards of major companies, to SME organisations, to trade unions and also to public administration bodies, the DIPLOMAT project partners share one common experience of an overwhelmingly consistent response pattern:

> *Beyond all differences concerning expectations, interests, and specific issues of predominant relevance, every group of actors expresses the demand for*
> *(1) additional, better and more reliable information such as statistics; and*
> *(2) recommendations which are precise but not definitive or immutable.*

Therefore, the success of both guidelines development and telework deployment very much depends upon a strategy that offers reliable, pragmatic information and communication on the most important issues related with telework implementation, and upon the openness of the guidelines development process. What is clearly is counter productive is any publication, presentation or request to support either the Charter, Guidelines, or telework in general, which conveys *the impression that people*

addressed would be asked to join an initiative to take on board guidelines or certain assumptions of the Charter which are unchangeable and had been decided prior to asking them or their relevant organisation for their endorsement.

The conclusions of DIPLOMAT, for dissemination, are:

- Signing *The European Charter for Telework* is not a confirmation of pre-formulated results of increased dissemination of telework, nor assumes that the signatory has an obligation to follow a given mainstream to promote the spread of telework irrespective of what kind of teleworking methods are applied, and neither does it disregarding the diverse pre-conditions for the deployment of telework in different sectors of the economy and sizes of organisations.
- *The European Charter for Telework* is a public statement concerning the establishment of measures to safeguard positive results of the use of telework and the changing modes of work organisation; it aims to position Europe as a leader in economically, environmentally and socially acceptable policies and working practices for the Information Society.
- *The process of consensus building* of telework issues, and in particular on the discussion, dissemination and practical implications of best practice guidelines should be kept as an open process, inviting Signatories to the Charter and active members of *Consensus Groups* to continue their participation, and to allow new participants to join these processes.

3.18.1.3 Future plans: the work programme of THE W.I.S.E. FORUM

THE W.I.S.E. FORUM consists of representatives of the *Consensus Groups* and new members interested in either providing and/or receiving services of the Forum. The Forum will be established as a not-for-profit association according to the law of Austria, promoted by the DIPLOMAT consortium, offering services through the work of the consortium, drawing on the project's results and other resources available to their respective institutions.

The mission of *THE W.I.S.E. FORUM* is to: -

- Support measures to unleash the positive potential of flexible work forms and teleworking, particularly in the key areas of employment, labour relations, organisational design, democracy and participation, sustainable development, and the improvement of quality of life in general.
- Promote further development and deployment of Guidelines across Europe concerning the implementation of new ways of working, encouraging best practice in teleworking for those employed in small businesses and large organisations, and for the self-employed.
- Serve as a platform for transnational and inter-institutional social dialogue concerning the modernisation of the contractual framework of work, working methods and work organisation; linking study groups, research and training institutions with companies, SMEs and large companies, and social partners.
- Participate in the creation of a European model for business re-structuring, work organisation and employment generation in the 21st Century, involving economically and socially relevant constituencies within all EU Member States, particularly aimed at fostering integration and development of useful relationships with the Central and Eastern European countries.

Services provided by *THE W.I.S.E. FORUM* include: -

- International and inter-institutional platform for social dialogue and for discussion and evaluation of National Employment Programmes
- Facilitate consensus building processes on issues concerning the transition towards the Information Society
- Checklists, guidelines and other practical tools for the implementation of new work methods
- Provide studies and empirical data, high level reports, communication networks and training.

Work schedule - 2nd half of 1998 - of *THE W.I.S.E. FORUM*, emerging from DIPLOMAT:

- 23 September, 1998, at the Telework Assembly 199, Lisbon:

First General Assembly, formally adopting the statute and thus constitute the relevant bodies of the organisation, and deciding on a work programme for 1999 until 2004

- September 1998: Publication (book) and presentation of "The WISE Report, Vol. 1: Work and Employment in the Information Society"
- 6 November, 1998, Vienna: "Employment generated by new work organisation", workshop, one of the activities of European Telework Week 1998
- 29 November - 2 December 1998, in conjunction with IST '98, Vienna:
  First meeting of the Advisory Council, to be Chaired by Mr. Lacina discussing the impact of the National Employment Programmes as drafted by the Member States earlier this year.
- Preparatory and editorial work on next WISE Reports: ;Vol. 2: "Assessing future work processes"; Vol. 3: "Education and training for new flexible work organisation"; Vol. 4: "Transport policies and work"

Organisation and contact:

The President of the ***THE W.I.S.E. FORUM*** is Mr. Ferdinand LACINA, former Cabinet Minister for Financial Affairs (1986-1993), and subsequently board member and senior consultant in a major bank, and personal advisor on European employment issues to the Federal Chancellor of Austria.

THE W.I.S.E. FORUM is open to everybody interested in the issues of new ways of work organisation, extending by democratic participation the Consensus Building processes on these matters, started in the DIPLOMAT Consensus Groups.

THE W.I.S.E. FORUM will offer *Membership* and *Associated Membership*, subject to membership criteria, with clearly defined benefits and service packages. Management will primarily be undertaken by the *General Secretariat*, and services will be provided by a *Research Unit* and *Programme Directors* working with the Consensus Groups established by DIPLOMAT. The *Advisory Council* is an assembly of representatives of "*Strategic Partners*", e.g. relevant research bodies and institutions of the Social Partners (Industry, Unions), the European Commission, EC-supported projects and organisations such as the European Foundation for the Improvement of Living and Working Conditions, Member States, and CEE countries. An annual *General Assembly*, comprised of Charter Signatories and the Members will be held in tandem with the annual "*European Assembly on Telework and New Ways of Working*".

The organisational structure of ***THE W.I.S.E. FORUM*** will be kept as simple as possible, in order to allow further development in stages that are currently being planned. Detailed information can be found at: http://www.wise-forum.org, and printed in The WISE Report, Vol. 1.

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3.18.2 European Telework Development (ETD)

The basic tenets upon which ETD builds its activities are that:

- the Information Society is already happening globally, and that Europe can either lead or follow
- developments today are led from outside Europe, because (compared to other leading regions) Europe is under-invested and under-connected
- our industry, policy makers, public services and citizens cannot make sound decisions about the Information Society on the basis of second hand opinions - they must become connected themselves
- ignorance breeds fear; knowledge and experience breed confidence.

Given this background, the overall objectives of ETD through its outreach and communication activities are to:

1. broaden the concept and impact of telework in order to also encompass:
   - teletrade/electronic commerce: enterprises trading electronically
   - telecooperation: enterprises, individuals and governments cooperating electronically with each other
2. become a prime agent and facilitator in moving the agenda from research and discussion to action and implementation by:
   - increasing awareness
   - developing understanding
   - promoting appropriate and successful implementation.

ETD's achievements over the past year include:

- Support for, and animation of, the GAT Telework Chain in ACTS
- Cooperation with the DIPLOMAT project in both GAT Chain activities and in assistance in the development and promotion of the European Charter for Telework
- Comprehensive response by ETD's 14 National Coordinators to the Commission Green Paper *Partnership for a New Organisation of Work*, as practitioners of telework and new ways of working in each Member State.
- Web-site: now the most comprehensive, most frequently visited, and most successful telework web-site in the world. Its one millionth information request since February 1996 was recorded in November 1997.
- The Telework 1997 and 1998 publications, prepared in collaboration with, and published by, the Commission services
- Collaboration with the European Information Technology Observatory (EITO) and contribution to the EITO 98 yearbook, including new telework market models developed from ETD's market matrix efforts
- European Telework Week 1997 (ETW97), marking a considerable uplift in range and level of activities and two important new European promotional elements (European Telework Awards and Telephone Cards programme)
- Stimulation and support of other European initiatives, including (IsdAC - the Information Society disAbilities Challenge, EACN - the European Association for Community Networking, an online conference for the LEADER Initiatives discussions concerning the use of ICTs for rural development, etc.

ETD's aim is to provide services that are open to all in both electronic and non-electronic formats but with the avowed intention of encouraging take up of the electronic services in order for users to become fully engaged in the Information Society through telework, teletrade and telecooperation.

Contact: Jeremy Millard, e-mail: 100117.1157@compuserve.com, or Horace Mitchell, e-mail: 100126.2412@compuserve.com. URL: http://www.eto.org.uk/etd.

4. Telework and the European Commission

4.1 European policy framework

The European Commission's first interest in telework dates from 1989. Concerns were raised in the context of the Communication Technology research programme RACE, when assessing risks (of exclusion) and opportunities (for decentralisation) arising from the economic impacts of advanced communications on rural areas and remote regions. The strategic analysis performed by DG XIII in liaison with DG VI (Agriculture), as part of the reform of the Common Agricultural Policy (CAP) and the need to focus on increasing non-agricultural employment in rural areas, identified telework as a key theme.

These considerations led to the launch of the ORA RTD Programme, with a planned synergy with the LEADER I Structural Funds initiative in support of local and rural employment initiatives. It was in this framework that the first research projects with a focus on telework were launched: PATRA (on social and psychological aspects), MITRE (to explore the "business case" for teleworking), and the consensus and awareness raising project SYNERGY (ECTF). Widespread awareness of telework was stimulated in 1993 by a set of explorative research and stimulation actions initiated by the Commission[57], linking Europe's transition to an Information Society with the need for greater flexibility in employment.

Starting with the White Paper on *Growth, Competitiveness, Employment, the Challenges and Way Forward into the 21st Century*, launched in 1993, the European Commission set the priorities for the coming years to prepare Europe for a new form of society: the Information Society. The main concern expressed in the White Paper was work. The enormous growth of an army of unemployed in the Union reinforced the need for a new focus.

Building on the conviction expressed in the White Paper that "the enormous potential for new services relating to production, consumption, culture and leisure activities will create large numbers of new jobs...", a High Level Group, under the Chairmanship of the Commissioner for Industry Mr. Martin Bangemann, recommended to the Council an Action Plan in order to ensure that new jobs will be created in Europe as rapidly as possible. This Action Plan was first adopted in 1994[58], and identified telework as the first of ten applications to launch the Information Society. It was updated in 1996 as a "Rolling Action Plan"[59], building on the success achieved in liberalisation of the telecommunications sector and in implementing the 4th Framework Programme (1995-98), notably by a large number of support measures for European Research and Technology Development (RTD), especially ACTS (new communications services), ESPRIT (information technology development in the context of changes in business processes), and the Telematics Applications Programme.

These measures are being reinforced by new support opportunities for deployment, such as Trans European (telecommunication) Networks and European structural policies and funds, especially those concerning regional development, training and the adaptation of business structures, and telework is seen as an important component of these.

[57] "Telework 1996: Actions for stimulation of transborder telework and research cooperation in Europe; Final Report", DGXIII B, April 1996 (OPCE: CD-94-96-695-EN-C)
[58] "Europe's way to the information society: An Action Plan", COM(94)347, 19 July 1994
[59] "Europe at the forefront of the Global Information Society: Rolling Action Plan", COM(96)607, 26 November 1996. Available at http://www.ispo.cec.be

The 1996 Rolling Action Plan identifies four priorities:

1. *Improving the business environment* through the application of the internal market principles in the Information society context: actions will promote the use of new technologies in business, especially in small businesses. New initiatives will bring together actions related to personal satellite communications and measures to enable the rapid and coherent development of electronic commerce.
2. *Investing in the future*, recognising that the Information Society starts in the classroom, but must involve life-long learning[60], and the need for staying in front with R&D;
3. by putting *people at the centre* of the information society - as envisioned in the Green Paper published in September 1996 on "Living and Working" in the information society[61], and the more recent Green Paper "New Partnership for Work Organisation"[62].
4. Finally: a focus on the *global context*. A first achievement was the successful completion of the multilateral negotiations on basic telecommunications services in the WTO framework.

A major instrument for the implementation of this Action Plan, including a reinforced focus on new ways of working, will be the 5th Framework Programme for RTD, scheduled for the period 1999 to 2002. Strong themes of direct relevance to telework are being incorporated, for example new working practices in the context of flexible, remote and mobile working, and electronic trade. Important here is the need to see RTD well integrated with both national and structural policies at European level. For more information: see in section 5.

4.2 The social dimension

Building on the *Action Plan* towards the Information Society, DGV prepared a 1995-97 *Medium-Term Social Action Programme*, which referred to the Commission's plan to publish a communication on telework "to provide examples of good practice". DGV, together with the European Foundation for the Improvement of the Living and Working Conditions, undertook major comparative research and analysis on the Social Implications of Telework. Their studies focused on three themes: labour law, social security and occupational health and safety. Experts drew up national reports under these three headings: 45 reports in all. These analyses were summarised in three reports and on this basis a final report was issued in April 1996. These reports constituted working papers[63] for a conference on the Social Implications of Telework which was held in Brussels in May 1996.

The social aspects of telework have been addressed by two Green Papers. First by the Green Paper on *Living and Working in the Information Society: People First*, adopted in mid-1996. The ensuing consultation process showed a somewhat polarised debate, some believing telework should evolve naturally, others arguing that new legislation is needed to protect teleworkers. The follow up to this Green Paper, *The labour Market and Social Dimension of the Information Society*[64], also addressed telework and announced, inter alia, the launching of a consultation with the social partners on whether and to what extent Community action on the protection of teleworkers is advisable.

The second Green Paper, on *A Partnership for a New Organisation of Work*[65], adopted in mid-April 1997, had a consultation period running until 30 November 1997, and which led into a major European conference in April 1998 to discuss all the issues arising.

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[60] e.g. "Learning in the Information Society", COM(96)471, 2 October 1996

[61] "Living and Working in the Information Society: People first", COM(96)389, 30 Septmebr 1996, available at http://www.ispo.cec.be/infosoc/legregl/docs/people1st.htm

[62] "Partnership for a new organisation of work", COM(97)128, 16 April 1997, available at http://www.europa.eu.int/en/comm/dg05/soc-dial/social

[63] "The social implications of teleworking", Joint Commission/European Foundation conference, 30-31 May 1996, Brussels. Working Papers.

[64] COM(97) 390, 24 July 1997: http://www.ispo.cec.be/infosoc/legres/infosoc.html.

[65] COM(97)…§§, April 1997/ http://www.europa.eu.int

4.2.1 Work organisation

Competing in a global economy requires high performance enterprises with a high performance workforce. New technology, fast changing markets and the growth of the service sector accentuate this need. Adapting to this new environment means striking the right balance between flexibility and security. Employers need greater flexibility, in particular more interchangeable skills among their employees and adaptable working patterns, while employees need assurances about their own employability and job prospects. Better organisation of work can offer workers increased security through greater involvement in work organisation, a greater choice of working arrangements, more job satisfaction and the possibility of developing skills and long-term employability. In turn, this provides employers with increased flexibility in the form of a more skilled, motivated and versatile labour force, better able to take the initiative, to cope with change and to be more deeply involved in the economic health of the company. Social dialogue has a key role in achieving the right balance.

The commission presented in 1997 a Green Paper on Partnership for a New Organisation of Work[66], that launched an ambitious debate on the modernisation of work organisation. The responses to the Green Paper generally confirmed that work organisation is a of vital concern to Europe's current and future competitiveness.[67] That the debate on work organisation examines the organisation as a totality ('holistically') is considered essential – changes in one part of the organisation have repercussions on all others, and the organisation interacts with its environment.

The Green Paper was followed up by a European Conference 'Working for the Future' 28 – 30 April 1998. The participants at the conference agreed that there is a need is to renew the structures and the agreements which govern the organisation of work. Strong emphasis was placed on the importance of the role of the social partners and their partnership as an economic factor. Social partners are much closer to the realities of enterprises and workplaces than political institutions, and they represent the two interest that must be balanced to strike a productive compromise between flexibility and security.

The importance of work organisation was endorsed by the Luxembourg Job Summit in December 1997, which made adaptability and the renewal of the organisation of work one of the four pillars of the employment strategy and thereby an important part of the Employment Guidelines 1998. It invited the social partners to negotiate agreements to modernise the organisation of work. Member States undertook to examine the possibility of incorporating more adaptable forms of contract into their law.

The National Action Plans on the implementation of the Employment Guidelines have been sent to the Commission. The content of these report shows clearly that the dynamic of developing the national actions plans has helped to foster the idea of adaptation to change as a mainstream part of employment policy. Furthermore it has directly aided the process of policy integration in work organisation issues. Policies on education, training, taxation, legal reform, and the contribution of the social partners to the modernisation process overall, is clearly in evidence. Training is identified as a powerful force in adapting to change.

In its Social Action Programme 1998 – 2000,[68] the Commission has announced that it will continue to promote a new framework for the modernisation of work organisation and a better balance between work and family life. In particular, it will:

- present a Communication on work organisation and adaptability at the end of 1998 to facilitate and complement implementation of the adaptability pillar of the Employment Guidelines by:

[66] COM(97)128 final 16 of April 1997;

[67] For example see Bertin, I, *Partnership for a New Organisation of Work: Telework COM(97)128*, ETD Project National Coordinators Comments, 1997

[68] COM(98)259 of 29 April 1998

  - consulting social partners on a possible framework agreement on all elements of work organisation, including, inter alia, working time flexibility
  - identifying the issues to be addressed at EU level to adapt the legal frameworks to encourage more adaptable contractual arrangements, including the link between social protection and changing working patterns
- present a Communication in mid-1998 on adapting and promoting social dialogue at Community level
- consult the social partners in 1998 on the need for Community action on the protection of teleworkers
- present proposals in mid-1998 to protect workers currently excluded from the working time directive, further to the 1997 White Paper, and the subsequent consultation of the social partners
- launch an initiative to encourage greater employee financial participation in companies by highlighting good practice and identifying obstacles, building on the 1992 Council Recommendation
- bring forward clear guidelines concerning state aid for training.

4.2.2 The social dialogue on telework

Both the High Level Group of Experts and the Information Society Forum have underlined the need to make a coherent adaptation of the social and legal framework concerning telework.

The Green Paper Partnership for a New Organisation of Work, building on extensive research and comparative analysis of Member States labour, health and safety and social security legislation[69], asked public authorities and the Social Partners to consider *"how telework and related techniques can bring about a net increase in work opportunities for Europeans in such a way that the overall quality of working life is enhanced".*

From the consultation process on the Green Paper it can be concluded that it is commonly agreed that telework is here to stay. Companies are developing with their workforces innovative new ways of distance working. However, there are different views on how significant it will be as a form of work organisation. Neither trade unions nor employers' organisations call for national or European specific legislation in the field of telework, but both underline the need to address issues such as voluntarism, the right to return to on-site work, privacy protection, proper equipment standards, hours of work and remuneration in the field of telework. One of the challenges of telework is the separation of working and living environments.

In its Communication People First - The Next Steps[70] and in its Social Action Programme 1998-2000, the Commission has announced that it will consult the social partners in 1998 on the need for Community action on the protection of teleworkers. The consultation document will aim to give an overview of the social dimension of telework within the European Union, in order to identify the horizontal and specific problems of the statutory and contractual framework of telework especially in the fields of labour law, social security and occupational health and safety. Within the social dialogue at European sector level, the Joint Committee on Telecommunications have agreed that telework will be the first of their working priority areas for 1998.

[69] The Social implications of Telework, not yet published.

[70] Communication on the Social and Labour Market Dimension of the Information Society, People First - The Next Steps. COM(97) 390 Final of 23 July 1997.

4.3 European RTD

The Fourth Framework programme supports European RTD with 13,200 million ECU for a four year period. It brings together universities, research centres and private enterprises, paying particular attention to projects which have a direct impact on competitiveness and the quality of life. Telework is featured in many of the 17 specific programmes of research. Examples include a task to explore possible substitution of commuting in the Transport Research Programme, and a task to explore better use of energy by working at home in the Non-nuclear energy research (THERMIE).

However, the main contributions to furthering the take-up of more flexible ways of working are being made by the three specific programmes related to Information and Communication Technologies: ACTS, ESPRIT, and the Telematics Applications Programme.

4.3.1 The ACTS Programme

An important aim of the 4th Framework RTD programme Advanced Communications Technologies and Services is not only to develop new technology, but also to validate its usefulness to citizens and organisations by using the new technologies in trials with real end users, and to distil out of the work done a number of "Guidelines" in areas of broad policy interest, of which telework is one. This commitment to Guidelines is based on the Maastricht Treaty (Art.129 c). Where these require or could benefit from wider political endorsement, the Commission has the unique responsibility to transmit them to the European Council of Ministers and the European Parliament for consideration as formal recommendations.

In most areas of development related to advanced communications, no groups - even Governments - are in a position to impose guidelines solely on the basis of expert opinion. A wide consensus is a pre-requisite for political endorsement. This is particularly true in the case of telework. An important role for ACTS is therefore to coordinate and consolidate the consensus that can be reached in the different constituencies accessed by ACTS projects.

In the Programme, many projects have relationships with one another, for example one develops components for another's prototype, which may in turn be validated by a third project. At the most basic level, the deliverable may be the communication of key findings or other information. However, interaction between projects extends much further than this. A structure for an integrated set of projects has been identified in order to optimise meaningful inter-relationships and information exchange between the actors. One of these "chains of projects" is the ACTS Telework Concertation Chain (GAT).

Special attention is needed for trans-border telework. However, the key objective in developing guidelines is to achieve a wide consensus on how to deal with telework. Again, the most important success factor in this is the breadth of consensus. The best set of guidelines from a viewpoint of content is that one that has the commitment and agreement of the major players.

The ACTS Telework Concertation Chain

The ACTS Telework Concertation Chain (GAT) is a forum for concertation, information exchange and cooperation between independently financed and managed projects. Its focus is the link between ACTS projects (and ACTS as a whole) and a positive and balanced European approach to telework technologies, services, methods and practices. Its specific interest is to ensure that investment in and relating to telework is encouraged by the early resolution of issues and uncertainties, based on consensus among the various constituencies. The projects within the ACTS Telework Concertation Chain are included in Annex 2.[71]

[71] Information about the GAT Chain is available on: http://www.eto.org.uk/gat

The objectives of the ACTS GAT Chain are to enhance understanding of the link between existing and new technologies and economic and societal success in the context of telework and telecooperation, and to seek consensus around Guidelines that will improve the confidence of users and suppliers in their decision making about these applications. The Chain also ensures that Guidelines are 'endorsed' within ACTS and by its constituents of interests, including:

- developers and suppliers of relevant products and services
- decision makers in industry, commerce and public services that need to use the applications
- policy makers and policy advisers at both European and local community levels

GAT has, at present, endorsed three Guidelines, and others are being developed:

- GAT-G1: *First-time interoperability across "Extranets": developing European competence and confidence*, authored and developed by ETD.[72]
- GAT-G3: *Work job and employment in the Information society*, authored and developed by the DIPLOMAT project (see also section 3.18.1).[73]
- GAT-G5: *Implementation of telework for multi-site software development*, authored and developed by the TECODIS project.[74]

In May 1998, the GAT Chain ran a seminar on *The home as a market in an Information Society context*, which drew attention to the extremely large potential market for home consumption of ICTs. At an average of 5 kECUs (thousands of ECUs), European consumers/homes represent an annual disposable income of some 750 BECUs (Billion ECUs). At present Home Internet Commerce in Europe is only about 1.7 BECUs, but even conservation estimates reckon that this will rise to at least 9 BECUs by the year 2001. This represents less than 2% of disposable income and a tiny fraction of European total trade. The critical aspect is its growth rate, making it essential that European enterprises make an early start on the learning curve, even if they believe there won't be a significant impact in their particular market for some time, Industry must gear itself for this. At the same time, the potential for teleworkable jobs is at least 50% of all jobs, and this is further increasing the potential growth of the Home as a market.[75]

4.3.2 Related RTD within the ESPRIT Programme

Esprit is the European Community's IT R&D programme. One of the principal components of this programme is work on electronic commerce and teleworking. Esprit itself is divided into a number of 'domains'. Because of their interdisciplinary nature, work related to electronic commerce and teleworking is carried out in several Esprit domains. The most important of these is *Technologies for Business Processes* (TBP), which is based on the acknowledgement that it is not possible simply to introduce, for example, workflow system technologies into businesses without also looking at their organisational structures, processes and goals. TBP's overriding goal is to support innovation in the way European enterprises do business in order to compete effectively world-wide by focusing on three elements: human resources, business processes and technologies and methodologies. The first two are normally the drivers, and the last is the enabler, but sufficient attention must be paid to all three components.

In addition, the domains Integration in Manufacturing (IiM) and High Performance Computing and Networking (HPCN) also cover work in areas such as collaborative design and computer simulation which is highly relevant to electronic commerce and teleworking. Although such work may not be narrowly focused on electronic commerce and teleworking *per se*, nevertheless it is connected with 'doing business electronically' and thus falls within a broader definition of these terms. It follows from this that there is a natural connection between work in these areas and those grouped under electronic

[72] Available at http://www.eto.org.uk/gat/guides/gat-g1.htm
[73] Available at http://www.eto.org.uk/gat/guides/gat-g3.htm
[74] Available at http://www.eto.org.uk/gat/guides/gat-g5.htm
[75] Data from EITO 1998.

commerce and teleworking in the new Fifth Framework Programme Key Action 2 "New ways of working and electronic commerce". (See section 5.2 below).

Innovation in business implies a transformation away from the traditional, hierarchical company with processes focused only on internal activity, which excludes those working outside the company, is characterised by both external and internal walls between people, functions and tasks, and where communication takes place only across the top levels and vertically down within functional departments. Decisions and reactions to outside events thus need long lead times. A possible reorganised and transformed company open to innovation is where internal walls have disappeared and the structure has flattened, and lines to customers and suppliers are strengthened. Such a structure requires a good overview of processes being used, how they are being used and who is using them, all of which technology can provide. These processes can be both internal and external to the company, and include contacts, sales, support, distribution, payments, etc. Electronic commerce processes are an important aspect here.

Technologies are needed to effect these processes, including EDI, multi-media, encryption secure technology, etc. In addition, and coming between these technologies and the processes they serve, are applications like management information systems, workflow, cooperative work, human resources systems, document retrieval systems, etc. These applications are needed so that everyone in the restructured company can access and retrieve the information necessary to perform the processes they are involved in, wherever they may be, whether this be in a virtual company, a branch office or the main office. Similarly, methodologies are also important in reorganising a company, whether this involves incremental or radical change, in order to define where you are, where you want to be, and thus the path leading from the former to the latter. A methodology also allows experience to be systematically collected so that the company can learn through its change processes. These methodologies include business process re-engineering (BPR), total quality management (TQM), just-in-time (JIT), etc.

ESPRIT-TBP has put in place three types of actions:
1. business innovation tools, as traditional RTD projects
2. business innovation (or best practice) pilots, in which the lead user company drives the project based on its business requirements, and the technology partners enable the change. There are about 60 of these pilots, varying from simple incremental process change to full electronic commerce or virtual company development, which are considered as good examples and which also examine issues of human resources and new ways of working, in addition to the technology
3. 11 business innovation transfer projects in order to ensure that the results of this RTD reach a wider audience than the partners themselves through consolidation of the results arising out of the tools and pilot projects.

Telework, as well as other new ways to work, is seen by ESPRIT as part of the total process of change, and good examples of telework involve much more than an examination simply of where the work is done. Telework requires flexibility within the company and can only succeed if it part of the total concept of the organisation. Apart from TBP, telework is also prominent in a 1997 ESPRIT call which focused on a series of themes cutting across the existing eight domains, one of which is concerned with mobility.

4.3.3 The Telematics Applications Programme

The major difference between the Telematics Applications Programme (TAP) and other European RTD is that it attempts to move closer to deployment with real prototype development that could become commercial applications. In this context, users play a central role in TAP projects.

The TAP covers nine vertical sectors, each concerned with specific areas of activity, like health, education, transport, etc. Interest in telework appears in a number of these but tends to be more

explicitly addressed in the TURA sector (Telematics for Urban and Rural Areas), especially through its focus, amongst other things, on:

- telework to strengthen competitiveness and employment
- telework and teleservices to fight social and economic exclusion

Other TAP sectors also provide some work of relevance to telework, such as "Education and Training" through its concern for knowledge-based activities, "Healthcare" with remote access to medical services and "Libraries" in terms of availability of remote information sources used by teleworkers. Among the results produced by these sectors, it is worth mentioning the study conducted by the MIRTI project from the "Telematics Engineering" sector on "Models of Industrial Relations in Telework" and the study on "Telework for People with Disabilities" from the AVISE project, a preparatory action from the "Disabled and Elderly" sector. (See Annex 2 for more information).

New projects were launched in 1997 addressing the topics of 'decentralisation of activities' and 'support for constrained workers'. The wide range of telework related activities in TAP highlights the fact that telework is an evolving concept. Initially it was seen largely as people working at home whereas today the concept is much broader than this because:

- new technologies are now available, such as groupware, CSCW, etc.
- there is an increasing need to integrate telework with human resources development and management practices
- new areas of application are arising, such as the relocation of public services, applying business process re-engineering to administrations, Government-On-Line, etc.
- the legal framework of telework is evolving as part of the general change in the legal structures of working conditions and work organisation generally
- the cultural impact of the Internet will increase dramatically, especially as the next generation brought up using computers joins the labour force.

4.4 Trans European Telecoms Networks

Trans European Telecoms Networks (TEN-Telecom) is not part of the Fourth Framework Programme RTD but is an investment stimulation action in the framework of the Trans European Network Chapter in the Maastricht Treaty. With its main aim at stimulating large scale deployment of Trans European Telecommunication Networks, it can assist in the deployment of projects after research has taken place in cases where additional Commission funding is seen to be an advantage. In fact the partners in some of the currently running TEN projects have been previously engaged in Research projects and special measures under the Fourth Framework Programme. The development of trans-European frameworks for telework is seen as a key to the further consolidation of the European market and to business competitiveness. At present, a number of these projects are concerned with telework.

The overall budget of TEN-Telecom is quite small at between 25 to 30 MECU/year. Overall objectives are to help launch trans-European telecoms applications and generic services by showing that the infrastructures can be used to help facilitate the transition to the Information Society by:

- strengthening the internal market
- assisting regions in working together in improving socio-economic cohesion
- demonstrating that through the use of ISTs, new activities and new employment opportunities can be supported

TEN-Telecom was established in 1994 with a number of preparatory actions following on from the Maastricht Treaty and the Bangemann Report. In 1995, Financial Guidelines for TENs were made available and the Euro-ISDN Guidelines were published, thus providing the first available platform for multi-media services to which all TEN-Telecom projects are linked. Since these developments, stress has been laid on the fact that applications require an integrative approach to different networks, e.g. ISDN, PSTN, mobile, satellite, more advanced broadband networks, etc., all of which need to be inter-operable. In mid-1997 new guidelines were adopted which defined a new working environment in which

the main features include emphases on full market deployment, public-private partnerships and areas of public interest which can provide the justification for additional Commission funding.

TEN-Telecom's areas of work are defined by these guidelines where the main emphasis is on applications with high public interest like telework, telecom services for SMEs, distance education, transport, environment, culture and health. Another basic line of projects is concerned with inter-operable generic services providing common tools for different types of applications, such as e-mail, but also multi-media tools and other support services like payment systems, etc. TEN-Telecom financial support should be seen as a catalyst which can assist in covering the risks rather than becoming the driving force of a project in its own right. Typically, up to 50% of costs can be obtained for commercial and feasibility studies, but the total contribution cannot exceed 10% for the whole project, including actual implementation.

In order to qualify for TEN-Telecom support, projects should:
- be able to fulfil users' requirements, i.e. users or their representatives should be involved
- be mature, i.e. all RTD activities are complete so the project is ready for commercial validation or at least the initial launch steps
- have potential economic viability, i.e. although these are areas of public interest it is expected that conditions are such that implementation can start on a long-term sustainable basis, e.g. by long-term financial commitments from public bodies, realistic assessment of income from users, etc.
- have solid commitment from public and private partners, e.g. in the case of telework there may be the expectation that SME representative organisations would be partners in addition to relevant public and private organisations.
- be trans-European, i.e. participants from more than one country.

One objective of TEN-Telecom is to establish a sound technical, operational and legal framework for a large number of businesses and other organisations to coherently integrate trans-European telework networks. The framework is expected to support European networks of call centres/service centres offering employment near the home in both urban and rural areas, European networks of business centres offering teleworking facilities to business travellers, and European virtual enterprises with a dispersed workforce of teleworkers in various countries.

The aim is to achieve open support frameworks for transborder telework, acceptable to the self-employed and small businesses, with reliable and secure communications, and with appropriate provisions for data protection, insurance, social security and health and safety at work. The framework(s) will be expected to ensure multi-media access to and from:
- individuals in their homes
- virtual corporate networks
- Internet/WWW and advanced high-speed services (ATM-based)
- cellular radio links to mobile terminals.

Initial feasibility assessments are prepared addressing technical feasibility, manageability, acceptability to all social partners concerned (notably to potential teleworking users of facilities), and the commitment of a substantial number of organisations to work together in making use of one or more trans-European telework frameworks.

4.5 Structural funds

The European Union intervention in support of structural adjustment through its Structural Funds amounts to almost 30,000 million ECU per year. There are four structural funds: the European Regional Development Fund (ERDF), the European Social Fund (ESF), and funds for the agricultural sector and for fisheries, as well as the Cohesion Fund.

Whereas the RTD funds are managed by the Commission, most of the Structural Funds are not. Only 9% is set aside for Community initiatives, the main part being managed by the member states, and indeed individual regions, themselves. In some of the Community initiatives, attention on new ways of working plays a role, for instance in Employment NOW (New employment Opportunities for Women). A specific mention of teleworking is given in the description of one of the four priority themes, i.e. the reconciliation of work and family life, where it is explicitly stated that measures for avoiding negative effects, like isolation and loss of social protection, should be included. The main initiatives are, however, to be found in the LEADER, ADAPT and EMPLOYMENT Initiatives.

In order to bridge the difference between regions in terms of the development of new ISTs, Article 10 of the ERDF and Article 6 of the ESF identify the translation of the Information Society concept into real life in the regions as a priority. This is achieved through the demonstration of innovation applications and services as one of the priority areas for pilot actions, of which telework is often an important component.

4.5.1 The LEADER Initiative

LEADER[76] is the French anagram for *Links between actions for the development of the rural economy*. The Community's participation has been set at 1,755 million ECU of which 900 million ECU are for the regions of Objective 1 (lagging behind in development). LEADER I was established to bring the operation of the Structural Funds into closer collaboration with the Commission's RTD initiatives, such as ORA in 1990 and 1991. LEADER II applies for the duration of the new period of reform of the Structural Funds from 1994 to 1999.

LEADER covers geographical areas of limited size with a strong local identity. It is based on the active involvement of the local people, firms, associations and authorities. It serves as an incentive for development strategies adapted to the area's characteristics using a global, multi-sector approach.

Among the eight key points for rural territories[77], four of them may concern teleworking: activities and jobs; migrations and social and vocational integration; technological developments; competitiveness and access to markets. Several teleworking projects have started under the "rural innovation programmes" (measure B), the "transnational cooperation" (measure C), as well as the European network for rural development (measure D). These are included in Annex 2.

Rural development is increasingly understood as sustainable integrated development to include social, cultural, economic and environmental dimensions in a context of geographic diversity. Issues about new ways of working with IT have been tackled by many project holders within the LEADER framework, with some success and many failures. In rural areas, when major structural problems are present such as poor telecom connections and overpriced local service provision, the strongest factors of resistance tend to come from the firms which are reluctant to outsource the work to unknown distant teams (risk management), and from local governments which fear unpredictable changes in the population's social and economic status, especially women returning to work and qualified young people.

Further efforts are being put forward to bring IT closer to any activity or service bringing benefits to local people in rural areas and it is believed that innovative aspects of such projects will continue to be supported by the European rural development initiative.

[76] more information on this rural development initiative and its operational projects is available in six languages from the Rural Europe Web site http://www.rural-europe.aeidl.be

[77] The eight key points identified by the LEADER network are: the mobilisation of the local population and social cohesion; the area's culture and identity; activities and jobs; the area's image; migrations and social and vocational integration; the environment, management of spaces and natural resources; technological developments; competitiveness and access to markets.

4.5.2 The ADAPT and EMPLOYMENT Initiatives; projects in the field of telework

ADAPT and EMPLOYMENT are the European Social Fund's Human Resource Community Initiatives. ADAPT is designed to help employers and workers anticipate industrial change and deal with its effects. It has a specific priority linked to new information and communication technologies (NICTs) and human resources. EMPLOYMENT targets groups facing discrimination and difficulties in the labour market: women (NOW), young people (YOUTHSTART), people with disabilities (HORIZON), and excluded people (INTEGRA).

At least 1,286 ADAPT projects, drawn from all Member States, address the Information Society as a priority theme, reflecting its importance as a factor in industrial change, and as a response to it. This emphasis on the Information Society, and the fact that ADAPT targets workers threatened by redundancy as a result of industrial restructuring, has led national authorities to select some 100 innovative projects working on various human resource aspects and implications of teleworking. Some 85 projects linked to telework have also been selected within the four strands of the EMPLOYMENT Initiative.

Telework projects in the ADAPT and EMPLOYMENT Initiatives encompass projects dealing with preparation and training for the implementation of telework schemes, projects concerning telecentres, and projects promoting all forms of tele-cooperation and virtual firms. Because of lack of space, only a small representative group of projects are directly cited in Annex 2, but a complete set of descriptions is available on the ADAPT Web site (http://www.europs.be/)

Both ADAPT and EMPLOYMENT telework projects, working for two, or sometimes three years in trans-national partnerships, and drawing on a wide range of innovation in virtually all Member States, have an important contribution to make to European practice and policy. They also have a role to play in raising awareness of telework amongst the business community and the general public.

ADAPT and EMPLOYMENT projects are selected nationally, and often regionally, reflecting a diversity of real needs and circumstances. ADAPT directly reflects business needs and perceptions. The structure of both Initiatives guarantees transfer of innovation to mainstream policy and practice: National Support Structures help administer project activity in the Member States, social partners and other interest groups are represented in Monitoring Committees, and thematic analysis and developmental work at European level is jointly administered by the Commission and Member States.

ADAPT and EMPLOYMENT telework projects share many common approaches. ADAPT deals with the impact of industrial change on both workers and their employers, especially those in small firms. Projects share an anticipation approach, meaning that they encourage attitudes and mechanisms which help workers, managers, service providers and policy-makers to prepare themselves for future evolution and change. EMPLOYMENT projects are, however, focused on the specific needs of their particular target groups:

- NOW projects, using telework to create self-employment for women, and working on its implications for equal opportunities
- HORIZON projects, focusing on using telework to improve the integration of people with different types of disability
- INTEGRA projects, examining telework as a means of integrating people who, for various reasons, have been excluded from the labour market
- YOUTHSTART projects, using telework as a means of introducing young people to work.

Examination of all these projects shows that:

- most ADAPT telework projects use tele-training or distance learning to prepare managers and future teleworkers

- some EMPLOYMENT-NOW projects see teleworking as a route to self-employment for women, others as a route to new jobs in the IT sector, and still others as a job-creator in rural and remote areas
- a substantial number of projects are promoting telework in SMEs, and many are experimenting with SME networks and virtual enterprises as a means of improving small firms' capacity to compete with larger companies
- some projects are focused on occupations or activities where telework is causing radical change.

In the following sub-sections six key themes within ADAPT and EMPLOYMENT telework projects are presented.

4.5.2.1 The introduction of telework

Most of these projects are concerned with the introduction of telework, and raising awareness of its possibilities. The projects are:

- researching conditions which favour telework, the removal of barriers to it, legal frameworks, and regulation of working conditions
- undertaking feasibility studies on telecentres and on opportunities for telework in existing companies
- raising awareness of telework amongst decision-makers in local or regional administrations, and one project is encouraging private companies to use distance working in their administrative work
- offering advice and services to SMEs and new entrepreneurs interested in introducing telework
- piloting telework in SMEs, or the introduction of telecentres to local economies
- working with potential teleworkers in telecottages or home offices, raising awareness through drop-in sessions, or via local training and education institutions.

A number of projects are concerned not only with the impact of telework, but also with the new tools and methods needed to support it. The approaches and products in development include:

- a self-evaluation model for SMEs on the feasibility of introducing telework
- an evaluation scheme to help teleworkers measure their performance
- tools to facilitate the introduction of telework in SMEs (including ICT use, changes in work organisation, training requirements, and legal and insurance issues)
- research into, and monitoring of, trends in teleworking for people with disabilities
- analyses and surveys related to improving the situation of women-teleworkers
- a telework co-operative set up and run by people with disabilities
- a transnational Telework Observatory to supply unions with hard data, analysis and guidance on the application of telework in various industrial sectors.

4.5.2.2 The use of training

Most ADAPT and EMPLOYMENT telework projects are involved in developing training for future teleworkers, some already in employment, others - sometimes the unemployed - seeking to create their own small firms. Some projects are concentrating on the needs of managers. It is interesting to note that:

- much of this training is designed to be interactive (training programmes complemented by hot lines providing coaching and tutoring)
- multimedia tools (CD-ROMs, videoconferencing, online working) are widely preferred to traditional classroom and print approaches
- where employees are being trained as teleworkers (in electronic commerce, or in virtual companies), tailor-made tele-training, delivered in the workplace, is the usual medium
- virtual environments, merging as quickly as possible into real work (one project is training prisoners from their workstation in jail) are being used to train unemployed people and prospective entrepreneurs; tele-tutoring or tele-coaching is widely used; training is often linked to SME advice and support services
- skill centres are being set up for the tourism sector, and for the event and conference organising industry; projects are developing new skill profiles for the telework sector.

4.5.2.3 New types of job

Electronic commerce - call centre agents and dispatchers, tele-marketers, helpdesk officers – is the focus of a number of ADAPT projects. Examples in other occupations include:

- a regional newspaper, changing its work organisation fundamentally as local journalists are starting to work from their home offices
- an inter-bank training centre is researching the possibilities for virtual banking on the Internet
- a project will develop a clinical information system, including on-line medical consultation
- a promoter is developing tele-diagnosis and tele-maintenance for industrial equipment, in order to reduce the travel-time of qualified technicians.

EMPLOYMENT-NOW projects developing new occupations are:

- training highly-qualified women to become experts in introducing and monitoring the use of telework in SMEs
- creating services to support web-site development.

4.5.2.4 Tele-cooperation - new business opportunities and increased competitiveness

Companies are using outsourcing to respond more flexibly to customer demands, often forging strong cooperative relationships with their suppliers or service providers. At the same time, employees are forming their own small firms to supply their employers with outsourced services or products.

Some of these very small companies are building their own networks, organising everything from local services to international marketing. Others are combining to found virtual enterprises to undertake joint projects, enabling them to compete with larger firms. One such project is in the media industry, where a telecommunications operator is capitalising on the liberalisation of the telecoms market, developing new services for consumers and businesses by creating an international network of micro enterprises. More traditional industries show potential as well. For example:

- SMEs specialising in machine construction for steel mills are introducing tele-cooperation and Computer Supported Co-operative Work systems
- health and safety experts are being linked by teleworking to the development of a health and safety communication network between SMEs
- traditional consultancy, marketing, and accountancy services are being delivered to SMEs.

4.5.2.5 The regional and local dimensions

Teleworking bridges distance and allows work to be organised more flexibly. It has obvious attractions as a source of regional and local job creation. Most current efforts are being concentrated on developing telecentres and local service networks for SMEs:

- Telecentres – or (in rural areas) telecottages - provide tele-workplaces for employees or self employed people. The benefits of telework remain (no traffic, flexible working hours), but teleworkers are not isolated, and have the benefits of a comprehensive supported and serviced installation. Training, guidance, coaching, and tutoring are nearly always provided, via local or regional training providers, or multimedia distance learning or self-learning packages. Often teleworkers use telecentres for two or three days a week, and work at home for the rest of the time.
- Some projects are clearly operating within a ‘learning region’ model, in which local administrations, service providers and training institutes combine to provide SMEs with accommodation and logistical support, Internet-based services (administration, marketing, taxation), and more classical advice or marketing services, as well as training.
- Some telecentres function as telework agencies or brokers. Networks of telecentres are also being created. In one case a local administration is trying to foster private telework jobs by introducing teleworking in its own services. Some telecentres use the Cybercafé model: drop-in centres where people can use computers, get advice, or register for training. Others search for local jobs capable of being transformed into telework.

4.5.2.6 Equal access, equal opportunities

Teleworking can play a positive role in the extension of equal opportunities:

- NOW projects see the flexibility of telework as offering new job opportunities to women who are still predominantly responsible for the care of dependants, and telework's cost-efficiency as offering unemployed women new opportunities to create small businesses. Telework can play a positive role in reconciling home and working life, but through greater flexibility, not reduced working hours; good childcare facilities and sharing of domestic responsibilities remain essential conditions for successful teleworking by women
- HORIZON telework projects are mostly about providing telework training and guidance adapted to the needs of people with different types of disability; promoters, mostly small, highly specialised NGOs, experienced in experimental and pilot work, are concerned to raise employers' awareness of the capacity of people with disabilities to be successful teleworkers
- the few INTEGRA telework projects are concerned with improving the labour market opportunities of groups suffering social discrimination: former prisoners, the long-term unemployed, lone parents and carers, and unemployed young people
- an ADAPT partnership is developing a best practice guide on the use of telework to combat the exclusion of workers over 45 years of age.

In summary, ADAPT and EMPLOYMENT telework projects embody a unique critical mass of European and national innovation. They are trans-national, and are monitored and supported in their Member States and on a European basis, ensuring that their experiences and products will be disseminated and passed into the mainstream of telework development. They will make a special contribution to the shared understanding of:

- best practice in introducing telework to existing companies and sectors
- experiences in creating new job opportunities and businesses
- training methods and materials worthy of dissemination at European level
- best practice in support, counselling, advice and coaching for SMEs
- how to inform, support and advise individuals affected by the introduction of telework
- how to use telework training and services to strengthen SMEs' and micro-companies' capacity compete with larger companies
- how to maximise a region's or local community's capacity to benefit from the introduction of telework
- good practice in equal access to jobs and income, and in guaranteeing equal opportunities.

4.5.3 Article 10 (ERDF)

In terms of inter-regional cohesion in Europe, recent statistics indicate that the least-favoured regions are faced by a "technology gap" twice as great as the differences measured by income per head. In line with the priorities of Article 10 approved for the 1995-1999 period, innovative measures aimed at developing new ways of introducing innovation in the regional development agenda of the less favoured regions of the European Union have been introduced. These include "increasing awareness in SMEs from less favoured regions about research and technological development activities" and, more generally, about the regional economic implications of technological change, as suggested by the Regional Commission of the European Parliament.

One of the priority areas for pilot actions under Article 10 of the ERDF and Article 6 of the ESF for the 1995-1999 period is the translation of the Information Society concept into real life in the regions through demonstration of innovative applications and services, i.e. Regional Information Society Initiatives (RISI).

RISI has two elements:

a) RISI 1 - the development of a regional partnership in the elaboration of a regional Information Society strategy and action plan and
b) RISI 2 - preparation and launch of pluri-regional pilot applications for demonstrating best practice and developing know-how in the regional deployment of the Information Society.

The Information Society is revolutionising the ways in which we work and live together. For the regions of Europe, their future economic and social well being will depend to a large extent on how they are able to participate in the Information Society in the making. This pilot action therefore aims to help regions benefit from the opportunities now opening up to them and to minimise the risks of being left behind in this revolution.

The overall policy in the Information Society Strand of Article 10 is to pursue an active learning strategy both within a region and between regions. This will take place through the stimulation, experimentation, evaluation and diffusion of best practice in the creation of the necessary socio-economic conditions for the development and implementation of teleworking, SME networking and other Information Society services and applications which will in turn contribute to regional economic development, in particular in the less favoured regions (LFRs) of the European Union.

Projects under RISI 1 (Information Society Strategy and Action Plan) draw on the lessons and follow the pre-pilot experience, launched in 1995, of IRISI (Inter-Regional Information Society Initiative) in six test regions in the Union (Piedmonte, Valencia, Nord Pas de Calais, North West England, Central Macedonia and Saxony) [78]. The overall aim is to enable regional partnerships to make better use of existing resources for developing the Information Society.

These pilot projects follow an interdisciplinary approach and are being followed and managed jointly by DG XVI (Regional Policy and Cohesion) in cooperation with DG V (Employment, Industrial Relations and Social Affairs) and DG XIII (Telecommunications, Information Market and Valorisation of Research). [79]

RISI 2 (Pluri-regional Pilot Applications) projects focus their scope on the Less Favoured Regions (LFRs). Rather than identifying specific basic services and generic applications, these projects try to demonstrate innovative uses of validated information and communication technologies in working and trading in LFRs. The focus is on the adaptation of existing validated technologies, rather than on new ones.

4.6 Awareness raising: ISPO

ISPO is part of DGXIII and has the objective of promoting cooperation and development in the Information Society in Europe. ISPO's role is as 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, including technological, social, economic, etc.

ISPO is part of the Information Society Activity Centre (ISAC) whose role is to raise awareness of the opportunities and impacts of Information Society development by arranging special events, providing a leadership role in running conferences, participating in other relevant conferences, workshops, seminars, etc., and in participating in selected projects. The intention is to be present whenever Information Society related issues are discussed, whether these are positive or negative.

[78] more detailed information about the IRISI pre-pilot actions may be obtained at the Web site http://spavalda.polito.it/

[79] more detailed information about the RISI 1 pilot actions may be obtained at the Web Site http://www.risi.lu.

ISPO operates a series of information services, based upon alternative information distribution technologies and channels, for example

- a web-site (http://www.ispo.cec.be) which acts as a one-stop-shop in the area of the Information Society, a European "hot site" with more then a million hits per month
- a monthly newsletter, free of charge and available in both paper and electronic forms
- a help desk and free-phone service

The brokerage of ideas, applications and services is an important function of ISPO, and it is especially interested in best practice lessons and success stories which have a portable value. ISPO also provides guidance on Commission funding instruments, especially for newcomers who have a good idea but need relevant contacts in the Commission. The collection of information from a variety of sources is another area of activity, to which value is added in order to provide open information inventories. This also involves linking to external information services, thus maintaining a network of networks to provide easy access to relevant information through a concept of decentralisation in which each information source is maintained where it has been established and where the interest and expertise is to keep it up-to-date, rather than by ISPO itself.

ISPO also establishes and manages small scale programmes and projects with its own calls under the umbrella of Information Society promotion. The first call in 1996 received over 100 proposals, from which 16 were funded. The second call in June 1997 included:

- the demonstration of applications and their trans-border promotion
- studies of the impact of the Information Society
- accompanying measures such as workshops, seminars, information material, CD-ROMS, etc.

The European Information Society Week, which will take place again this year in October 1998, offers a platform for raising awareness of Information Society applications such as telework. ISPO also supports DG XIII in advertising European Telework Week and other events on the European Telework Agenda.

5. Telework Outlook - 1998 and beyond

With teleworking moving beyond the "early adopters" phase towards a much wider uptake, new challenges now need to be met. The present status of telework in Europe, as a major item on the agenda of many decision-makers, needs to be built upon in the future if its benefits to Europe's economic and social well-being are to be optimised. Telework's clear attention in the social debate is crucial in this: in practice the social framework has changed already, although not all institutions have yet found their new roles. Technology has become a driving factor for change. Nevertheless, ongoing investments need to be made supporting a wide uptake of place-independent work for anybody who wants to benefit from this 'new flexibility'. In particular, the major restraining factors, as mentioned in preceding sections, need to be tackled and the major drivers strengthened.

The European Commission has a major role to play in all this, but this can only be successful in cooperation with other powerful actors, like the social partners, national and regional governments, employers and industry. Following the recommendations in the Communication on *The Social and Labour Market Dimension of the Information Society*[80] the creation of an adequate framework for telework has the attention of the parties concerned, and has even become part of the Employment Debate, which resulted from the Amsterdam Summit in 1997.

The objective of the Commission is to improve the conditions for the development of telework. The Commission is preparing for consultations with the social partners on whether, and to what extent, Community action on the protection of teleworkers is advisable.

In its Proposal for the Fifth Framework RTD Programme, a specific Key Action will focus on New Ways to Work and Electronic Trade. Following a favourable Council Decision, about 500 million ECUs will be made available for developing RTD in this domain by the end of 2002.

The Commission, in recognising the importance of directly experiencing telework for itself, has launched the first two pilot projects in DG V and DG XIII. These experiences will feed into a proposal for wider uptake within the Commission after two years.

Today, although still not a major type of work organisation, telework is developing fast, so that about 4 million Europeans are teleworking in some form or other[81]. The nature of telework has changed as both managers and the workforce, as well as families, are now becoming more aware of the benefits of being able to work where and when it seems most appropriate to do so, from both a commercial and a personal perspective.

Much of this has been driven by continuing rapid improvements in the availability and affordability of advanced technologies, including in recent years the unprecedented growth of both on-line and mobile communications, and of new services, with a clear boost now being given by the liberalisation of telecommunication in most EU countries.

The problems of working together over distance will be lessened, even more, in the coming years. Teleworking and flexible working are set to become easier, less expensive, and applicable to many more people. High quality bandwidth is available, although still expensive, all over Europe. Even for those who are restricted to narrowband access, it will be easy to hold daily videoconferences with superiors, colleagues and customers, and to access audio, graphical and text information worldwide.

It is clear that available technology and its falling cost is yet another stimulant for the further expansion of telework practices. Therefore, the need for a clear social and legal framework is growing every day.

[80] COM(97)390, 23 July 1997

[81] [81] According to the EITO Task Force Mid-range estimate, EITO 1998

Summarising the major initiatives of importance in 1998 and beyond, related to the further development of new ways of working in the Information Society and teleworking, mentioned in previous sections:

- the consultation of the social partners on telework
- preparations for the Fifth Framework Programme for RTD, and, in particular, the Key Actions:
  - New Methods of Work and Electronic Trading with the theme *Creating a user-friendly Information Society*
  - Products, Processes and Organisation with the theme *Promoting Competitive and Sustainable Growth*

  and, from 1999, new projects in support of new ways of working
- initiatives for the further development of awareness and consensus, like the European Assembly on New Ways of Working and Telework, and European Telework Week, etc.

This section presents future perspectives relating to new technology opportunities, as well as outlining the support that the Commission is providing through its actions.

5.1 Where are we going?

Rapid technology change can be baffling and unnerving to those who don't use the technologies concerned and see what is happening only from an outside, superficial perspective. For the active user of PCs and Internet, news of a new breakthrough in cheaper, faster bandwidth is very welcome and the results eagerly awaited. For companies running successful websites as a vehicle for market expansion or better customer services, news of new, low-cost devices for home access strengthens the case for yet more investment in online marketing innovation. But the citizen who is not yet connected only sees and hears - but doesn't understand - strange new jargon in advertisements (website URLs) and radio programmes (email addresses). The owner-manager of a bookshop in a country where one in a hundred citizens are connected sees in the trade press that a bookseller elsewhere has trebled turnover through his website; what does this mean - and can I do the same? Citizens and managers need to know about these technologies; they also need to know what they mean in the context or their own lives and work.

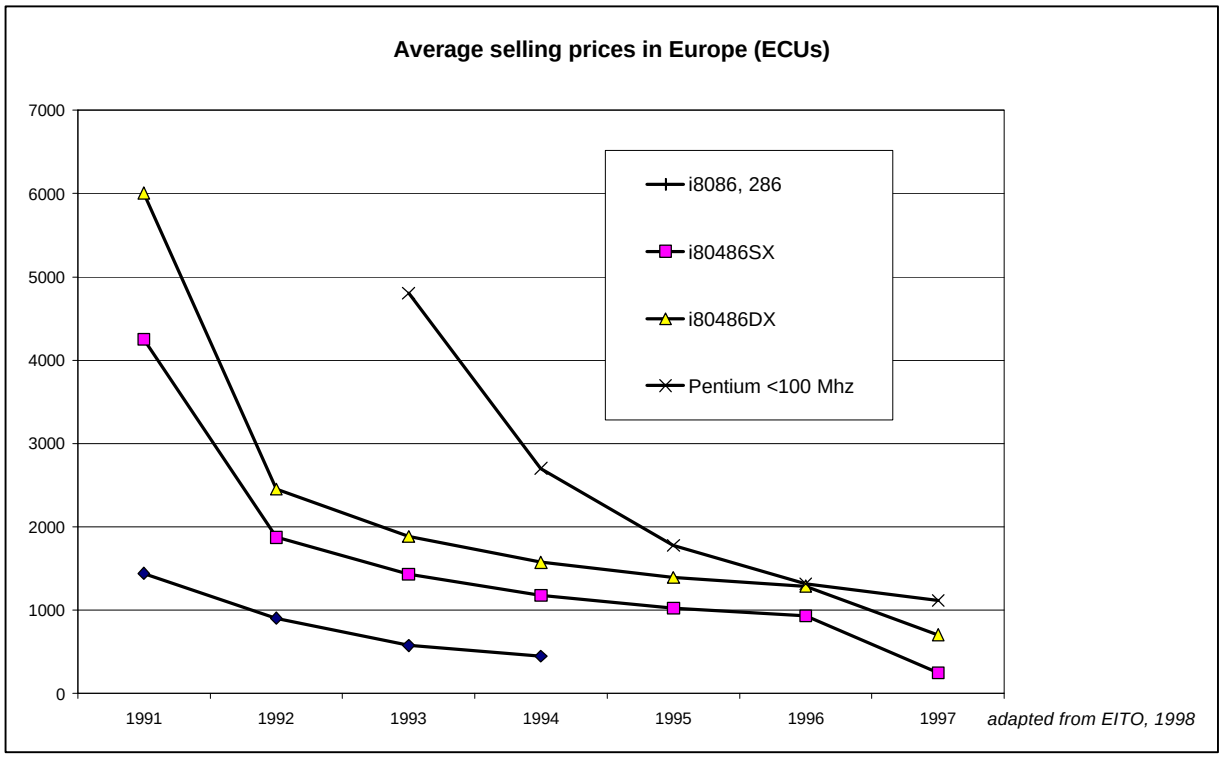
It would be inappropriate to attempt to list here the very many technology and application developments that are expected in the next few years. Instead, we select some trends and examples that have particular relevance to telework. The medium term future can most readily be understood in the light of three undisputed facts:

1. relative to almost all other costs, technology gets cheaper each year, while most things get more expensive
2. the performance of technology improves each year at a rate that is out of proportion to our experience of performance in most other aspects of life and work
3. this combination enables innovative (and sometime unforeseen) new products and services, together with market-transforming changes to existing products and services.

Teleworking in its many forms is part of the response by individuals and organisations to the new opportunities presented by these factors.

5.1.1 Price-performance, affordability and innovation

EITO reports each year on the pattern of prices for PCs:



A machine that was the ultimate in performance in 1991 had become, by 1997, effectively obsolete for business purchasers and only dubiously appropriate as one of that year's household Christmas buys for a reasonably affluent household in Northern Europe. The earliest PCs (c. 1981) had either no fixed storage at all or at most perhaps 10 or 20 megabytes of disk. Today's most heavily advertised PCs (mid 1998) have several gigabytes of fixed storage - several hundred times the capacity. A colour printer was a significant corporate purchase shared between many users as recently as 1994-5; today good quality colour printing can be had for around 200 ECUs. So we see that each year the underlying improvements in price-performance of the technology bring new capabilities within reach of the citizen. They also bring new reasons for buying the technology and new challenges to existing enterprises. Consumer applications for colour printers now include design and production of greetings cards at around the same cost as shop-bought cards, and reproduction of photographs taken with digital cameras without the need for the commercial processing associated with conventional colour photography. Sophisticated digital cameras may cost several thousand ECUs but basic ones are already available for a few hundred ECUs.

5.1.2 A new focus on low cost systems

An important development in 1997-1998 has been a new focus among PC suppliers on producing lower cost systems specifically targeted at the consumer. In the past, consumers have simply bought the machine that corporate users were buying three years earlier; typical selling prices seldom dropped below 1500 ECUs before the configuration was effectively obsolete. Now, sophisticated and current models for the consumer are being promoted at or below 1000 ECUs and the trend is downwards. This is an early response by the PC industry to another consumer-focused development, TV-based technologies targeting the mass market for Internet access. Within a few years, such developments may start to transform access by households and smaller firms in countries with lower per capita GDP and lower PC penetration. Greece may have only one quarter the level of Internet use of (say) Belgium, but it has an almost identical level of television ownership per head of population. Developments such as the network PC[82] may offer similar opportunities to accelerate use of ICTs in government, public services and industry.

[82] Network PCs reduce the cost per desk for corporate networks by minimising the hardware requirements within the desktop system and putting more of the power "upstream" in the network and servers.

5.1.3 The influence of pervasive mobility

Mobile technology already plays a key role in many countries as the first personal experience of the locational flexibility associated with an Information Society and a networked economy. Here again we can expect significant changes in both performance and costs. And a close link between technology and teleworking. The same mobile phone is used by many people for both work and non-work calls, in the same way that many office workers have made essential "private" calls using the company phone while at work and essential "business" calls using their own phone when at home. When a teleworker answers his or her mobile phone, the caller has no idea whether the teleworker is at home, in a company office or at the airport. Mobile telephony is one Information Society technology in which Europe leads the world; this lead is being underpinned by research and investment in the next generation of mobile communications, UMTS[83]. This is just one more example of technology enabling "anything to be done anywhere", and providing the opportunity for individuals, companies and society to re-examine our perceptions of what we want to achieve through both work and leisure.

5.1.4 Agent technologies

An important new focus towards the end of the Fourth Framework Programme is on so-called "intelligent agents". The term "intelligent" often confuses in the context of ICTs. We are a very long way from computers that are intelligent in the sense that we understand human intelligence in everyday conversation, but computer applications can have a lot of useful "specialist knowledge" built into them so that they behave in focused and narrow domains in something like the way we would expect a human to behave. From the user's standpoint the issue is not whether they are "intelligent", but whether they are useful! "Agents" are software applications that can to some extent act independently in carrying out some task. For example instead of the teleworker undertaking a search of the Internet, an agent that embodies knowledge about search methods and sources and knowledge about the interests of the particular teleworker can undertake the search and report back its results. The idea of intelligent agents is that they will learn and improve as they work.

5.1.5 Teleworkers' particular requirements

A new ACTS project, ACTSLINE, is assessing, *inter alia*, the particular technology requirements that can be identified from experience in teleworking. Needs already identified through the ETD project include:

- technologies and mechanisms to reduce interoperability and other technology adoption and migration difficulties for home-based and other individuals who have difficulty in getting adequate technical support locally
- better and cheaper language translation technologies to facilitate work and business relationships across Europe for individuals and small firms
- continued improvements in telecommunications price-performance, especially in the delivery of low-cost bandwidth in areas with low concentrations of economic activity and population
- improved mechanisms for interpersonal and group interactions across networks, including virtual presence[84]
- mechanisms for facilitating individuals joining and leaving widely dispersed groups/teams (getting quickly up to speed with the group dynamics and knowledge base), and mechanisms for groups to receive and integrate new individuals gracefully and effectively

[83] Universal Mobile Telecommunications System (UMTS) will enable many new applications and innovative hand held and in-vehicle devices and services. Work in the Fourth Framework Programme suggests the potential for everything that we now do across fixed wires to be done across mobile links.

[84] Virtual presence means enhancing the range and depth of communications capabilities so that the local presence of a distant person seems more realistic. As a current example, video enables the distant person to be seen, while the telephone only allows him or her to be heard. Current and future research focuses on providing three-dimensional representation and much higher levels of realism.

- mechanisms for declaring competencies and experience profiles and for assisted searching of competency bases to identify qualified and appropriate individuals for particular tasks
- enhanced access methods for information sets, including distributed information sets[85]
- enhanced infrastructures, in particular intelligence in networks such that a mobile worker can more readily attach and connect using a mix of mobile facilities, local facilities (eg in hotels), distant (home base) facilities and facilities integrated within the network (this applies also to the majority of home-based teleworkers, who work partly at home, partly at one or more offices, and partly while travelling)[86]
- investigation of the payoffs between synchronous and asynchronous communications in a multimedia environment, and technologies supporting the use of asynchronous mixed media communications[87]
- enhanced methods for screening and prioritising incoming communications[88]
- new approaches to optimising the timing of synchronous communications between individuals and among groups
- methods for supporting asynchronous participation in primarily synchronous communications (meetings), including meetings that are primarily physical (a current example of asynchronous experience of a synchronous meeting is achieved through an archived webcast of the meeting)

The work of ACTSLINE, together with continuing inputs from experienced practitioners and through workshops and conferences, is important in ensuring that today's research is more rapidly convertible into products and services that solve problems and succeed in the market.

5.1.6 Putting technology in context

As well as mechanisms for informing the research and development community (and suppliers of products and services) about the needs of the market, we also need more and better ways to assist decision makers and users to see beyond their experience of last year's and this year's technology so that there is less surprise and confusion when new technologies appear and so that today's decisions are less likely to look dated and irrelevant in future years.

An important aspect of telework and related programmes in 1998 and beyond is to more effectively communication visions and images of forthcoming technologies in terms that make sense to ordinary citizens and those who represent them. Some success in this is being experienced by initiatives such as the MediaPlaza in Utrecht and Échangeur in Paris[89]. Large numbers of senior executives and policy makers and advisers have gained both insights and confidence through intensive exposure to working examples of the technologies in action at these future-oriented showcases and learning environments. The investment and skills needed to develop and sustain a convincing and realistic experience of this

[85] For example, to address the frustration experienced by users who know (or suspect) that the information they need is available somewhere, but they cannot know for certain and have difficulty in deciding where to look and how long to continue looking.

[86] Like many requirements, this combines technical needs with infrastructure investment needs

[87] Synchronous communication occurs when two or more people link concurrently, for example in a telephone call or a videoconference. Asynchronous communication avoids the need for concurrent links, as in the case of email and email-based discussion lists, newsgroups etc. Asynchronous methods present many advantages (avoiding, for example, the difficulty of arranging for a group of people in different time zones to all be "online" at the same time) and is a primary reason for the popularity of email and voicemail. However, considerable further research and experimentation is needed in order to understand how to optimise the mix of synchronous and asynchronous forms in a future environment that includes realistic virtual presence (see above).

[88] An important benefit cited by teleworkers is the ability to control interruptions, for example by switching the telephone through to voicemail. However, inappropriate use of these capabilities frustrates people who are trying to connect with the teleworker. Enhancements from the field of Agent technologies may go a long way to address such issues.

[89] Links to these initiatives will be found at the European Telework Online website, http://www.eto.org.uk

nature are both very high, but essential in seeding the economy and society with senior individuals who now feel able to make sound decisions and successful investments.

For the ordinary citizen, the Internet itself provides the lowest cost and (for those actively connected) the most effective way to gain experience and reassurance through confidence and competence. A useful development in 1997-1998 has been the emergence of local community networking initiatives in several countries and the proposed formation of a European Association for Community Networking. Senior executives in national and regional organisations need the kind of "global view" provided by MediaPlaza; ordinary citizens need to gain confidence through meeting online the people and services they already meet locally every day. Local community networks exhibit strong synergy with local telework activities such as telecottages and telecentres, as well as telework applications in local authorities and public services. These activities provide the essential "human face, human scale" to the Information Society that is often lacking in the coverage given by national and international media. Technology is and must remain society's servant not its master. Local, national and European efforts are all needed to deliver the knowledge and understanding this requires.

5.2 The Fifth Framework Programme: status medio 1998

The basic task of the European Union's research and technological development policy is to ensure that advances in knowledge and technologies serve the purposes of the Union and its policies. From this perspective, the two inseparably linked objectives of this policy, taken into account during the preparation of the Fifth Framework Programme proposal from the Commission[90], are:

1. to maintain and enhance, in the context of a genuine '*European research area'*, the **research potential** of European laboratories, universities and companies and their ability to produce knowledge of the highest level and high-quality technologies
2. to help ensure that European research serves the Union's economic and social objectives, in other words, **European research at the service of the citizen** and **European competitiveness** in a global framework.

For the first time, this Commission proposal for the Fifth Framework Programme brings together in one Key Action (Key Action 2 of the Information Society Technologies programme) all actions related to helping individuals improve the quality of their working lives; helping companies operate more efficiently,, as well as in trading goods and services. The *Objectives and RTD priorities* of the Key Action are defined in the Specific Programme as follows:

> *The aim of this work is to develop Information Society technologies to enable European workers and enterprises, in particular SMEs, to increase their competitiveness in the global marketplace, whilst at the same time improving the quality of the individual's working life, through the use of Information Society technologies to provide the flexibility to be free from many existing constraints on both working methods and organisation, including those imposed by distance and time. It covers both the development and the trading of goods and services, in particular in the electronic marketplace, and takes into account the different requirements of the individual worker, consumer and of businesses and organisations, and includes related training. Considerations of the global context, in particular the rapid evolution of the marketplace, and socio-economic factors will guide the work, and the objective will be to develop and demonstrate world-best work and business practices, exploiting European strengths such as electronic payments, smart cards, mobile systems, software for business process modelling and enterprise management and consumer protection.*

[90] Proposal for a European Parliament and Council Decision concerning the 5th Framework Programme of the European Community for Research, Technological Development and Demonstration Activities (1998-2002), European Commission COM(97)142, April 1997

It is the intention to form the Key Action around four groups of Action Lines which, while each has its own separate focus, are integrated together.

1. The first group of Action Lines (**Flexible, mobile and remote working methods and tools**: Human Workspaces, Shared Spaces for Collaborative Work, Dynamic Networked Organisations) are those that bring together the needs of the individual and then those of teams and finally those of organisations, and their interaction with their environments.
2. The second group (**Management systems for suppliers and consumers**: Digital Design & Development, Customer-Product Relationships, New Marketplaces, Financial Services for Trade & Commerce) lead naturally on through the development of new goods, systems and services, the management of customer relationships, and the trading and the financing of products and services in the new market places.
3. These two groups are underpinned by a number of Action Lines related to security (**Information security**: Digital Object Security Management, Acceptable Authentication Architectures, Components & Services for Non-Cash Payments).
4. The whole is tied together by Action Lines that cut across the Key Action and link through to activities elsewhere in the IST Programme and in the other thematic programmes and in other European policies.

This grouping, however, is subject to further development of the Work Programme for the IST Programme. It is the intention to consult with an external advisory group in October 1998, and to propose the Work Programme to the European Council of Research Ministers by the end of the year, followed by a proposal to the IST Management Committee.

Consequently, the first Calls for Proposals are to be expected in early 1999.

5.3 Awareness activities

As the High Level Group of Experts on Social and Societal Aspects of the Information Society[91] expressed in their interim report in early 1996: "technology in itself is neither good nor bad: it is the way that we use it...". The speed in which we succeed in adapting the new technologies to our social lives will determine the effectiveness of our society.

In order to be kept informed and play a part in the new developments, it is important for all to participate in appropriate networks of people with similar needs, rather than doing nothing and hoping for the best. Information on all the events mentioned below is available at, the website of the European Telework Development (ETD) project[92]. As such the ETO website is supporting the emergence and existence of "virtual communities" by facilitating on-line discussions and providing information, and links to information, of interest to the regular visitors of the website.

5.3.1 The Information Society Forum and the employment debate

The Information Society Forum[93] is an independent unit, set up jointly by the Council of Ministers and the European Commission about three years ago, as a deliberate attempt to foster a much broader and independent view of Information Society developments. Its membership includes individuals from all walks of life and all interests, including industry, the trades unions, employers' organisations, as well as

[91] High Level Group of Experts: http://www.ispo.cec.be/hleg.
[92] European Telework On-line (http://www.eto.org.uk)
[93] For further information contact the Information Society Forum Secretariat in Brussels: Tel.: +32 2 295 3028; Fax: +32 2 295 0688; E-mail: ulric.fayl@bxl.dg13.cec.be.

special interest groups of all types. The Forum is thus very different as a source of policy advice than anything else at European level. Given its 130 members, it is very difficult to obtain a consensus, but despite this the six working groups have convincingly succeeded in pursuing their objectives.

One of the working groups, chaired by Joan Majó, is concerned with employment and job creation, and has been considering telework a great deal, even though it is not its main concern. The group originally had a broader remit across economic and growth issues but has tended to focus down strongly on employment and jobs because of the political concerns surrounding them. After the Amsterdam Treaty, the EU established a more dynamic approach to employment policies, including six-monthly high level summits on employment, and this has opened the possibility for a more productive relationship between the IS Forum and the European Union. The Forum has now created a parallel process in which every six months the working group issues an advice paper feeding directly into the summit schedule, and thus into the highest levels of policy development in Europe. These papers have come to be known as *declarations*, so that just before the Luxembourg Summit in December 1997 the Barcelona Declaration was issued as the working group met in that city in November 1997. Similarly in May 1998, the working group issued the Newark Declaration which fed into the Cardiff Summit in June 1998.

The Barcelona Declaration concentrated upon explaining the new relations between growth and employment in order to counter the fallacy that growth alone will solve employment problems. Member States are currently spending about ECU 200,000 million every year on their employment policies. Based upon the legitimate political objective of solidarity, two thirds of this amount are spent on passive measures, which mainly consist of ensuring minimum levels of income for unemployed people. Progressively, awareness has increased and it is now acknowledged that public money is better spent on active measures that favour employment, trigger job creation and encourage people to acquire new skills or update their existing ones.

The Newark Declaration contains policy recommendations. These are related to the necessary restructuring of education and training systems, the adaptation of the business environment to make it conducive to adaptive organisations of companies and favourable to start-ups, the need for incentive for training and better valorisation of up-dated skills in the unfolding of professional life, and the need for demonstrating best practice in the uptake of new ways of work.

5.3.2 The social dialogue on telework

In its Social Action Programme, 1998-2000[94], the Commission has announced that it will continue to consult the social partners on the need for Community action on the protection of teleworkers. (See also section 4.2.2 above.). As telework is a specific form of work organisation, this consultation process will be initiated after the communication on work organisation and adaptability adopted in October 1998. It is expected that a consultation document will aim to give an overview of the social dimension of telework within the European Union in order to identify the horizontal and specific problems of the legal and contractual framework of telework, especially in the fields of labour law, social security and occupational health and safety, gender issues, and trans-border work.

Within the social dialogue at European sector level, the Joint Committee on Telecommunications has already agreed that telework will be the first of their priority areas for 1998. The social dimension of telework has also been given a central place on the agenda of the Fifth European Assembly on Telework and New Ways of Working in Lisbon in September 1998 (see section 5.3.6 below) and can also be expected to figure strongly in European Telework Week events (see section 5.3.7 below).

[94] COM(98)259 of April 1998.

5.3.3 The European Telework Agenda

As explained in section 3.17.1 above, the European Telework Agenda is a series of key events spanning the spectrum of telework issues, put together and promoted by the European Commission together with the ETD project.[95]

5.3.4 The W.I.S.E. Forum[JM2]

As explained in section 3.18.1 above, *THE W.I.S.E. FORUM* (on Work, Information Society and Employment) has been established as a follow-up to the DIPLOMAT project in order to continue discussion on telework and related issues and to further the enhancement of the best practice Guidelines for implementation and dissemination of telework.[96]

5.3.5 The Third International Workshop on Telework: Teleworking Environments, Turku, Finland (September 1998)

Following on from successful workshops in London in 1996 and Amsterdam in 1997, the Turku workshop from 1-4 September 1998 is being designed to provide the opportunity for in-depth discussion of key contemporary issues in teleworking, alternative officing, virtual organisations, Internet-based working and computer-supported distributed work. In particular, the workshop aims to draw together the latest conceptual, theoretical and analytical work of researchers and academics, and the practical experiences and problems of practitioners and policy-makers.[97]

The event will concentrate in particular on four environments of telework:
1. the 'decision-making' environment – assessing the costs and benefits of telework and integrating them into business plans
2. the 'workplace environment' – building workplaces that embrace virtual working possibilities and provide stimulating and productive work interactions, including social and emotional support
3. the 'management environment' – controlling, coordinating and integrating work processes that include remote workers, colleagues and business partners
4. the 'social environment' – the consequences of telework for society, transport and ecology.

5.3.6 The Fifth European Assembly on Telework and New Ways of Working, Lisbon, 23-25 September 1998

The Fifth European Telework and New Ways of Working Assembly (Telework'98) will be held in Lisbon between 23-25 September 1998. The Assembly is Europe's top annual telework event for practitioners, policy makers, industry, researchers and consultants at all levels. With the overall theme of *Rediscover life...Be there from anywhere*, Telework'98 will be the opportunity for an informed discussion on the state of art of telework at a global level. Above all, it will be a privileged forum for evaluating the prospective architecture of work in the next century. During the five parallel sessions and two plenary discussions, a range of important topics will be discussed, including telemedicine, the technological and

[95] See http://www.eto.org.uk/events/keyevent.cfm
[96] See http://www.wise-forum.org
[97] For more information contact the Turku School of Economics and Business Administration: Tel.: +358 2 338 3409; Fax: +358 2 338 3451; Email: reima.suomi@tukkk.fi; http:(//www.tucs.abo.fi/events/teleworking/indexx.htm

organisational environment, new working opportunities, the integration of disabled people enabled by teleactivity, the legal and contractual framework, and the future of the work society.

Telework'98 is being organised by two Portuguese organisations. APDT, the Portuguese Association for the Development of Telework[98], launched on 23 July 1997, is a non-profit-making organisation created to help improve and develop telework, thus contributing to the growth of the economy and the creation of employment opportunities. TELEMANutenção[99] is a network of people supplying quality professional services from their homes through the use of information technologies. These organisers are supported by three primary sponsors: Portugal Telecom as the leading Portuguese telecommunications supplier; DGXIII of the European Commission which is playing a central role in stimulating the beneficial introduction of new ways of working; and Sun Microsystems as one of the world's leading providers of award-winning products, services and support solutions for building and maintaining networked computing environments.

Participation in Telework'98 will, as in previous years, be the highlight event of the European Telework Agenda. It will be a unique chance for all interested in telework and new ways to work developments to keep abreast of the latest thinking and to meet the main influencers and players in this expanding field. Keep up-to-date with Telework'98 news and developments on the web-site:

http://www.teleman.pt/telework98/

5.3.7 European Telework Week 1998

As in previous years, the European Commission DG XIII will support *European Telework Week (ETW)* during the first week of November 1998. ETW has grown into a major event, providing platforms for debate as well as leveraging awareness raising of new ways of working at local, regional, national and European levels. ETW'98 is the fourth such event. In previous years DGXIII and its telework constituency managed to bring together over 30 events in 1995, over 50 in 1996, and this soared to 147 registered events and over 345 reported events in 1997 (see section 3.17.4 above).

Planning for ETW'98 is already taking shape. Five European-level sponsors have already pledged their support: CISCO, France Telecom, Siemens, Telecom Italia and Tosiba. Groups and individuals across Europe that make this week the focus of so many of their activities are launching their plans and gathering their resources to generate an even greater impact than we saw in 1997. In addition to well-established activities at local and national level, which will attract even more participants this year, the Telework Awards are also expanding and it is expected that there will be many examples of excellence in telework development. In 1998, there will be seven award categories:

1. Best Contribution to European Competitiveness
2. Best Advertising Campaign
3. Most Entrepreneurial use of Telework
4. Most Innovative use of Technology
5. Best Public Initiative

[98] See http://www.teleman.pt/apdt
[99] See http://www.teleman.pt

6. Best Contribution to European Sustainability
7. Best Single Article or Programme

Support mechanisms for ETW'98 are already in place and include:

- as an organiser of an event you can use the European Telework Logo in your documentation, adverts, etc.
- if you have a web site you can link to the national and international web pages and they will reciprocate.
- documentation and newsletters that are widely distributed around Europe will help give your activity visibility.
- the national support centres will be happy to advise on several aspects of organising an event based on experience.

The Telework Week web site is collecting information regarding the various activities about Telework Week, as well as the awards and other items of interest. This web site is complementary to the ETD web site www.eto.org.uk where there is a substantial and rapidly growing repository of information about European, National and local initiatives concerning telework, teletrade and telecooperation. These sites will keep you informed of the latest developments, so get connected to:

http://www.etw.org

5.3.8 Other initiatives

Other networks exist at both regional and national levels, bringing together people to discuss and explore new ways of working. For example, national Telework Associations organise their annual events and commercial event organisers initiate thematic events. Examples of large events with a mainly national participation but an international perspective include: the event organised for the last three years in conjunction with the European Telework Week in London with a focus on business applications; the springtime European Telework Festival in Serre Chevalier, France, which has also now taken place three years running; and the intention to build a network around a yearly event in Berlin with the theme of On-line Cooperation where a multidisciplinary group of people from academia and practice, focusing on new perspectives on telework, come together. (See sections 3.17.6 and 3.17.8 above).

And there is much more. Telework is now firmly on the conference agenda as a subject of continuing interest, in an environment that has become more stable, and serving a growing community of interest. This is substantiated by the fact that multiple, large, annual events on the subject seem to be commercially viable (including sponsorship from private and/or public organisations).

ANNEX 1
EUROPEAN TELEWORK WEEK 1997: COUNTRY ROUND-UP

For an overall review of ETW'97, see section 3.17.4. A full report can be found at http://www.etw.org

Austria

12 events took place during ETW '97 in Austria. Most focused on raising awareness regarding the opportunities provided by information and communications technologies. Activities included an event '@mi-after mining' in Styria, open days at the telework centre in Landeck (Tyrol) and three telecentres located in Vienna. ETW '97 has stimulated several new initiatives. For example, the local authority of Rauris in the Province of Salzburg presented new ideas and projects for the initiative 'Net-Kultur-Dorf Raurisí (Net-Culture-Village) with a follow-up event on 24th Nov 1997.

There was good media coverage, with several reports in national and local newspapers. The week after ETW '97 a telework report was presented on the radio.

Belgium and Luxembourg

1997 was very active in Belgium for telework centred events, particularly in the spring. This activity level extended through European Telework Week, during which the events below were registered. As in 1995 and 1996, the Belgian Teleworking Association (BTA), also collected the written commitment of 20 top political, academic, industrial and media personalities, who agreed to form the Belgian National Committee for ETW'97.

On November 5, SRBII (Belgian Royal Society of Engineers and Industrialists) organised a conference on telework with the support of BTA. The agenda was designed to cover the main telework related fields and the speakers included key experts in these fields:

- Christian Van Asbroeck of BTA introduced and chaired the session
- Marc Vandercammen of IWERF developed the workers (and union) point of view
- Laura Ballarin of the Ministry of Labour clarified the provisions of the law on home working
- Jean-Claude Adam of IBM explained their successful large scale implementation
- Paul Van Binst of ULB commented on economic and societal impacts

On November 6, Fabrimetal (professional association of metal, electrical and electronic industries) launched a six-week roadshow to feature daily throughout the country, on «Innovate and Produce via Internet- the Winning SME». The highlight of the launch session was a live demonstration of telecooperation between two small industrial enterprises, one that designed a prototype and another that manufactured it using the CAD-CAM file telecommunicated by the former. In addition to e-mail, telephone and video conferencing were used for human interaction.

On November 7, the European Telework Awards ceremony was organised in Brussels by ETD, with support from BTA. Also on November 7 and following the awards event, BTA held its annual reception. As in previous years, this was the opportunity for BTA executives to refresh their contacts or make new ones with key people who may help in 1998 activities.

No event was reported in Luxembourg. However, the country was not inactive during the year, as a telework association was in the process of being created, with support from BTA.

Denmark

'Distance working in Storstroem County', Vordingborg, was a series of events over a five day period. They included a touring bus and open house events. Leaflets were handed to Copenhagen bound commuters at Naestved railway station and practical demonstrations of telework by experienced teleworkers took place at the main shopping centre. Naestved is Denmark's leading 'spearhead region' for the Information Society and has invested alongside Tele Danmark and Telia in developing leading edge infrastructures and services.
http://www.naestvednet.dk

There were also conferences in Copenhagen, and a seminar at Aabenraa, the main city in the Danish County of South Jutland. The Danish Employers' Federation and the Danish Trades Union Congress, discussed the different forms of telework and reviewed the many initiatives taken by the Danish social partners (employers' and trades unions' organisations) concerning telework over the last 12 to 18 months.

Overall the events of ETW '97 throughout Denmark were judged a success. They were supported by good local media coverage for the regional events. Although there has been a dramatic change in attitude to telework over the last two years, important gaps in awareness and practice remain. One is that the enterprise and organizational dimension is typically ignored, whilst discussion focuses almost exclusively on the conditions of employed teleworkers working at home.

Finland

ETW '97 in Finland was inaugurated by the seminar 'The Limitless Local Economy', held in Jarvenpaa from 3-4 November. This seminar triggered practical discussion on how to develop local economies in the Information Society. Other events included an open house in Rovaniemi (Lapland), 'Telework and Subcontracting' seminar, Rauma (Satakunta) and 'Telework Open Market', at University of Tampere.

There was an Open House all week at Ammatti-instituutti (Helsinki), the largest vocational adult education centre in Finland. Attendees learnt about the telework 'driving licence', which tests the person's ability to telework. Passing the test enables the person to be included in a teleworkers file (WWW), from which possible employers can seek suitable employees.

France

ETW'97 saw the first involvement of France in organising large scale events with major actors. A political focus was given with three events taking place at the French Senate. First, the launch of Telework Week with a welcome speech from Mr. R. Monory, President of the Senate; second a relevant presentation by Mr. P. Johnston to introduce a debate on the Information Society with two senators -MM F. Serusclat and A. Gérard organised by the French Telework Association; and finally a demonstration of the Epri-Watch system (see Annex 2). This was also the opportunity to present the Telcard project in which France Telecom was a major actor.

France telecom also organised the first Telecom Forum in Lyon with a set of conferences and debates about telework and teleservices which attracted about 3,000 people. Telework Week was also the opportunity to organise a large event in Guadeloupe (French Antilles) which covered all the aspects of the use of ICTs in daily and business life and attracted about 15,000 visitors over five days. Further, two telecentres -Telpro and Telespace du Vercors- organised on open door day and shared experiences through videoconference for the visitors. Distance learning was tackled during a half day conference at the Ministry of Education, and art was also part of Telework Week with the Chaos in Action project which involved eight cities and more than hundred artists.

Germany

Events during ETW '97 included a conference for insurance companies organised by Management Circle and a Cafe Mondial stand at the Software Forum Saar.
http://www.cafe-mondial.com

Events in Southern Germany, included presentations on Virtual KMU Management, Solkit, CoCoTel projects and Euro. The latter included a discussion by experts about telecooperation by videoconference.

One month after ETW '97 (4th December) the biggest German teleworking event in 1997 took place. Attracting 650 visitors - most of them SMEs, there were 4 parallel sessions and a plenary session. Here the federal initiative 'Telearbeit fur den Mittelstand' ('Telework for SMEs') was introduced, including an award ceremony for the best concept presented to introduce telework into an SME. The goal of the initiative, where TA Telearbeit is conducting the accompanying survey and academic study, is to help up to 5000 SMEs with a total budget of about 10MECU to become teleworking enterprises as soon as possible.
http://www.iid.de/telearbeit/mittelstand/

Ireland

There were two main events. A one day conference 'Teleworking: sweatshop or social progress?' was held at the European Foundation for the Improvement of Living and Working Conditions, Dublin. This was opened by the Minister for Communications and attracted 85 attendees. Two 2-hour hands-on Internet courses were run at PFK Computers, Cork.

Telework Ireland - the Professional Association of Teleworkers in Ireland - held its Fifth National Conference - "Teleworking Your Business". This successful two day event was opened by the Minister for Science Technology and Commerce and included the launch by Forbairt, the Irish Government Development Agency, of its brochure "New Business Opportunities in Teleservices" written in conjunction with Telework Ireland, and the formal affiliation of Telework Ireland to the Small Firms Association (SFA), the representative body of SMEs in Ireland. Presentations considered the many facets of integrating teleworking into the organisation and using it to develop the newly formed business. Workshops, focussing on practical and specific items which are identified as issues and areas of potential by Telework Ireland, provoked much interest and involvement by delegates. The event attracted a major and unprecedented level of sponsorship from leading business interests including Telecom Eireann, The Sunday Business Post, Hewlett Packard, Hibernian Insurance and Co-Operation North. Media coverage included live coverage and 11 minute feature on national television, 15 minutes live coverage on national radio, and extensive coverage in the national, provincial and business press.

The highlight of ETW '97 in Ireland was excellent general media coverage. On national radio on 4 November, the Pat Kenny Today show, that attracts around 10% of the population, did a 15 minute feature on teleworking. Participants were Imogen Bertin, ETD National Coordinator, and Nicola Sheridan, a teleworker for VHI, Ireland's largest health insurer. Following the events and media coverage, over 250 telephone enquiries were received by the telework enquiry line.

Italy

During ETW '97 over 32 different seminars, conferences and training courses on telework were held in 15 different Italian cities. The 6th November was telecentres' 'open day' throughout Italy. The new 'Proxima' centre in Sesto S. Giovanni was inaugurated by the Agency for local development of North Milan. The main goal of ETW '97 in Italy was to change the public perception of the telework stereotype of being work "at home, mainly done by woman, using a computer".

The events included a press conference at the 'Frentani' Congress Centre, Rome, an official opening ceremony with the participation of Government representatives and industry top managers, and conferences in Rome, Milan, Naples, Reggio Emilia, Modena, Ancona and other centres. Videoconferencing was used to connect several locations and a course was held using videoconferencing between Rome and Naples.

During the week ETD and Services On Line offered a free telephone help desk to SME managers and entrepreneurs for explaining the opportunities of telework. The service was used by over 50 firms.

Media coverage was excellent, amounting to over 70 different articles, radio and TV interviews in national and local media, including "L'onda lunga dei telecentri" (on the emergence of telecentres in Italy) in *Il sole 24 ore*. Many articles and reports were focused on telecentres and the two participating centres (Nexus in Rome and IFOA in Castelnuovo ne Monti) became the scenery for many TV shots.

The organising Committee estimate that at least 10,000 people were directly involved in ETW '97. One of the most important results was the 'mass-discovery' of telework and, as hoped, because of the telecentre coverage, the shift of the message away from just "working at home".

There was also an event organised jointly by the CEILL and MIRTI Consortium on 'Telework: a perspective for new generations', which attracted 200 participants and included speakers from the Commission as well as politicians, experts and companies.
A full report on ETW97 in Italy can be found at http://www.mclink.it/telelavoro/etw97

The Netherlands

ETW '97 in Holland was marked by a single large event, organised by Focus and Quercus, that combined a large seminar, and the fourth Dutch telework award. The two day event attracted 250 participants. The prize winners were Twijnstra and Gudde for their model to define a new workplace, and Interpolis, an insurance company, for their courage in implementing a new flexible office for 1500 users, including middle and top management. There was good media coverage including slots on television and radio.

Already plans are under way for ETW '98. The venue will be the Mediaplaza in Utrecht, a high tech demonstration area. Each day of the week will focus on a different aspect: of telework - overall management, employment for 'other' groups (handicapped, women, elderly etc.), facilities management, individual aspects, and human resources.

Spain

As part of their contribution to the European Summit on Employment in Luxembourg, the Information Society Forum Group under the chairmanship of Mr. Majo issued the 'Barcelona Declaration'. It's key points are:

1. The relationships between technology, productivity, growth and employment are complex. Any simplistic approach to the problem is dangerous.
2. The promotion of the Information Society could be and has to be a key pillar of European employment policy.
3. The challenge is to develop the necessary conditions to fully exploit the job potentialities of the Information Society.
4. The modalities of growth in coming years should be different as different economic conditions are present.
5. Growth alone will not solve Europe's unemployment problems.
6. Information Society is at the root of sustainable growth.
7. Market forces alone will not solve Europe's delay in entering the Information Society nor eliminate unemployment.
8. Public authorities have a key role to play in this domain.
9. Budgetary resources exist at all levels for new active employment measures related to preparing people and organisations for the Information Society.
10. The Luxembourg Summit should establish lines of action for European as well as national policies in this domain.
11. The Information Society Forum is ready, at the request of the Luxembourg Summit, to provide further insight.

Barcelona November 3, 1997. The full text is at:
http://www.etw.org/97/news/html/barcelona.html

Sweden

Over twenty different events took place during ETW '97. Highlights were 'The Competence Fair', 'The Internet World fair, Virtual organisations the winners of tomorrow?'. There was a lunch seminar at the World Trade Centre, Stockholm: 'Telework: practical consequences in a flexible world.'

It must not be forgotten that ETW '97 was somewhat overshadowed this year by the high profile pan-European Event ***Telework´97*** held in Stockholm during September (see section 3.17.3 of this publication).

Additionally, many important activities were done internally within organisations. Such internal activities were of high quality, and according to ETD National Coordinator Lilian Holloway: "they will probably have a much deeper effect on promoting telework, since they are rooted in the organisation's own interest."

United Kingdom

Telework World in London was the main event of ETW '97, attended by over 200 delegates. Topics included the impact of teleworking on people and the way they are managed; a broad view of industrial relations across Europe; specific issues relating to tax, insurance, health & safety and employment. Speakers also covered the latest developments in remote access technology and videoconferencing, pointing to the rapid growth in these areas. The conference also practised what it preached by videoconferencing its opening sessions to over 80 'virtual' delegates at five telecentres, and webcasting to 30 more virtual delegates.

During ETW '97, The UK Telework Platform, a co-ordinating body for organisations that promote and develop telework, launched to Members of Parliament a manifesto 'Telework: The Opportunity'. The document urges the Government to encourage teleworking through employment legislation, tax incentives and by exemplifying teleworking. It urges the government to:

- Enable individuals to choose their preferred lifestyle secure in the knowledge they are protected from exploitation
- Exhort businesses to identify the benefits of telework for them and adopt best practice
- Encourage people to telework rather than travel whenever possible
- Exemplify this through the civil service, saving both money and pollution

ANNEX 2
TELEWORK-RELATED PROJECTS AT EUROPEAN LEVEL

1. Commission contacts

The ACTS Programme

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Article 10 of the ERDF

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2. Projects in alphabetical order

45 plus	**ADAPT Initiative**

The objectives of the project are to develop training and consulting methodology. The information technology training needs of SME employees, over 45 years of age, will be studied, and a training programme to increase their capabilities in the use of IT and telework will be put into place. The project aims to improve SMEs' ability to capitalise on the new opportunities brought on by the information society, whilst preventing the exclusion of older employees by giving them capabilities to operate in an environment based on information and the utilisation of information technology.

The project is going to develop and test different approaches for providing learning and development, based on needs analysis and individual development plans for identified target groups in a number of pilot SMEs. The results / experiences from the three national partner projects - Belgium, United Kingdom and Finland - will form the basis for a guide on best processes, methods, means and practices.

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Finland

AC-DIRECT	**Article 10 of the ERDF**

The aim of AC-DIRECT in the region of Västerbotten in Sweden is to create a regional network infrastructure for public and private organisations with a strong focus on SMEs and to inter-connect companies and public authorities at low cost and offering at the same time an affordable connection to other regions and countries via a common internet gateway. AC-DIRECT's expected impacts are to:

- enhance effectiveness of marketing and export capabilities of SME's
- improve the provision of public services
- stimulate telework possibilities
- facilitate the efficiency of public administrations

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ACTI LIMOUSIN	**Application Concrète des Technologies del'Information en Limousin)**	**Article 10 of the ERDF**

ACTI Limousin will be developing a strategy and action plan for the Limousin region of France. Although the region has a good telecommunications infrastructure, there is not a lot of activity in the services offered by new technologies. The Conseil Général du Limousin in Dec. 1993 decided to establish a regional Master Plan with the aim to identify the major concerns in the region in the context of Information Society. Based on the conclusions of this examination, the region established in 1995 a unit within the Agence Régional de Dévéloppement (ARD) which will promote the new information technologies and which is also responsible for this proposal. As a result of the 1994 Master Plan on Information Society, there are 4 main proirities 1996-67:

- awareness programmes dedicated to small and average size enterprises (SMEs);
- intoduction of information technologies to educational practices and the development of new training methods in schools and universities;
- promotion of teleworking companies and of actors of new information technologies in the area.

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ACTIVE	**ACTIVE multiplier project**	

Taking into account the results of the AVISE project (see entry), the ACTIVE multiplier project aims at favouring access to employment through teleservices (or teleactivities) for the unemployed, including disabled people. ACTIVE is a two year project (December 1997 to December 1999) co-funded by the LEONARDO-DA-VINCI Programme of DGXXII. The main objective is to train in tele-skills in order to provide teleservices, e.g. how to conduct a telephone conversation in order to ensure customer satisfaction. Conception, development and validation of training modules are made in close partnership with teleservice businesses in the 3 countries involved in the project: France, Germany and the Netherlands. The trainees are using teleworking methods.

Contact ACTIVE:
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ACTSLINE	Marketing ACTS results	ACTS Programme

ACTSLINE aims to act as a marketing department for the ACTS programme. It will identify which results will interest actors outside the programme, develop customised packages of information for each group of actors and actively promote the ACTS messages to them. In addition it will seek out packages of ACTS technology which are almost ready for commercial development and encourage groups of interested actors to develop roadmaps for the final pre-competitive steps. Link to Telework/Tele-cooperation:

ACTSLINE will package results from the ACTS programme for specific constituencies, including telework, new ways of working, e-commerce, etc. The project will gather market issues and requirements in this area, with support from the National Coordinators of the ETD project.

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AEGIS	the European study centre project	ADAPT Initiative

The Grampian Region of Scotland is predominantly rural (Objective 5b), but with major industries around which a culture of sub-contracting is developing. Grampian Enterprise is the sponsor of a project which is developing a flexible framework of virtual learning opportunities for the growing number of teleworkers, as well as for small firms, outsourcers and sub-contractors. The project, which is based in the city of Aberdeen, but covers the wider region, recognises that teleworkers, who often work in the rural parts of the region, share with small firms, difficulties of gaining access to training and other learning resources. The local consortium behind the project involves colleges, universities, and the economic development agency, which includes the chamber of commerce. These partners are establishing a linked network of virtual learning centres offering training and learning which can be accessed online, and which will be linked to the system of National Records of Achievement. It will provide teleworkers with a service enabling them to develop and follow programmes of lifelong learning.

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AVANTI	Adaptive and Adaptable Interactions for Multimedia Telecommunications Applications	ACTS Programme

The main objective of this project is to demonstrate, through practical testing, that it is possible to develop generic multimedia telecommunications applications of important social impact and potential commercial value, which are adapted and adaptive to the requirements of most potential users (including e.g. disabled people, elderly people, occasional users, professionals), in terms of communication means, information content and man-machine interface.

Link to Telework/Tele-cooperation:

AVANTI is particularly interested in the social impact of advanced telecommunication services on potential user groups. Therefore, some joint planning and conducting of trials together with the project will take place. Originally, the prime focus has been on the development of instruments for improving accessibility of teleservices for people with specific needs. However, since their use requires extensive training, the project will have to engage in trials with different groups of handicapped and non-handicapped people to prepare for new ways of working, including teamwork.

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AVISE	Telework and People with Disabilities	Telematics Application Programme

The AVISE study was carried out within the context of the TIDE initiative (Technology Initiative for Disabled and Elderly People) of DG XIII from July 1994 till July 1995. Three countries were covered: France, Germany and Spain. The main objective was to analyse how teleworking could really favour access to employment for disabled people. For that purpose, case and feasibility studies, interviews with 'key actors' and an examination of training requirements have been carried out. The AVISE findings led to practical recommendations and propositions which underline the necessity to be very cautious when promoting telework for disabled people. On that basis, the AVISE project partners are now implementing telework and/or teleservices related training programmes for disabled people.

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Betratungs und Qualifizierungsprogramme für Klein-und Mittelständische Unternehmen	ADAPT Initiative

Competence development: trainer qualifications; new qualifications
New jobs: teleworking
Enterprise strategies: gaining new markets, structures to handle incoming orders.

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BINTERMS	Basic Interoperability for Terminals for Telematic Services	ISIS Action

BINTERMS is in the Teleworking Domian and validates key components of the T.120 protocol specifications for functional and syntactic completeness. A major part of the project is to identify the conditions and requirements for basic compatibility of terminals for telematic services conforming to the ITU-T recommendation T.120 series. This will result in a significant contribution to standardisation organisations and working groups including the ABK/VCC (Video Communications Committee - chaired by a project member), ATM Forum and ITU-T. BINTERM validates the T.120 protocol and basic compatibility specifications by producing detailed test specifications (ATS - Abstract Test Suite) and implementing the ATSs using special TTCN tools.

Relevance to standardisation:
There is a clear requirement for common standards among organisations and their IT systems. the BINTERMS consortium will supply appropriate standardisation bodies (e.g. ETSI, ITU-T, VCC, ATM Forum), and other ad-hoc groupings concerned, with relevant inputs, e.g. test suite structure (TSS), test purposes (TP), and abstract test suite specifications

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Bootstrap	ADAPT Initiative

The aim of the project is to develop a common approach to provide strategic advice and support to SMEs in order to enhance their competitiveness in the global market against unemployment through
Modern information technologies.
In the south of Hesse a centre of competence for telecooperation, teleworking and teleteaching has been established in order to meet the specific needs of regional enterprises providing them with direct access
to new information systems and offering them training and seminars.
Main activities of the Bootstrap project are:

- 7 Supporting SMEs for improving the qualification of their employees
- 7 Providing information and transfer of modern telecommunication techniques
- 7 Demonstrations of telecommunication techniques supporting teleworking and telecooperation

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BOURBON	Broadband Urban Rural Based Open Networks	ACTS Programme

The BOURBON project seeks to address the issue of providing cost effective, saleable access to ATM-based advanced services for SMEs in the wider context of Europe and the Information Society. There are two parallel streams running through the project, one technology-focused, demonstrating advanced features of ATM-based networking, the other user-focused, with particular emphasis on the needs of SMEs, both urban and rural. It is within the convergence of these streams that the project will ultimately seek to define network and service architectures taking into account present technology that will support the move to higher bandwidth services whilst maintaining a realistic view on what is required by SMEs and on the affordability of the services.
Link to Telework/Tele-cooperation:
Within this framework, BOURBON plans to look at the link between ATM-induced improvements in SME-internal logistics and in the value-added chain "suppliers-SME-distributors-customers/clients of the SME's product(s)" on one side and the economic and social sustainability of those new ways of working on the other.

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CAFÉ MONDIAL	Communication Applications for Education, Multi-user Open Network Design, Infrastructure and Logistics	Telematics Application Programme

Café Mondial is a project funded by the Urban and Rural Areas sector of the EU's Telematics Applications programme. The project, launched in February 1996, aims to establish a network linking universities, institutions, enterprises and users across the world to provide opportunities for learning and working on-line. The project partners are now providing a wide range of courses on-line in the following field of health care, animal health, business studies, languages, information technology and telework, multimedia, and arts and culture.
Café Mondial members can provide or attend general and professional training as well as training for university degrees. Members can also supply, or shop for, media, hardware and software. Café Mondial centres have also been established, where members and visitors can learn how to use modern communication tools critically, creatively and efficiently for telelearning and teleworking.

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CALL-WARE		ADAPT Initiative

CALL-WARE, promoted by the small Flemish enterprise Controlware Benelux, will respond to the radical change in the telecommunications which will take place with the fall of the industry's protective barriers throughout the EU. This will be an exceptional opportunity for European businesses to develop new types of services for consumers and businesses. The project will create a network of SMEs wishing to capitalise on this liberalisation of telecommunications. The principle object is to establish an international 'Call Centre' to meet the needs of their clients on a 24 hour basis, by offering telephone information and support on products and services. Participating SME employees will be offered know-how on managing an SME in the telecommunications sector; on the market in the Benelux; on the different needs and markets of other EU countries; on data transfer systems such as ISDN and ATM; and language training. This inter-company co-operation would enable those participating to offer a wider variety of products and support. This innovate project goes far beyond the typical 'telesales' that usually make up call centre activities, and represents an important step towards adapting technology for the small enterprise's needs. The transnational partnership will engage in exchange of information and material, joint conference, and the joint development of products.

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CoCoTel Kooperation und Kommunikation durch Teleworking	**ADAPT Initiative**

The project illustrates the use of telework as telecooperation between SMEs. It is aimed at developing a network of SMEs in the field of Industrial Safety. The main objective is to help SMEs implement the revised Industrial Safety Standards and enable them to access information and consultancy in the field of health and safety. Thanks to the network, SMEs can communicate to each other and provide sources of information as well as training in the field of Industrial Safety. Competent experts from public and private institutions will be available to guarantee a high level of quality and a constant updating of the information provided on all features of Industrial Safety.

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Commutech	**ADAPT Initiative**

The project is using Euro ISDN and media conferences to set up a decentralised enterprise and management for 15 entrepreneurs in the field of out-sourcing. The entrepreneurs and the workforce of these SMEs are telematically linked in a so-called virtual enterprise. They are provided, through tele-coaching, with expertise and counselling, and through tele-teaching, they are given management training and skills to meet new job requirements. Transnationally, it will develop and evaluate the potential for multi-media approaches to teleworking for outsourcing of companies' activities.

[Afventer update of project description]

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COMPRIS	**Cooperating Members of Public and Private sector toward a Regional Information Society Strategy**	**Article 10 of the ERDF**

COMPRIS is an iniative to promote a Regional Information Society Strategy in the Yorkshire and Humberside region of the UK. The projects targets SMEs and the public in general for raising awareness and promote training opportunities. As there is no regional government in UK, COMPRIS, for the first time, will unite all key regional players and link existing initiatives to the Information Society initiative. Working groups will focus on teleworking, distance learning, knowledge networking, telematic services to businesses, healthcare networks, andpublic services.

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COTCOS	**European research network on cooperative technologies**	

COTCOS is a CSCW (computer-supported cooperative work) project funded by the EC Training and Mobility Programme, and is mainly devoted to improving European collaboration through the exchange of students and researchers. The project objectives are to develop new and innovative approaches to the analysis of cooperative work in complex work settings and to the design of CSCW systems for such settings. Accordingly, the COTCOS research is multi-disciplinary. The network involves universities in France, Ireland, the UK, Belgium, Italy and Denmark.

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France

CREATION OF A NETWORK OF TELECENTRES IN EMILIA-ROMAGNA	**ADAPT Initiative**

The project will carry out experimental research on a large sample of enterprises to analyse the potential of teleworking in relation to requirements, to the organisation and to information flows in the companies themselves. A series of awareness-raising seminars will be offered to managers and technicians who are responsible for company decision-making processes on the use of teleworking. Some of the training courses will promote the dissemination of the network culture in the SMEs of the region. A network of Telecentres, located in the Chambers of Commerce of Emilia-Romagna, will be organised to enable experiments in teleworking, and to promote new forms of co-operation and communication between companies as a tool for competitiveness on national and foreign markets.

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DEMETER	Distance Education, Multimedia Teleservices and Telework for Farmers	Telematics Application Programme

DEMETER is applying telematics to bring a better quality of life for farmers living in isolated rural areas in five European countries. It is providing easily accessible educational and consultancy services, including regional marketing information and opportunities for international co-operation in a sector undergoing profound change and where there is a need to provide new jobs. The existing regional infrastructure is being harnessed and comparable strategies developed for similar areas elsewhere.

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DIANE	Design, Implementation and operation of a Distributed Annotation Environment	ACTS Prograame

Distributed multimedia services envisaged today in most cases distinguish sharply between service and content provider on one side and consuming users on the other side. Only a few applications have been realised strengthening the role of end users both as content provider and consumer. Existing multimedia
authoring systems are either application-specific or allow solely combinations of media generated entirely by a user, as is the case for multimedia mail. The goal of the project is to develop a multimedia service removing these deficits. DIANE is conceived as a service allowing users to create, exchange and consume multimedia data easily. As trial applications, the DIANE Consortium is testing the annotation service in two areas:

1. telemedicine (pathology, radiology and medical imaging in general)
2. computer based training for parallel programming tools.

Link to Telework/Tele-cooperation:

In order to cooperate by exchange of annotated documents, the DIANE users access a shared workspace situated on a common server. The powerful combination of multimedia authoring, audio/video streaming and groupware technology provides unique advantages for teleworkers.

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DIPLOMAT	European Charter for Teleworking	ACTS Programme

DIPLOMAT comprises two main actions:

- to create a comprehensive European Charter for Telework, identifying applications for ACTS and other technologies, and to obtain agreement on that charter.
- to contact up to 2000 influential organisations in the process of discussions and of obtaining agreement, in order to solicit their views and inform them about teleworking, ACTS Technologies and the Information Society, stimulate telework trials and usage of ACTS technologies.

Link to the Telework/Telecooperation Chain:

DIPLOMAT will use input from ACTS projects in general, and, more specific, from GAT Chain projects, in developing the guidelines.

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URL: http://www.telework-forum.org/diplomat.uk
New site: http://www.wise-forum.org

DISNET STEP BY STEP	EMPLOYMENT Initiative HORIZON

This project sees the development of tele centres as a key factor in developing opportunities for people with disabilities as they give the target group direct access to tele training. The centres also enable people with disabilities to work with enterprises via the Internet. Opportunities for self-employment of the target group are also being supported. The project also manages a Panhellenic database that provides information on training and employment opportunities for people with disabilities. Awareness raising strategies aimed at employers and young people entering the work force is another feature of the project. The awareness raising campaigns will also be extended to family members and the general public.

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Dispositivo de Intervencion Comarcal para Teletrabajo Comarca del Bages	ADAPT Initiative

The project is situated in a region of Catalonia characterised by traditional industry (textiles, metallurgy, mining), which is in the process of transformation, and by the emergence of new economic activities. The introduction of teleworking in newspapers has stimulated interest in widening the approach to the work of other sectors. The local (departmental) administration is setting up an initiative to create telework, involving:

- carrying out research into the potential of the region to generate telework in response to the impact of technological innovation, and to changes in work organisation;
- revising companies' production and work organisation processes so as to develop their human resources, and improve their potential to adapt to teleworking;
- exploiting new business opportunities (production and services) which are likely to lead to simplification of processes and structures, to outsourcing of production, and to working in networks;
- supporting cultural change and adaptation to new forms of distance working;
- encouraging the creation of businesses experimenting in new forms of teleworking

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EIES	European Information Exchange Service for the communication between harbours	ACTS Programme

EIES aims at defining, implementing and experimenting an advanced communication service to support routine and non-routine communication between harbour authorities, ship owners, customs, fire brigade etc. within harbour areas. To do so a demonstrator will be put into place and be used on a platform based on several technologies (Internet, ATM, ISDN, mobile technologies).

Link to Telework/Tele-cooperation:

Will provide input on guidelines on telecooperation and telework by exploring implementation of AC in-depth in a specific environment.

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http://www.isl.org/EIES

EMPLOY	European Multimedia Pedagogic Local Support Network Organisation for the Social Integration of Unemployed Young Europeans	Telematics Application Programme

EMPLOY offers a telematics network for the social integration of unemployed young people in five European countries. This involves building and interconnecting multimedia training centres, and the preparation of multimedia training content and methods evaluated in comparison with traditional practice. The project involves local authorities and interest groups (NGOs) which are attempting to provide teleservice and teleworking tools for persons who may be socially excluded because they are unemployed or under-employed, and who may lack the necessary training to become active members of the labour market. Creating employability is an important goal here.

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EPRI-WATCH	European Parliament Research Initiative Watch	ACTS Programme

The project's main objective is to stimulate information exchange between those involved with technology development/trials in ACTS, and those involved in policy debates on Information Society issues in European, national and regional parliaments and policy making bodies. Seminars and workshops on fields of common interest combined with video events and distributed seminars and presentations of ACTS trials and demonstrations will be held to generate better awareness of the policy concerns relating to technology developments. The main trial will involve the use of advanced telecommunications by parliamentarians themselves and by their support staff and will generate valuable feedback for the Commission's research programmes from an important user group.

Link to Telework/Tele-cooperation:

EPRI-WATCH can play an important role in the development of guidelines on a political level, by providing assistance in communication with the political community.

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Erstellung und Umsetzung von Marketingstrategien für KMU	ADAPT Initiative

This project's two main objectives are to strengthen the competitive position of SMEs in the Brandenburg region and to increase awareness on the possibilities of ICT usage. The project's main activities:

- Training and stimulation of SMEs on the use of telematics, teleworking and Internet.
- Development of teleworking places in SMEs and professional staff training.
- Development and implementation of Internet marketing strategies for SMEs.
- Development of new tools for electronic commerce and on-line service.
- Development of the regional economic structure of Brandenburg in conjunction with marketing on the Internet for products of the companies concerned with the project.
- Development of the informational structure in Brandenburg.
- Assistance in the commercial field for the companies working within this project.
- Connecting the commercial field with the Internet presentation.

Installation of a teleworking place within each company that participates in the project.

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ETD	European Telework Development	ACTS Programme

ETD has a wide remit covering telework, tele-trade and tele-cooperation, which includes direct support to the ACTS telework chain as well as comprehensive dissemination and awareness-building activities across Europe in order to:

- stimulate early and effective take up of telework
- develop common and concerted actions at both European and national level, using professional outreach methods to reach selected target audiences
- remove barriers to take up by developing a clear vision and perspective of telework, and sharing this with the parties concerned
- stimulate and support early and widespread use of the technologies of telework through a European network of telework websites and associated on-line services

Important mechanisms employed include:

- the most comprehensive and frequently visited global web-site for telework, plus a network of related web-sites many of which are in local languages
- support for European Telework Week each year in November, which in 1997 experienced a significant increase in activity and impact with 147 registered events across Europe
- comprehensive national and local initiatives and support through a network of 14 National Coordinators

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European Teleworking Market - Europäischer Telearbeitsmarkt	**ADAPT Initiative**

The aim of the project is to train employees in teleworking, to develop computer-based training materials, and to advise companies on telework. A CD-ROM will be developed, which introduces participants to teleworking systems, exploring interfaces between users, companies and the Internet, and practicalities such as connection to the Internet and to the company, and accessing data and documents. Also, company processes will be simulated in the fields of accountancy, staff management, marketing, and organisation. The CD-ROM will enable the trainees to take on self-study (simulation of company processes). Supervision and advice accompany the training via e-mail and the Internet.

Workshops will be organised for the users of the CD-ROM to complement the material and to provide practise session for those without a CD-ROM drive, or Internet access. Advisory and support service for SMEs on teleworking will be developed via a homepage on the Internet. The homepage will contain information on the project, a networking service between potential teleworkers and companies, a newsletter and an information platform on the subject of teleworking.

Information and advice for SMEs will be provided in the introduction of telework, as well as the possibilities for co-operation in related affairs. In the framework of this part of the project, 35 companies will be given thorough advice on the subject of telework.

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European Virtual Enterprise Network Transnational	**ADAPT Initiative**

This project is concerned with the establishment of a pilot training experience on teleworking to anticipate new activities, notably within SMEs.

41 workers, threatened by unemployment or already in a conversion situation will be involved as well as 10 trainers. An awareness raising campaign will be carried out aimed at the local authorities concerned with economic development.

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EURO-TELETRAVAIL	Formation de Travailleurs au Télétravail, Création et Guidance de Centres d'Autoformation au Tékétravail	ESF Objective 4

This project's ultimate goal is to set up a European network of education centres offering a regular course programme in telework. It is an Objective 4 project, designed to enhance workers adaptivity to industrial changes. The target users are the SMEs.

Starting in 1998, a network of five technical and business High Schools, one in each of the French-speaking provinces of Belgium, offers a full, modular, education programme covering organizational, managerial, social and psychological, as well as technical aspects of telework implementation in an enterprise. Self-training centres are also put in place. Local Chambers of Commerce are involved in the programme promotion.

Current associates are the University of Firenze, Italy (Banca Impresa project) and the University of Erfurt, Germany (teleworked jobs creation project in Thuringia).

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EVENT	European Virtual Entrepreneur Network	ADAPT Initiative

The project will deliver training, counselling and advice on self-employment for workers made redundant due to industrial restructuring, especially in SMEs. It will construct, develop and test a transnational model to train people for the new virtual style of working, and it will seek to create job opportunities in new virtual companies (teleworking networks). The transnational partners will create a European Virtual Enterprise Network that will act as a transnational agency/clearing house for collaboration and support.

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Fortel - Formacion de Teletrabajadores	ADAPT Initiative

Information technology promotes the emergence of new forms of job creation, such as telework. This project aims to help SMEs in the information services and industry to become more aware of, and to adapt to, this new distance working technique. Counselling and training will be provided and other activities will include the development of data-processing equipment to support training and the creation of an Electronic Employment Agency for teleworkers.

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GLADNET	Global Applied Disability research and information NETwork on employment and training	

The GLADNET association is a non-profit organisation affiliated with the Vocational Branch of the ILO (International Labour Organisation). It is an Internet-based association which namely contains an on-line Infobase providing information on practical measures concerning the employment and training of people with disabilities. The Infobase is organised around thematic directories which are developed under the responsibility of the Infobase partners. One of these directories deals with telework issues.

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HTML	Handicap Tele Multiopportunità Lavoro – Nord. Monitoraggio ricerca sulle	EMPLOYMENT Initiative HORIZON

This project will research and monitor trends in the telework market. This research will pay particular attention to the role of the Helios programme in relation to telework. Guidance and training modules for people with disabilities will be tested at regional level. In addition to basic telework courses and methods to adapt the workplace, the project will organise seminars and information modules, guidance and tests.

These will focus on the promotion of self-managing disabled groups, social enterprises willing to invest in this area, support in private enterprises where people with disabilities work and public bodies already involved in the telework domain. A catalogue will be published quoting examples of people with disabilities in telework and a video will be produced and disseminated.

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IBCoBN	Integrated Broadband Communication and Broadcast Networks	ACTS Programme

The main objective of the project is to identify the broadband communication needs of residential users and key residential applications. It also aims to initiate longer term R&D into the IBC needs of the CATV sector and to create a centre of excellence (Euro Cable Labs) to take over the identification of future requirements for local and regional cable networks. IBCoBN will be running trials in several CATV sites in Belgium, the Netherlands, Portugal, UK, Russia and possibly Spain.

Link to Telework/Tele-cooperation:

The universal IBC service planned by the project addresses the communication needs of residential users including older and disadvantaged people, as well as the needs of businesses (with emphasis on SMEs and freelancers/portfolio workers) and of the public sector (in particular health, education and local government). By verifying high speed applications which are desirable and affordable. The project expressed their interest to play a major role within the Telework Chain, as telework is seen as a major application to support by residential broadband.

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ICARE 9000	On-Demand Consulting and Remote Electronic Training for SMEs in Urban and Rural Areas	Telematics Application Programme

ICARE 9000 is using advanced telematics tools like videoconferencing to provide technical support for companies seeking to achieve the ISO9000 certification by using tele-consulting techniques. Some of this consulting support is provided on-line, for example when an SME has a specific problem in applying the quality control manual, as this enables rapid expert advice to be offered. The project aims to improve the access of SMEs, particularly in less-favoured areas, to ISO9000 training courses, the follow-up of information and to offer telematics advice to quality engineers for whom regular travel to traditional courses is costly and time-consuming.

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Identifying and Acquiring new Professional Competencies	ADAPT Initiative

The project is meant to develop methodologies to anticipate new competencies and qualifications in the sectors of data processing maintenance service, graphic arts and teleworking.

New flexible training methodologies will be implemented and tested for workers in SMEs, particularly women.

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IMMP	Integrated Multimedia Project	ACTS Programme

Main objective of the IMMP is the integration of services and service architecture addressing both residential and business users, focusing on the overleaps and synergy between the two. The project will run trials with selected services to understand the key issues: technical, human and commercial, which will effect the successful deployment and end user acceptance of such services.
Link to Telework/Tele-cooperation:
The outcomes of those trials can provide input to the guideline development for the GAT chain.

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Information, Communications and Technology Advisory Service	**LEADER Initiative**

Since it was set up in May 1994, the of the Western Isles, Skye & Lochalsh group has created about 100 teleworking jobs in the Hebrides, in North-West Scotland. One of the main points of this experimental phase was the constitution of a file of potential "teleworkers": a list of some 500 people, either residents or people wanting to move back to the islands, was drawn up and their skills noted. Since no local company existed in this sector, the LEADER group created a limited liability company, "Lasair Ltd", capable of managing contracts concluded with principals from anywhere in the world. Through the nature of the work, these teleworking posts constitute an activity with real added value, which goes far beyond simple data entry but involves skills in editing, re-writing, re-reading, computer graphics, etc. An experimental contract in 1996 with the Scottish Health Board further proved that purely "mechanical" data entry was non-profitable because it faced fierce competition from Third World countries. LEADER provided approximately 35,000 ECU for the supplementary training of the teleworkers.

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Integrated programme for the development of teleworking centres	**ADAPT Initiative**

The project entitled aims at the encouragement of teleworking , this new “type of work” on regional level. More specifically the project aims at the encouragement of teleworking via the development of Teleworking Centres in remote areas of Greece. The targets of the project are as follow:

- Exploration of a study concerning the framework (legal, financial etc) for the teleworking in Greece and in other countries of the E.U as well.
- Collection and recording of employment opportunities of teleworkers in organisations and companies in the main cities of Greece (Athens , Thessaloniki,etc)
- Recording of qualifications and characteristics of the human working potential in the target regions in which the teleworking centres will be established.
- Preparation of the support actions in the teleworking centres
- Establishment and pilot operation of four teleworking centres in remote areas.
- Creation and operation of the Association of Teleworking Centres.

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Iperion “Continuous Traning Telematic Service and Certification”	**ADAPT Initiative**

This project is aimed at the creation of a fully supported, integrated distance learning system. This system, which will have a telemetric base will incorporate the key issues of validation and certification of the training action. New forms of work e.g. teleworking will also be supported.

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JADE	**Joint Approach to Developing Entrepreneurs**	**ADAPT Initiative**

The project will provide a customised approach to developing the skills of SME owner-managers and managers, and will provide telemetric experience normally only available to large firms. SMEs targeted are those employing fewer than 50 staff, and those which have been operating for between two and three years. Materials will be designed by the training partners and the Aberdeen Chamber of Commerce. Transnational partners will be linked through telematics, and joint teleworking will be a regular part of the programme. Cirrculum, training and programme materials will be jointly developed and evaluated in transnational fora.

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KulTour	**Kulturgüter Thüringens - Offerten für den Tourismus**	

This project is a part of the EC initiative PMETOUR (promotion via the Internet of SME tourism publicity and commerce, ACTION II) which is a joint DGXIII and DGXVI initiative). There is a European network of about 40 servers in less favoured regions of Europe, the Central Access Point of which is situated in Palma de Mallorca (Spain). The common methods of working together of the projects are new telecommunication technologies (tecommunications, telecooperation and teleworking, shared working space in the Internet, e-mail, etc.). The aims of the project are to:

- establish and operate a regional Internet server for Thuringia to concentrate and manage the offer of tourism services provided by SMEs
- collect SME data, create web pages for the SMEs and implement existing pages
- establish a regional network of local and regional actors in tourism
- provide advanced electronic services for the SMEs and the users of the system (booking facilities, electronic payment, hot line support)
- promote the possibilities of the new technologies among the tourism SMEs of Thuringia

* use the new telecommunication technologies to keep the database and the web-pages up-to-date

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LEVERAGE	**Learn from Video Extensive Real ATM Gigabit Experiment**	**ACTS Programme**

LEVERAGE intends to demonstrate how the use of multimedia broadband technology can support and greatly improve communication between learners in cross-linguistic situations by offering collaborative work facilities to groups of students in different member states

Link to Telework/Telecooperation:

The basic LEVERAGE paradigm is that a learner in one country makes contact with a learner in another country, and that they agree to assist each other in the performance of a mutual task, alternatively playing the role of tutor (own native language) and learner (second language).

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Mercurio: Teletrabajo - Oportunidad de Desarrollo en el Medio Rural	**ADAPT Initiative**

This project aims to study the opportunities for teleworking in various sectors of the Community of Aragon. It will start with an in-depth analysis of the potential for and technical implications of teleworking, especially for disabled people. It is expected to be an important starting point in raising awareness about teleworking as an alternative way of working.

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MEDIAN	Wireless Broadband CPN/LAN for Professional and Residential Multimedia Applications	ACTS Programme

The MEDIAN project objective is to evaluate and implement a high speed wireless customer premises local area network (WCPN/WLAN) pilot system for multimedia applications, and to demonstrate the usability in a real -user trial. The trial will be based on a wireless ATM LAN environment, where the MEDIAN demonstrator provides the wireless access points.

Link to Telework/Tele-cooperation:

The MEDIAN concept will very much support the place independency of work by exploring the wireless LAN possibilities in today's and future systems. Therefore the contribution is in eliminating technical barriers to place independency of the work place.

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MEMO	Multimedia Environment for Mobiles	ACTS Programme

The main objective of MEMO is to develop a generic architecture for the provision of interactive multimedia services to mobile and portable terminals. Based on the experience of two generations of prototypes, user requirements studies and evaluation of user trials, MEMO will develop a generalised service model and both hardware and software platforms to implement a wide variety of interactive datacasting services where mobility is the key issue. Link to Telework/Telecooperation:

MEMO will contribute to both mobile multimedia technology and to interactive mobile multimedia services in the publishing and construction industries.

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MIRTI	Models of Industrial Relations in Telework Innovation	Telematics Application Programme

MIRTI (in the Telematics Engineering sector) is providing models of industrial relations in telework innovation by examining different definitions and types of telework through a series of case studies, developing suitable tools (legal framework and contractual arrangements), and scenarios. Its objectives include providing:

- guidelines for companies and public administrations when they introduce telework
- guidelines for contacts between employers and employees
- wide recommendations and guidelines at national and EU levels.

The web-site provides translation in five languages (English, French, German, Italian and Spanish) and the CD-ROM including the MIRTI Handbook "Implementing Telework" (5 languages) includes a hypertext comparison of 30 European agreements on telework across a number of issues, including working time, technology, privacy, status, health and safety, etc. The CD-ROM was made available in July 1998.

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Mise en place et évaluation du télétravail dans les organisations	ADAPT Initiative

The new forms of work offered by the emerging information society, notably telework, overturn conventional approaches to company organisation and workers' conditions. For a company, it can often be the opportunity to put off to another day fundamental questions about work organisation, management and workers' conditions. For the new teleworker, it means installing a work station away from the normal place of work, often in the home, organising joint tenancy with other teleworkers or with a family group, managing at a distance, and reorganising a social life less founded on close proximity to work. The purpose of this project is, in a formal framework, to help companies experiment in and install telework in their organisations, whilst working on five key themes:

- management of working time,
- the conception and reorganisation of working space,
- management,
- organisational learning,
- preserving a social aspect to work, and a collective identity,and social negotiation.

A model teleworking project will be constructed based on a study of existing and experimental approaches, and presented in the form of a methodological guide. Summaries of grass roots experience will be supplied in open access form on an Internet site devoted to teleworking, which will include a version of the methodological guide in interactive form. This Internet site will also offer a selection of legal and administrative texts relating to telework, and exchange and encounter for use by teleworkers.

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MULTIMEDIATOR	Multimedia Publishing Brokerage Service	ACTS Programme

The project has demonstrated the use of an intelligent multimedia brokerage service for pan-European customers and suppliers in the publishing area. Services offered include specialised video-on-demand, hypervideo, and conventional publishing services. Existing technology and project developments have been integrated for this purpose. Amongst the key issues are a whiteboard for multimedia document production and communication APIs for several communication protocols. Link to Telework/Tele-cooperation:

The trial has explored the added value of the services to be developed to telework/telecooperation.

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NET-TELEMED European network on telemedicine	ADAPT Initiative

The project will implement a telemedicine structure and a Clinical Information System (CIS) within a private hospital and it will begin a continuing training system for the personnel (technical, medical and nursing) to guarantee the quality of the service offered to patients.

Using the system, a strong co-operation will be developed, between the hospital and other modern medical centres throughout Italy, and Europe (test-bed for on-line consultation). The project will establish an innovative system of telemedicine for patient assistance through a computer-based system and qualified personnel. The training action plan for is one of the major aspects of the project, and will provide all of the personnel in charge of hospital services with the necessary technological know-how and practices. The project will also attempt to accelerate the development of new tasks and activities, such as teledoctors.

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NEWTTEL - Women	New Technologies and teleworking for women	EMPLOYMENT Initiative NOW

Since 1994, SEFIA, a training centre in Paris, has collaborated with the human resource department of BULL, the new technologies giant in France. SEFIA has elaborated an inquiry to identify all of the different forms of new jobs in the new technologies sector. Based on former NOW experience, SEFIA wants to continue to explore these, especially for women. Even if women tend to be unemployed longer than men, they often fall into the trap of searching for traditional female jobs. On the other hand, lack of information and insufficient professional guidance may keep women out of new opportunities emerging in information technologies. Tele-maintenance represents one of these new opportunities. SEFIA is keen to support women to diversify their vocational and professional choices. Therefore, the centre is training unemployed women to become technicians in hard- and software maintenance from a help-desk in a specialised centre. Three distance learning modules combined with practical work experience are offered to upgrade the qualification level of the trainees. An observatory on teleworking by women will also be created in collaboration with other European telecentres. This network plans to elaborate a common guide on good practice for women teleworkers. The telecentre seeks to provide an information platform on employment opportunities in the NIT sector for women under the auspices of the Women's Rights Service.

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NUEVAS TRABAJADORAS	EMPLOYMENT Initiative NOW

The regional authorities of Andalucía are investigating new sources of employment in the new technologies sector. Female unemployment is especially high in Andalucía: with more than 40% as compared to 27% for men, it is an alarming situation.

An important partner for the regional authorities is EUROCEI, the Business Innovation Centre (BIC) that can draw on a large experience in working in the SME sector. The BIC provides a wide range of services responding to the needs of SMEs and it is developing strategic plans for economic revival of local areas at risk. Through its expertise in the SME sector the BIC is very well placed to help analyse the needs and requirements of enterprises related to teleworking. A telephone inquiry targeting more than 7.000 enterprises in Andalucía will help to detect the pros and cons of teleworking from the enterprises' viewpoint. On the basis of the study's findings, new professional profiles will be mapped out in the teleworking sector. Training materials will be developed and piloted with a group of women trainees. Given the fact that the BIC has a clear overview of the real needs of the enterprises regarding teleworking, the women trainees can target their job searches very precisely.

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Ökologie-Kontaktbörse-Altenburg-Rositz	ADAPT Initiative

Main objectives of the project are:

- to install an ICT based service centre for SME with the special aspect of an information management
- to stimulate and perform a transnational technology transfer
- to create computer-based databases to provide relevant information (e.g. ecological) for SME
- to demonstrate teleworking applications and their benefits for SME with the aim to create new jobs, especially in rural areas or handicapped regions
- to introduce teletraining and teleteaching into SME as one way to qualify the employees and employers for teleworking

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ON THE MOVE	Multimedia Information Services	ACTS Programme

On The Move will develop and propose to standardise a mobile Application Programme Interface to facilitate the use of multimedia applications. For this it will develop an architecture to support both "mobile aware" and "non mobile aware" applications. Link to Telework/Tele-cooperation:
By doing this the project will enhance the place independentness of work by increasing the efficiency for mobile workers and by facilitating easier access from isolated locations to broadband communications and applications.

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OPTIMA	**Obstacles and potential of telework in labour markets**	**ADAPT Initiative**

Aimed at SME managers, the project is producing training and methodological support packages to encourage and help Irish companies make more extensive use of teleworking. It is led by the Work Research Centre Ltd. (WRC), a research, consultancy and training organisation specialising in the impact of new technologies on working life and society in general, and health at work. Its first priority is to address three key issues – the lack of awareness about the realities of teleworking, the lack of knowledge about how to implement and manage it, and the lack of techniques for overcoming these difficulties. An appropriate package of tools and services is then being developed. The consortium includes Forbairt, the Irish national development agency, the National College of Industrial Relations, Telecom Eireann, the Institute of Personnel Management and the Irish Institute of Training and Development. The transnational partnership involves French, German and Greek projects.

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OSPRACT		**ADAPT Initiative**

The OSPRACT project is establishing a European observatory of telework practice and its implications. OSPRACT intends providing the social partners and researchers with data, analyses, and a counselling facility on the organisation of teleworking and its impact in terms of changes in work organisation, as well as on the impact of teleworking on globalisation. Achieving a better understanding of telework, and understanding more about its influences on work organisation and the risks of job loss as a result of work being taken off-site, will enable them to identify the factors they should seek to influence. It will also indicate how they can change the circumstances of those involved, provide them with counselling, and give them access to information and tools to which they may not have access, and which can be of use in confronting the major issues they face. The transnational aspect of the project involves setting up a database on teleworking in Europe, publishing guides for European trade unions and workers involved in developing teleworking. It will provide a European snapshot of activities which may be capable of being carried out through telework, and it will set up an early warning system for trade unions, and will produce qualitative case studies on key projects and businesses.

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OUEA	**Observatoire Urban du Axe Atlantique**	**Article 10 of the ERDF**

OUEA is run by EixoAtlántico, an association of 18 cities in two areas, Galicia in Spain and the North of Portugal which aims to promote the European principles of free movement of people, capital, trade and services. OUEA is a system of collection and access to information that will offer a dynamic, on-line, database of information to all local players and will facilitate political decision making for regional economic development. The system will be flexible and adaptable to the needs of the users. The project's expected impacts are to:

- make available an on-line database of dynamic socio-economic information;
- promote teleworking with the aim of creating new jobs;
- facilitate strategic decisions that will have an impact on cohesion;
- minimise the negative effects of the socioeconomic isolation of peripheral regions.

The European Commission recently approved the project's feasibility plan and the implementation phase is now on course.

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Pour la Creation d'Emplois en Corse	**ADAPT Initiative**

The project will analyse and will make a diagnosis of 20 `entreprise projects´ and six of them will then be developed with a potentiality of at least 20 new jobs.
Human and financial resources will be devoted to these `project ideas´ to develop them and to create new lasting opportunities.
The transnational partnership will provide exchange and comparison of methods to create new activities as well as trainer and manager exchanges. A common effort will be to find out possible sectors for new jobs: renewable energy, waste recycling, teleworking and leading edge industries.

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PRISMA	**Photonic Routing of Interactive Services for Mobile Applications**	**ACTS Programme**

The aim of PRISMA is to increase the operational efficiency of fibre-wireless networks, by introducing flexible multiwavelength techniques for delivering capacity on demand. It will demonstrate the viability of the system both in a laboratory trial and in a small-scale field trial at the University of Ghent. The system concept will stimulate the introduction of broadband wireless applications, and facilitate the overlay of wireless services on existing networks. Link to Telework/Tele-cooperation:
Efficient broadband wireless access will promote tele-working by offering employees the same network capabilities at various places (e.g., for using their laptops at home as well as at various office locations).

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Recherche de Productivite par la Mise en Oeuvre Du	**ADAPT Initiative**

Employees with a semi-nomadic lifestyle who are involved in distance working such as teleworking are adapted to the needs and problems of such new work organisation. The target group are trade agents, service technicians and support personnel.

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RURAL EUROPE TEAM	**LEADER Initiative**

The Rural Europe team project has been operational since March 1996. It involves six teleworkers contracted by AEIDL within the framework of the networking activities of the LEADER initiative. They are in charge of maintaining the Rural Europe information system in six languages. The overal cost of this project amounts to 54,000 ECU per annum. It provides three part-time jobs in remote firms which are setting up telematic activities at local level, either in the field of training or consultancy. A web platform, FTP access and e-mail are used for workflow routines.

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SHOW	**Standards for Home Working**	**ISIS Action**

SHOW aims at the definition of a virtual workdesk system for teleworkers of Local Public Administrations (LPAs) based on widely accepted and reliable standards. The service categories to be provided include information gathering, production support, and cooperation support. In the pilot phase, the project benefits from the cooperation of one German and four Italian municipalities. These LPAs are interested in decentralising their activities both to their employees' homes and to their satellite offices. The project architecture is based on the network-centric computing paradigm and is focused on small remote (client) work-stations with a view to significantly reducing management costs.

Relevance to standardisation:

Starting from the identification of the real needs of an LPA work environment, both on the social and clerical side, the project focuses on identifying a set of suitable standards (e.g. Z39.50, T.120, H.320, etc.) to support a technological solution coping with those needs. In order to do this, the project maintains constant informal contacts with a group of selected standard organisations, to ensure a good level of information flow and mutual awareness. At the end of the project, the results of the use of the identified standards, with particular emphasis on the usability, interoperability and service inter-networking aspects, will be collected and distributed both to the above mentioned organisations and to the national and European agencies and authorities.

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SICMA	Scalable Interactive Continuous Media Server - Design and Application	ACTS Programme

SICMA aims to design a scaleable server for the delivery of images, data and continuous multimedia information. It will also demonstrate its efficiency by applying it in a "Virtual Museum". The server will be used within various testbeds serving a large number of users under various conditions. An extension of the project- SICMA-EAST - provides a scaleable HTTP server for delivery of highest resolution still images, together with metadata information. In a Pan-European trial the chain: data server in Moscow – satellite link to a mirrow server in Germany - Internet connection to a museums network in Europe will be implemented and demonstrated. Link to Telework/Tele-cooperation: The design of scaleable interactive media servers will have a strong impact on the cost of on-line services, and will, therefore, contribute to the place independence of work.

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SMARTS	SME and Regional Telecoms Support	ACTS Programme

The strategic objective of SMARTS is to increase the participation of small and medium sized enterprises (SMEs) in the work of and exploitation of results from the ACTS programme. In this project 'participation' is defined as:

- full partnership or subcontractor in a new or established ACTS project
- triggered use of broadband technologies and services in their own proprietary technology base
- attendance at ACTS events
- use of broadband products and services by non-technically based SMEs (e.g. in tourism)
- engineers and scientists from SMEs joining ACTS projects and trials as guest researchers.

In the second phase of the ACTS programme SMARTS will focus on the opportunities provided by the emerging electronic market and by the diversification and improvement of electronic commerce software, for SMEs and their partners (suppliers, clients, distributors). Link to Telework/Tele-cooperation:

SMARTS will contribute particularly in the areas of tele-cooperation and teletrade, whereas the overlap with the electronic commerce environment can be substantial.

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SME and Micro-Business Adaptation via European Superhighway Technology	ADAPT Initiative

The project will introduce teleworking and teletraining into SMEs in traditional rural areas where multimedia and telecommunication technologies are slow to be accepted. The Trentino Alto-Adige Region is marked by small, scattered communities. The project addresses the needs of commuters, of women workers who can combine their home and parental care duties with a job, and of those who have difficulty reaching a workplace. It has three objectives: enabling workers to adapt to industrial change by improving their qualifications and mobility; creating new jobs through the European Superhighways; and providing executive counselling.

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TEAM	Team-based European Automotive Manufacture	ACTS Programme

The project aims at a virtual integration of the entire automotive supply chain in a trial, demonstrating a variety of multimedia applications. Key issues are the cultural aspects of including 2nd/3rd tier suppliers & SMEs, integration of complex applications like CAD, the tariffs by PNOs for broadband communications, confidentiality and security issues and the necessary training/skills aspect. Link to Telework/Tele-cooperation:
The project will demonstrate tele-cooperation in the full meaning of the word. Doing so it provides input to the development of guidelines on telework/tele-cooperation, both in the sense of technical solutions as in overcoming cultural, financial and confidentiality/security constraints.

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TEAMNET		

The TEAMNET project is a two year pilot project (December 1996 to December 1998), co-funded by the LEONARDO-DA-VINCI Programme of DGXII. The project aims at developing on the Internet, a database of telework jobs dedicated to disabled people. This database uses a specific interface (the TOWN system) which ensures matching between the supply and demand of telework jobs.

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Italy *URL: http://www.asphi.it*

TECODIS	Teleworking in Co-operative Development of Industrial Software	ACTS Programme

Teleworking is now viewed as one possible means of achieving a more flexible allocation of skilled people to time critical projects than is currently possible within a centralised office environment. In this context the project has two main objectives: Firstly, to demonstrate the use of teleworking in the software development industrial area in the most realistic possible way. Secondly, to demonstrate the viability of teleworking by developing a teleworking support platform and demonstrating its practical use in a large scale international engineering project. Link to Telework/Tele-cooperation:
TECODIS will be able to contribute to the future deployment of telework, as well as to the development of guidelines, considerably. The project's contributions to be expected are the development of a Teleworking Model, a Cost/Benefit evaluation based on real users, development of a teleworking platform and in the area of dissemination and linkage to other programmes.

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TELEMANUTENÇAO	ADAPT Initiative

This project focuses on introducing telemaintenance, and on anticipating the effects that it will have on the traditional professional profile of the maintenance worker. The project's main target group is maintenance personnel in need of qualification for this new way of working which entails remote surveillance, diagnosis, and maintenance of equipment via information and communication systems.
First, a survey of the workers' training needs will be carried out, followed by a period of developing training materials. Training for trainers and maintenance technicians will be offered, along with seminars designed to inform entrepreneurs and managers of industrial and service enterprises about the advantages of telemaintenance.
The project will allow the development of know-how in the area, enabling the future implementation of telemaintenance networks at national level and the increasing use of distance control processes (reducing the displacement of qualified technicians).

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TELEMART	Telematics Marketing of Teleworkers	Telematics Application Programme

TELEMART's objective is to develop teleworking services and systems to the benefit of new and existing teleworkers, telework brokers and telework clients alike. The project is concerned with attempting to create better conditions in the labour market for workers looking for a job using telework tools and techniques through networking activities such as brokerage services. Marketing of teleworkers and finding the business are the keys to this, as historically the problem has always been finding the work.. The key players or actors in TELEMART are TeleMart Inc., clients, brokers and "suppliers" (i.e. the teleworkers). TeleMart Inc. is a commercial vehicle for providing services to brokers and suppliers, including standards and accreditation, facilities management, marketing and training, and an association of accredited brokers.

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TELESHOPPE		**ACTS Programme**

The main objectives of TELESHOPPE are to investigate how the usability of the user interface with advanced multimedia technologies and virtual reality can be enhanced by simulating the "touch and feel" of physical shopping in a tele-presence shopping experience. Usability will be measured in a series of usability trials of tele-shopping services using broadband ISDN and IBC networks. The objectives seek to characterise the effect that network bandwidth (to the end user client device) will have on usability of the tele-shopping service.

Link to Telework/Tele-cooperation:

The key issues involve multi-disciplinary collaboration ranging from software engineering, virtual reality, interactive coded video, speech technology, spoken dialogues, video production and programming. The prime interest of the project is usability engineering of the user interface for IBC shopping applications. This will obviously provide input to the products of the telework chain.

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Web-site:http://www.cocom.dk/teleshop.htm

TELETEST	**Euro-ISDN as platform for Teleworking**	**Trans European Telecoms Networks**

Euro-ISDN is the most commonly used platform for teleworking applications which use switched networks. A good variety of teleworking applications have been developed. Interoperability of such applications is regularly not ensured. The project aims at using Euro-ISDN as a platform for the verification of interoperability problems of teleworking applications from different providers. The following tasks are being conducted:

- identification of commercially available teleworking applications in the EU (short standardised descriptions of them)
- identification of their characteristics and the obstacles for interoperability
- test of those applications against each other and identification, analysis and description of interoperability problems
- drawing up a proposal for a general purpose teleworking application
- execution of a pilot with the target application

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TELE TOOLS		**ADAPT Initiative**

The aim of the project is to develop tools which facilitate telework in SMEs. These tools will not only cover the IT aspect, but will also include aspects related to individual development and work organisation, as well as legal and insurance issues. The project will use the Web to give access to introductory material about telework, on-line learning sessions, references to consultants, other experience (local, national and international). Learning material in book-form and on CD-ROM will be developed. A group of instructors, able to teach and work as consultants, will be available as mentors/animators.

The transnational aim of Teletools is to develop an understanding of teleworking , to identify best practices in serving the needs of the teleworking society and to exchange know-how about necessary framework for teleworking. The development work will include appropriate training strategies and methods as well as learning material that facilitates the design of flexible organisations. The transnational partners are from Germany, Austria, Ireland and Denmark.

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TELEWINT	TELEWork INTerregional	

The objective of TELEWINT is to strengthen the competition-position of SME's in the Benelux Central Area by the application of Telework. It is a pilot project in which "border-crossing" telework knowledge and experience will be obtained by the realisation of 64 teleworking places in 16 participating SMEs. Two types of telework are involved:

- home telework
- telework in tele (satellite) offices

A proposal for EU subsidy has been presented to the IGRESecretariat of the Supervising Committee of the Interreg II Programme. Pariticipating SMEs are responsible for co-financing.

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E-mail: 101522.11202compuserve.com

TELEWORK	Interoperability Euro-ISDN solution for selecting and starting up telework application	Trans European Telecoms Networks

The study aims at using Euro-ISDN as platform for the verification of interoperability problems of teleworking applications from different providers. The principal objectives are:

- to identify commercially available teleworking applications (in the EU) and provide a short, standardised description of them.
- to identify their main characteristics and the obstacles for interoperability.
- to test those applications against each other and identify, analyse and describe the interoperability problems.
- to make suggestions for the resolution of interoperability issues and identify commonalities.
- to draw up a proposal for a general purpose teleworking application
- to perform a pilot with the target application

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TEMeTeN	Towards a European Medical and Teleworking Network	Article 10 of the ERDF

TEMeTeN has partner regions in Greece (two), Italy, Spain and Finland for the purpose of developing telematics applications and services in health care and teleworking. It's over objectives are:

- Regional level: integration, validation and demonstration of systems and services that provide teleconsultation and remote diagnostic work between health care providers at different locations;
- Trans-European level: definition of standard medical and operational procedures for medical assistance
- development of teleworking centres and mobile teleworking workstations;
- provision of basic teleworking services to visitors of major resort hotels;
- provision of advanced teleworking service to residential communities for both residents and tourists.

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TEMPLE	Telematics Employment Engine	Telematics Application Programme

TEMPLE's objective is to stimulate job prospects for teleworkers, the creation of enterprises, and promotion of a more vigorous entrepreneurial culture in Europe. The project uses telematics to overcome barriers between the supply and demand of telework, focusing on Just-In-Time concepts and a telematics employment agency. A quantitative objective is to support 50 teleworkers in each of the five European sites using four key applications: on-line training, support facilities, a European database and a European web-site.

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TEN-TREND	Telework Remote Enterprise Network Development	Trans European Telecoms Networks

The overall objective of the project is to investigate the feasibility of applications of telecommuncations services to support a full range of telework and other new ways of working. The principal objectives are to:

- investigate user needs in respect of applications supporting telework
- define organisational requirements for supporting teleworking employees and their implications for TEN-TREND applications
- draw up a framework covering user, application, management, organisational and legal aspects of telework
- define a full set and a core set of applications for support of telework
- investigate the feasibility of the set of applications defined in the TEN-TREND framework
- validate pilot implementations of selected applications
- monitor the viability of proposed applications as evidence of feasibility, acceptability and usefulness, and generate and maintain up-to-date business plans
- assess viability and commit appropriate levels of resource to complete the investment plan for the project

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TEX.AT.WORK	Textile Application of Teleworking	Telematics Application Programme

The final aim of the TEX AT WORK Project is to provide telematics tools for business processes in the Textile Clothing Distribution industry chain. The goal is to make the information flow along the chain as easily as possible providing thus greater awareness of market trends. All the telematics tools involved in the Project fall within the Electronic Commerce concept, being in fact teleworking applications based on EDI, videoconference and web.

A greater awareness of the benefits of telematics tools and a greater utilisation will be obtained through the development of a set of innovative applications.

These innovative applications are being tested in European SMEs and will then be disseminated in other companies of the same sector. Mainly, they answer the following needs:

- to reduce the reaction time to the market demand changes, thus increasing the quality level of the service provided to customers;
- to accelerate the flow of materials, both eliminating the non productive downtimes and also by making the transportation organisation more effective;
- to tune the operations carried out by the various actors of the sector.

For the SMEs involved the dissemination of such telematic applications will both mean an immediate benefit in competitive terms and a more effective organisational pattern. In fact, thanks to the applications developed by the TEX AT WORK project, the involved sector will be able to implement the notion of “extended virtual company” and to apply appropriate organisational techniques such as Just in Time, Quick Response and Total Quality Management Techniques.

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TOBASCO	Towards Broadband Access Systems for CATV Optical networks	ACTS Programme

The aim of TOBASCO is to upgrade existing CATV networks with high splitting counts, with broadband interactive services by applying High-Density Wavelength Division Multiplexing in a cost effective way, and to demonstrate the viability of the system in a field trial. Thus the project will advance the introduction of interactive services in existing CATV networks.

Link to Telework/Tele-cooperation:

Interactive services on CATV networks will allow mass participation in applications as telework and telelearning. The project will contribute to the promotion of those applications.

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TOOLIT	**LEADER Initiative**

The Toolit project brings together three partners involved in teleworking projects in rural areas of Northern Sweden, the Western Isles of Scotland and the Highlands of Luxemburg. The scope is to create a value added service with the collaborative input of each partner's skill resources, like languages and marketing. The first partnership meeting was fully supported by LEADER funding (local budgets plus a 5,000 ECU transnational cooperation grant from the LEADER European Observatory).

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TWEURO	**Telework Europa**	**Telematics Application Programme**

TWEURO is a TAP support action providing mediated services and fora on both Compuserve and the Internet for TAP projects, and is now also the unofficial web-site for the TURA (Telematics for Urban and Rural Areas) section where information about projects, their deliverables, plus other relevant issues relating to TURA tasks can be accessed. TWEURO is now also developing push mechanisms for its dissemination activities, including web-casting TAP and other events, thereby making real time audio and video signals available to ordinary narrow-band internet users. TWEURO also provides an unofficial but nevertheless useful way by which TURA projects (or prospective TURA projects) can telework with each other and with the Commission.

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TWCA Werknet	**ADAPT Initiative**

The main objective of the TWCA Werknet project, in Amsterdam, is to set up an experimental organisation, which provides people with disabilities, especially those with serious mobility limitations, with the opportunity to work from home via teleworking. The accent is placed on providing participants with the skills needed to realise their individual 'entrepreneurial plans'. The project will be realised by a partnership of educational institutes, regional training centres, organisations active in the integration of people with disabilities, employment organisations, the municipal social services, etc. This wide-reaching partnership has made it possible for the organisers to thoroughly examine the particular needs of the target group, whilst providing automatic routes for effective information and product dissemination to others looking for innovative solutions to overcoming the labour market segregation facing people with disabilities. The project's transnational partners, from Germany and Portugal, will co-operate in the joint development of a new methodology, the building of a training route, and the implementation of this unique entrance programme to entrepreneurship for people with disabilities.

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The Netherlands

USINACTS	**Usability in ACTS**	**ACTS Programme**

The function of USINACTS is to identify, characterise, document and disseminate examples of successful application of usability principles from ACTS usage trials, and from industry. The objective is to show that the application of usability principles delivers tangible benefits, through promoting services better adapted and configured to the requirements of the users. Link to Telework/Telecooperation:
Accurate and thorough user needs analysis is a critical requirement for developing and operating applications and services suitable for teleworking and telecooperation.

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Virtual Workplace	**ADAPT Initiative**

The Virtual Workplace project intends to help SMEs to benefit from information networks in their business. The use of ICT leads to changes in ways of working, which can be realized as telework using ICT. A number of telework training programmes has been created and run in the project: virtual entrepreneur, teleconsultant, media on the web, utilization of information networks. They have been delivered over the Internet being in this way also practice in the use of the tools for telework. Both virtual and physical telework support services have been set up to facilitate a continuing training process.European Telework Support Centre (ETSC) has been created in cooperation with the transnational partners. An expert database has also been created to make available expertise of the experts. A 'telework driving license' verifying mastery of telework tools and practices has been developed. Creating networks of SMEs offers them new business opportunities.

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http://www.amiedu.net/eng/virtual1.htm

VKN Virtuelles KMU Network-Management		**ADAPT Initiative**

The basis of this project is the transfer of competencies for the management of virtual companies as a precondition for the development of virtual SME networks. New modular training packages will be developed, in order to train future teletrainers on interface management, process organisation, new ways of providing information, corporate culture and the intercultural dimension. Simulation games, and software, such as Virtual Company and LOTUS Notes, constitute the appropriate training tools. Furthermore, it is planned to link people with future-oriented business plans in order to allow them to co-operate as virtual companies, connecting them to the target group of teletrainers. This networking will be supported technically by the promoter. Starting in the region Südbaden, this project will eventually spread throughout Germany.

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ANNEX 3
ONLINE INFORMATION ON TELEWORK AND RELATED TOPICS

1. European Telework *OnLine* (ETO)

The **European Telework *Online*** web site at: http://www.eto.org.uk is now the world's largest and busiest site focused on telework and related topics, with links to related sites in many languages and countries. During November 1997 the site clocked up its one millionth information request. An indication of its popularity is that during May 1998 it serviced more than 80,000 requests, from users of more than 6,500 host networks in at least 65 countries. Over 1000 other sites have links into the site. The top domains from which the site gets visitors are .com, .net, .uk, .de, .it.

Developments in 1997

The number of publicly accessible information pages more than trebled during 1997-8, from less than 500 to over 1,500. Areas of particular development during 1997-8 were:

- Country Pages - more information in languages other than English and addition of new country pages, especially for non-EU countries. For examples pages for Switzerland, and pages in Greek, Bulgarian, Polish and Russian.
- Telework Events Database - users can make selections and obtain a listing in various categories
- More Frequently Asked Questions, including doing business across networks, pricing, the role of the Internet and employment issues.
- The ETD Newsletter - a quarterly newsletter published in conjunction with ETHOS, the information observatory for the Telematics Applications Programme.
- Strengthened links with other programmes, and communities. Examples include the European Telework Week website (which now has its own web site separate from ETO), DIPLOMAT (the Telework Charter), the Information Society disAbilities Challenge and EACN - the European Association for Community Networks.

The ETO site also became a member of the Information Society WebRing (managed by ISPO). A web ring is a collection of pages and/or sites that fit together through a common theme, all joined by html code that links them up in a circle, or ring. This allows users to glide seamlessly through each page in the ring. A ring provides the World Wide Web with a different way to organise web sites.

Overview of the ETO Site

European Telework *Online* aims to provide employers, policy makers and teleworkers with access to useful and timely information and help. The site into several main sections:

- Telework - general information, opportunities and strategies
- Teletrade - information on electronic commerce and enabling mechanisms
- Telecooperation - guidance on working virtually over electronic networks
- Country pages - information and links to telework information in different countries
- Frequently Asked Questions - on topics ranging from disabilities to employment
- Events calendar - of telework and Information Society events around the world
- Resources and Links - details of key resources (e.g. reports); links to other web sites
- European Telework Development (ETD) - information about the ETD project
- GAT (General Access Telework) - The ACTS Telework Chain - reports of meetings, guidelines etc.

As well as Web pages, the site also holds many telework related documents in word processing format, including these status reports e.g. Telework 1997. To aid navigation a search facility and a table of main contents are also provided. A schematic outline of the site, giving URLs, is shown below. The following table shows the main contents, extracted from the corresponding web page. (Note: on the web page, each entry is a 'hot link').

Popular Pages

The top pages accessed during May 1998 were

1. European Telework Online Home Page: http://www.eto.org.uk/
2. Useful Ressource (Links, FAQs, Definitions etc.): http://www.eto.org.uk/resource.htm
3. European Events Calendar Service: http://www.eto.org.uk/events/index.htm
4. European Telework Main Page: http://www.eto.org.uk/twork/index.htm

5. Iniciativa Europea de Teletrabajo en España (European Telework Online Spain in Spanish) http://www.eto.org.uk/nat/es/indexesp.htm
6. European Telework Agenda: http://www.eto.org.uk/events/keyevent.cfm
7. European Telework Online – Contents: http://www.eto.org.uk/contents.htm
8. Telework (Telecommuting): The Benefits: http://www.eto.org.uk/faq/faq03.htm
9. How Can I Get Work As A Teleworker?: http://www.eto.org.uk/faq/faq04.htm
10. European Commission - Telework Information Day: http://www.eto.org.uk/agenda/telework/infoday.htm

The Telework Forum

Linked with the site is an active e-mail-based discussion forum with over 500 subscribers from 53 countries, and an "announcements only" e-mail list with over 500 additional subscribers. ETO is also supporting or linked with similar online discussions in different languages, including French, Spanish, Italian and Danish.

The ETO site is at ***http://www.eto.org.uk***. There are simple online forms for joining the discussion or announcement e-mail lists. Please address questions or problems to eto-info@eto.org.uk

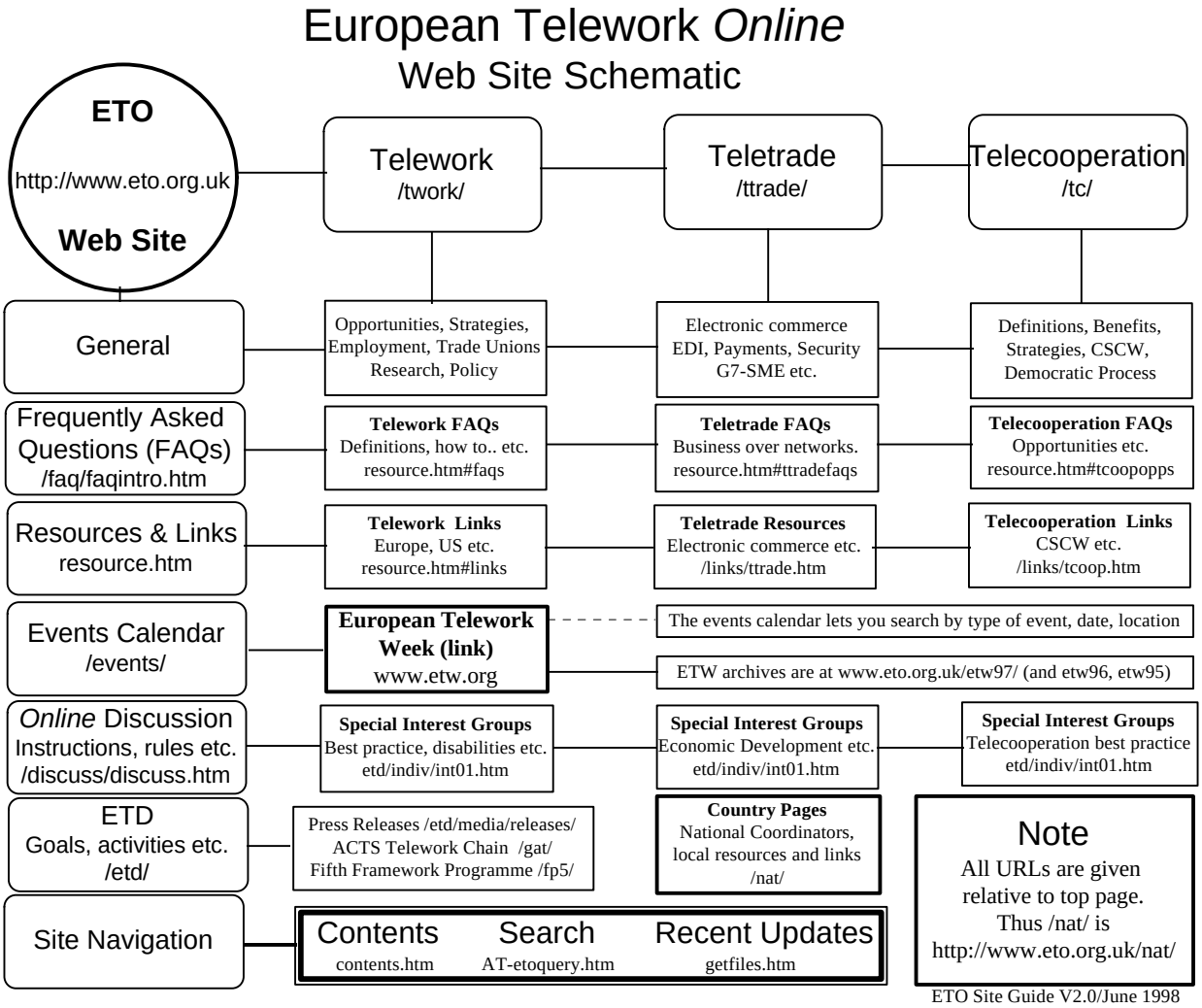

Table A3.1 - European Telework Online Web Site: Overview of Contents

Telework
ACTS Telework Chain
Benefits and Opportunities
Telework Charter (DIPLOMAT)
Code of Practice
Definitions
Disabilities and Telework
Employment - Getting Work
European Telework Agenda
Events Calendar
Homeworking
Resources and Links
Strategies - Employers
Strategies - Teleworkers
Telecottages vs. Telecentres
Traffic Congestion
European Commission Status Report: Telework 1997 - WWW Pages or Zipped File
Actions For Stimulation Of Transborder Telework And Research
Cooperation In Europe: Telework 1996
- Zipped File

Teletrade
Benefits and Opportunities
Challenges
Definition and Overview
EDI -Electronic Commerce (EC)- contrasted
EC - SME Memorandum of Understanding
Enabling Mechanisms
- Payment Mechanisms
- Secure Transactions
G7 Conference on Electronic Commerce
Resources - see also Documents
Strategies

Telecooperation
Definition
How does telecooperation work?
Who can benefit from telecooperation?
ETD - an example of telecooperation
Telecooperation and the Democratic Process
Reading about telecooperation/related subjects
Some presentations on telecooperation
What Are Groupware and CSCW?
Links related to telecooperation and CSCW

European Telework Week
European Telework Awards
Coordinators Guide
Country Contacts
Submitting Events
Support Facilities at ETO site
Previous Telework Weeks:
ETW97 , ETW96 , ETW95

Information Society (General)
Economics of - OECD Workshop
EC Fifth Framework Programme
Opportunities and Threats

Internet/Intranet
Access (Universal)
Growth Intranets
Regulatory

ETD (European Telework Development)
Goals
Interest Groups (discussion lists)
Who Can Benefit
Participation - how to get involved
- Join the ETO Site Team
Presentations (Powerpoint)
Press Releases
The ETD Team
- The People Behind The Web Site

Audience Interests
Employers (and ETD)
Employers and Managers (telework)
Researchers
IT and Individual Teleworkers
IT and Telecommunications Managers
Media
Policy Makers
Suppliers (IT, Telecoms etc.)
Technology Developers
Trade Unions

Countries
Austria
Belgium
Bulgaria
Central and Eastern Europe
Denmark - In Danish
Finland
France - In French
Germany - In German
Greece - In Greek
Ireland
Italy – Italiano
Luxembourg
Netherlands
Poland - In Polish
Portugal
Russia - In Russian
Spain - In Spanish
Sweden - In Swedish
Switzerland - In German
U.K.

Information and Resources
Discussion Lists - general
- ETD Interest Groups
ETHOS-ETD Newsletter
Events Calendar
Links to other TTT sites
- Telework
- Teletrade and Electronic Commerce
- Telecooperation
- Information Society
Media Backgrounders
Press Releases (ETD)
ETO Web Site Accolades
Recent Additionas and Updates

Note - This is an extract from the contents page at http://www.eto.org.uk/contents.htm Please consult this web page for current update and active links to these subjects.

2. European Telework Sites

A. Telework Association Sites

Austria	Austrian Telework Association	http://www.ata.at
Belgium	The Belgian Teleworking Association (BTA) – French and Dutch	http://www.bta.be
France	Association FranHais du Télétravail et du Téléactivities (A.F.T.T.)	http://www.aftt.net
Germany	Verband Telearbeit Deutschland (VTD)	http://www.vtd.org
Ireland	Telework Ireland	http://www.telework.ie
Italy	Telelavoro Web Italia	http://www.mclink.it/telelavoro/
Italy	Societa'Italiana Telelavoro (SIT)	http://www.societaitalianatelelavoro.it
Netherlands	N.T. Forum (Nederlands Telewerk Forum)	http://www.ntforum.nl
Portugal	Associacao Portuguesa de Teletrabalho	http://www.teletrabalho.com
	Associacao Portuguesa para o Desenvolvimento do Teletrabalho	http://www.teleman.pt/apdt
Spain	Asociación Española de Teletrabajo	http://www.cibertica.es/aet/
Sweden	Telestugan Svenska	http://www.telestugan.se/sve/
UK	The Telework Telecottage and Telecentre Association (TCA)	http://www.tca.org.uk/
	Scottish Teleworking Association (STA)	http://www.cali.co.uk/sta/
	Telefythynnad Cymru (Telecottages Wales)	http://www.telecottages.org/

B. Other Country Specific or Local Language Sites

Austria	European Telework *Online* Austria Austrian Telework Website (German)	Http://www.eto.org.uk/nat/at/ Http://www.telearbeit.at/
Belgium	European Telework *Online* Belgium	Http://www.eto.org.uk/nat/be/
Bulgaria	European Telework *Online* Bulgaria	Http://www.eto.org.uk/nat/bg/
Denmark	European Telework *Online* Denmark Telearbejde i Danmark Distancearbejde	Http://www.eto.org.uk/nat/dk/ Http://www.ttt.dk/ Http://www.distancearbejde.dk
Finland	European Telework *Online* Finland National Telework Theme Group Finnish Flexiwork Forum Finnish Association for Distance Education	Http://www.eto.org.uk/nat/fi Http://www.uta.fi/telework/ Http://www.tkk.utu.fi/joustotyo Http://oyt.oulu.fi/fade

France	European Telework *Online* France	http://www.eto.org.uk/nat/fr/
	Télétravail - information française	http://www.eto.org.uk/nat/fr/
Germany	European Telework *Online* Germany	http://www.eto.org.uk/nat/de/
	European Telework Deutschland	http://www.eto.org.uk/nat/de/indexde.htm
	TA Telearbeit	http://www.ta-telearbeit.de
	Telearbeit im Mittelstand	http://www.iid.de/telearbeit/mittelstand/
	TELEWISA	http://www.telewisa.de
Greece	Site for Greek teleworking (in Greek and English)	http://www.teleworking.gr
Greece	European Telework *Online* Greece	http://www.eto.org.uk/nat/gr/
	In Greek	http://www.eto.org.uk/nat/de/indexgrk.htm
Ireland	European Telework *Online* Ireland	http://www.eto.org.uk/nat/ie/
	Communication Workers Union site with telework support services	http://www.cwu.ie/archive.htm
Italy	European Telework *Online* Italy	http://www.eto.org.uk/nat/it/
	European Telework *Online* Italia	http://www.eto.org.uk/nat/it/itindex.htm
	Telework and Disability	http://www.ailun.nuoro.it/telework
Luxembourg	European Telework *Online* Luxembourg	http://www.eto.org.uk/nat/lu/
The Netherlands	European Telework *Online* Netherlands	http://www.eto.org.uk/nat/nl/
Poland	European Telework *Online* Poland	http://www.etc.alpha.net.pl/eto/
Portugal	European Telework *Online* Portugal	http://www.automail.pt/telework/
Romania	Sfetcu Home Page with general information on teleworking	http://www.geocities.com/eureka/park/3622
Russia	European Telework *Online* Russia	http://www.eto.org.uk/nat/ru/
	In Russian	http://ieie.nsc.ru/~eto/
Spain	European Telework *Online* Spain	http://www.eto.org.uk/nat/es/
	Teletrabajo en España	http://www.eto.org.uk/nat/es/indexesp.htm
	Forum Español de Teletrabajo	http://www.festel.org/
Sweden	European Telework *Online* Sweden	http://www.eto.org.uk/nat/se/
	Distansforum	http://www.distansforum.se
	Swedish Networkers Association	http://www.enter-by.net
Switzerland	European Telework Switzerland	http://www.eto.org.uk/nat/ch/
	In German	http://www.eto.org.uk/nat/ch/chdeindx.htm
	Telework Unlimited	http://www.telework.ch
UK	European Telework *Online* UK	http://www.eto.org.uk/nat/uk/
	UK Teleworkers Web Site	http://members.aol.com/telwebsite/

C. General Telework Sites

Andrew Bibby – telework notes	Http://www.eclipse.co.uk/pens/bibby/telework.html
British Telecom – telework reports	Http://www.labs.bt.com/innovate/telework/index.htm
Connected - Alan McClusky: views/links	Http://www.connected.org/
ECTF – European Community Telework/Telematics Forum	http://www.telework-forum.org
ISPO (Information Society Programme Office) - EC background paper on telework - page of telework links	http://www.ispo.cec.be/infosoc/telework.html http://www.ispo.cec.be/g7/backg/telework.html http://www.ispo.cec.be/infosoc/telework.html
Heriot-Watt – information & bibliography	http://www.midnet.com/midnet/telework.htm
MIRTI project	http://www.telework-mirti.org
Poptel - trade unions and telework	http://www.poptel.org.uk
Research Institute (FIM) – Linz	http://www.fim.uni-linz.ac.at/telework/telework.htm
TW Europa – website and CompuServe	http://www.tweuro.com/ *GO EUROBUS* on Compuserve
W.I.S.E. forum (Work , Information Society and Employment	http://www.wise-forum.org

3. International Sites

Gil Gordon - telecommuting (USA)	http://www.gilgordon.com/
Inno Visions - promoting telework in Canada	http://www.ivc.ca
Telecommute America! (USA)	http://www.att.com/Telecommute_America
The International Telework Association (Telecommuting Advisory Council, USA)	http://www.telecommute.org/

ANNEX 4
DEFINITIONS AND GLOSSARY

1. Definitions

1.1 Telework

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.

Teleworker, telecommuter
Generally interpreted to mean someone who works at home all or part of the time, which is a limited view of the concept. Whereas telecommuter can be seen as an expression to of a worker with an arrangement to avoid commuting by working at home, or closer to home, all or part of the time, a teleworker is someone who uses computers and telecommunications in order to overcome constraints in place or time of work, thus becoming more flexible in the location of work.

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 may be converted country cottages, redundant farm buildings or parts of school premises - or they may be conventional office buildings. 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.

1.2 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.

1.3 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.

2. Glossary of Terms

ACD (Automated Call Distribution). A system where calls to a central telephone number are automatically diverted to a free operator. This person may be a remote or home-based teleworker.

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

ADSL (Asymmetrical Digital Subscriber Line). A way of providing high bandwidth services into the home, such as television, video on demand and Internet access. It uses conventional twisted pair copper cable.

AET (Asociación Española de Teletrabajo). Spanish Telework Association.

AFTT (Association Française de Telematique et Teletravail) French Telework Association.

ATM (Asynchronous Transfer Mode). A communications standard for combining data, voice and video on high speed data channels. Data is sent in packets of 53 bytes, comprising 48 data bytes and a five byte header. ATM is likely to be the main protocol used on Internet backbone channels in future. Channel speeds of 155, 625 and 2,540 Mbps are being planned by telecommunications operators.

Audioconferencing. A multi-way telephone conference. Several people are connected at the same time by the telephone service provider and can hold virtual meetings. Connection may be initiated by dialling out from the service provider or dialling in at a pre-determined time. Providers offer a range of add-on services such as transcription.

BPR (Business Process Re-engineering). The radical redesign of businesses processes to improve efficiency, quality, reduce cycle times and improve customer service. Telework offers opportunities to reconfigure supply chains, and gain benefits of round-the-clock working. However, the EC supported project COBRA found little exploitation of telework in BPR initiatives.

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.

CERN (Centre European Researche Nucleaire). Research centre near Geneva where the WWW was invented.

Communities of Practice (CoP). Informal groups of people who share information and knowledge. A term originally coined in Xerox Parc to describe "peers in the execution of real work", as opposed to formally constituted teams. Examples are CoPs that work virtually in electronic communities (q.v.). CoPs are playing an increasingly important part in knowledge management (q.v.), particularly for tacit knowledge sharing across departmental boundaries.

Computer conferencing. A form of groupware where users can send messages to 'bulletin boards' or other information databases and receive replies. The information bases are organised into topics, thus making it easier to connect with people with common interests.

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.

DECT (Digital European Cordless Telephone). As its name implies, this is a standard for cordless phones. The most likely scenario is around a building though there are some services that operate in public places.

Desk Top Conferencing (DTC). Videoconferencing where communications is from computer-to-computer, rather than remote video camera to local monitor. The users have a small video camera mounted on top of their computer monitor. Software integrates video images into the Windows desk-top environment. This means that participants can see images of each other alongside other computer generate information such as documents. Telecooperation takes place by a combination of visual conversation and collaborative document sharing.

Ecash (Electronic cash). Cash that exists as information. It may be held in smart cards or on disk storage and can be traded through special terminals or over networks. At the moment several commercial variants are appearing e.g. Digicash, Mondex.

ECTF. European Community Telework/Telematics Forum.

EITO European Information Technology Observatory.

Electronic Commerce (E-Commerce). The handling of formal transactions over electronic networks, often directly computer to computer. Early electronic commerce took place over proprietary networks using EDI (Electronic Data Interchange), but the scope is now consider wider including trading over open networks such as the Internet (see Internet Commerce). Similar to, but narrower in scope than teletrade (see definition above). Many aspects of electronic commerce are now attracting 'E' labels e.g. E-payments, E-shopping, E-banking.

Electronic Communities. Usually refers to a Virtual Community (q.v.) in the electronic commerce or electronic market context.

Electronic Markets. Locations on the Internet, which facilitate connections and trading between buyers and sellers. These may be in the form of virtual shopping malls, trade directories, electronic communities or online auctions.

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 Annexe 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.

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.

FAQs (Frequently Asked Questions). Files of answers to questions commonly asked by those joining an online service such as an email distribution list, a computer conference or Internet newsgroup. The ETO Web site has a series of frequently asked questions including questions of interest to teleworkers seeking

employment, researchers into telework and of those balancing work and domestic commitments. See Web page http://www.eto.org.uk/faq/faqintro.htm.

Firewall. A secure gateway limiting access in and out of an internal computer network, such an Intranet. A combination of settings on communications hardware, and software on computer servers, denies access to unauthorised users.

ftp (File Transfer Protocol) The process for transferring binary files (e.g. documents or software) across a network.

GAT (General Access Telework). The telework 'chain' of the ACTS programme. GAT brings together those working on specific projects that involve telework (see Annexe 2 for a list of these projects).

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. Lotus Notes is the most widely used groupware product.

GSM (Groupe Special Mobile). 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 70 in total). The main alternative digital standard is PCN. This is used by some European operators (e.g. Orange in the UK), but is more widely found in the Far east and Northern America. An emerging standard UMTS (q.v.) should hopefully overcome the current incompatibilities.

GIF (Graphics Interchange Format). Compression algorithm for computer images in 256 colours. Two variants GIF87 and GIF89. The mostly used format for images on the Internet, although JPEG (q.v.) compression is considered better for high quality photographs and usually compresses smaller.

HTML (HyperText Mark Up Language). The code used on WWW pages to instruct the browser how to display the text. It add different types of tags and pairs of tags to delineate blocks of text. For example, the pair <H1> </H1> around a block of text indicates a first level heading, <B> </B> indicates bold text, and <P> is a paragraph tag. HTML is evolving rapidly. Version 3 is currently the existing standard, but HTML extensions (e.g. new tags) and new standards (e.g. XML) are being developed all the time and used in particular packages, which means that users must keep upgrading browsers or using different browsers to read all such 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.

IAP (Internet Access Provider). A supplier of connections to the Internet. Such connections may be dial-up (where the Internet is accesses through a modem), ISDN (q.v.) or leased line.

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. It is universally accessible through advanced information and communications technologies.

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.

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, including technological, social, economic, etc. ISPO is part of the Information Society Activity Centre (ISAC) whose role is to raise awareness of the opportunities and impacts of Information Society development by arranging special events, providing a leadership role in running conferences, participating in other relevant conferences, workshops, seminars, etc., and in participating in selected projects

JPEG (Joint Photographic Experts Group). An image format for compressed photographic images. It gives good results at compression ratios of up to 20:1. This efficiency means it is widely used on the Internet. See also GIF and MPEG.

Kiosk. A customised access unit, providing consumers simplified access to a range of information services. A typical kiosk is found in a public area, such as a shopping centre or railway station, and is robustly constructed. It is a metre or so high and operated by people standing up. Although powered by computer, its interface is not usually a computer keyboard, but is typically a touch screen display or a standard display with a customised set of interface buttons.

Knowledge Management. The management of an organisation's knowledge, both explicit (information or knowledge that can be codified) and tacit (the knowledge in people's heads). It involves a systematic approach to managing knowledge processes - creation, identification, gathering, classifying, storing, disseminating and using - as well as creating the environment for knowledge creation and sharing to flourish. Collaborative technologies, such as the Internet, Intranets and groupware play an important part in most knowledge management initiatives.

Knowledge Networking. The creation and development of knowledge through person-to-person networking, often augmented by online communications. Knowledge networking takes place in communities of practice (q.v.), electronic communities (q.v.) and various forms of virtual organisation (q.v.).

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.

List Server. A server that redistributes electronic mail to those that have "subscribed" to the list. Commonly used software for list servers are listserv or MajorDomo.

LIW (Location Independent Work). A generic term for flexible work and telework that indicates that the physical location of where the work takes place in unimportant. Modern communications and computer technology bring the work to the worker, wherever they happen to be.

MIME (Multipurpose Internet Mail Extensions). A standard format for encoding files for sending over the Internet. It is able to handle special character codes and symbols, which the Internet, which can only handle 7-bit ASCII codes is unable to do. Thus it can be used to send files as varied as word processing documents, spread sheets, image and video files. Such files 'attached' to an email are typically MIME encoded, often automatically and transparently to the user. BASE64 is a specific MIME format.

Modem (modulator-demodulator). A device that connects your computer to the telephone network to access remote computers and online services. Modern modems work to standards such as V32. Most can send and receive fax, while later models also handle including voice messages.

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. By restricting its range of application it can be made simpler and cheaper than a fully configured personal computer. Common formats are hand-held devices and slim-line table-top devices with no local hard disk storage.

Newsgroups. Bulletin boards, where users post messages that can be accessed by others using a "news reader". Each newsgroup focuses on a specific topic, often of very narrow interest. Each newsgroups has its own unique address, such as uk.business.telework. These are organised into hierarchies, where the prefix indicates types of newsgroup (e.g. biz. (Business), sci (science) rec. (Recreation) etc.) or country using the Internet two character codes (e.g. uk, de, es). See also USENET.

NTF (Nederlands Telewerk Forum). The national teleworking association in The Netherlands.

OEN (Open Electronic Networking). The use of open systems like the Internet, for telecooperation. This contrasts with proprietary online services (q.v.). OEN uses a variety of methods including electronic mail, distribution lists and the World Wide Web.

OLR (Off-Line Reader). Software that allows users of email and the Internet, to download new information into their local computer and browse it while not connected. This saves significantly on telephone charges. A built in feature of many email systems (e.g. Eudora), but some specialist packages (e.g. Virtual Access) provide similar interfaces for multiple services.

Online Services. Services that dial-up users access for electronic mail and a range of information services. Some are restricted to information access, such as Lexis-Nexis, while the more general services such as CompuServe and AOL, also offer email, computer conference and WWW access. At one time many of these services used proprietary software and did not allow Internet access. The dividing line between these and Internet services is blurring.

PGP (Pretty Good Privacy). A method of encrypting messages, such that they can only be read if the recipient applies the appropriate decryption method. Encryption and decryption relies on a combination of private 'key', known only to the sender and a 'public' key, known to the recipient. Since messages are encoded using cryptographic algorithms they are extremely difficult to decode if intercepted. Encryption is at the heart of secure electronic transactions (see SET). PGP was developed privately to overcome restrictions placed by US legislation on the export of encryption technology.

PoP (Point of Presence). Used to indicate an access point to an Internet Access Provider (q.v.). Many providers now provide PoPs on a national or international basis, through agreements with other IAPs or ISPs. This gives their clients Internet access for the cost of a local telephone call from many locations, a boost to reducing the cost of location independent working (see LIW).

Push Technology. A way of pushing information to an Internet user in background mode. While the user is browsing or accessing email, 'channels' of information (according to user selection) are pushed into their local computer invisibly. They may be viewed later by user selection, or activated as a screen saver. Pointcast, for example, scrolls ticker tape style stock prices, and shows panels of information (including news headlines, company and industry news, and weather forecasts) when the users' computer is otherwise idle.

Remote Access. Software that allows a computer user to access any application on a remote computer. This contrast with specific applications, such as email, where the client software is already held in the local computer. Variants include remote node and remote control. Remote node gives access to a remote network, and you are just another user running application. Remote control means you actually take control of the remote PC through your local keyboard. The remote PC runs the application and its display image is mirrored back to your local computer.

RISI (Regional Information Society Initiatives), part of the Article 10 of the Structural Funds.

Search Engine. A facility that lets you search for information on the Internet from an index, that typically holds references to all the text on WWW pages. The indexes may relate to the content on one site (e.g. a version of Excite indexes the ETO Web pages daily) or hold references to WWW pages all over the Internet (50 million plus). Commonly used engines are Lycos, InfoSeek, AltaVista, and Excite. Selection of pages to index may be manual (a creator submits pages for indexing) or automatic, where a 'crawler' or 'spider' (intelligent agents q.v.) roams the net to find new and pages.

SET (Secure Electronic Transactions). A protocol standard which uses key encryption for transmitting information as part of a teletrade transaction. It may be used to authenticate buyers and transfer funds. The standard is backed by major finance clearing organisations (VISA and Mastercard) and will increasingly be incorporated into commercial electronic commerce servers and client (browser) software. An important aspect of the practical use of such as standard is that of 'trusted third parties' who hold the private parts of the keys of buyer and sellers. See also PGP.

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).

Spamming. The frowned upon practice of posting messages indiscriminately into newsgroups and individual emails e.g. for unsolicited advertising.

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.

Telecommuting. See Definitions (above)

Telecooperation. See Definitions (above)

Teleconferencing. A generic term that includes both video- and audio- conferencing (q.v.).

Telecottage. See Definitions (above)
Telecentre. See Definitions (above)
Teletrade. See Definitions (above).

TTS (Transport-Telecommunications Substitution). The substitution of telecommunications based methods such as telework and teletrade to replace physical travel or transport. Telecommuting to replace physical commuting is one example of the former, while document delivery over a network, instead of using a courier is an example of the latter.

TQM (Total Quality Management). A systematic approach to inject quality thinking throughout an organisation. While the ultimate focus is on quality of products and services, the essential ingredients are conformance to a set of standards, such as those embodied in ISO9000 and ISO9001.

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.

URL (Uniform Resource Locator). It defines an Internet location and type of resource e.g. ftp://ftp.myfiles.co.uk is an ftp server and http://www.myco.co.uk/pages.html is a reference to an html page

USENET. Also known as Net News. A large distributed bulletin board system consisting of over 12,000 newsgroups. Each newsgroup is propagated around the Internet on a daily (or more frequent) basis. Internet Access Providers hold copies of a large proportion of these for local access by their users.

UUencode. An encoding format that translates files into 7-bit format for transmission over the Internet. An earlier alternative to MIME encoding (q.v.).

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. Videoconferencing equipment ranges in size from person-to-person, to large group. Users can control camera direction and angle of vision, so that remote users may be shown images other than the user's face. Person-to-person communications is increasingly being incorporated as another channel in computer communications (see Desktop Conferencing), while use of compression techniques means reasonable quality video over much slower links than traditionally (e.g. 128kbs ISDN).

Virtual Organisation. An organisation of various independent members that operates cooperatively (and may have been created) without the constraints of space and/or time. Telecooperation (q.v.) is its main *modus operandi*. ETD (q.v.) is an example of a virtual organisation. It is a consortium of business partners and individuals who work as a coherent organisation on the ETD initiative.

Virtual Communities. Communities that have been developed around an area of common interest, and use online techniques to sustain themselves. They may use electronic bulletin boards (forums), the World Wide Web or email distribution lists to share information and maintain communications. As well as volunteer run communities, others are being developed by commercial ventures, to create a focal point for electronic marketing (see Electronic Communities).

Virtual Corporation. The more commonly used American term for a virtual organisation.

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.

Virtualisation. A blanket or umbrella term used to embrace the many types of virtual activity or structure, where traditional forms are replaced by those taking place remotely over networks. Telework, for example, is the virtualisation of work, while teletrade is the virtualisation of products and services. Virtual teams (q.v.) and virtual organisations (q.v.) are other specific examples of virtualisation.

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. Speakers' overheads can also be made available, and facilities for receiving Internet users' real time feedback (by telephone, fax or email) can be provided. After the conference, the event archive can be stored for subsequent downloading and replaying.

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
RECENT PUBLICATIONS AND REFERENCES

1. Publications of the European Commission

Title	***Author***	***Other Details***	***Date***
Deployment of Telework in European Public Administrations Rapid Assessment	Fritz Betz, Johanna Riegler and Irene Schwarz Centre for Social Innovation, Vienna	European Foundation for the Improvement of Living and Working Conditions, and DG V	30 April, 1998
1998 Report of the Information Society Forum	The Information Society Forum	Information Society Forum Secretariat BU 24 2/70 Rue de la Loi B-1049 Brussels	Jan 1998
Report on the European Telework Information Day, 28 May 1998	Jeremy Millard	Available from CEC, DG XIII/B/1	August 1998
Status Report on European Telework - Telework 1997	European Commission (DGXIII-B)	Available from CEC, DG XIII/B/1	October 1997
Communication on The Social and Labour Market Dimension of the Information Society: People First - The Next Steps	European Commission (Communication)	COM(97)390	July 1997
Telework in Europe: Bridging the Gap between Social and Societal Needs and New Technology Opportunities: Seminar Report	Jeremy Millard	Available from CEC, DG XIII/B/1	June 1997
Partnership for a New Organisation of Work	European Commission (Green Paper)	COM(97)128	April 1997
Proposal for a European Parliament and Council Decision Concerning the 5th Framework Programme of the European Community for Research, Technological Development and Demonstration Activities (1998-2002)	European Commission (Proposal to Council and Parliament)	COM(97)142	April 1997
Europe at the Forefront of the Global Information Society: Rolling Action Plan	European Commission (Communication)	COM(96)607	Nov. 1996
The Information Society and the Citizen: A Status Report on the Availability and use of Information and Communications Systems.		ISPO BU24 2/78 Rue de la Loi 200 B-1049 Brussels	Sept. 1996
Living and Working in the Information Society: People First	European Commission (Green Paper)	COM (96) 389 Published as supplement 3/96 to the Bulletin of the European Union. ISBN: 92-827-7869-X Price: ECU 7.	July 1996
Networks for People and their Communities	The Information Society Forum	Information Society Forum Secretariat BU 24 2/70 Rue de la Loi	June 1996

		B-1049 Brussels	
The Social Implications of Teleworking: Abstracts	European Foundation for the Improvement of Living and Working Conditions	European Foundation Loughlinstown, Dublin 18 E-mail: postmaster@eurofound.ie	May 1996
Building the European Information Society for Us All: Interim Report.	High Level Experts group on the Social and Societal Aspects of the Information Society,	Available from CEC, DG V/B/5 Rue de la Loi 200 B-1049, Brussels	Jan. 1996
The Citizen's Network: Fulfilling the potential of public passenger transport in Europe - Green Paper	European Commission	ISBN 92-827-5812-5	1996
Building The European Information Society For Us All: Interim Report	High Level Group Of Experts		1996
Actions for stimulation of transborder telework and research cooperation in Europe - TELEWORK 96	EC - DG XIII B1	ISBN-94-96-695	1996
Electronic Commerce Workshop (Brussels 22-23 April 1996)		Report on workshop.	1996
Telework Congress, Chance and Challenge for Europe, Luxembourg (26-28 June 1996)	Various.	Conference proceedings. ISBN 92-827-8640-4 Price: ECU 22	1996
The Way Forward: Advanced Communications, Economic growth and Social Development in Europe.	Project FAIR (ACTS)	ISBN 0-903622 77 7 Available from: DG XIII-B1 Ave de Beaulieu 9, 2/27 B-1160 Brussels Email:adb@postman.dg13.cec.be	1996

Publications obtainable from the Office for Official Publications for the European Communities, L-2985, Luxembourg.

2. Other Publications

Title	*Author*	*Publisher/Other Details*	*Date*
Building Action on Ideas: Report of Amsterdam '97 International Workshop	Paul J. Jackson Jos M.M. van der Wielen	WORC Report 97.08.004 ISBN 90-75001-19-9 Work and Organisational research Centre Tilburg University PO Box 90153 5000 LE Tilburg The Netherlands	Jan. 1998
New International Perspectives on Telework: from Telecommuting to the Virtual Organisation	Paul J. Jackson Jos M.M. van der Wielen	Publisher: Routledge, FEEPOST, Andover, Hants SP10 5BR, UK http://www.routledge.com	April 1998
Flexible Werken/Telewerken; het	Mininsterie van	Available from Ministerie	Mei 1998

managementinstrument van deze tijd	Verkeer en Waterstaat	van Verkeer en Waterstaat, Directie Voorlichting, Postbus 20901 NL - 2500 EV Den Haag	
Telework in the Netherlands	Hester de Vries	Hugo Sinzheimer Institute, University of Amsterdam, Tel.: +31 20 52535	1998
Telewerk is Maatwerk		Industriebank LIOF, Tel.: +31 43 3280280	1998
Le Guide Pratique du Télétravail	Charbonneau, Dorin, Dumoulin, Gauthier, Lombard, Turbé-Suetens	Les Editions d'Organisation ISBN 9 782708 119789	1998
Prime Esperienze Italiane di Telelavoro - Capire I bisogni e contrattare gli accordi (Second edition)	Renato Rizzo	Mondadori Informatica	1998
European Information Technology Observatory 98 (EITO'98) - section on *Telework: Status, Development and Issues*	EITO Task Force	EITO, Lyoner Str. 18, D-60528 Frankfurt/Main. Can be ordered from ETD Office: Fax: +45 86 28 64 99 or web address: http://www.eto.org.uk/eito/	March 1998
The Telecommuters	Francis Kinsman	ASIN 0471917893	1998
Managing Telework: strategies for managing the virtual workforce	Jack M. Nilles	John Wiley & Sons ISBN 0471293164	Aug.1998
The Home Office Solution: how to balance your professional and personal lives while working at home	Alice Bredin, Kirsten Lagatree	John Wiley & Sons ISBN 0471192090	May 1998
New Workplaces for New Workstyles	Marilyn Zelinsky	McGraw-Hill ISBN 007063324X	Apr.1998
The Ultimate Home Office Survival Guide	Sunny Baker, Kim Baker	Petersons Guides ISBN 0768900077	Apr.1998
The Death of Distance: How the Communications Revolution will change our lives	Frances Cairncross	Harvard Business School ISBN 0875848060	Oct.1997
Making Telecommuting Happen: a guide for telemanagers and telecommuters	Jack M. Nilles	John Wiley & Sons ISBN 0471286338	Dec.1997
Telearbeit, Telekooperation und virtuelle Unternehmung	Reichwald, München, and others	Springer-Verlag, Berlin ISBN 3-540-62013-3	1997
Il manuale del telelavoro (Italian adapted edition of The Teleworking Handbook)	Patrizio Di Nicola (ed)	SEAM ISBN 88-8179-105-6 Price: ITL 30.000	November 1997
Le Guide Pratique du Télétravail	Charbonneau, Dorin, Dumoulin, Gauthier, Lombard, Turbé-Suetens	Les Editions d'Organisation	1997

Télétravail : réalité ou espérance ?	Schneider, B & Rosensohn, N	PUF: Le Sociologue	1997
Etätyöopas työnantajille	Telework Theme Group. Ilari Rantala – Ari Luukinen ed.	Finnish Ministry of the Interior. Orders: http://www.uta.fi/telework	1997
Progettare il telelavoro	G. Bracchi & S. Campodall'orto (eds)	Franco Angeli ISBN 88-464-0101-8 Price: ITL 38.000	1997
Telelavoro oggi	Maria Luisa Felici	EPC Libri ISBN 88-8184-073-1 Price: ITL 25.000	1997
Notat om telearbejde	Lars Qvortrup	Prepared on behalf of LO, the Danish Trades Union Congress, November 1997	1997
En arbejdsplads i Danmark – esktern vudering af pilotforsøg med hjemmearbejdspladser hos Arbejdsskadestyrelsen	Arbejdsskadestyrelsen (National Board of Industrial Injuries)	Arbejdsskadestyrelsen Tel.: +45 39 17 77 00 Fax: +45 39 17 77 11	1997
The Teleworking Handbook: New Ways of Working in the Information Society.	Imogen Bertin and Alan Denbigh	TCA - The Telework, Telecottage and Telecentre Association, UK. Tel: +44 1203 696986. Compuserve 1000272,3137@ ISBN: 0 9528492-1-6	Second edition, 1997
Contrattare il Telelavoro	Patrizio Di Nicola	Lavoro e Diritto, number 3, pp. 493-520	Summer 1997
Sperimentando Oggi il Lavoro di Domani - Resultati del progetto Roma Tra-De.	E. de la Serna, G. Scarpitti, D Zingarelli, e.a.	City of Rome - ECTF Italy	March 1997
New International Perspectives on Telework: Report of London '96 Workshop 'From Telecommuting to the Virtual Organisation'	Paul J. Jackson Jos M.M. van der Wielen	WORC Report 97.01.001 ISBN 90-75001017-7 Work and Organisational research Centre Tilburg University PO Box 90153 NL - 5000 LE Tilburg	Jan. 1997
Teleworking and Trade Union Strategy	Andrew Bibby for FIET	FIET, International Federation of Commercial, Clerical, Professional and Technical Employees, CH http://www.fiet.org	1997
Telearbeit Deutschland '96 – Neue Formen und Wege zu Arbeit und Beschäftigung	Empirica	Hüthig	1997
European Information Technology Observatory 97 Chapters include 'The Future of the Internet' and 'Electronic Commerce over the Internet'		EITO, ISSN 0947-4862 Available from EITO Members (CEBIT, ECTEL, Eurobit, SIMOTCI and SMAU) or the ETO Web site http://www.eto.org.uk.	1997

Telecommuters: The Workforce of the 21st Century: An Annotated Bibliography	Teri R. Switzer	Scarecrow Press Pages: 192 Price: $34 (paperback)	1997
Manual on Remote Working	Kevin Curran and Geoff Williams	Gower ISBN: 0-566-07839-2 Price: £65	1997
Telecommuting: Modeling the Employer's and Employee's Decision Making Process	Adriana Bernadino	Garland Press (Studies on Industrial Productivity) ISBN: 0-815-32723-4 Price: $46	1997
Teleworking in brief	Mike Johnson	Butterworth-Heinemann Pages: 160 (paperback) Price: £12.99	1997
Virtual Teams: Reaching across space, time and organisations with technology	Jessica Lipnack and Jeffrey Stamps	John Wiley & Sons ISBN: 047 116 5530 Price: $28.	1997
Management Handbuch Telearbeit	Godehardt, Korte, Michelsen, Quadt	Hüthig Verlag Heidelberg	1997
Workplace Innovations - a way of promoting competitiveness, welfare and employment	Tuomo Alasoini, Mari Kyllönen, Antti Kasvio - Finnish Ministry of Labour	National Workplace Development Programme ISBN 951-735-192-5	1997

3. Telework 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 Available on subscription: £99 for institutions, £50 for individuals
Telewerken (Dutch)	(including the N.T.FORUM Newsletter Overkleeft Uitgeverij bv Brinkpoortstraat 38 7411 HS Deventer Tel.: +31.570 611044 E-mail: kene@pi.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 Price:£3.95 per issue.
Teleworx (German)	IWT magazin verlags-GmbH,, Am Gewerbebogen 1, 85591 Vaterstetten, Deutschland Tel.: 081 06/3 50-0 Fax: 081 06/3 50-190 E-mail logopress@compuserve.com Http://www.iwtnet.de/teleworx	6 per year Price 7,80 DM Subscription DM 31 for six issues

4. Telework Associations in Europe

Country	Address	Email/WWW	Tel/Fax
"Europe" ECTF - European Community Telework/Tele-matics Forum	12 Castle Street Totness, Devon UK - TQ9 5NU	protocol@ectf.org.uk http://www. telework-forum.org	Tel: +44.1803.865852 Fax: +44.1803.868377
Austria Austrian Telework Association	Akademistra. 2/4 A-1010 Vienna	Info@ata.at http://www.ata.at	Tel:: +43 1 585 2300 Fax: +43 1 585 2300-11
Belgium Belgian Teleworking Association	c/o Teleport Brussels Buro&Design Centre Esplanade du Heysel B-1020 Brussels	bta@compuserve.com http://www.bta.be	Tel: +32 2 475 2000 Fax: +32 2 475 2010
France A.F.T.T.	Telespace Vercors Chemin des Breux 38250 Villard deLans	infos@aftt.net http://www.aftt.net	Tel : +33 4 76950896 Fax : +33 4 76955702
Germany Verband Telearbeit Deutschland (VTD)	Balhomer Weg 47 D-34308 Bad Emstal Germany	Si-Reis@t-online.de http://www.vtd.org	Tel.: +49 5624 925383 Fax: +49 5624 925384
Ireland Telework Ireland (TWI)	7 Clones Road Monaghan Ireland	riona@telework.ie http://www.telework.ie	Tel: +353 47 72069 Fax: +353 47 72070
Italy Associazione Lavoro & Tecnologia	P.O. Box 2395, 00100 Rome	lavtec@italymail.com http://www.mclink.it/ telelavoro	Tel.: +39 338 8759486 Fax: +39 6 4391066
Italy Societa'Italiana Telelavoro (SIT)	Via Pierluigi da Palestrina 48 00193 Roma	Sit@isinet.it Http://www.societaitalianatelelavoro.it	Tel.: +39 6 3211285 Fax: +39 6 3224256
Netherlands Nederlands Telework Forum	Vijzelmolenlaan 10 P.O.Box 623 3440 AP Woerden	Http://www.ntforum.nl	Tel: + 31 348.493650 Fax: +31 348.482288
Portugal Associacao Portuguesa de Teletrabalho	Av. D. Nuno Alvares Pereira 27 2735 Cacem	telework@automail.pt http://www.teletrabalho.com http://www.automail.pt/telework	Tel.: +351 1 913 85 03 Fax: +351 1 913 70 99
Portugal Associacao Portuguesa para o Desenvolvimento do Teletrabalho	Av. Miguel Bombarda 8 F, Apartado 117, 2780 Oeiras	100135.266@compuserve.com http://www.teleman.pt/apdt	Tel.: +351 1 4416965 Fax: +351 1 4415767
Spain Asociación Española de Teletrabajo	Las Calas 3 28016 Madrid	mickx@ciberteca.es mistrala500@wotwe.es http://www.ciberteca.es/aet.htm	Tel: 341-5153707 Fax: 4137950
Sweden Telecottage Association Sweden	Box 110 S-930 90	telestugan@telestugan.se http://www.telestugan.net	Tel: +46 961 107 65 Fax: +46 961 100 60
United Kingdom TCA - Telework, Telecottage and Telecentre Association	Freepost CV2312 WREN Warwickshire CV9 2RR	http://www.tca.org.uk	Tel: +44 1203 696986 Fax: +44 1203 696538

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[HM1]Statistics for languages (native speakers, official languages, second languages being sought
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[JM2]