BENCHMARKING PROGRESS
ON NEW WAYS OF WORKING AND
NEW FORMS OF BUSINESS
ACROSS EUROPE

ECaTT Final Report

IST Programme
KAll : New Methods of Work and Electronic Commerce

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Foreword

This report results from an original attempt to monitor on real time a fast developing and dynamically evolving situation on electronic commerce and tele-working. It is highly informative in this context. It also enables a more structured effort on what should be measured, what can be measured and how. Learning from the results and of their limitations are both equally valuable.

Since the launch of this project, there has been an increasing awareness about the need to have statistical indicators on the digital economy available, which resulted into explicit calls for proposals in the IST programme. As a result, a number of new projects have been recently launched in this domain, maintaining and strengthening the efforts.

Further importance is attached to this work with the need to support the eEurope initiative with benchmarking exercises and quantitative data. The publication of the ECaTT project results is a timely and direct contribution to benchmark progress on key issues of the eEurope Action Plan, adopted during the Feira Summit on 20 of June 2000.

Thanassis Chrissafis
DGINFSO-C2
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empirica GmbH
Bonn, July 2000
1 Introduction

ECaTT - Electronic Commerce and Telework Trends: Benchmarking Progress on New Ways of Working and New Forms of Business across Europe – is a project carried out by empirica, Bonn, in collaboration with numerous European partners and with financial support from the ESPRIT and ACTS programmes of the EU commission. Europe-wide representative surveys were carried out using identical questionnaires (translated into each language) in 10 EU countries (Germany, the United Kingdom, France, Italy, Spain, Sweden, Finland, Denmark, Netherlands, Ireland). A total of 7,700 people above the age of 14 (General Population Survey – GPS) as well as 4,158 establishments, targeting IT managers, (Decision makers Survey, DMS) were questioned on new work forms and e-commerce. In addition, in-depth case studies in Europe, the USA, and Japan, and extensive national reports were also produced. The GPS was carried out between February and March 1999, and the DMS in April and June 1999. Additionally, surveys using the same instruments were also conducted in Switzerland a few months later. In contrast to other studies, the ECaTT study has the advantage that historical comparisons can be made with earlier similar based studies (especially TELDET - Telework Development and Trends) and the results can be compared in a benchmarking exercise for the 10 countries.

This report is also available in a web-enhanced edition (pdf-file) with links to resources on the Internet. It is also available in html format on the ECaTT Website which also includes a set of reports that more comprehensively cover survey results, status reports of individual countries and case studies. The Website can be accessed at www.ecatt.com.

Data from surveys conducted in Switzerland has been included in this report as far as it was available at the time of writing. Swiss data which could not be included here will be made available on the ECaTT Website.

1.1 Telework and E-commerce: Two Central Pillars of the Information Society

Interrelated developments in technology (the rapid digitisation of information and networking of processing units) as well as the economy (accelerating economic restructuring and globalisation) have together created a new societal paradigm: the age of the Information Society. Central to this paradigm are trends in the labour market and in the production process. Teleworking and e-commerce can be seen as exemplifying these developments which underpin the shift towards the Information Society.

Telework is not an isolated phenomenon. In its traditional form, telework is one of a number of options organisations can choose from to adapt to changing circumstances, e.g. market conditions; and individuals can choose from to balance working life and personal preferences or obligations. At the same time, major characteristics of telework (freedom from some of the time-space restrictions that have traditionally been associated with work) are already being integrated in many kinds of work practices, so that the term telework loses its distinctiveness.

From a broader perspective, telework can be interpreted as one of a number of developments leading towards greater flexibility in the way paid work is organised. The degree to which this flexibility goes to the benefit of the employer or the employee side varies and is negotiated politically and socially. A more flexible workforce means that labour can be more efficiently allocated according to where (and when) it can be used most productively. On the other hand, changes that benefit both the business community and employees are feasible. These developments occur mainly along the dimensions of working time (daily, monthly, annually, employment commencement, retirement age), working place(s), type of contract and inter-organisational co-operation.
What might be called the traditional, post-war work paradigm consisted of the following determinants:

- permanent employment with a contract of employment;
- “life-time employment”;
- standardised working hours (“9 to 5”);
- full-time employment (35-40 hours/week);
- state-provided social security provision;
- workplaces are co-located in centralised buildings (offices, factories, retail outlets etc.);
- strong intra-organisational co-operation based on face-to-face meetings, while contacts to external people and organisations are limited to certain gateways (e.g. purchasing and distribution departments).

A changing economic environment together with shifts in social attitudes and the widespread application of new ISTs have resulted in the emergence of what may be called the 21st century work paradigm (see figure) which is characterised by spatial dislocation, “self-employment” (whether officially or just in relation to characteristics) with far-reaching self-responsibility for ensuring social protection, greater diversity and flexibility in working time patterns and stronger boundary-transgressing communication and co-operation:

This paradigm is far broader than the post war paradigm as it comprises a much wider spectrum of ways of working. Still, old-style employment patterns will continue to exist and remain at the core of the labour market, but they will be only one of a variety of work patterns that is serving the requirements of 21st century economies.

The way in which telework differs from traditional forms of work must be seen in the light of these general trends. Results from empirical research indicate that teleworkers:

- generally have more freedom to decide their own working hours, adapting them to the needs of their work and to personal preferences;
- are often self-employed or “employed self-employed”, i.e. are very much responsible for their work; management by objectives is practised so that pay is much less determined by the time spent working but by the efficiency of the work;
divide their working time between two or more work locations, e.g. the office, the central customer, the home office, the road;
are closer to external business partners such as customers and suppliers resulting in closer inter-firm co-operation while intra-firm communication is reduced.

One of the aims of ECaTT was to find further evidence for (or against) these findings and especially to identify changes in the developmental path of telework diffusion compared to the findings of the mid 1990’s TELDET project1.

**E-commerce** has become more important than all other IT-related topics in the public eye. Until a few years ago, only a handful of futurists predicted that the Internet would have more than a marginal effect on the structure of economic activity - today there is much wider acceptance of the profundity and significance of its impacts. The Internet revolutionises our concept of how the economy functions and wealth is created. E-commerce comprising not only business-to-consumer, but also business-to-business transactions, lies at the heart of this revolution.

The effects of e-commerce are manifold:

Firstly, e-commerce reduces costs of certain activities central to economic processes, especially those concerning the collection, processing, analysis, transmission and distribution of information in the course of a commercial transaction (transaction costs). Cost reductions produce a direct gain in competitiveness for companies that adopt e-commerce faster than the competition.

Secondly, costs decreases always cause changes in cost structures. An indirect effect, therefore, is that some economic activities which have not been able to generate a profit in the past become economically feasible for the first time. For example, many Internet firms (the New Intermediaries or Infomediaries) match supply and demand much more flexibly and accurately than has traditionally been possible.

Thirdly, e-commerce revolutionises business-customer interaction where the customer takes on a much more active role in choosing products and, ultimately, in designing them so that they exactly match his/her needs. This applies especially to business customers but also to consumer items which have until now been mass produced.

Fourthly, e-commerce is a process innovation in that it enables a much closer integration of value chain segments. Businesses can co-ordinate their activities with their suppliers, clients, distribution partners to a degree that makes possible complete but decentralised management of value chains. One effect of this is that separate companies lose their independence and significance, while groups of companies organised in value chains or “business webs” gain importance. Companies have to co-operate or die - this holds true much more than it has ever done before.

While in public as well as academic discourse, **telework and e-commerce** are still regarded as separate issues, some labour market developments point into a future where labour is treated as just another commodity, which will be traded freely on the net as electronic products already are. The establishment of **electronic labour markets** is already under way. Telework provides a model for the organisation and execution of work by actors in (partly or fully) virtual business communities. Telework and e-commerce can be treated as two sides of the same coin: e-work is employee-to-business e-commerce where private households supply factors of production (see figure below), while in business-to-consumer e-commerce, private households constitute the demand side. By means of the Internet it will eventually be possible to mould the vast network of small businesses, government agencies, large corpo-

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rations, and independent contractors into a single, virtual business community with the ability to interact efficiently with each other seamlessly across any computer platform.

<table>
<thead>
<tr>
<th>Labour Market E-Commerce Process Model</th>
</tr>
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<tbody>
<tr>
<td><strong>Employer/Client</strong></td>
</tr>
<tr>
<td>Identify need</td>
</tr>
<tr>
<td>Find employee/contractor</td>
</tr>
<tr>
<td>Arrange terms</td>
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<tr>
<td>Telemange</td>
</tr>
<tr>
<td>Pay</td>
</tr>
<tr>
<td><strong>Transaction</strong></td>
</tr>
<tr>
<td>market information</td>
</tr>
<tr>
<td>job advertisements, work samples</td>
</tr>
<tr>
<td>contract details</td>
</tr>
<tr>
<td>work products, support, cooperation</td>
</tr>
<tr>
<td>payment details, e-cash</td>
</tr>
<tr>
<td><strong>Employee/Contractor</strong></td>
</tr>
<tr>
<td>Identify interest</td>
</tr>
<tr>
<td>Find employer/client</td>
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<tr>
<td>Arrange terms</td>
</tr>
<tr>
<td>Telework</td>
</tr>
<tr>
<td>Receive pay</td>
</tr>
</tbody>
</table>

This report can only hint at developments in this field, but we think it is very important to acknowledge that electronic labour markets constitute an emergent area, as changes in the way the deployment of labour is organised might affect key determinants of economic well-being and social progress.

As ECaTT builds on earlier work in projects like TELDET as far as telework is concerned, the following section presents a short review of telework developments since the beginning of the 1980s.

1.2 Telework in the 1980s and 1990s

Korte and Wynne gave a representative overview of the main developments during the 1980s’ and early 1990s’ in telework implementation and academic/political discourse in their 1996 book² (based on the results of the TELDET report). The major trends of the 1980s were:

- Public discussion of telework was centred on (permanent) home-based telework, leading to strong opposition from large numbers of employees as well as employers in the face of a perceived threat of social isolation and lack of supervision.
- Because of technological restrictions, teleworkers were only rarely connected to their employers/clients via data networks. Telework mostly came in the form of what today would be called computer homework, work results being transported manually, e.g. on floppy discs.
- The tasks and occupations of teleworkers were in general limited to DP professionals (e.g. programming), sales staff, data entry/text processing and management tasks, while all other occupations were very seldom executed via telework.
- Trade Unions generally responded negatively to the concept of telework. In Germany as well as the USA, proposals to legally ban telework were brought forward between 1983 and 1986. Media reports on telework focused mainly on the negative, presenting telework as a revival of traditional home-work with specific connotations of exploitation es-

especially of female labour. With hindsight, 1980s trade union doubts about telework should be seen against the background of the general onslaught which unions were facing during the Reagan and Thatcher years.

Inertia among company managers resulted in a lack of willingness to change work organisation models which were then perceived to be near-optimal.

Compared to the 1980s environment, described by Peter Johnston as a ‘hesitant period of experimentation’, the early 1990s were characterised by a stronger emphasis on feasibility and the exploitation of business cases that make use of telework. In addition, the self-employed and micro-businesses obtained greater access to ISTs which enabled them to gradually adopt teleworking models. Some major trends include:

There was strong political initiative to make use of telework to foster economic competitiveness, on the European as well as the Member States level, spearheaded by the European Commission’s 1993 ‘White Paper on Growth, Competitiveness and Employment’.

The increasing availability of ISTs that enable fast, economical and reliable link-up of teleworkplaces to central computer networks (amongst them ISDN and remote access solutions) meant that more tasks could be executed via telework.

At the same time, low-skill telework did not grow as fast as envisaged by both telework proponents and opponents in the 1980s: “The suspicion is that questionable social acceptability coupled with marginal profits were sufficient to prevent viable telework for jobs such as these typing and data entry work, which were the first for which technologies to support locational independence of work were available”. Because control over labour becomes more important the lower the skill requirements are, low-skill employees are more likely to be centrally located even in the future.

Environmental protection was high on the political agenda, leading to plans to use telework as a means to reduce overall commuter traffic and peak-time traffic volumes. However, only a handful of such projects succeeded in the long run.

Off-shore telework was beginning to be regarded as a viable option for larger companies. Typically, freelancers or several workers grouped together in a telework centre in low-pay or English speaking locations such as India, Jamaica, East Europe or Ireland working for companies based mainly in the first world. Off-shore telework might be regarded as a means to bypass traditional home-based telework and go directly for outsourcing — generally to the disadvantage of EU labour markets.

The spread of telework in the major EU member countries was still modest in 1994 (when TELDET surveys were conducted) with the exception of the United Kingdom, where already 5.4% of the labour force were doing some kind of telework. The U.K. enjoyed a head-start over all other large EU member countries. A possible explanation might be that large-scale

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economic restructuring set in earlier in the U.K. than in other EU Member States; already in the 1980s in the years of Thatcherism, the U.K. industry was forced to adapt to rapidly changing market conditions, while the economies of France and Germany with their more powerful manufacturing sector were able to keep longer to their traditional ways of doing business.
2 The ECaTT Conceptual Framework

2.1 Defining Telework for Measuring

This section presents the working definitions for measuring telework used by the ECaTT consortium. We fully agree with Qvortrup\(^4\) that counting teleworkers is “like measuring a rubber band” - it is not impossible but the results depend on how far you stretch your definition, with many alternatives to choose from. Because one of our main research purposes is benchmarking, the implications of this problem are somewhat less grave: it is most important that a definition is used which is clear-cut and unambiguous as well as easily applicable (operationalisable) in all countries surveyed. On the other hand, a clear-cut definition forces us to draw boundaries around a phenomenon (e.g. telework) which by their very nature tend to be arbitrary. While there is no satisfactory way to resolve this problem, we have adopted the approach of transparency in definitions, which then allows for critical assessment by third parties.\(^5\)

2.1.1 Home-based telework

Home-based telework is the most widely recognised type of remote work\(^6\). In its textbook interpretation, it implies a relocation of the workplace, for part or whole of the working time, from the company site to the home of the employee. If complete days are spent at home instead of a central site, the number of work trips per week decreases, being substituted for by “tele-commuting”.

For reasons of data availability, however, home-based telework often has be equated with homework in general, traditionally being low-skill work done mostly by women and with limited social security protection. This has caused some critics to state that telework is just a new label for an old and exploitative way to organise low skill labour. Rapid progress in IST applications and their ongoing diffusion into everyday life, however, has diminished the relevance of this dispute. While homework in traditional industries like the textile industry has almost vanished in Western Europe because of the general demise of these industries, low skill homework in the service industry (mostly data processing) continues to play a role at least in some European countries, e.g. in the U.K.\(^6\). Because this work involves the use of a PC and of telecommunication services like phone, fax or file transfer, the great majority of traditional homeworkers in the service industry legitimately have to be regarded as teleworkers today (which does not necessarily prevent them from being exploited).

To distinguish teleworkers from those “occasionally bringing work home” (see below) we defined a threshold of at least one full day per working week being spent at home. We believe this threshold to be adequate because as it implies more than occasional practice, a degree of regularity, and has an impact on commuting behaviour. A higher threshold, as for example used by Huws in her study on telework in Britain\(^7\) (50% of working time) would be inappropriate, as anecdotal evidence as well as national studies suggest that the majority of teleworkers consider dividing their time between home and the office the ideal organisational form of


\(^5\) “work” refers to paid work, i.e. excluding unpaid work like housework and honorary work


telework. We call them “alternating teleworkers”\(^8\), whereas individuals who spend more than 90% of their working time at home are called “permanent teleworkers”.

Home-based teleworkers are usually in salaried employment. Self-employed individuals working from home usually have a home-based office (SOHO – Small Office-Home Office) that acts as their main place of work. These persons form an extra category (see below). Only those who have their main place of work at home fall into the category of “home-based teleworkers”.

**Home-based teleworkers** are those who

- work from home (instead of commuting to a central workplace) for at least one full working day per week
- use a personal computer in the course of their work
- use telecommunications links (phone/ fax/ e-mail) to communicate with their colleagues/ supervisor during work at home
- are either in salaried employment or self-employed in which case their main working place is on the contractor’s premises

Individuals who are teleworking from home more than 90% of their overall working time are referred to as permanent teleworkers, while those working from home less than 90% of their overall working time, but more than one full day per week, are referred to as alternating teleworkers.

### 2.1.2 Supplementary telework

The move towards management by objectives means that contractually agreed working hours are rapidly losing relevance. Employees demand to be enabled to do work at home and when travelling even after they finished their “normal” working hours. They can do so efficiently only when equipped with a networked workplace and access to the company’s computer system. This gradually leads to the development of what we would like to describe as “supplementary” telework. The term implies that this work tends to occur in addition to the regular working time which is spent at the central establishment site.

**Supplementary teleworkers** in our definition are those who would fit into the home-based category described above but for the fact that they spend less than one full day teleworking from home per week. They are also called “occasional teleworkers” to distinguish them from regular teleworkers.

### 2.1.3 Centre-based telework

The extent of telework in telework-centres, sometimes referred to as telecottages and also including teleservice-centres, is very difficult to measure. Telework-centres are establishments that offer workplaces to employees of one or more organisations, or offer tele-mediated services to remote clients. Most studies use the term telework-centre in connection with the provision of workplaces in close proximity to the homes of the individuals working there.

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\(^8\) Alternating telework is sometimes referred to as "part-time telework". We prefer the use of "alternating telework" to avoid confusion with teleworkers who have part-time work contracts.
Individuals working in such centres usually are not aware of this fact unless, of course, the organisation explicitly calls itself a “telecentre”. This is not surprising, as even researchers have much difficulty in stating exactly what distinguishes a telework-centre from a traditional branch office or from a multitude of other start-ups in business services that make use of ISTs. We frankly admit that we ourselves have tried to find a clear-cut definition but gave up after realising that such a definition, if academically satisfying, would without doubt be unsuitable for a survey (especially if this was to be targeted at the general population).

In our opinion, the term telework-centre is of limited use because most multi-site organisations consist of a headquarters and a number of establishments at other sites, and these have become more and more closely integrated into the corporate production process by means of new ISTs. The only distinguishing feature of a telework-centre would then be the aim of providing workplaces near the homes of employees. But does this mean (a) only existing members of staff or (b) newly recruited employees? If (a) holds true, all available evidence suggests that only a few organisations exist in Europe that would fit this description9, making any efforts to measure telework in such centres as a share of total employment futile. If (b) is true, it should be noted that every decision about where to set up an establishment takes into account the accessibility by prospective employees. If a western multi-national corporation sets up shop e.g. in India to benefit from lower local labour costs, it is with the purpose to be close to a certain type of employees. To summarise, distinguishing telework-centres from traditional branch establishments of multi-site organisation has in our opinion become meaningless. For these reasons no results regarding the spread of telecentres are given.

2.1.4 Mobile telework

Mobile teleworkers make use of new ISTs by either increasing their locational flexibility (where and - by implication - when to work) or enhancing their productivity (e.g. accessing corporate data during stays in the field to improve services to customers). What distinguishes them from traditional field workers, e.g. sales representatives, is the use of online connections while travelling. Online connections, especially e-mail, allows distant workers to continue co-operating with staff at the central site (as well as external business partners) and remain integrated in the production process. Communication does not have to literally take place “on the move” (e.g. in a train), but can also occur at a hotel, on the customer’s premises or at some other (stationary) place. The focus here is not on the technology of mobile communication, but on permanent integration into the communicative flow of an organisation while on business trips.

Mobile workers in our definition are those who spend 10 hours per week or more away from their home and their main place of work, e.g. on business trips, travelling or on customer’s premises. This threshold was chosen to include only teleworkers who are mobile regularly and for a considerable portion of their working time. Occasional travellers should be excluded, just as supplementary teleworkers are not included in the “home-based teleworkers” category.

Mobile teleworkers are those who

- work at least 10 hours per week away from home and from main place of work, e.g. on business trips, in the field, travelling or on customer’s premises;

2.1.5 Telework by self-employed in SOHOs

It makes perfect sense that persons to be counted as “teleworkers” do not have to be in salaried employment but might also be self-employed: Many self-employed persons do commute to a workplace that is located on (one of) the contractor’s premises and are closely integrated into the contractor’s operational structure. Not to call these individuals teleworkers just because of their contractual status would be inappropriate.

However, an effort to count self-employed teleworkers is complicated by the question of how to deal with the small business community, many of them companies whose sole employee works from home or from an office very close to home (i.e. on the same site). In the USA, these businesses are often referred to as small offices - home offices (SOHOs). We decided to set up a separate category for self-employed persons whose main place of work is at home (meaning a SOHO) and who are communicating with their contractors and clients and business partners by way of new ISTs. Self-employed individuals who have their main place of work away from home, i.e. on the contractor’s premises, are treated as home-based teleworkers in salaried employment.

Self-employed teleworkers in SOHOs are those

- who are self-employed or effectively self-employed (e.g. persons employed by own company or employed by organisation they have considerable managing power over);
- whose main place of work is at home or they claim not to have a main place of work;
- who use advanced ISTs for communicating with clients and/or (other) business partners.

2.1.6 Combinations of different kinds of telework

In future, we expect individual types of telework to become something of a menu from which highly qualified and flexible workers can choose from according to their personal and (especially) business needs. “Work where you want, when you want” is the key element here. For example, a highly qualified employee might divide working time between spells at the office (to communicate face-to-face with other staff members), ‘out on the road’ (to stay in touch with customers and business partners) and at home (to do some “proper work”). On the other hand, in many occupations telework will be introduced to improve control over low-skilled labour (Stanworth, 1998). Here, one might not expect increasing flexibility of employees regarding place and time of work. To test these hypotheses, the survey design allows for individuals practising different kinds of telework, e.g. home-based teleworkers who also spent a considerable amount of time ‘out on the road’ and make use of data-connections when doing so.

2.2 Defining E-Commerce for Measuring

In view of the wide, heterogeneous and in parts not very systematic discussion of e-commerce, a clear definition and differentiation of the different classifications and forms of e-
commerce has become essential. What is e-commerce? Looking at the literature we find a lot of different definitions.

One of the simplest definitions is provided by the Electronic Commerce Association\(^1\): 

Electronic Commerce is doing business electronically.

Hawryszkiewycz\(^1\) has collected some more specific definitions:

- E-commerce is a way of conducting business transactions electronically. It is confined to aspects of managing financial transactions across networks. Important issues here are the security of such transactions.
- E-commerce is a way of marketing your product. In that case knowledge distribution, primarily through the World Wide Web, becomes the important issue.
- E-commerce is a way of providing client support by responding to problems, providing ways to monitor progress of services, or to build client relationships.
- E-commerce is a way of conducting business. This can, for example, include aspects such as arranging contracts, resolving conflicts. In that case systems concentrate on personal relationships with confidentiality an important issue.

He states:

Perhaps ultimately it (the concept of e-commerce) should be an integration of all of the above. In that case it will support the entire business cycle starting with developing requirements from client needs, through to marketing sales and after sales service.

Knowledgecenters\(^2\) has identified as the minimal common denominator of different understandings of EC:

Electronic Commerce extends beyond the boundaries of a single enterprise and relies largely upon computer to computer exchange of data.

Young defines\(^3\) Electronic Commerce as:

the buying and selling of goods and services where part if not all of the commercial transaction occurs over an electronic medium.

The Year-X Ltd. in their overview of E-Commerce\(^4\) complements these definitions by three other variants:

- The Automotive Industry Action Group in North America defines it as: the enablement of a business vision supported by advanced information technology to increase the effectiveness of the business relationship between trading partners.
- An alternative is: E-commerce is the enablement of a business vision supported by advanced information technology to improve efficiency and effectiveness through the trading process.
- Another definition was picked up from a bulletin board discussion on EDI: Electronic Commerce covers any form of computerised buying and selling, both by consumers and from company to company.

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\(^1\) cited in: Derek Miers, Technology Futures for the World Wide Web. Enix 1998, [http://www.enix.co.uk/webtech.htm](http://www.enix.co.uk/webtech.htm), visited 14.5.98


\(^3\) in: [http://www.knowledgecenters.org/e-commerce](http://www.knowledgecenters.org/e-commerce), visited 20.4.98

The definition is complemented by a list of elements: choosing the goods, ordering, delivery, after sales service, paying, and examples for these elements which we omit here.

The OSM consortium defines:

E-commerce is the ability to perform exchanges of goods, services, content, assets and money, between two or more participants (users, organisations) using electronic tools and techniques.

This is complemented by a set of basic functions required:

Participants, in order to perform e-commerce, have to be able to navigate, to gather, search, filter, deliver, route information, to communicate, to exchange contracts, services and other commerce related objects.

Against the background of these attempts at defining e-commerce, we have adopted the following working definition:

**Electronic Commerce** is the electronic preprocessing, negotiation, performance and postprocessing of business transactions between commercial subjects.

Our own definition as well as the ones mentioned above are implicitly or explicitly consisting of three levels which together distinguish e-commerce from other forms of commercial transactions: the technological level (by which means?), the processual level (what?) and the participant level (who?).

### 2.2.1 Constituents of the definition: technological level

E-commerce transactions take place on the basis of electronic communication systems, although electronically mediated communication might be supplemented by face-to-face interaction for some parts of the transactional process. E-commerce is carried out in closed networks such as extranets, direct EDI connections and Web-EDI, as well as in open networks such as the Internet. The central infrastructure for e-commerce is indeed the Internet.

### 2.2.2 Constituents of the definition: processual level

E-commerce in its narrow sense means the performance of a market transaction, i.e. a transition of an asset or a claim from one economic subject to another, over the Internet or an other online service. However, we also speak of e-commerce if only pre-processing and/or post-processing of a transaction are executed online, as long as it is of substantial nature. The following figure shows a model of a process (purchase of a product) and the kind of information that is exchanged between supplier and customer during the transaction.
We can distinguish different phases of the performance of a business transaction:

- the preprocessing phase
- the negotiation phase
- the processing phase
- the postprocessing phase.

In each of these phases, e-commerce can play a vital role.

E-commerce applications differ considerably regarding the degree to which they have integrated online services into their business processes. A model which focuses on front-end applications of e-commerce distinguishes between five stages. They can also be interpreted as developmental stages, although individual companies do not have to pass all stages, and they may also take different developmental paths.

### E-Commerce Classification Model by ECATT

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description of e-commerce solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1: General Marketing</td>
<td>Presentation and marketing via Internet; Offers of goods and services in form of static information on web pages; Typical example: online brochure, information services</td>
</tr>
<tr>
<td>Stage 2: Tailored Marketing</td>
<td>Presentation and marketing via Internet; Interactive offers with dynamic information; Typical example: reports, real time statistics, database search, product catalogues, e-mail interface</td>
</tr>
<tr>
<td>Stage 3: Contract (Sale/Purchase)</td>
<td>Presentation, marketing and sales via Internet; Interactive offers with online ordering feature; payment details (credit card number) may be transferred via Internet; Typical example: online shops, online markets (shop-in-shop, shopping malls); With online sales, no online transactions and distribution</td>
</tr>
<tr>
<td>Stage 4: Payment</td>
<td>Presentation, marketing and sales via Internet; Interactive offers with online ordering feature; Payment Transaction via Internet using Internet payment device; Typical example: online shops, online markets (shop-in-shop, shopping malls); With online sales and payment transactions, no online distribution</td>
</tr>
<tr>
<td>Stage 5: Distribution</td>
<td>Presentation, marketing, sales and delivery/distribution via Internet; Interactive offers with online transactions, payment with online payment device or by invoice (in case of long-term delivery contracts); Typical example: suppliers of music on demand, software distribution etc.; With online sales, transactions and distribution</td>
</tr>
</tbody>
</table>

At stage 1, companies have a Website with some basic information updated irregularly and on an ad hoc basis, offering very limited interaction to the user. Most often, existing print brochures and other material (which is not adapted to the needs of Internet presentation) are simply digitised and offered online.

At stage 2, interactive elements take on a stronger role offering users real added value. An example might be a product catalogue which is fully searchable. Even more sophisticated
are Websites that are linked to internal ERP systems, thereby allowing users to obtain real-time information about current availability of products.

At stage 3, users can order products online. Payment is by credit card, cash on delivery, invoice, or other means, goods delivery is (just as in traditional mail-order businesses) via mail.

At stage 4, the Website additionally offers payment by an online payment device (e-cash). At present, however, no e-cash technology has been able to gain a secure foothold in the market.

Finally, at stage 5, all segments of the transaction process are executed online including the delivery of goods, which have to be in digital and easily transferable form.

2.2.3 Constituents of the definition: participant level

E-commerce basically supports the following relationships:

- business-to-business,
- business-to-consumer,
- business-to-administration,
- consumer-to-administration (maybe better termed ‘citizen-to-administration’).

Schoder & Strauß (1998) expand these categories by the addition of 2 further types. However they explicitly point out the inclusion of the last category to e-commerce is debatable. Their categorisation is as follows:

1. Business-to-Consumer
2. Business-to-Business
3. Business-to-Administration
4. Consumer-to-Administration
5. Consumer-to-Consumer
6. Administration to Administration.

In this report, we will focus mainly on the ‘core’ relationships of business-to-business (b2b) and business-to-consumer (b2c).
2.3 Methodology

2.3.1 Surveys

Because private individuals and organisations take different roles in telework and in other new ways of working as well as in e-commerce (one usually acting as supplier, the other representing demand), primary research on these subjects must cover both groups of respondents. Therefore, surveys were directed at the general population as well as decision makers in organisations.

Results about teleworking practice can be expected to differ considerably depending on whose statements are taken for projections. Decision makers in companies might have knowledge only of those telework relationships which are part of organised company schemes, i.e. which are based on a formal agreement between employer and employee. On the other hand, they might not know about the extent of individual employee’s teleworking.

The empirical part of the study consisted of

- representative surveys of establishments in each of the participating countries; with a sample of 500 in larger countries and 300 in smaller countries approximately 4,000 establishments across Europe are surveyed, using a questionnaire of around 70 questions (Decision maker survey – DMS);
- representative surveys of individuals (aged 15 and older) in private households - 1000 in larger and 500 in smaller countries, amounting to approximately 7,700 people, using a questionnaire of more than 100 questions (General Population Survey – GPS);

The project includes data on 10 EU Member States (see table below). In addition, comparative work was carried out in Japan and the USA. Switzerland was covered in a parallel project using the same instruments.

### Survey population

<table>
<thead>
<tr>
<th>Country</th>
<th>General Population Survey (GPS)</th>
<th>Decision Maker Survey (DMS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>502</td>
<td>361</td>
</tr>
<tr>
<td>Finland</td>
<td>502</td>
<td>308</td>
</tr>
<tr>
<td>France</td>
<td>1,008</td>
<td>501</td>
</tr>
<tr>
<td>Germany</td>
<td>1,000</td>
<td>501</td>
</tr>
<tr>
<td>Ireland</td>
<td>547</td>
<td>374</td>
</tr>
<tr>
<td>Italy</td>
<td>1,010</td>
<td>506</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>526</td>
<td>300</td>
</tr>
<tr>
<td>Spain</td>
<td>1,010</td>
<td>500</td>
</tr>
<tr>
<td>Sweden</td>
<td>500</td>
<td>306</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>1,095</td>
<td>501</td>
</tr>
<tr>
<td>EUR 10</td>
<td>7,700</td>
<td>4,158</td>
</tr>
<tr>
<td>Switzerland</td>
<td>400</td>
<td>200</td>
</tr>
</tbody>
</table>

The General Population Survey was based on a representative random sample of the population in Germany, United Kingdom, Ireland, Sweden, the Netherlands, Finland, Italy, France, Spain and Denmark. The survey was carried out in February and March 1999 by Infratest
Burke and Emnid (Taylor Nelson Sofres Group). Interviews were carried out on the telephone using computer-aided telephone interviewing techniques.

The Decision Maker Survey was based on a random sample of establishments in Denmark, Finland, France, Germany, Netherlands, Ireland, Italy, Spain, Sweden and the United Kingdom, stratified by establishment size (number of employees) and industry. Quotas of establishments weighted by size were set to ensure that the results would not be dominated by small units but properly reflect the situation of workers in larger enterprises. The fieldwork took place in April and May 1999. The samples were either drawn from special establishment master samples maintained by the survey institutes. Fieldwork was carried out by Infratest Burke, again using computer-aided telephone interviewing.

The respondents were chosen to be the head of the DP department, senior professionals in the DP department (in large organisations) or the managing director, general manager or proprietor (in small organisations). The questions were worded to elicit working practice in the respondent’s own establishment, rather than in the company as a whole. This methodological decision was based on the assessment that no single respondent would be able to give reliable and detailed information about working practice across the whole company, particularly in large multi-site organisations.

Because of the size-weighted sampling employed, reference in reported results such as “50% of all establishments in country A” are properly interpreted to mean “establishments accounting for 50% of all employees in country A”.

EU10 averages are mean values weighted according to total population aged 15 and higher (GPS) and total number of employees (DMS). For this reason, the smaller European countries have only a very limited weight in EU10 averages.

The following table shows the sample composition before and after weighting.15

<table>
<thead>
<tr>
<th>Number of employees</th>
<th>less than 10</th>
<th>10 to 49</th>
<th>50 to 199</th>
<th>200 to 499</th>
<th>500 and more</th>
<th>n.a.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>before</td>
<td>after</td>
<td>before</td>
<td>after</td>
<td>before</td>
<td>after</td>
</tr>
<tr>
<td>Denmark</td>
<td>21.3</td>
<td>18.4</td>
<td>28.5</td>
<td>27.0</td>
<td>9.7</td>
<td>14.5</td>
</tr>
<tr>
<td>Germany</td>
<td>28.7</td>
<td>27.3</td>
<td>24.0</td>
<td>23.1</td>
<td>20.4</td>
<td>16.8</td>
</tr>
<tr>
<td>Finland</td>
<td>33.4</td>
<td>24.2</td>
<td>34.4</td>
<td>26.4</td>
<td>17.5</td>
<td>22.8</td>
</tr>
<tr>
<td>France</td>
<td>27.5</td>
<td>30.9</td>
<td>26.0</td>
<td>28.3</td>
<td>20.4</td>
<td>20.4</td>
</tr>
<tr>
<td>U.K.</td>
<td>22.0</td>
<td>19.3</td>
<td>24.6</td>
<td>30.6</td>
<td>19.2</td>
<td>15.8</td>
</tr>
<tr>
<td>Ireland</td>
<td>26.5</td>
<td>31.2</td>
<td>28.3</td>
<td>24.2</td>
<td>21.1</td>
<td>17.5</td>
</tr>
<tr>
<td>Italy</td>
<td>41.1</td>
<td>45.8</td>
<td>26.3</td>
<td>23.1</td>
<td>19.2</td>
<td>16.4</td>
</tr>
<tr>
<td>Netherlands</td>
<td>15.7</td>
<td>15.7</td>
<td>27.0</td>
<td>27.0</td>
<td>26.7</td>
<td>26.7</td>
</tr>
<tr>
<td>Sweden</td>
<td>27.8</td>
<td>23.9</td>
<td>28.8</td>
<td>28.4</td>
<td>24.8</td>
<td>24.5</td>
</tr>
<tr>
<td>Switzerland</td>
<td>15.0</td>
<td>15.0</td>
<td>24.5</td>
<td>24.5</td>
<td>26.5</td>
<td>26.5</td>
</tr>
<tr>
<td>Spain</td>
<td>38.8</td>
<td>34.4</td>
<td>26.2</td>
<td>24.8</td>
<td>14.8</td>
<td>20.0</td>
</tr>
</tbody>
</table>

15 In the Netherlands and Switzerland data were not weighted because quotas were achieved through the sampling procedure itself.
2.3.2 Case Studies

All consortium partners have profound knowledge of current trends in telework and e-commerce in their respective countries and are therefore in a position to identify best practice and innovative cases. Most of them do also have first-hand experience in telework and/or e-commerce consultancy.

A listing of different types of applications were drawn up to ensure that the choices of case studies would cover topics of primary interest in current debate about new ways of working and telework and e-commerce. These are:

<table>
<thead>
<tr>
<th>Telework/ New Ways of Working</th>
<th>E-Commerce</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telework in SMEs</td>
<td>Online shops &amp; service distribution</td>
</tr>
<tr>
<td>Telework in large companies</td>
<td>E-commerce platforms/ malls</td>
</tr>
<tr>
<td>Telework in the IT sector</td>
<td>Online reservation and booking</td>
</tr>
<tr>
<td>Telework in the public sector</td>
<td>Online financial services/ online gambling</td>
</tr>
<tr>
<td>Mobile tele-work and hot desking centres</td>
<td>Infomediaries</td>
</tr>
<tr>
<td>Centre-based telework and teleservice centres</td>
<td>Online auctions</td>
</tr>
<tr>
<td>Entrepreneurial telework</td>
<td>Value chain integrators</td>
</tr>
<tr>
<td>Virtual Organisations and freelance networks</td>
<td>E-procurement</td>
</tr>
</tbody>
</table>

In order to cover both topics – e-commerce and new ways of working - two distinct, but overlapping interview protocols, one for each of the main themes of the project, was needed. The reporting structures are similar in structure, but obviously have different content.

The interview protocols were integrated into one instrument, but with a number of dedicated sections for both teleworking and e-commerce cases.

The main thrust of the interview protocols was to obtain information to describe the history, operations and future plans of the telework or e-commerce initiative. The interview protocols are therefore primarily descriptive in nature.

The structure of the protocols for each type of case study is outlined below:

A. Description of the organisation
   Company demography
   Interviewee demography

B. IST infrastructure for the initiative
   Hardware infrastructure
   Software infrastructure
   Network usage
   Problems and successes
   Future plans
   Will the initiative remain/reduce/extend
   Why?

C. Description of the history of the initiative
   Who was involved?
   Why was the initiative set up?
   When was it set up?
How was it organised and managed

D. Description of the current state of the initiative
   Numbers and type of people involved
   Business functions involved
   Centrality of the initiative to the organisation

E. New ways of working
   Contractual relationships
   Social security
   Working time
   Location of work
   Business practice

F. Assessment of the initiative
   Was the initiative successful?
   Was it evaluated?
   Which objectives did it meet/fail to meet?
   Main impacts on employees, employers and the organisation
   Main barriers and facilitating factors for the initiative
   Lessons learned to date
   Future plans for the initiative

The complete interview protocol is provided in the Annex.

The reporting structure for telework and the e-commerce cases follows the interview structure closely. The first one has been developed for the long version of the case studies, the latter one for the abridged version which is provided on the ECaTT Website as html text whereas the long versions as pdf download files:
### CASE STUDY REPORTING STRUCTURE (Full Report)

1. Name of Company
2. Function of Company, i.e. what business are they in?
3. Distinctiveness of the Case, i.e. why was this case selected?
4. Description of the Initiative
   - Include the following:
     - Genesis of the Initiative, Strategy/Response developed and Implementation:
     - Describe the process of implementation,
     - Highlight technical and organisational solutions
     - Problems encountered and how they were dealt with
5. What changes, if any, have taken place since the scheme started?
6. Innovative aspects, of/ the Initiative
7. Benefits of the Initiative
8. Barriers to the Initiative
9. Impact(s) of the Initiative
10. Lessons Learned from the Case Study
11. Expectations and Future Organisational Plans
12. Contact Information: Name of national organisation
    - Contact Name
    - Tel, Fax and email details
    - Website URL

### CASE STUDY REPORTING STRUCTURE (Web Report)

1. Company Name and Function, i.e. who are they and what business are they in?
2. Short Description of the initiative
3. Innovative aspects
4. Benefits
5. Barriers
6. Contact Information: Company Name and Country, Contact Name, + email address + URL

Participating companies were offered the opportunity to remain anonymous.
3 The State of Telework at the Turn of the Century: ECaTT Research Results

3.1 Key Survey Findings

3.1.1 How many teleworkers?

In the beginning of the 1990s a working group of top-class experts in the EU laid down the goal of 10 million teleworkers by the year 2000. While this seemed hugely ambitious at the time, the ECaTT study arrived at a figure of a total of 8 million teleworkers in the 10 countries surveyed. Projected for the whole European Union, the 9 million limit has been exceeded, making it most likely that the 10 Mio. threshold will be passed at some time during the year 2000.

With regard to absolute numbers of teleworkers, Germany and the United Kingdom lead Europe. Between them, there are more than 4 million teleworkers, i.e. almost half of all teleworkers in Europe. The Netherlands follows ahead of Italy, France, and Sweden.

At the end of the 90s the time is ripe for dislocated working. Efficient and inexpensive information and communications technologies allow employees to work when and where they wish. Successful forerunner organisations have demonstrated that telework can be applied to the advantage of businesses as well as employees, and have urged many other businesses to follow suit. A great number of campaigns, support measures and support programmes of the EU commission and the various political platforms of the individual Member States were probably also of assistance.

Comparison with the TELDET study that was carried out in 1994 in the United Kingdom, France, Italy, Spain and Germany shows that the number of teleworkers increased most in Germany - in 1994 there were only a few hundred thousand teleworkers in Germany, which has risen to more than 2 million within 5 years, which corresponds to an annual increase of 34%. The corresponding growth rates are 29% in Italy and only 11%, 10% and 8% in Spain, France and the U.K. respectively.

In Germany telework has developed very rapidly in the 1990s, commencing from a very low starting point. This may be explained not least by the efficient telecommunication infrastructure as well as – due to the liberalisation in the telecommunications sector - the recent strong decrease in telecommunication costs. A further reason might be the supposed German reluctance to innovate. In the United Kingdom on the other hand negative experiences with particular forms of telework (freelance) as well as businesses’ motives (cost savings, flexibility forced on workforce) may have contributed to the slow growth in telework. It may also be that there is some kind of upper limit to teleworking prevalence, which the UK and now other countries may be approaching.

Germany’s performance is less significant when looking at relative figures: 6% of European employees already practice telework - roughly the same level as in Germany, but much less than in the Scandinavian countries (Finland, Sweden and Denmark) as well as in the Netherlands. The U.K. is also above average, while the diffusion of telework in Ireland, Italy, France and Spain is trailing behind. These figures confirm that there is a considerable North-South decline in telework: Finland have the highest rates of telework penetration with 17%, Spain, France and Italy are at the bottom with 3%. Generally, barriers for telework diffusion in Southern Europe are to be found in relation to negative attitudes, more cramped conditions in private homes, and the poorer quality of the technological infrastructure.
3.1.2 Types of Telework and Their Interrelationship

In the EU there are almost 3 million home-based teleworkers. By far the majority practice alternating telework, i.e. they switch between their workplace at home and in the business location. 1.4 million employees can be classified as self-employed teleworkers in SOHOs (small office, home office). Moreover, there are 2.3 million mobile teleworkers (some of them also counting as home-based teleworkers because they spent more than one working day per week at home, or as self-employed in SOHOs). Home-based telework is thus the most widespread form of telework in Europe, ahead of mobile telework, an order that is established in most of the countries surveyed. Exceptions are Germany where all 3 organisational forms are equally spread, and the Netherlands where mobile telework is particularly widespread.

ECaTT also covers the phenomenon of so-called supplementary telework. 3 million teleworkers in the EU, i.e. 2% of all employees, telework at home occasionally. As supplementary teleworkers already have experience of working from home linked up to their employer/client via telecommunications networks, it can be expected that many of them may soon become regular teleworkers.

With regard to supplementary telework there are also country specific features. In contrast to telework in the stricter sense, supplementary telework is particularly widespread in Ireland, Sweden and the Netherlands. In these countries there is roughly one supplementary teleworker for every regular teleworker.

3.1.3 Who Is Teleworking?

In contrast to the labour force as a whole, results from ECaTT surveys show that 75% of teleworkers in Europe are male and only 25% female. This finding stands in sharp contrast to the widespread opinion that telework is a predominantly female domain. The image of the female clerk or typist who via telework manages to combine work and family more satisfactorily, as often presented in the media, only represents a minority of teleworkers in Europe.

The majority of teleworkers belong to the middle age range. 63% of all teleworkers in Europe are aged between 30 and 49 years of age (compared to 56% of non-teleworkers). The average age of the European teleworkers lies, as with all other employees, at around 39 years.

However, there are significant differences to non-teleworkers with regard to education and self-employment. Teleworkers are mostly highly qualified. Every third teleworker is furthermore either self-employed or employed but enjoying freedom to decide his own terms of employment due to his position in the business. Such employees need to be involved in the business activities more often, even outside normal office surroundings.

Obviously there are also groups of people with other motives for telework such as better compatibility of family and work or reduction of commuting. For example, every 2nd woman who practises home-based telework has children under the age of 6. Every 6th teleworker (against every 27th non-teleworker) has a commuting distance of more than 50 km. Such groups, however, represent only a minority of teleworkers.

In view of the characterisation of the typical or “average” teleworker as male and highly qualified, it is not surprising that he differs significantly from non-teleworkers in his way of working. This is true for the field of activity, technology application and communication behaviour, amongst others, as well as the length of working hours.

Whereas the proportion of people who do physical work is understandably lower among teleworkers than non-teleworkers, a disproportionately high number of teleworkers have managerial functions or carry out tasks that require a high level of qualification. A large number of teleworkers are also characterised by long commutes. Furthermore, teleworkers are
significantly keener to communicate: almost all teleworkers report to having frequent external business contacts.

The average amount of working time spent teleworking is rather low. Permanent home-based telework - which many expected to become the dominant form at the beginning of the telework discussion in the 80s - did not come about. Thus the alternative is not between either work in the office or at home. In its place, throughout Europe, alternating telework with its switching workplaces has clearly become the norm. For the majority of job tasks, a part-time presence in the office continues to be necessary or desirable.

Finally, differences between actual and contractually fixed working time deserve consideration. Whereas every 2nd non-teleworker works more hours per week than contractually agreed, this figure increases to 80% for teleworkers. However, the data does not explain what the principal cause is: Is the extra workload a consequence of telework - or do people who tend to be workaholics become teleworkers more often than average? This finding has particular implications for the quality of life of teleworkers and their households – it may be that quality of working and non-working life is in many cases compromised by this work form.

3.1.4 The Supply of Teleworkplaces: Establishments Applying Telework

30% of all establishments in Europe already practise regular telework. Including supplementary telework the diffusion rate is 36%.

Again there are significant differences between the European countries. Diffusion of telework amongst establishments has spread farthest in Scandinavia and the United Kingdom. The Netherlands, Ireland and France are in the middle, Germany takes on 8th position with Spain and Italy behind; the latter countries have a business size structure that differs noticeably from all the others, with a considerably higher share of micro-companies.

In the course of time the number of establishments practising telework has increased noticeably; it has grown even faster than that of teleworkers. Obviously, a large number of establishments have introduced telework in the second half of the nineties. Throughout Europe, less than a third of establishments have been carrying out telework for 5 or more years. Half of the establishments have introduced telework over the last 2 years.

However, the extent to which telework has diffused inside of establishments, i.e. the number of teleworkers as a share of total establishment workforces, is on average still modest.

Telework is still mainly practised by large organisations. Nearly ¾ of all European establishments with 500 or more employees offer teleworkplaces. This figure is significantly lower for smaller establishments. Only 15% of all establishments with less than 10 employees employ teleworkers.

Establishments from the financial and business services sector take a leading role. The number of teleworkers working in this sector is above average. Other service sectors’ representation as employers of teleworkers lies below the average.

There are significant differences between single-site companies and establishments belonging to multi-site companies. Amongst the single-site companies only a quarter practise telework, compared to more than half of the establishments belonging to multi-site companies.

Almost every 2nd business that employs teleworkers uses them for specialised activities. The second most mentioned tasks are management tasks. In spite of evidence of some negative attitudes, telework is obviously suitable for managers. By far the least practised forms of telework are secretarial duties. The strong need for communication and impromptu acts as the main barrier here.
As has already been mentioned, the number of teleworkers per business is rather low. The majority of establishments have less than 10 teleworkers\textsuperscript{16}. On the other hand, the number of mobile teleworkers per business is comparatively high. There still exists a large growth potential in those establishments that already practise telework.

3.1.5 Teleworkability and Interest in Telework

The further development of telework requires, amongst others:

- sufficiently large numbers of jobs which are suitable for this work form,
- sufficient interest of employees to practice telework as well as
- establishments' willingness to provide teleworkplaces.

\textit{Suitability}

Two thirds of European employees carry out activities suitable for telework on at least one day per week. This includes office work, tasks such as writing and telephoning that are generally carried out at a desk, as well as working on the computer or with machinery controlled by a computer. Thus, at least part-time telework is ‘technically’ feasible in 2 out of 3 cases.

\textit{Employee interest}

There is no lack of interest in telework by employees. In addition to employees who already practice telework, an average of 60\% of employees show an interest in working from home either occasionally, alternating or permanently throughout Europe. As might be expected, the interest of those looking for work is even stronger. When comparing the result with the 1994 findings, interest has increased even further. Today by far the strongest interest is expressed in Sweden; all other countries are relatively close to the average.

\textit{Establishment interest}

The situation on the establishments side is not quite as clear cut. Amongst telework practising establishments, almost half show an interest in extending telework.

Amongst those establishments which do not so far practice telework, interest in implementation is comparatively low. In addition to 36\% of telework practising establishments a further 12\% show an interest in an introduction. Germany had highest levels of interest with 17\%.

However, the growth potential of telework is not limited to additional establishments introducing telework. The largest, as yet untapped potential lies in further intra-company diffusion, taking into account that the average number of teleworkers per establishment is still very low.

\textsuperscript{16} excluding mobile teleworkers
3.2 Key Facts in Charts

3.2.1 Population Survey

There are currently 9 million teleworkers in Europe. This figure covers all kinds of telework, not only those regularly working a day or more per week away from the office at home or on the road using computers and online connections (6 million) but also those who do so less often, the “occasional” or supplementary teleworkers (3 million). The overall European figure translates into an average of 6% of the European workforce. Here the ECaTT survey exposes large differences across Europe. Whereas in some countries only half the average have taken up telework to date, Finland has achieved nearly three times the average: 17% of the workforce is already taking advantage of these new techniques.
The figure of 8 million teleworkers has been reached in 1999 in the 10 EU Member States under review. Extrapolating this figure to the entire European Union results in around 9 million teleworkers. The goal set by a high level expert group in 1994 for 10 million teleworkers to be achieved in the year 2000 will almost certainly being met.
The vast majority of European teleworkers are regular teleworkers. Germany ranks top here followed by the United Kingdom. More than half the 5.5 million regular teleworkers in the 10 European countries under review come from these two countries. The Netherlands follow ahead of Italy and France. An additional 3 million, i.e. 33% of all teleworkers, practise "occasional" teleworking. Their share is especially high in the Netherlands, Sweden and Ireland.
6% of the employees in Europe already practise on form of telework or another. There is a remarkable difference in the speed of diffusion between the northern and southern European countries. Apparently the better prerequisites for telework exist in the Scandinavian countries and the Netherlands. The openness towards technological and organisational innovations is above average among the population and in the organisations in these countries. In addition a sufficient and appropriate technical infrastructure exists.
Roughly 4%, i.e. each 25th employee in Europe, is a regular teleworker today. Telework penetration is highest in the Scandinavian countries (Finland, Sweden and Denmark) and the Netherlands. Switzerland, the United Kingdom and Germany can be found in the mid-field (both are above the European average). Penetration is lagging behind in Italy, France, Spain and Ireland.

2% of the European employees are supplementary teleworkers. Since they have already gained experience in working from home with the help of ISTs, it is likely that many of them will become regular teleworkers in the near future.
Almost 3 million home-based teleworkers can be found in the European Union. The vast majority of these practise alternating telework, i.e. divide their working week between time spent at a workplace in the home and time spent in the central office. 1.25 million employees can be classified as self-employed teleworkers in SOHOs, and 2.3 million are mobile teleworkers, a form of work organisation which is very widespread especially in the Netherlands.
Home-based telework is the dominant form of telework in Europe followed by mobile teleworking. Already a significant percentage of teleworkers are self-employed workers in SOHOs (small offices, home offices).
The gender distribution shows that in modern teleworking, women are underrepresented. Most teleworkers in Europe are male, significantly more than the average in the working population.
Levels of formal education are high among teleworkers, the majority are qualified professionals. Almost 60% of teleworkers are in the “highly level” category whereas in the labour force as a whole the figure is under 30%.
The majority of regular teleworkers belongs to the group of middle aged persons. Especially the group of 30 – 49 year old shows a very high proportion of teleworkers: 68% of all regular teleworkers come from this age group (opposed to only 56% of the non-teleworkers).
In spite of benefits for parents with young children often being stressed in the debate about working at home, there are only slight differences in the household type structure between home-based teleworkers and non-teleworkers. 22% of home-based teleworkers live in households with young children (below age 6), while 17% of the non-teleworking European labour force do so.
The majority of teleworkers are professionals with managerial responsibility. Almost all teleworkers - regular as well as supplementary ones - have gone through a special professional training before starting their working life, and around three quarters of them have managerial responsibility in their job. This is markedly different to non-teleworkers, where only 45% have some sort of managerial responsibility.
The financial and business services sector has been leading in the introduction of telework in Europe - almost 9% of the labour force in this sector is made up by teleworkers - followed by the distribution, transport and communication sector. Public administration ranks low: not much more than 2% of its workforce are teleworkers.
The figures show the difference between the actual working time and weekly working hours as specified in the contract of employment. Among non-teleworkers only every second employee actually works more than the working times laid down in the contract; among the teleworkers (and also among supplementary teleworkers) this figure reaches 80%. However, from this data we can not specify the type of causal relationship: are those who tend to become ‘workaholics’ more likely to become teleworkers or do teleworkers work long hours a result of teleworking?
The majority of teleworkers use an online connection to a central server when teleworking. Only Spain and Sweden can be seen as somewhat exceptional on this point.

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The majority of teleworkers use an online connection to a central server when teleworking. Only Spain and Sweden can be seen as somewhat exceptional on this point.
Two third of the European labour force are interested in either occasional (supplementary), alternating or permanent telework from home. The by far highest level of interest can be found in Sweden. There are only smaller differences with respect to levels of interest in telework across the other countries.
Interest in telework in % of individuals looking for work

Those searching for a job show higher levels of interest in telework than those already in paid work. The base here is not identical with the unemployed as many individuals who might be interested in employment do not apply for unemployment benefits.
Since 1994 levels of interest (including practice) in telework have risen significantly with the highest increase in Germany and Italy. Stagnant shares of interested can only be found in Spain, although at a high level.
Interest in telework: different kinds of telework

Alternating telework and supplementary telework are clearly most attractive for the workforce in all countries studied. Permanent telework is of interest to significantly fewer, with work in telecentres being attractive for less than 25%
Telework has experienced rapid growth over the past five years. The average annual growth in the number of teleworkers from 1994 to 1999 has been 17%, with Germany leading the field with an average annual growth rate of more than 30% in the recent past.
70% of the employees in Europe are aware of telework, i.e. have heard about it. Highest awareness levels can be found in the telework frontrunner countries, i.e. in Scandinavia and the Netherlands. 22% of European employees have already considered practising telework for themselves.
Employees are more aware of telework than those currently searching for a job. Awareness among job-seekers is highest in the Nordic countries. Roughly two third of those who are aware of telework have considered it already as an option for themselves. This shows that telework continues to be very attractive for a large share of persons looking for work.
Two third of all persons in paid work practise tasks which are feasible for teleworking. They either

- spend more than 6 hours per week doing some kind of office work or
- spend more than 6 hours doing work that could be done at a desk (paperwork, writing, reading, working with pictures, using the telephone) or
- spend more than 6 hours doing work on a computer-controlled machine.

Accordingly, telework is “technically” feasible in two out of three cases. This holds true under the assumption that the tasks which lend themselves to teleworking can be collapsed on (at least) one working day and – as a consequence – at least one full working day is spent teleworking from home. Note that teleworkability does not positively correlate with the actual number of teleworkers: While teleworkability is high in Italy, the spread of telework is not.
3.2.2 Establishment Survey

Almost 1/3 of European establishments practise regular telework with countries like Finland and Denmark already achieving figures of almost 50% followed by Switzerland, the UK, Sweden. Italy and Spain are lagging behind with less than 20%, Germany, France, Ireland and the Netherlands find themselves in the mid-field.
Among types of regular telework, mobile telework is most widespread. Throughout Europe around one fifth of all establishments practise this way of working. While 14% of European establishments practise home-based telework, only 9% work with self-employed teleworkers. Accordingly, telework by self-employed is the form of telework least widespread in Europe. Finland, France and Italy are exceptions. In these countries telework by self-employed in SOHOs plays a much more important role and even exceeds the penetration rate of home-based telework.
Including supplementary teleworkers, the share of establishments practising telework is 36%. There are marked differences across Europe with the Scandinavian countries leading together with the UK and Switzerland. The middle spectrum consists of Netherlands and Ireland as well as France and Germany, while Spain and Italy still have some catching up to do.
A comparison of the situation in 1994 and 1999 is possible for five of the countries in the survey since the same survey questions were asked as part of TELDET surveys five years ago. When analysing this data it becomes apparent that the share of establishments either practising home-based telework or telework with self-employed has increased considerably, with almost identical growth rates (there were no inquiries into mobile or supplementary telework in 1994). With some variations across the countries, the annual growth rates are between 22% and 31%. On average telework has increased threefold over the past five years.
Nearly three quarters of very large establishments in Europe (with 500 or more employees) already employ teleworkers. The figures are significantly lower among SMEs with just 15% in those with less than 10 employees and 28% in establishments with 10 to 49 employees.
Teleworking is most widespread in establishments from the financial services and business services sector. Also the primary (excluding agriculture) and secondary sector shows telework penetration figures which are above the average, whereas other services sectors such as the public sector and personal or social services are below average. The tail light is with the sector “distribution, tourism, transport and telecommunications”.

Penetration of telework in establishments by sector 1999 (EU10)
The average number of teleworkers per establishment is still low. The majority of companies employs less than 10 teleworkers (this figure excludes mobile teleworkers). Accordingly there seems to be a very high potential for telework growth within the companies already practising this form of work organisation. Only in the Scandinavian countries, the UK and Spain there are larger numbers of establishments employing 100 and more teleworkers.
Telework is most often applied in qualified tasks (48% of all establishments that practise telework). It is also very common in management (45%) - although many believe that managerial tasks can not be combined with teleworking, the evidence suggests that no such simple limitations exist. Secretarial tasks are by far the most seldom to be found amongst establishments that practise telework. This can be explained by the high share of ad-hoc tasks that is typical for the job of a secretary.
Establishments being interested in introducing telework were asked which tasks they considered feasible for being executed by a teleworker. As opposed to the actual practice (see previous chart), supportive tasks are the ones which the highest number of respondents consider feasible, while managerial tasks rank much lower. We can conclude from this finding that many non-practitioners see telework to be limited to routine or non-communicative tasks while the practice tells us that such limitations do not exist.
The rapid growth of teleworking can also be seen in the length of teleworking experience. Roughly half of all establishments have introduced telework only in the last two years. This share is even bigger (three quarters) in Italy, whereas 50% of Finnish establishments have implemented telework already 5 years ago or even earlier.
European managers' main concerns with regard to introducing telework include data security issues. Despite the evidence, many managers also continue to have doubts as to the productivity of teleworkers or the quality of their work. Other concerns mentioned by a high share of establishments are: lack of know-how and difficulties in supervising and managing teleworkers. Few problems with trade unions are expected and few expect their workforce to resist introduction of telework - given the levels of interest measured, this is a realistic view.
### Ranking of barriers to telework 1985-99*

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<td>Lack of any pressure to change current practice</td>
<td>Insufficient knowledge</td>
<td>Data security problems</td>
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<td>Expense</td>
<td>Difficulties of managing and supervising teleworkers</td>
<td>Productivity/work quality</td>
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<td>Organisational effort</td>
<td>Problems organising communication with teleworkers</td>
<td>Insufficient knowledge managers</td>
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<td>Lack of supervision and control</td>
<td>Expense of computing equipment and telecommunication services</td>
<td>Difficulties managing teleworkers</td>
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<td>Inefficient computing equipment</td>
<td>Lack of any pressure to change current practice</td>
<td>Lack of pressure for change</td>
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<td>Training effort</td>
<td>Reasons relating to productivity or work quality</td>
<td>Expenses</td>
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<td>Lack of acceptance by staff</td>
<td>Employees would not want to telework</td>
<td>Problems organising communication</td>
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<td>Resistance from trade unions</td>
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Compared to 5 years ago, issues of technology availability and cost have become relatively unimportant in managers’ assessment of telework in 1999. Looking further back to 1985, “no pressure for change the current practice” as a reason for not introducing telework has been widespread in the 1980s, but not anymore in the more competitive environment of the 1990s.

* not directly comparable due to differences in methodology used
Currently 12% of European establishments are practising alternating telework (a type of telework where employees spend part of their working time at home and the other part at the office). Of these, more than one half are interested in extending the number of alternating teleworkers. Another 8% are interested in introducing this type of telework, a quarter of which already have concrete plans.
Nearly one half of establishments have mobile workers, i.e. employees who spend more than 10 hours per week on the road or on customers’ premises. Roughly a third (31%) practise mobile telework or are interested in introducing it. Of these, 20% already practise mobile telework. 6% have concrete plans and 5% are interested without having concrete plans.
The interest in telework is comparatively high among those establishments that do not practise it yet. In addition to those already practising telework (36%), another 11% express an interest in its introduction and implementation. Remarkably, Germany ranks top with 17%.
Practice and interest in home-based telework

The figure shows that the numbers of establishments interested in the implementation of home-based telework is nearly as high as the number of those already active in this area. If a significant share of these will put their plans into practise and become teleworking organisations, penetration rates will almost double soon.
Practice and interest in self-employed telework

Contracting out work to self-employed teleworkers who work on the company’s premises or at their own SOHO is not widespread in Europe. Remarkably, it is the countries lagging behind (Italy and Spain) where a comparatively high degree of interest in these forms of telework is expressed.
Practice and interest in mobile telework

In addition to those establishments already practising mobile telework, many more are interested in implementing it. If these expressions of interest become reality, almost one third of the European establishments will soon employ mobile teleworkers. Only Italy and Spain will continue to be laggards. This seems partly to be due to the fact that in both countries micro establishments play a dominant or at least important role.
Supplementary telework is the most widespread form of telework in Europe. However, only a comparatively small number of non-user establishments express an interest in its implementation. Highest levels of interest can be found in Germany and the United Kingdom.
Telework is predominantly practised by large organisations. Nearly three quarters of establishments with 500 or more employees already offer teleworking (incl. supplementary telework) to their staff members. The share is significantly lower among small and medium-sized establishments. The highest telework growth rate – as measured in the percentage of establishments expressing an interest in implementing telework – can be expected in medium-sized establishments. However, the highest annual growth rates will appear among the very small establishments, mainly due to the fact that they start from rather low levels of telework practise.
The financial and business services sector is the European telework frontrunner. All other service sectors show levels below average. While telework practice varies widely across sectors, interest in its implementation is rather evenly distributed across all sectors.
3.3 Key Case Study Research Findings

3.3.1 Introduction

The ECaTT case studies represent most of today’s most prominent and/or most talked about types of telework. The following categorisation is not based on a definitive taxonomy of telework, but is intended only to highlight the major features of the case studies chosen. It also reflects characteristics of user organisations that most strongly determine the shape and impacts of the introduction of telework. These are:

- **locational type of telework**: Telework has different technical and organisational implications depending on its locality, the three main types being at home, in a dedicated telework centre, and mobile, i.e. at “any place”. Furthermore, an analysis of telework centres should cover traditional organisations working for domestic customers as well as offshore telework centres whose primary objective is to serve foreign markets exploiting low labour costs and other specific national competitive advantages.

- **size**: The way of doing business, i.e. the production process and the underlying organisational structure, differ considerably between SMEs and large companies. As a result, the introduction of telework not only requires completely different approaches, but also yields different results;

- **economic sector**: Comparative analysis of telework practice in different economic sectors has shown that the success of implementation is at least partly determined by characteristics of the sector. This applies especially to public sector. A special case is the IT sector because the implementation of telework here is also an end in itself: these companies are intent on gaining know-how in a market they want to serve themselves, i.e. the market for teleworker tools and management consultancy.

- **organisational position of teleworkers**: If teleworkers are drawn from the lower reaches of the organisational hierarchy (especially in large organisations), the organisation of telework often focuses on the management of telework by supplying a regulation framework that gives teleworkers (and their supervisors) the degree of reliability (control) that they need. Teleworkers that have supervisory or management responsibility choose telework primarily to increase their personal flexibility. They are not to be controlled, but wish to improve their control over the work process.

- **contractual position of teleworkers**: Telework and new self-employment are related issues. Entrepreneurs, especially those working in the main fields of the New Economy, make heavy use of teleworking techniques as a matter of course. Telework, on the other hand, encourages self-employment if not by forcing workers out of permanent employment contracts, then by supporting self-management and independent working modes in teleworkers. The self-employed, however, deal with telework quite differently than employed teleworkers so that a distinction is clearly necessary.

The assignment of individual case studies to one of the following types of new ways of working is not meant to be definitive, but only highlights the main focus of the case study.
## OVERVIEW OF CASE STUDIES OF NEW WAYS OF WORKING

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### 3.3.2 Types of New Ways of Working/Telework

#### a) Telework in SMEs

SMEs have generally lagged behind in telework diffusion in the 1980s as well as the 1990s. For this reason, many EU governments have initiated programmes to help SMEs implement telework - with some success. On the other hand, entrepreneurs and business start-ups, i.e. new, very small firms that have replaced the millions of traditional small businesses that vanished in recent decades make heavy use of telework without even recognising it as such. Moreover, telework in SMEs is much less analysed and publicly discussed for a number of reasons, the main one being that small companies do not have the resources to market the implementation of telework as a means of ‘being nice’ to their employees, but ‘just do it’ when the need arises.

Suomen M-Rakennuskeskus Ltd. is a small company from Finland employing a staff of 12 that designs and oversees the construction of farm buildings, and is a good example for the kind of need that might arise: Working in close (physical) co-operation with customers, Suomen wanted to extend its reach to include customers from the whole country without setting up regular offices throughout Finland. Now telework is being used to fill the gaps on the map that cannot be reached from one of the 5 regional offices. Employees divide their working time between their home, customers’ premises, the road and one of the regional offices. Telework has also been a valuable tool to increase the Suomen’s bargaining power on the labour market because employees do not have to move if they want to work for the company.

**Suomen M-Rakennuskeskus (Finland)**

Suomen M-Rakennuskeskus Ltd. is a construction engineering company that specialises in agricultural building. The company has 12 permanent employees whereof the number of teleworkers is seven. All the CAD-designers work on commission. The company is an SME that has decentralised its teams and operations so that it can serve the whole country. There are five offices and three home-based posts in different regions. The designers do plenty of mobile telework since they must frequently meet their customers around Finland. Telework was implemented in 1995 because the company wanted to enlarge its business territory. In 1996-97 the firm participated in a development project which boosted teleworking and the procurement of laptop computers. At the beginning of 1997 three teams were established to carry out customer projects. Simultaneously the amount of telework increased remarkably since the teams were not regional but decentralised. The main challenge during 1997-98 has been the creation of a scheme that supports both flexible telework and teamwork.

Company URL: [http://www.mmtalo.sci.fi/raksu/raksu.htm](http://www.mmtalo.sci.fi/raksu/raksu.htm)

Full case study see [http://www.ecatt.com](http://www.ecatt.com)

Hifi equipment manufacturer Densen from Denmark is an example of a small company that makes use of home-based teleworkers who work as freelancers (but may be switched to full-time employees soon) from locations distant to the central office. Telework has enabled the company to get access to scarce skills. It is also one component of a business model totally based on flexibility.

**Densen Audio Technologies (Denmark)**

Densen is an SME producing audio technology equipment and that changed from a traditional organisation to a ‘networked’ organisation. Production has been outsourced and free-lancers working from home handle design, construction and occasional support. Products are distributed world-wide through a network of around 30 dealers. The company experienced immediate growth and efficiency as result of the change. Densen is
very small, i.e., there are only four people employed in the central office in Esbjerg, Denmark, one sales person placed in the UK and 3-4 free-lancers living in other places in DK. All manufacturing is out-sourced to BB-Elektronic, Horsens. Activities took off in 1988 at the hobby level from a downtown apartment. Over the next 5 years experiments gradually refined design ideas. Densen started seriously building equipment in 1992 and in 1993 the activity became full-time professional. From 1993 until the end of 1998 production grew out of the apartment and into a 1000 square metre production facility while the number of employees grew to 15. Freelance designers are hired per task with an initial agreement about cost. The freelancers are essentially teleworkers living in different places. In case the demand for design will grow in the future full time or part time employment may be relevant. In that case at least two of the designers are candidates for teleworking as employees, one living in the northern of Jutland, the other in Flensburg, Germany, close to the Danish border. Distributor contacts are typically made at international audio equipment exhibitions and there are currently representatives in some 30 countries. All distributors are renowned country level specialists in high-end equipment.

Company URL: http://www.densen.dk
Full case study see http://www.ecatt.com see http://www.ecatt.com

b) Telework in large companies

Telework in large companies has often been viewed as an isolated human resource (HR) issue, at best an extension of ongoing shifts towards flexitime that accommodate employees wishes for deregulation of strict 9 to 5 rules. The strategic importance of telework was hardly ever taken into account when business re-engineering projects and other popular restructuring efforts were devised. This situation has hampered the spread of telework in large organisations especially in manufacturing industry, as many large companies in this sector have restructuring on the top of their agenda.

However, the BSL case study demonstrates that in the second half of the 1990s, more companies have realised the strategic potential of telework and begun to implement it as part of larger restructuring plans. Telework in this context helps organisations to improve customer service by giving them real-time access to company databases. Team-building and knowledge management are other important aspects, as mobile telework liberates employees to communicate with their peers at any time and place they need to.

BSL (France)

Beginning in 1993, in the framework of a national call for teleworking projects, the programme of virtualisation of the production process has enabled the BSL Industries to come through an industry in crisis, the boilermaking industry. Combined with a policy of buying small companies about to go bankrupt, the company achieved an increase in productivity and a reduction of costs. BSL chose to develop new skills by integrating virtual services at every level of its production process (commercial, studies, planning, manufacturing, quality control, technical support), in order to come through the European boilermaking industry crisis, and preserve the 360 jobs that had been saved after the restructuring of the company. The company took advantage of this new “savoir-faire” combined with the efficiency of the new organisation to exploit new markets by intervening in companies about to go bankrupt. In 4 years, 8 French and Belgian companies were integrated into or became associated with the group “BSL Industries”. BSL Industries now has 12 companies of about 50 employees on average.

Company URL: http://www.bsl.fr
Full case study see http://www.ecatt.com
Large Companies in the service sector have been among the first to introduce telework, not least because of the suitability of the types of jobs found in this sector to distance working. Companies in the financial services sector were among the first to introduce computer workplaces as well as computer-to-computer data transfer across great distances. Large numbers of employees produce work output in digital format which can easily be transferred via PSTN or other communication networks.

Nevertheless, problems arise in connection with jobs that rely on paper-based documents for work inputs, e.g. claim processing in insurance companies. Here, innovative organisation is needed to enable teleworking if it is not to affect throughput times and, thereby, effectiveness. Germany’s LVM and Sweden’s Dial are at the forefront of telework implementation in the insurance sector. LVM, in the face of a massive drop in prices on its markets and new competition from direct insurers, implemented alternating telework as a means to reduce office space requirements and boost employee morale. The strategy was immensely successful. Additional costs for equipping home offices arise, but a rise in productivity more than compensates for it. Employees are much more committed to serving their customers than before, a prerequisite for future success on the insurance market because traditional insurers like LVM find it difficult to compete with direct insurers on price alone.

**LVM Versicherungen (Germany)**

LVM implemented telework on a large scale, reacting to a request from employees for new forms of work organisation and working time flexibility. LVM is a front-runner in Germany in teleworking with almost 500 teleworkers which amounts to about 30% of its workforce in the headquarters which lend itself to telework. Teleworking was started in 1995. Teleworking also had the effect that LVM did not have to build a new second headquarters in the north of Münster which the company had already planned due to an office space shortage at the original location. This and the move of the entire workforce could be avoided by introducing telework on a large scale and building a smaller extension to the existing headquarters. In total approx. 100 Million DM (= approx. 50 Million ) was saved.

LVM was also the first company in Germany practising teleworking using the “tandem model”. This model had the positive side effect that smaller (mainly organisational) problems are solved by the tandem (i.e. the team of two) on a case-by-case base. In the meantime many companies (e.g. Barmenia, Deutscher Herold, SIGNAL) not only from the insurance sector have also adopted this model when implementing telework and also report positively on it. LVM has measured a productivity increase of 10% among the teleworkers. It is against this background that the company together with the works council and the explicit agreement of the teleworkers concerned has developed and signed an agreement whereby all teleworkers agree to carry additional workload of 10% on the days when working from home at no extra pay. LVM does not plan to set any limitations concerning the number of teleworkers in the future.

Company URL: [http://www.lvm.de](http://www.lvm.de)

Full case study see [http://www.ecatt.com](http://www.ecatt.com)

Dial on the other hand is such a direct insurer, communicating with customers by phone or by the Internet. The company uses virtual call center technology to make enable its staff to work at home, especially during evening hours when the willingness to work at a central office is very low but the demand for call center staff is very high (because customers can best be reached in the evening hours). Mastery of call center management is of prime importance to direct sellers. Telework can play a decisive role here.

**Dial (Sweden)**
Dial insurance company started to employ 13 teleworkers in 1997 in the remote municipality of Lindesberg some 250 km away from the company headquarters. The teleworkers perform telemarketing as well as insurance sales tasks via the telephone connected to the central computer system. Apart from telephone sales Dial also sells its products via the Internet. Both these ways of insurance sales have enabled the company to offer its products and services at very competitive prices. Today 120 of the 250 employees of Dial work from a home base. Another remarkable aspect of this teleworking scheme is the fact that it was originally initiated by the municipality of Lindesberg with the objective to create more qualified jobs and employment opportunities in a remote area. The individuals were trained for their jobs in an education centre (“Masugnen”) in Lindesberg and afterwards received a job at Dial.

Company URL: [http://www.dial.se](http://www.dial.se)

Full case study see [http://www.ecatt.com](http://www.ecatt.com)

### c) Telework in the IT sector

Almost all of the major IT sector players have been involved in telework projects because they themselves offer teleworking solutions to their customers and therefore need their own experience for product development purposes and as a way to demonstrate to clients that teleworking ‘works’. For these reasons, IT sector companies have usually advanced further towards ‘work where you want when you want’ scenarios than companies from other sectors. Good examples are AT&T which has actively pushed the telework issue in the USA since the 1980s, IBM Japan which has possibly the largest mobile workforce in the country, and Tele-Denmark which makes extensive use of informal telework based on “remote access arrangements”.

#### AT&T (USA)

Initially, AT&T looked at telecommuting as one method to meet provisions of the federal Clean Air Act. Beginning with some exploratory studies in the 1980s, the AT&T program formally began as a pair of pilot projects, in Los Angeles, California in 1989, and Phoenix, Arizona in 1990. The company developed a set of preliminary guidelines and policies for the projects. The projects involved almost 200 employees who were first trained, then allowed to telecommute from their homes a day per week. The Phoenix project also included employees from the state government of Arizona. Telecommuting has expanded to the point where half of AT&T’s managerial and professional staff of 55,000 now have telework arrangements. AT&T’s telecommuting option stands out both for its size and its diversity.

The AT&T telecommuting program is the largest of its kind in any major corporation. To accomplish this, substantial changes in traditional management attitudes and processes were required. Although large telecommunications companies are more often characterised by their ponderous behaviour, AT&T has shown itself to be very flexible in exploiting its new technologies to the benefit of its employees, its customers, the communities in which they live, and the environment.

AT&T is also a major backer of Telecommute America™, a project of the International Telework Association and Council (ITAC) that is dedicated to expanding and extending telecommuting and broader forms of telework as work options in the USA.

Company URL: [http://www.att.com](http://www.att.com)

Full case study see [http://www.ecatt.com](http://www.ecatt.com)

#### IBM (Japan)
IBM Japan represents one of, if not the largest example of mobile work implemented in Japan (3,800 mobile workers as of 1999). The company has promoted mobile work in a series of steps, the first being a small pilot involving 10 workers in late 1995 (Pilot 1). A second larger pilot was run for 6 months in 1996 (Pilot 2, 114 participants). This was followed by full introduction of a formal program in August 1997 with 500 mobile workers. This number had increased to 2,500 by March 1998 and 3,800 by April 1999. The cited goals for introducing mobile work are fourfold. Firstly, the Company wished to improve its customer satisfaction in an increasingly depressed but competitive business environment. Secondly, it wished to improve worker productivity. Thirdly, it wanted to create a more worker-friendly environment in a city where average commutes are notoriously long and business related travel frequent. A final goal was cost reduction. The owner of the land on which one of the Tokyo offices (Roppongi) was situated had decided to sell, so the Company was faced with having to accommodate these workers at the already cramped Hakozaki facility. Mobile work was seen as a viable way of doing so without increasing real estate costs.

Company URL: http://www.jp.ibm.com
Full case study see http://www.ecatt.com

In Germany, Deutsche Telekom (Europe’s largest telecom) has belatedly started to adopt telework in the second half of the 1990s when a pilot project was conducted. Although the pilot was very tentative in its initial stage, much stronger commitment by the company’s board led to telework being formally acknowledged as a regular way of working at Deutsche Telekom in 1998. This turnaround might have had a decisive influence on the willingness of other companies to adopt telework, as Deutsche Telekom was in general regarded as an organisation not well suited for telework because of strong union influence and work ethics which were close to those in the public sector.

d) Telework in the public sector

Telework in the public sector has been subject to both the main positive and negative trends in telework in the 1990s. It has benefited because the attention politicians brought to the topic led to a number of projects that were intended to demonstrate the public sector’s commitment to telework as well as serve as an example and model that private sector companies should emulate. It has suffered because the emphasis put on flexibility that was one of the main features of the 1990s telework discussion contrasts with traditional ways of working in the public sector and the powerful role unions play in this sector.

For these reasons, telework is being implemented especially in relation to reducing the hardships for employees affected by restructuring (as is the case in the example of IMH-Oost in the Netherlands, where mobile environmental inspectors from many parts of the country have been spared a move to the new central office in Arnhem). In Västerbotten in Sweden, telework was used as a tool for reaching regional development objectives, benefiting regions that are in danger of degradation as a result of a drain on young and skilled inhabitants.

**IMH-Oost (Netherlands)**

Inspectie Milieuhygiëne Oost (Environmental Health Inspectorate) Arnhem is part of the Ministry of Housing, Planning and Environment (VROM). There are 45 employees. It originates from the merging of several divisions of the environmental inspection agency in the Provinces of Overijssel and Gelderland. It has a monitoring and controlling task in relation to environmental issues. Clients are mainly local and provincial authorities.

The telework initiative arose from the director of IMH-Oost who had to manage the reorganisation. He saw home offices as a solution to the problem of ambulant employees working in a large area and mostly living far from the new office in Arnhem. He did not want just the realisation of an office, but creating what he calls a ‘working environment’.
To work out the initiative of flexible working, IMH-Oost was awarded a special trial status. This allowed it to deviate from the normal standards.

The objectives of IMH-Oost from this new way of working were:

- Reduction of office-space (environmental effects);
- Improvement of access, client-friendliness;
- Reduction of commuter traffic;
- Corporate identity;
- Improvement of the effectiveness of working hours.

The project lasted from June ‘96 to December ‘98.

Today 30 ambulant environmental inspectors and their director are teleworking from their home base as a result of the merging of different divisions, combined with new accommodation at one location. The inspectors only come to their new office for meetings and communication. The office is small and specially equipped for that purpose.

Company URL: none

Full case study see [http://www.ecatt.com](http://www.ecatt.com)

The experiences of French utility operator EDF/ EGF are interesting because the emphasis here has moved from home-based telework to mobile and “in situ” telework, as this was found to be more in line with business objectives while at the same time limiting legal and social problems connected with home-based telework. As is the case in the County Council in Hertfordshire in England, telework is being implemented as a means to break up structures that became stagnant over long years of stability, thereby making better use of human resource potentials.

**EDF/EGF (France)**

Telework implementation at EDF and Gaz de France was used as a means to better respond to the reorganisation needs of the two companies. Starting in 1993 both have continuously refined their telework policy through the implementation of a multitude of small telework projects. Today, about 50 telework projects are in operation, some concerned with collaborative work in a networks (e.g. DIESE project), others dealing with mobile working for staff members frequently travelling (e.g. “telework and small jobs” project.

Company URL: [http://www.edf.fr](http://www.edf.fr); [http://www.gazdefrance.com](http://www.gazdefrance.com)

Full case study see [http://www.ecatt.com](http://www.ecatt.com)

**Hertfordshire County Council (U.K.)**

Hertfordshire’s “WorkWISE” initiative was developed in the mid 1990s to link employment practices with environmental and transport service delivery strategies.

“WorkWISE” is about a range of flexible working practices designed to improve service delivery whilst still meeting the needs of employees. It includes flexible working hours, part-time or flexible contracts, remote working and remodelling office accommodation. The Trading Standards department in the County Council was chosen as the pilot to test some of the issues in WorkWISE in 1995.

Following the pilot the authority has developed “WorkWISE” at a considerable pace. The Social Services department has started a programme covering over 300 people, which will expand to over 3,500 employees, moving them away from static bases to
working in a variety of locations. In the Social Services department 33 are home workers, 194 are mobile workers and only 83 are office based.

The aim is to make effective use of office spaces (reduction to 60%), reduce time and money spent on travelling, improve service delivery and work more effectively. The initiative was funded by some of the capital receipt gained by selling two County Council buildings.

Company URL: http://hertscc.gov.uk

Full case study see http://www.ecatt.com

e) Mobile telework and hot desking

Mobile telework schemes differ from more traditional projects focussing on home-based telework because their underlying rationale is different: They do not to focus on improving employee satisfaction but adapt the business process to the needs of the market. For this reason, mobile telework is often introduced without asking each of the employees affected for consent. The business imperative behind mobile telework, however, is much stronger than with home-based telework, because mobility plays a strong role in improving the responsiveness of organisations in general and customer service in special. To quote the case study of Danish insurance company Danica, one important goal is to make field staff (e.g. insurance agents) "more visible to (actual and potential) customers".

Danica (Denmark)

Danica started a reorganisation project a couple of years ago. It grew out of the need to position Danica in the new market situation. For conservative Danica it was breaking new ground to think in terms of telework, new work partition by means of a call centre, and development towards Internet based sale of the simple standard products. However the market situation called for higher competitiveness. The overall strategy was to develop and enhance the sales process, to provide a better service to the customers by means of better systems and more efficient processes as well as customer handling, developing needs-oriented - rather than product oriented - sales, - and last, but not least, to reduce costs. A core competitive issue was to make the insurance agents more visible in the local areas, because there is a clear tendency that the agent’s presence in the local area is more important than the company name. During the process a fraction of the reorganisation project took the initiative to develop a telework scheme as part of a new organisational scheme. Considerations started in autumn 1997 and telework pilots initiated half a year later with daily operation from mid-1998. The insurance agents work in principle full time from home, or mobile with the option to work at the satellite centres, i.e., the regional offices, when required, for example when secretary assistance is needed.

Company URL: http://www.danskebank.dk/danica

Full case study see http://www.ecatt.com

Traditionally, sales agents and other mobile staff had a full workplace at a central office while working for the most part of their working time in the field, supplemented by some additional paperwork at home. With the help of advanced mobile computing technology, mobile staff can today work where they want accessing central databases via GSM, ISDN or PSTN data connections from their home, customer’s premises or any other place. The investment for equipping employees with mobile gadgets is in part recouped by saving central office space through the introduction of desk-sharing and hot desking offices that function on a first come first served basis. This has in some instances led to opposition of employees as their entitlement to a physical workplace at the central office is questioned. Interestingly, the kind of quarrels that have resulted have drawn much less public attention than the (mostly hypothetical) danger of regular office workers being pushed into telework against their will. This
may be because field work has always been assigned a special status by the public, which is also reflected in labour legislation (as outlined in the NEC case study from Japan).

### NEC (Japan)

NEC’s involvement with telework dates back as far as 1984. Since 1992 the Company has established a number of in-house telework centres within a 30-40 kilometre radius of central Tokyo. More recently, it has been developing mobile work with 500-600 of its salesforce currently involved. NEC has put in place a comprehensive range of telework models to ensure the best mix across business and job types. It has 3 satellite offices, 4 business centres, 3 spot offices, home-based telework in 2 sectors, a home-based access program and mobile work in 3 corporate sectors. Telework tasks cover a broad range from planning and research to writing reports and presentation material. In order to be eligible, workers must have at least 3 years experience with the Company as well as the approval of their supervisor. The major aim of the program is to enhance office worker productivity in terms of effectiveness, creative output and timeliness.

Company URL: [http://www.nec.co.jp](http://www.nec.co.jp)

Full case study see [http://www.ecatt.com](http://www.ecatt.com)

In the second half of the 1990s, hot desking has become one of the most noticeable features of telework projects. In Europe, hot desking was not very widespread before because of the low penetration of teleworking schemes and perhaps also because of some reluctance to take away central office workdesks from teleworkers. Empirical research, e.g. on the teleworking scheme of IBM Germany\(^\text{17}\) has underpinned such misgivings, finding that many teleworkers fear being driven out of their work teams when they lose their personal workdesk. However, a bigger stress on the ROI of teleworking investments together with evidence that social isolation can be avoided through alternating telework meant that all successful large-scale teleworking projects have included at least desk-sharing, many of them also a redesign of office space, as in the case studies of Autodesk in the USA.

### Autodesk (USA)

Beginning with a 1996 pilot project Autodesk developed its Future Work-Now program, which has since expanded to include telecommuting and hoteling for half of its employees. Work options in its Future Work-Now program include telecommuting, flexible hours, hoteling\(^\text{18}\), and sabbatical leave every four years, all with the goal of reducing worker stress and increasing employee job satisfaction. The FWN program began as a pilot project involving 20 employees who were allowed to telecommute. Telecommuting began as an outgrowth of a policy established at Kinetix, the Autodesk’s division that specialises in multimedia. The policy was that no meetings were to be held on Wednesdays and Fridays. This provided the opportunity for employees to work at home on the non-meeting days. Since the pilot project’s successful end hoteling was added as a work option and the FWN opportunity was extended to all of the company’s eligible employees; that is, those whose job characteristics allowed work to be performed at other than their primary offices.

Of Autodesk’s 3,060 employees, 46% percent telecommute regularly; 10% of the US telecommuters do so essentially full time, and many are regular users of the hoteling

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\(^{18}\) “hoteling”is a term used to describe the use of an office location by “drop in” employees. That is, if an employee needs the use of office facilities for meetings or access to special equipment while traveling, or instead of telecommuting, he/she can reserve desk or meeting space at a company hoteling facility. The facility may also be partly devoted to more traditional office uses as well.
option. In mid-1999 the company had 14 (fourteen) locations world-wide where hoteling was available. “The Future Work-Now (FWN) Program at Autodesk is designed to allow Autodesk employees to work whenever and wherever they can be most effective on the task at hand. The most common example of FWN currently practised is home-based telecommuting. Working at home part time can complement working in the central office, and is frequently preferred when the need for concentration and ‘heads-down’ work exceeds the need for face-to-face interaction. Telecommuting can also be used to replace an unproductive commute with a few extra hours of productive work, and it can help employees meet aggressive deadlines in the comfort of their homes.

Company URL: http://www3.autodesk.com/adsk/
Full case study see http://www.ecatt.com

f) Centre-based telework and teleservice centres

Centre-based telework has not developed the way foreseen by researchers and politicians in the 1980s and early 1990s. As Werner Korte has outlined in his evaluation of international evidence on this issue: “It still remains to be seen whether telecentres in the future will face a fate of permanent state subsidies or whether they will become the next big growth industry. Though, with some exceptions, little points to the latter, certainly not in the short or medium term”. State-funded call-centres still persist, some of them successfully acting as catalysts of regional development like Telespace Vercors in rural France, but commercially profitable examples like the Kite Teleworking Enterprise in Ireland are very rare in Europe as well as in the USA.

Telespace Vercors (France)
The telecentre Telespace Vercors has been set up on the “plateau du Vercors”, a rural area at an altitude of 1000 metres in a conservation area around 60 km away from Grenoble in 1992. It comprises an institution hosting teleworkers as well as organising awareness-raising activities for the inhabitants of the surrounding region. Today it is occupied by teleworkers from large companies as well as individual teleworkers. Telespace Vercors provides offices, computing and telecommunications equipment and various shared services which allow companies to (temporarily) employ their staff members at a distance in the telecentre but also offer work options for new start-ups and individuals working and providing their services as teleworkers. It was set up as part a global initiative for local development addressed to rural regions.

Company URL: http://www.cyberaccess.fr/Overcors/vercors_connect.htm
Full case study see http://www.ecatt.com

KITE Teleworking Experience (Ireland)

Kite Ltd. (Kinawley Integrated Teleworking Enterprise Ltd.) was established on 25th November 1993. The company provides a full range of data management services to its clients. This type of service often requires the company to use a combination of telephone and computer integration. Its main clients are predominantly companies that rely on some form of outsourcing and/or are in position to avail of data processing services from another time zone. The company is based in a rural area and prides itself in open-

ing new possibilities for the local community. The teleworking initiative is of primary importance to the company and the whole strategy is based upon it. Kite Ltd. is a winner of ‘the most entrepreneurial use of telework in Europe’ for 1998. Kite Ltd. employs 19 people and is ISO 9002 compliant.

The company started from a Greenfield site and is operating from a purpose built office in Kinawley, County Fermanagh. Due to its location, it experienced all the familiar problems regarding ICT infrastructure and the general infrastructure during its development phases. The tasks performed by staff include telephone research, transcription, targeted mail shots, www searches, web page writing, database building, reporting, customer training, telephone calls handling, and tasks relating to remote conference management. The above tasks require staff to be both able to work alone as well as to be part of the effective team. Although this was guiding criteria for their recruitment and selection, the Managing Director realised that further training in this area was warranted and this has subsequently been undertaken. There are 15 employees working on these types of assignments, which amounts to 80% of the workforce (remaining four are employed as childcare workers in company’s crèche). All employees are on standard, full time contracts consistent with national norms. However, employee control over working hours is tempered by customer needs and inevitably, the company has to rely on Flexitime. A major part of the company strategy is to avail of the time difference between the USA and Europe. The contract with a group of US hospitals to provide overnight data processing services (which in effect extend the client’s working time) was a major breakthrough.

Company URL: [http://www.kiteltd.com](http://www.kiteltd.com)
Full case study see [http://www.ecatt.com](http://www.ecatt.com)

Nevertheless, a (rarely acknowledged) form of centre-based telework has spread rapidly in the second half of the 1990s, that is call centers. However it has to be noted that the rationale behind the set-up of call centres has very little to do with providing jobs close to where employees live and very much to do with functional specialisation on the one hand and IT-enhanced control of the labour process on the other hand. Moreover, call centres play a central role in the discussion about cross-border (or “offshore”) telework because they are often set up in countries that offer cheaper labour and sometimes also working hours that enable night-time work due to location in a different time zone.

Recently technological progress has made it possible to build virtual call centres consisting of a network of home-based teleworkers that are integrated into a centrally managed automatic call routing system. The U.K. Automobile Association (AA) has set up such a virtual call centre made up of 25 permanently home-based teleworkers and 3 mobile managers whose sole responsibility is managing teleworkers.

Automobile Association (U.K.)

The AA is a 24-hour breakdown service within the Automobile Association in Leeds, England. The AA provides a dedicated motor handling service for members who breakdown. Calls for help are relayed to mobile patrols that lend assistance to motorists in difficulty. The type of teleworking practised in the AA Call Handling Division is full-time home working. Teleworking was first introduced in 1997 following an extensive research period which culminated in a study visit to the Canadian Automobile Association. A pilot programme consisted of approximately ten teleworkers some recruited externally, some with disabilities and others from inside the AA. A two-week induction training session was provided to teleworkers unfamiliar to the ways of AA and supplemented by the daily support of a mentor in the teleworkers own home for a period of one month. This ‘support’ proved costly and was phased out in favour of an on-site induction lasting 6-9 months. Teleworkers were also provided with additional data protection training. The success of the pilot programme led to an expansion of the programme and there are now 25 teleworkers and 3 mobile managers who manage the remote relationship. The
process of implementing teleworking was evaluated periodically and an independent evaluation carried out after 20 teleworkers.

Company URL: http://www.theaa.co.uk/

Full case study see http://www.ecatt.com

ECaTT chose to include only one case study of telework for special needs groups, for two reasons: Firstly, there has been ample research on this topic dating back to the beginning of the 1980s. Most of findings from these research efforts still apply with the possible exception of the technological leaps that have improved the feasibility of practical applications. Secondly, in the late 1990s telework was no longer considered a tool for solving specific problems by minority subgroups of the labour market (women with small children, handicapped, inhabitants of peripheral regions), but as a general strategy for improving competitiveness of almost every organisation. As a logical consequence, the attention given to special needs groups began to diminish rapidly in the telework discussion.

Nevertheless, telework remains a potentially very effective tool for the integration of special needs groups into the labour market, e.g. physical handicapped employees. Spain’s CEPES is a good example here, although it diverts from the norm as it offers centre-based telework to self-employed handicapped individuals.

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<th>CEPES (Spain)</th>
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<td>CEPES, established in 1992, set up the Telecentro Cepadite as a teleworking pilot project for disabled people. This activity took place as part of the work of the EMPLEO/HORIZON project “CEPADITE”. The project was split in a training and trial period.</td>
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<td>The main objectives of this project were to:</td>
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<tr>
<td>• facilitate the social integration of disabled people,</td>
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<tr>
<td>• gain experiences in the creation of employment by practising new ways of working and employing forms of auto-employment,</td>
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<tr>
<td>• promote new ways of working,</td>
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<tr>
<td>• make companies aware of the possibilities to employ disabled.</td>
</tr>
<tr>
<td>20 self-employed disabled teleworkers are providing their services to the market.</td>
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</tbody>
</table>

Company URL: http://www.cepes.es

Full case study see http://www.ecatt.com

g) **Entrepreneurial telework**

ISTs and some general trends in business strategies (most notably the outsourcing push) have improved the prospects of individuals starting their own businesses. Telework plays a very important role in this because it makes it possible for entrepreneurs to connect with clients irrespective of distance. In some economic sectors working at a distance has become commonplace, as e.g. in translation, in software development (see Yolanda Velasco case study) and in scientific research. There are, however, obvious barriers to start-ups that try to enter a market: the possibilities to make contact with potential clients are in most cases very limited. As research into micro-business behaviour has shown, young companies depend very much on personal networks for business opportunities. Setting up such networks is a demanding task that seems to have not been made much easier by telework. In some countries public initiatives have been started to help entrepreneurial teleworkers connect with each other and with potential business partners, like the Flexinet Networking Project in Finland.
Yolanda Velasco (Spain)

Yolanda Velasco is a typical example of a teleworking freelancer offering tele-services on the market. These include graphics design, publicity design and web design. She carries out her work entirely from a home base.

E-mail: Yolanda@arcom.conectia.es
Full case study see http://www.ecatt.com

On the other hand, a dependence on face-to-face interaction for networking and getting to know clients can not be taken for granted. In the software industry, programmers and clients who are both very accustomed to working with the Internet have overcome the need for face-to-face interaction completely. For informal communication, chatting, newsgroups and e-mail have become vital tools, while word of mouth and work samples (e.g. Websites, programmes) are both very important for assessing the quality of prospective business partners. When more and more parts of the business population have become accustomed to online communication, this sort of virtual co-operation might become real in every sector of the economy.

Flexinet (Finland)

FlexiNet Networking Project was a nation-wide “umbrella project”, carried out in 1995-1998 and preceded by the Project for Telework in the Archipelago of Southwest Finland (1991-1994). The goals of FlexiNet included the development of the business activities, service abilities and effectiveness in the archipelago and rural areas of Southwest Finland. The basic idea of the FlexiNet project has been to activate the inhabitants of the islands and rural areas to independent development of sources of livelihood that arise from local needs. The starting point has been to support the present basic and vital occupations and businesses, but at the same time to conduct new projects that are experimental and even bold in nature. The project focused on finding, testing and developing of new approaches, products and methods that could help to organise work flexibly.

Another purpose was that the results and experience gained in the various sub-projects could be widely used and applied to improve the employment and livelihood of people living on the islands, in rural areas and also in towns and cities. The FlexiMarketing Association was established in connection with the telework project that preceded FlexiNet. Its goal is to support the marketing endeavours and co-operation of the teleworkers and small telework businesses in the Archipelago of Turku. Later it was expanded to include the entire region of Southwest Finland. In the beginning of 1999, the association had 110 members. Its central lines of business included translation, interpreting, telematics, graphic art and printing, bookkeeping, accounting, and other clerical work. The activities of the association now depend entirely on the activity of its members, as there are no salaried workers.

Company URL: http://www.tkk.utu.fi/
Full case study see http://www.ecatt.com

h) Virtual organisations and freelance networks

Entrepreneurial teleworkers that work in networks can also be part of what has become to be known as “virtual companies” or “virtual organisations”. There are two main kinds of virtual companies: Firstly, networks of individual freelancers or micro-businesses co-operating to jointly develop, produce and/or market a product or service, and secondly traditional companies that hollow out their production process by outsourcing mostly of manufacturing while focussing on knowledge intensive processes like R&D and marketing.
NTD International, a multinational shipbuilder based in Denmark, belongs to the latter category. NTD used to be a large company that went bankrupt. Then, some of its employees established a virtual company based on what was left from the closed wharf, i.e. the network of business relations. Instead of actually welding together ships and vessels, the company now concentrates on its core competencies, i.e. designing state-of-the-art ships and managing the construction process, based on a small team of experts most of which are located in a central office in Ringkobing. The physical work of assembling the vessels is outsourced to specialist manufacturers at locations with access to cheaper labour, e.g. Eastern Europe, Vietnam and Thailand.

<table>
<thead>
<tr>
<th>NTD International (Denmark)</th>
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<tr>
<td>NTD was established as a new enterprise which was built by splitting up a traditional shipyard business into the material and the immaterial processes concentrating on the knowledge based parts by extensive use of IT and telecommunication. As a result the enterprise operates world wide instead of locally involved in considerably more projects. NTD was initially selected because it started off as a true virtual enterprise with a few people. In a few months however the enterprise grew from 2 to 22 employees and changed from being a virtual enterprise to becoming a teleworking and mobile SME. NTD builds on the remaining of a traditional shipyard. The Former company W. Meinertz Olesen &amp; Co A/S, which is the base of NTD, went bankrupt due to the fact that that one of its two customers went bankrupt, primarily due to bad management. The board was without visions and a future perspective and ignoring signals of structural changes. An initiative was taken to continue what was considered to be the most profitable part of the business in the form of NTD. NTD was set-up to handle all the initial processes and work associated with starting a ship building project, design and construction processes, supplemented by some specialised products and services - winches and ship power supply. The original virtual enterprise only operated as a virtual enterprise for a short time because of fast success and the derived need for employing a larger number of people in one place. Much of the staff was recruited from staff of the former company already living in the area supplemented with new staff from outside the location. Three persons are permanently stationed in other harbour cities, i.e., one in Århus - 120 km away, one in Esbjerg - 80 km away and one temporarily in Croatia. Around fifty percent of the staff work alternately from office, home or where ever necessary. The exception is the workshop bound personnel. The majority of the staff work under an agreement about job-salary, i.e., paid for the job rather than on an hourly basis. Company URL: <a href="http://www.wmo-int.com">http://www.wmo-int.com</a> Full case study see <a href="http://www.ecatt.com">http://www.ecatt.com</a></td>
</tr>
</tbody>
</table>

Networks of freelancers underlie the business models of software developer Rauser Advertainment from Germany and virtual translation agencies Polyglot from the Netherlands and Translation Craft from Ireland. All of them benefit from the business clout the umbrella organisation can give (especially regarding effective marketing of services) while keeping a very high degree of flexibility because the labour input can be flexibly adjusted to variations in demand. This degree of flexibility, however, is not always to the benefit of freelancers as they have to do without the level of job and income security and predictability taken for granted in standard employment relationships. Disadvantages caused by this situation are usually the higher, the smaller the bargaining power of the individual on the labour market has. Thus, specialist software developers like those working for Rauser Advertainment have the power to extract benefits from their employer while individuals with skills less highly valued on the labour market (e.g. translation) are in danger of losing out.
Rauser Advertainment (Germany)

Rauser Advertainment is a prototype example of a virtual organisation operating globally and employing freelancers from countries throughout the world. The company has specialised in the development of entertainment and advertising products (e.g. computer games, screen savers) for customers coming from a variety of different countries. The computer games are used by the customers as advertising tools which are given away as “freeware” free for duplication. Networking of distributed team members in a virtual organisation under the name of Rauser Advertainment is the normal way of operation of this company from its very beginnings.

In 1999 Rauser Advertainment became a joint-stock company. Thorsten Rauser undertook this step to be able to develop an employee participation model based on giving shares to his staff to improve the relationship of his employees and freelancers and their commitment to the company. Any worker – no matter whether working under a contract of employment for the company or as a freelancer – who has been with Rauser Advertainment for more than two years is entitled to a special package of company shares. So far two employees and 10 freelancers from Germany, Austria and the US made use of this offer. Those individuals who have worked with Rauser Advertainment on at least two completed projects in the last two years are also entitled to a special benefits package which includes short term company loans, legal consultancy free of any cost, individual membership with the dmmv Deutscher Multimedia Verband (German multimedia association), and other benefits. It is hoped that these benefits will strengthen the ties between the company and its employees and freelance workers.

With its organisational and legal construction Rauser Advertainment constitutes a classical example of a virtual organisation. The company actively searches the www for new talented freelancers for carrying out programming, graphics, translation tasks or for writing stories or composing music required for the development of advertainment products. Tele-co-operation is the normal way of working and communicating, personal contacts are the absolute exception, communication and the exchange work results is carried out via e-mail and file-transfer. The geographical location of the team members, their working times etc. are of no importance, fixed working hours are a thing of the past. As a result of this two former staff members moved away from Germany (at least temporarily) and are now working as freelancers for Rauser Advertainment from their adopted countries, namely Turkey and Florida in the US.

Company URL: http://www.advertainment.com

Full case study see http://www.ecatt.com

Translation Craft (Ireland)

Translation Craft is a Dublin-based software localisation and development company, established in 1995 to provide high-quality Brazilian Portuguese localisation services and localisation software tool to clients in Dublin and around the world. Translation Craft represents an example of the ‘new self employed’. This Dublin-based company has a workforce of 6 people. These ‘employees’ are predominantly self employed and are paid a fee according to their output. They are hired according to their skill set and twined with the specific project requirements. The growth of the company arose from early successes with small projects, and experience was leveraged from project to project. The scheme initially started with only two ‘employees’. Due to the expansion of business (in scope) six are now employed. Also, the usage of subcontractors has increased both in their numbers as well as in the frequency they are used. The company also employs a teleworker who is teleworking from another country (Spain).

Company URL: http://www.tcraft.com

Full case study see http://www.ecatt.com
Another problem faced by virtual companies is trust-building. Without face-to-face contacts, building trust between business partners proves much more difficult. For this reason, many virtual companies rely on a pool of trusted freelancers instead of choosing freely from a world wide reservoir of specialists.

3.4 The Way Ahead: Factors Promoting and Inhibiting Telework

3.4.1 Potential

As the ECaTT study showed, employee interest in telework can be taken for granted. Thus the decision whether telework will be introduced and its extent lies mainly with the employers.

Which establishments primarily are expected to introduce new teleworkplaces or expand their numbers? With regard to internal diffusion these are mainly the larger establishments, which generally already have experience of telework. Establishments which will introduce telework for the first time will come mainly from the small and medium-sized group.

Given the fact that the vast majority of companies already active in telework have had positive experiences with this new way of working, the expansion of their teleworking schemes will be one of the major driving forces for telework diffusion and penetration. Currently these are mainly large organisations with more than 500 employees operating teleworking projects of small sizes with only around 10 teleworkers on average. Since around two third of the jobs in industry and in businesses lend themselves to teleworking (see findings on “teleworkability”) there still is an enormous potential for teleworking especially in large companies, which is likely to be realised in the coming years.

3.4.2 Promoting Factors

The rapid spread of telework in the second part of the 1990s has benefited from a number of developments, namely: availability of more adequate and cheaper ISTs, political support and supportive public opinion, economic restructuring, corporate restructuring and new work paradigms, and a change in social values and attitudes.

Availability of more adequate and cheaper ISTs

The convergence of IT and telecommunications technology has gained speed with the success of multimedia and online computing. The impact of the Internet on the economy only began to be felt in the late 1990s. The Internet can drastically change the way people make contact with communication partners, be it in business or in private life. In the tradition of mass transport and the telephone, the Internet marks another huge leap in overcoming time-place-restrictions, liberating labour from the constraints of physical location. As a consequence, working at a distance from the traditional workplace becomes a more realistic proposition in the minds of employees.

Liberalisation in European telecommunications markets has led to decreasing costs for voice and data communication. Whereas costs for data communications that is run on self-owned infrastructure (e.g. LANs, fixed lines) were much lower than data transfer via public networks, this gap has closed somewhat in recent years. As a result, the division of labour across various locations has become cheaper in relation to the costs of co-location. The second half of the 1990s has also seen the take-off and boom of the mobile phone market.

Availability of fast data transfer services such as ADSL, UMTS, cable modems for reasonable prices is around the corner. It will contribute to abolishment of bandwidth limitations that still hamper teleworking. Although video-conferencing until now has not been applied broadly for telework, high-quality video telephony might make a difference.
Hardware and software constantly become more powerful and better adapted to the needs of users, while prices go down. At the same time, computer technology spreads more and more into every aspect of business and private life. For instance, just as today’s mobile phones are nothing else than mini-computers, PDAs already have more computing power than top-class PCs just a few years ago. Lightweight and powerful handsets have made the mobile office a reality whereas it had been something of a myth before.

In many large organisations, technical developments have made decentralisation of work easier. E-mail systems and other tools for fast asynchronous communication - essential for telework - are now commonplace. Evidence from case study work has shown that introducing telework in organisations in which e-mail is not used as an everyday communication tool (or even not available at all) requires more effort from all participants, especially co-workers and supervisors, and is in danger of being less successful.

A further leap in digitisation (e.g. scanning of all incoming mail and fax messages so that these can be further processed on computer networks) has led to the partial abolishment of paper-based work processes. Digitisation is introduced mainly as a means to make business processes more efficient. Imaging technology and document handling systems have already gained a lot of ground in sectors that traditionally handle a lot of paper documents, e.g. in banking and insurance.

The mobile workforce has been equipped in large measure with mobile computing and communication devices. They have been joined by more and more executives who enjoy the freedom mobile technology gives them in deciding when and where to work. Here, technological progress has acted as a powerful enabler allowing executives to be more mobile and the mobile workforce to have more flexible access to data and tools.

Political support and supportive public opinion

Telework was the subject of much political support in the second half of the 1990s, on the EU level as well as in individual Member States and their regional administrative units. Support came in the form of awareness campaigns, best practice contests, financial aid to organisations promoting and introducing telework, publications as well as telework programmes in the public administration itself. Germany is a good example for the large-scale government initiatives described above. The German Federal Ministry of Economy and Technology in particular, launched a number of large and small initiatives to promote telework and to support its uptake in areas where opposition and scepticism is strong such as the public sector and among SMEs. In both areas best practise contests were started in 1998 and 1999 including a government investment of around 15 million DM (approx. 7 million ). In addition a 60-page telework brochure and a 100-page guide to telework introduction was developed and widely distributed. Besides these activities at the Federal level numerous activities have been initiated at the national level with specific programmes like media NRW, Bayern online etc. also dealing with the issue of telework. Also many ministries at both levels have themselves started teleworking, thereby acting as good examples for other organisations. All these initiatives and activities have contributed very positively to the rapid development and diffusion of telework in recent years which is reflected in the highest average annual telework growth rate in Europe of 34% since 1994 compared to a European average of 17%.

It is against this background that it has become a matter of fact that telework is now visible in public. The media has positively contributed to this. This is also confirmed by the levels of awareness and knowledge of telework among the population in Europe.

In some cases the legal framework has been adapted to the requirements of telework. More important, however, was that the existing framework has proved to be by and large sufficient to deal with telework-specific issues. There is now a broad consensus that new laws for protecting teleworkers are not necessary, minor adjustments will do the job. Worker councils in the large EU countries have now gathered enough experience with
telework that initial misgivings have all but disappeared. Today, we know of examples where works councils have even demanded telework as a work option for their members towards company management.

In the meantime a large number of company agreements as well as other examples of necessary agreements and provisions (e.g. with insurance companies to ensure insurance coverage) on telework exist and are publicly available. Companies interested in telework implementation can easily use and adapt these to their specific requirements. All this has positively contributed to the fact that telework no longer is seen as something exotic and its implementation no longer as being far too complex and difficult.

Media coverage on telework is very comprehensive and in almost all cases strongly positive. For this reason, there is a supportive public attitude towards telework and other flexible forms of work that results in a general feeling that the time is ripe for new ways of overcoming outdated work/family-distinctions and the daily hassle of commuting.

The further spread of telework has lead (especially in those countries that have shown the strongest growth during the 1990s) to a more realistic stance being taken concerning advantages and disadvantages of working away from the office, e.g. at home. While enthusiasm might have ebbed away, more and more employees look for practical solutions to their problems of combining work and family life and start low-key teleworking (sometimes referred to as “guerrilla teleworking”).

Unlike in the 1980s, critics of telework and Information Society developments in general do not influence public discussion in any significant way. The unions, once strongly opposed to telework, have in many cases turned into promoters of telework.

Economic restructuring

The proportion of information workers in the economies of Europe, i.e. those who are engaged in the production, collection, processing or dissemination of information, continues to rise, leading to an increase in jobs which can be executed via telework.

More and more workplaces have turned into computer workplaces, and also in traditional blue-collar jobs, computers are beginning to be used as a matter of course. Telework is just the next step.

The number of the self-employed, even outside of farming, has long been decreasing because of dwindling numbers of traditional small businesses (mostly craft, retail and personal services). In the second half of the 1990s, however, this number has started to rise again due to a wave of new entrepreneurs, many of them in what has been dubbed the New Economy. Many of them start as SOHOs, interacting with their clients and business partners through ISTs.

In general, start-ups belonging to the New Economy show a different attitude towards labour than traditional employers. As many of these start-ups have to grow at an extreme rate if they don’t want to be pushed aside by competitors, labour productivity too has to be very high. That means working where and when necessary or the most effective. No-one asks if this is at home or at the office as long as success.

The 1990s might be dubbed the decade of globalisation during which the international division of labour has been extended with great speed in almost every sector of the economy. Improved data communication technology has increased the feasibility of offshore teleworking. Huge differences in labour costs together with great improvements in productivity at specific locations (e.g. in India, Southeast Asia and the Caribbean) make substitution of offshore for domestic labour hard to resist for employers.

Corporate restructuring and new work paradigms

Increased competitive pressure in the face of globalisation developments and the increasing attention given to raising stockholder value (at the cost of the stakeholder value approach that has been a feature of corporate behaviour traditionally), meant that cost cutting and corporate restructuring were at the top of companies' agendas. Against this
background, telework was re-evaluated and emerged in many cases as a tool for improving customer service, office space management and labour productivity.

Conditions in companies are more supportive for telework now than have ever before. Flexitime schemes have gained a foothold in nearly all large companies, making employers more willing to experiment with telework as temporal flexibility is one of the main reasons for employer misgivings regarding telework. Also, management by objectives (a must for supervising teleworkers) is now praised throughout the economy as the only way of ensuring effectiveness in supervisor-subordinate relationships.

Companies have increased their efforts to focus on core competencies whereas diversification is no longer indicated - at least in most sectors of the economy. Activities that others can do better are outsourced on the free market to streamline production, shed costs and increase flexibility. SMEs and especially the new self-employed have benefited from this.

Management experts stress that value chains today have to function according to a customer-pull principle: The focus is on the customer who decides what she or he wants; all processes along the value chain have to be aligned accordingly so that customers are given the highest possible value. In practice, this means that the production process has to move closer to the customer to get to know him better. Closeness in this sense does not necessarily mean geographical proximity, but sometimes it does: Companies try to get in touch face-to-face with customers more often which means that they have to move part of their staff onto “the road”. At the same time, increasing co-operation between organisations on a regional, national and global scale (still) requires more people to spend a growing part of their working hours travelling. As a result of these developments, mobile teleworking has grown at high rates.

Change in social values and attitudes

Stability in employment (permanent or even life-long employment) is gradually losing its lure in the eyes of today’s young people, although social security systems in most European countries are still heavily weighted in favour of individuals who are in this kind of employment relationship. High-qualified, young employees call for flexible working times and variety in job assignments. Still, employees in the USA change their jobs much more often than Europeans, but the gap in employee attitude is closing.

Women demand the right to participate in the labour market and have children at the same time. Combining both is only possible when flexible ways of working are used, one of the most interesting being telework because it enables spatial proximity to the family at the same time as full commitment to a job.

As traditional gender role patterns crumble, fathers also want to spend more time with their children without having to make concessions job-wise. Turning commuting time into time with the family means more participation in family life (though whether this results in all cases is debatable, see findings on working hours of teleworkers).

Traffic problems have continued to mount in the late 1990s, although the possible role of telework in countering increasing traffic volumes was not regarded as a high priority since in the beginning of the 1990s. Moreover, there is indeed some evidence that certain forms of teleworking are associated with an increase in the amount of travel undertaken by workers. Discussion of telework in this context might gain more attention soon in the course of countries trying to meet their obligations regarding reduction of carbon dioxide emissions agreed on at the World Climate Summit in Kyoto in 1997.

3.4.3 Constraining Factors

In spite of a readiness to introduce telework, Europe’s managers still see barriers to further diffusion. Data protection and security problems are ranked highest amongst the obstacles mentioned. Fears about whether telework is really productive and effective, lack of knowl-
edge of how to introduce telework, as well as the problems of managing and leading teleworkers follow. In contrast, lack of interest of employees or opposition of works councils and trade unions are at the end of the list of possible barriers.

A comparison with the results of the 1994 survey shows that the problems of organising communication between office and teleworkplace and the costs for the technological equipment have significantly decreased in importance in the opinion of decision makers. When looking back further to the 80s, it is noticeable that the previously most often mentioned reason - the lack of willingness to change - is now, in the more competitive market environment of the 90s, only rarely mentioned by establishments. It is somewhat surprising that a lack of knowledge of how to introduce telework is still – as in the past – regarded as a major barrier.

**Data security concerns**

Critics of telework stress that fundamental problems concerning data security and data protection still have not been solved. Special risks arise from the possibility of data losses at the teleworkplace and during the (physical or electronic) transfer of data from the central office. In so far as the Internet is used for data transfer or as a work tool, teleworking seems to be especially prone to data security problems, even more so since a number of major attacks on corporate Websites have demonstrated that even the most advanced computer systems are not immune to disruptions by hackers.

It is often overlooked, however, that these problems are side effects of an economy that is becoming increasingly networked, regardless of telework. Moreover, companies from the financial service sector that are traditionally very sensitive to data security infringements have demonstrated that telework can be organised with a very high standard of data security in a economically and socially feasible way. Their positive experience will contribute to a more positive attitude towards teleworking among data security experts in the coming years.

**Doubts about return on investment**

Not all decision makers in companies are aware of the economic advantages of telework. Many consider it as very expensive - an obvious handicap in times in which cost-cutting and streamlining are at the top of companies’ agendas. Central to the viability of telework is the existence of productivity increases, but these are often found to be hard to measure statistically.

It is important to acknowledge that telework, when badly managed, does indeed often cause additional costs without producing any substantial savings. One reason is that organisations shrink back from desk-sharing since it would mean a breach in work culture. From many such examples it is known that half-hearted desk-sharing results in problems to achieve effectiveness in teleworking. The cost saving potential of telework can not be harnessed without innovative office space management techniques.

Many organisations also make the mistake to only allow very few members of a specific unit to telework. In such cases where the share of teleworkers per unit is too small, teleworkers remain outsiders (‘cranks’) with all the negative effects on work performance and results. When telework is being treated as an add-on, it will most likely cause extra costs instead of cost savings. Unfortunately, this is all too often practised in reality, giving a bad example to other organisations that might also be interested in telework.

**Misgiving about management and supervision of teleworkers**

The introduction of telework results in new requirements for middle management in the fields of supervision, teambuilding and coaching of staff. As a result, opposition from middle management against telework is widespread.

Many decision makers in companies see a contradiction between teleworking and teamwork. Against this background, developments which led to teamwork becoming the prime model for work organisation in knowledge-intensive industries seem to work against further penetration
of telework. But teamwork, although often made easier by close proximity, must also be possible without face-to-face interaction as co-operation in the face of globalisation has to stretch across regional and national borders. Tele-management, the management of teams of experts that communicate mainly (if not only) by phone, fax and e-mail, is one of the main skills supervisors must own if they want to adapt to changing business requirements. Telework can act as a boost to the development of tele-management skills. There can be, however, no doubts that this type of skills are underdeveloped in the majority of organisations today.

Demands of day-to-day business and lack of resources

As already mentioned above, take up of telework is especially underdeveloped in SMEs. SMEs are caught up in their day-to-day business ("there are always more important things to deal with first"), have no special departments which can be made responsible for telework implementation (like large organisations have with their HR and/or DP departments) and therefore refrain from its implementation unless they run the danger of losing important and highly valued employees. The relevance of this problem will decrease as teleworking becomes a mainstream way of working. Nevertheless, even after it has shed its exotic character and the myths surrounding it, many SMEs will consider its implementation to be costly and labour-intensive.

What is required is a reliable and easy to implement “Telework starter’s set for SMEs” that is available from the shelf and does include the necessary technological solutions as well as all related administrative and legal forms. Such a set would enable SMEs to implement telework in a plug-and-play fashion at very low cost.

Telework penetration in companies is also hampered by lack of available personnel resources. In the last years of the decade, pressing issues like the switch to the EURO and the Y2K problem have occupied staff from the IT and operational departments, leaving no time for less urgent tasks like the introduction of telework.

Uncertainty as to relevant issues around telework

Currently, and as has been revealed by some of the ECaTT case studies, there is still some uncertainty among organisations in Europe regarding how to deal with some implementation issues. These include issues which at first sight might seem trivial but have in many cases hampered telework implementation, e.g. the question whether living space in private homes or flats become business premises since legal and tax authorities may argue that when teleworking occurs, these are used for commercial purposes. What is needed is a more or less complete list of such issues with clear instructions and guides of how to deal with these in the telework implementation process on a country-to-country basis. This would contribute to reducing uncertainty among those organisations (especially SMEs) interested in telework introduction and support the faster and wider diffusion of telework.

Inertia

There is a growing feeling that many decision makers cite barriers which keep them from introducing telework as a means of doing nothing. Inertia may still be the most influential barrier to telework. Many companies simply do not get active without pressure from high-qualified employees who may leave if no solution for working at home is offered. Only rarely does a strategy for the introduction of telework exist.

There is also a certain inertia in the European workforce towards specific forms of telework and other new ways of working which is likely to increasingly become the norm in the Information Society. These constitute a shift away from those traditional ways of working which Europeans have become familiar with over the past. They include forms of work in which the status of employment will no longer be one of an employee but change to self-employment. The ECaTT survey results revealed that this is not a very desirable work option to the average European. Most Europeans also have difficulties in envisaging a situation where they
would have to choose people to work for them and their income would depend on their work or where they would be working for and paid for this work by two or more organisations. Even a situation where they get paid according to the results they deliver is difficult to envisage for some Europeans.

These results reveal that we in Europe are currently faced with a “culture of dependence”. “Culture of dependence” here relates to the fact that employment which requires social security contributions (encouraging a form of dependence) is the norm for most workers. Other forms carry the stigma of being abnormal or at least less desirable. However, there are some variations across the countries. While citizens in countries like Sweden seem to be rather well prepared for the coming changes, the situation is just the opposite in countries like Spain, where more than half of the workforce even object to a form of working where they only get paid upon delivery of results. These two countries constitute the extremes on this subject in Europe.

Cultural Distance

Cross-border and offshore telework is hampered by lack of what Horace Mitchell has called “cultural proximity”. He states that “in the networked economy one of the paradigm changes is that geographic distance becomes less significant for many purposes, but other forms of ‘distance’ become more significant, like ‘cultural distance/proximity’”. That means that cross-border telework can work perfectly well when “like-minded people” work together regardless of geographical distance, but due to cultural differences the likelihood to find such “like-minded people” usually decreases with geographical distance. This especially applies to cooperation with individuals from countries that have cheap labour as a result of being at a different developmental stage. Regions that have been successful in attracting outsourcing contracts (like Bangalore region in India) have tried to overcome this problem by using intermediaries that come from one of the major client countries and act as contact persons that bridge the cultural distance existing between potential buyers and sellers of labour services.
4 The Rise of E-commerce: ECaTT Research Results

4.1 Key Survey Findings

4.1.1 Supply and Demand by Establishments

*Use of information technologies relevant to e-commerce*

Most of Europe’s establishments are well equipped to participate in the online economy. Approximately 62% already use e-mail, and 66% have access to the Internet. A comparison of countries shows that Scandinavia and Switzerland are the forerunners here, with e-mail and Internet diffusion rates of more than 80%. A second group, still above the EU average, consists of the U.K., the Netherlands and Ireland, with between 70% and 80% of users among all establishments. Germany and Spain have usage rates at roughly the EU average level, while Italy and France lag behind with roughly half of all or even fewer establishments being connected to the Internet and using e-mail to communicate with the world.

In 2001, the number of European establishments using e-mail and having access to the Internet will each be about 16% higher according to current plans of those IT decision-makers surveyed. Countries lagging behind today have higher growth rates, meaning that they will catch up to the forerunners, although not fast enough by far to eliminate disparities between countries. In Finland, almost every establishment (95%) will be available for e-mail communication, whereas 39% of French establishments will still be offline.

More sophisticated ISTs that are being used primarily for intra-company communication, like Intranets and video-conferencing, are much less widespread. 31% of European establishments have an Intranet installed; another 21% have concrete plans for implementation to be accomplished until 2001. Danish and Swedish establishments are relying more than any others are on TCP-IP-networks, while the laggards are Italy and France again. The French, however, are massively investing in Intranets, so that the number of French establishments owning an Intranet will almost double in the next two years.

Video conferencing technologies are still in a very early phase of diffusion with currently only 12% of establishments in Europe taking advantage of them. Again the Scandinavian countries are the strongest users, together with the United Kingdom and Ireland where anecdotal evidence suggests that the technology is used heavily for communication between US subsidiaries and their parent companies overseas. The current plans of corporate IT decision makers show that video-conferencing is bound to take off in the near future: in almost any country in the survey, growth rates for the period 1999-2001 will be 100% or higher. These findings suggest that in 2001, about one quarter of all establishments will be using video-conferencing. In the U.K. and Ireland, the share will be roughly a third!

Roughly 15% of European establishments make use of a call center, and 6% will start doing so in the next 1-2 years. A call center is either an in-house unit which delivers services to other departments as part of the same establishment or at least within the same company, or an independent specialist organisation delivering call center services to third parties. The ECaTT surveys did not aim to find out how many call centers exist but to measure how many establishments actually use call center services. Companies that use call centers demonstrate a high degree of customer orientation; moreover, they strive for integration of customer service with internal business processes. Call centers make intensive use of new information technologies (e.g. CTI, intelligent net) and are beginning to be integrated with e-commerce applications. In the future, nearly all business-to-consumer e-commerce will be supported by call center services. Finland and the U.K. show the highest percent of establishments that are well prepared for this, while Italy, Germany, and Ireland have below-average rates.
Proportion of European establishments using e-mail, Internet and intranet according to business size

<table>
<thead>
<tr>
<th></th>
<th>0-9 staff</th>
<th>10-49 staff</th>
<th>50-199 staff</th>
<th>200-499 staff</th>
<th>&gt;500 staff</th>
<th>all sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>use of e-mail</td>
<td>29.9</td>
<td>53.5</td>
<td>78.8</td>
<td>91.9</td>
<td>96.3</td>
<td>61.7</td>
</tr>
<tr>
<td>Internet access</td>
<td>36.6</td>
<td>60.2</td>
<td>80.6</td>
<td>92.9</td>
<td>95.5</td>
<td>66.0</td>
</tr>
<tr>
<td>use of an intranet</td>
<td>9.9</td>
<td>21.0</td>
<td>41.5</td>
<td>47.6</td>
<td>70.3</td>
<td>30.6</td>
</tr>
</tbody>
</table>

Small establishments are less likely to use ISTs than larger ones (see table). Less than a third of micro-businesses with up to 9 employees, use e-mail. The equivalent share for small establishments with between 10 and 50 staff is 54% and for medium-sized establishments with less than 200 employees is 79%. In large establishments with 500 or more staff, e-mail is already almost ubiquitous, with only 4% not being connected to online mail.

Country comparisons shows that large establishments tend to behave much alike regarding e-mail use and Internet access, regardless of the country in which they are located. However, small establishments in the countries with below-average performance lag considerably more behind than the aggregate numbers indicate: for example, in Germany (Italy), only 35% (21%) of micro-businesses with up to 9 employees have access to the Internet; the corresponding figures for Finland and Denmark are 69% and 76% respectively. While this result in itself might not give reason for concern (as getting connected to the Internet is usually just a question of a few hours), establishments that in 1999 have not even begun to gather experience in how to use the Internet effectively might in future have to suffer from a serious deficiency of user know-how which might not be made up easily, if at all.

Over the next 2 years high growth rates are expected for e-mail and Internet use in small to medium sized establishments, whereas this is not the case for intranets (which show greater economies of scale and for this reason are not as efficient for small establishments as for larger ones).

Establishments using ISTs like e-mail, Internet access, and Intranets can either grant only a few specialists access, or they can make these applications available to the majority or even all of their (office) staff. The latter, ‘open’ approach causes extra costs (not only for the infrastructure, but also opportunity costs if employees use the new media inefficiently or for private purposes) but can ultimately reap higher returns because of the know-how that employees gain when they integrate ISTs into their every-day working habits. A rule of thumb might be that the more knowledge-intensive a job is, the more employees will need to develop knowledge in navigating the Internet and/or Intranet. However, as the country results show, their are huge differences in the degree to which employers give their staff access to e-mail, the Internet and their intranet which can not be explained by differences in the structure of national economies or job descriptions.

Only 55% of French establishments with online access grant the majority of their staff the right to access e-mail (Internet 39%), as opposed to a European average of more than 66% (46%). Finland’s establishments on the other hand behave exemplary with a figure of more than 90% for e-mail and 85% for Internet access. Germany is one of the countries with the worst performance regarding this variable. With only around 36% of establishments with Internet access allowing a majority of their employees to surf the Internet Germany scores the lowest percentage in Europe. This is an indication of a restrictive and timid approach towards the Internet, which might in the end, hurt German competitiveness - although in the short term cost savings might be achieved. Too many employees in Germany (as well as in France and the Netherlands) are denied the opportunity to use the Internet for professional purposes.
Even with corporate intranets (which combine the advantages of the Internet, in particular its user friendliness, with the advantages of closed user groups), a sizeable proportion of establishments (31%) that have an intranet installed do not make it available to all of their (office) staff. Obviously, establishments in those countries where IP networks have only recently been established on a larger scale start out by providing only some of the workforce with access, whereas the leading countries - again the Scandinavians - have fully embraced IP technology and have also implemented it faster for internal networking.

**E-Commerce**

Approximately 41% of European establishments are already present on the Internet, 37% of which have their own Website online. Another 20% have concrete plans to get onto the Net in the next 1-2 years, meaning that in 2001 almost two third of all establishments will be using a Website or some other kind of online presence (e.g. participation in virtual malls, web-directories). In Finland, the share will be almost twice as high as in Italy (84% against 42%), with the other countries in between. Today 18% of micro-businesses (up to 9 employees), 1/3 of small (10-49 employees), half of medium-sized (50-199 employees) and two third of big and very big establishments (200 and more employees) have an online presence. This means that although the Internet makes it possible for small companies to cover a catchment area considerably larger than has been possible before, it is still being used much more by larger businesses.

The large majority of establishments with online presence use it for advertising and marketing (76% in Europe) or the distribution of free information (79%). They are much less likely to make sales online (22%) or distribute chargeable information/ data online (12%). As a proportion of all establishments, only 9% make sales online and 5% offer chargeable information for downloading - still a very small minority of all establishments in Europe. However, forerunner country Finland shows that much higher diffusion rates are possible as today already 30% of all Finnish establishments sell some of their products online.

In all countries except for the Scandinavian ones, the number of establishments selling online will more than double in the next two years (in France and Italy, it will even triple), indicating that many of those companies which do not already use the Internet for distribution purposes are working hard to be able to do so in the near future. In 2001, almost one quarter of all establishments will sell online. There is in these findings an indication that, for a continuously growing proportion of establishments, the Internet together with other online services is developing from a ‘nice-to-have’ feature to a significant means of distribution.

Online-distribution of products in digital format, i.e. processing all necessary transaction steps including delivery itself on the Internet, is an exciting prospect for the world of commerce because of the considerable cost savings it would allow. However, anecdotal evidence suggests that so far potential suppliers have discovered that only highly specialised (professional) information and pornography could actually be sold in this way, while in other cases the demand for chargeable contents e.g. of newspapers and magazines was so low that trials had to be discontinued. These problems are due not least to the lack of micro-payment options for business on the Internet (T-Online and Minitel have been offering these for many years). As long as it is not known which forms of payment will succeed in practice in the future, it is hardly possible to make reliable prognoses even for the immediate future. According to the results of our survey until 2001 today's diffusion rates will at least double in all countries except for Sweden and Denmark.

While e-commerce activities mentioned so far can be targeted at end purchasers as well as business customers, the online exchange of data between suppliers and partner organisations as well as joint business processes online are limited to business-to-business applications. ECaTT survey results show that BackOffice e-commerce, e.g. the exchange of information with supply chain partners (as opposed to front end applications like online-shops) is already quite frequent and will gain in significance in the coming years. 20% of all establish-
ments (i.e. 48% of all online establishments) use their online presence for exchanging data with business partners (suppliers, distribution partners etc.), another 21% will be added until 2001. Above the European average are the Scandinavian countries, the U.K., and Germany.

The implementation of joint business processes requires more sophisticated organisational efforts than simple electronic data exchange between establishments. In contrast to the latter, joint processes mean the continuous optimisation of processes along a supply chain where the required data is automatically made available to all those involved according to their individual needs.

Accordingly, joint business processes online are practised by a smaller number of establishments. Still, 14% of European establishments belong to this group; and a further 18% have definite plans for implementation over the next 2 years. One third of all establishments that already have an online presence are engaged in joint business processes. These findings seem to indicate that the move of companies onto the Internet is not (primarily) motivated by the wish to sell online to end purchasers, but by attempts to increase the efficiency of the production process through closer co-operation with supply chain partners, via the exchange of data and the optimisation of business processes which stretch across individual organisations' boundaries.

Germany is also increasing its use of online services in the fields of obtaining raw materials, means of production, and services. While currently only just over ¼ are active in this field, according to current plans this will be almost half in 2 year's time.

To summarise e-commerce related results, we use an e-commerce evolution model (see figure) that describes the developmental path most companies go through when taking on online services and the Internet.

<table>
<thead>
<tr>
<th>stage</th>
<th>title</th>
<th>characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0)</td>
<td>“Offline”</td>
<td>no use of e-mail and Internet and other online services</td>
</tr>
<tr>
<td>(1)</td>
<td>“Basic Online”</td>
<td>use of e-mail and/or Internet and/or an other online service</td>
</tr>
<tr>
<td>(2)</td>
<td>“Web Marketing”</td>
<td>information offer on the Internet or an other online service</td>
</tr>
<tr>
<td>(3)</td>
<td>“Online Distribution”</td>
<td>interactive Website with online distribution (catalogue sales or chargeable downloads)</td>
</tr>
<tr>
<td>(4)</td>
<td>“B-to-B Online Integration”</td>
<td>data exchange with value chain partners (suppliers, customers, business partners) via the Internet or an other online service; maybe joint business processes</td>
</tr>
<tr>
<td>(5)</td>
<td>“All round Users” (3) as well as (4)</td>
<td></td>
</tr>
</tbody>
</table>
process. Initially most establishments use the Internet only as an information medium, i.e. in a passive way, and contact others interactively at best by e-mail (stage 1). This passive stage is followed by the active utilisation of the Internet as an additional means for marketing (stage 2). Today many establishments are only present on the Internet because a proprietary Website is regarded as expected, just like a business card or an entry in Yellow Pages and not because this decision is led by an explicit marketing concept.

For further development two different options can be given (see figure). While some establishments allow for online ordering of products and to a degree even transmit information to clients against payment on the Internet (stage 3), others concentrate on the optimisation of their supply chain by exchanging data electronically or even integrate business processes with their suppliers and business clients (stage 4). While the first option is generally chosen to approach new clients, i.e. to increase or defend market shares, online integration of establishments across supply chains especially targets efficiency gains and rationalisation effects.

Finally, establishments, which apply online services in the business-to-business field as well as for the sale of products, belong to the final stage in this simple development model. It is understood that there are also establishments, which straight away start as web based organisations and therefore immediately reach stage 5 with their founding. However, in the economy as a whole they play only a minor role, especially in relation to their proportion of total employment.

Taking this model as a basis, the following pattern becomes evident: As for e-commerce many European establishments are well on the way to completing stage 2 - in Europe as a whole 39% have reached this stage while 72% that have at least reached stage 1 (28% are still offline). This means that a very large proportion not only use e-mail and access the Internet but also offer information on the Internet themselves. However, only when a business distributes products online, i.e. allows orders of products or offers chargeable downloads (stage 3) or exchanges data with customers or suppliers along the production chain (stage 4) can they be described as taking full advantage of the Internet’s potential. Already 8% of European establishments are top level users (stage 5) of e-commerce and apply e-commerce to forward (final customer) as well as backward linkages (suppliers and business partners). Country differences appear quite clearly: Finland has a proportion of one quarter already at stage 5 and 40% of all establishments that have reached stage 4, while the corresponding percentages for Germany (Italy) are 10% (4%) and 25% (15%) respectively.

Even in the laggard countries, however, growth is very dynamic and will result in a rightward shift of establishments along the stages of the model (see figure). In 2001, already 24% of all European establishments will belong to the “all-round users” category, and 44% will be using e-commerce for optimisation of backward and forward linkages e.g. to suppliers and distribution partners. Countries that today show below-average performance will do some catching up, although not enough to endanger the lead of the Scandinavian countries. Amongst the large EU Member States, the U.K. and Germany perform best while France, Spain and Italy trail behind.

4.1.2 Demand by the General Population

Infrastructure for e-commerce

Almost 44% of Europeans have access to a PC at home, from which 32% actually do use it at least once a month. Dutch households are best equipped with 71% having access to a PC in the home. In Scandinavia and Germany, too, more than half of the population does so. On the other end of the ranking order, the French are very poorly equipped with less than one third of the population being able to use a PC at home. Disparities are even more marked when access to an online PC is analysed: 33% of the Dutch and 31% of Danes can go online from home, whereas only 7% of the Spanish and 9% of the French population can! It is striking that in some countries, roughly every second PC at home is linked to the Net (in Fin-
land, Denmark, the Netherlands and the U.K.), while in others, by far more home PCs are offline than online. A case in point is Germany, which has many more persons with access to a PC at home than the U.K., but falls back with regard to online PC access.

For Europe in general, the share of the population with online access at home is still modest (14%). Although many might be able to go online at work, for e-commerce uptake it is of major importance to have access to e-commerce applications in the home, because the use of the PC in the office for private purposes is mostly very restricted. As long as the share of PCs connected to the Net stays as low as it does today (in all European countries except for Scandinavia and the Netherlands), Europe will not be able to catch up to the more advanced countries regarding e-commerce participation - at least until other access paths will be opened up for the wider public, e.g. mobile access.

E-mail is an online communications application that is not only extremely easy to use but also creates instant added-value for almost every new user. For these reasons, e-mail has for many years been the IST application most PC users were first acquainted with. Moreover, knowledge in using e-mail (not so much on a technical level, but getting comfortable with electronic text-based messages as a way of communication) is of significance for e-commerce take-up because it enables users to make use of interactive features in Website presentations. Around 18% of Europeans currently use e-mail. The Swedes and Swiss (40%), Finns (37%), Danes (32%), Dutch (31%), and British (27%) are above average e-mail users. If current users are added to those who expect to become e-mail users in the near future in the countries mentioned above (and in Ireland) by 2001 more than half of the population will be using e-mail; in Sweden the share will be almost two third. Germany, France, Italy and Spain will, like today, remain below the average (38%) and will have to struggle to have reaches in 2001 the diffusion rates Scandinavia already has today.

The e-mail community in the 10 countries surveyed (which amount to 90% of the total EU population) already comprise 48 million users. Up until 2001, this number will have risen to 102 million.

The Internet today is one of the main topics of press coverage and public discussion. Therefore, it comes as no surprise that 95% of the European population (aged 15 and older) are aware of the Internet. 35% of Europeans have already accessed the Internet or have used another online service (e.g. Minitel or BTX/ T-Online). The Scandinavians and the Dutch, with more than 50% all of them, are clearly above average, followed by the British and French (the latter not using the Internet so much but Minitel). Germany just reaches the European average, Italy and Spain come far down the list with only 1/5 of the population having surfed the net or used another online service.

A similar picture appears concerning regular Internet use (i.e. at least once a month), with diffusion rates about 10 percentage points lower here. In the forerunner countries, not only have a higher share of the population used the Internet, but the number of regular users as a proportion of all users is also considerably higher. An estimated 39% of French and 60% of German Internet users can be classified as regular users, whereas the corresponding numbers for Sweden and Finland are 80% and 78% respectively.

In the 10 EU Member States surveyed together, 54 million already access the Net (or - seldomly - other online services) on a regular basis; and an additional number of 41 million are occasional users. The size of the total user community will rise to 135 million until 2001. It is worth noting that the four largest EU Member States alone will account for more than 100 million of this.

There is a strong correlation between Internet diffusion rates and age. The highest rates are to be found in the 18-29 age group; from here on, user shares decrease steadily with increasing age. Only 23% of Europeans aged 50 to 64 have ever used an online service like the Internet, and only 8% have done so in the oldest age group (65 or older). Amongst the young, Europe’s most advanced Internet countries (Finland, Sweden, and Denmark) score
best, even in relation to their general above-average performance. In these countries, almost every under18-year-old has already been surfing the Internet (the equivalent number for Italy as well as Spain is 36%). Seniors using online services are comparatively frequent in France and the Netherlands, although in the former most of them are Minitel users.

The Internet remains a predominantly male domain. Amongst men, 42% have surfed the Internet already, while the same share for women is 29%. However, especially in the advanced Internet countries, the gap between male and female users is gradually closing. Denmark is the only country where the gender gap will close completely until 2001. On the other hand, the U.K., Spain and Germany still have a long way to go to reach equality in participation rates. Nevertheless, an analysis of female and male diffusion rates differentiated by age groups shows that in Europe as a whole, the gender gap is much less marked amongst younger age groups that amongst older ones. This finding confirms that the Internet is gradually evolving from a man’s toy towards a common everyday tool in working and private life, for women as much as for men.

The higher qualified a person is the more likely he or she is to be online. This applies equally to all European countries. However, in Finland, the U.K., Sweden, Ireland and Denmark the use of online services even by those with few qualifications is comparatively widespread, whereas e.g. in Germany and Italy this proportion is very low. In the other countries mentioned, a point seems to have been reached where Internet use has also spread to this group. Germany, together with Spain, Italy, and France belong to those countries where lower qualified people are mostly excluded from Internet use.

To summarise, the typical Internet user is of young to medium age and qualified to a higher than average level. Users are mainly male, are more likely to live in urban areas, and are still in the minority in most of Europe except for the Scandinavian countries. At the same time, their are signs that Internet users will gradually lose their distinctiveness and begin to look more like a representative sample of the whole population.

The degree to which the population adopts new technologies, especially those whose use is rather expensive in relation to household incomes is in general dependent on the disposable wealth of the country. To judge if a country is advanced or lagging behind regarding its share of Internet users, the effect of differences in incomes should be accounted for. As disposable household incomes are not available for all countries in comparable form, we used GDP per head for correlation with Internet diffusion rates (see chapter 7).

The comparison of Internet use rates with the size of the gross domestic product per capita as a measure of the efficiency of an economy shows a clear link. When comparing the European values with those of Northern America (taking into consideration the limited comparability) it appears that although the USA and Canada have the highest gross domestic product they do not have the highest Internet use rate. Countries like Sweden and Finland rate even above Northern America. Denmark is just about the same. This shows that the leading countries are right at the threshold of Benchmarking developments in the area of e-commerce and Northern America need not be used as a comparison.

**E-commerce**

Amongst the purposes for which Europeans use the Internet (and which relate to ECaTT’s definition of e-commerce), the most popular are the search for information on suppliers (14% of population) and their prices (14%) as well as on the availability of travel offers (e.g. hotel accommodation, train and airline tickets: 8%). According to these results, usage of the Internet in the pre-processing stage is already very much advanced and bound to play a decisive role for already a considerable share of decisions about purchases.

Online shopping itself, i.e. ordering products on a Website for postal delivery or instant downloading, is also quite widespread already, with 14% of the European population buying online at least once in three months and 7% at least once a month. Additionally, many of
those who have not already ordered something online will start doing so in the next two years, so that the share of online shoppers will rise to at least 28% of all users in 2001. If those who do not yet use the Internet at all but are interested in online-shopping are included, the number rises to 38%. However, this share might only be reached if new, easy-to-use access technologies are developed and successfully marketed, e.g. mobile access or cable-modems that might enable the TV to act as Internet access device.

Online-shopping is least developed in Spain (6%) and Italy (8%) and most advanced in Switzerland (27%), Scandinavia (18-26%), the Netherlands (22%) and also France (20%). The latter results comes as a surprise taking into account the below-average performance of France regarding other variables, but can be explained by the long tradition online-shopping has in this country where Minitel has already been used by large parts of the population for commercial transactions back in the 1980s.

Online banking is another area of high growth rates. By the year 2001, the share of the population doing their banking online will have trebled. 20% of the population will by then carry out their banking online. If those who do not yet use the Internet at all but are interested in online-banking are added, the number rises to 31%. For some parts of the population, especially those age groups that are not attracted by flashy animation and computer games, online banking has been some kind of killer application for online PC use. Today, 5% of Europeans regularly use online-banking (i.e. are likely to have an online account) with individual country results stretching from 2% in Spain to 23% in Finland. France and Germany are above the average due to their Videotex-based systems Minitel and BTX respectively, both of which support closed user group technology, which offers more security than Internet-based online banking services.
4.2 Key Facts in Charts

4.2.1 Establishment Survey

Today 62% of establishments in Europe already use e-mail. In 2001 this will have increased to more than 78%, making e-mail a communication medium used almost universally in the business community with the exception of some very small establishments. Current user shares vary between around 40% in France and 88% in Finland. Apart from Finland and Denmark, Sweden and Switzerland also belong to the top group.
The figures for Internet access are at almost the same level or at most a few percentage points higher as for e-mail use. This means that not all establishments which have Internet access also use e-mail although this would be possible without added technological or financial effort. In these cases the Internet is evidently used only as a reference tool and for investigation purposes, but not for interaction with third parties.
31% of all EU establishments have an intranet. This is about half the number of those who have Internet access. By 2001 this proportion will have increased to more than 50% because around 20% of establishments have already planned to introduce an intranet in the near future. France, Italy and Ireland can report growth rates at or around 50%. Germany reaches only 8th position. Denmark, Switzerland and Sweden, where today more than 50% of establishments already have an intranet and where this number will have increased to two third over the next 2 years, stand out clearly.
Spread of video conferencing (either desktop systems which are integrated into individual workstations or larger video conferencing systems which can take up whole rooms) is still in its infancy: only around 12% of EU establishments currently use it. Judged by current plans for future introduction, over the next years growth in this area will be considerable (at average more than 100% in 2 years throughout the EU). This indicates that the technology will take off in the near future.
15% of all establishments in the EU use a call center, either an in-house unit which delivers services to other departments as part of the same company, or an independent organisation delivering from which services are bought in. European leaders are Finland where the telephone as a medium for client communication has gained a lot in importance with the enormous spread of mobile phones, and the United Kingdom which according to other studies has the highest amount of call center workplaces in Europe. Ireland and Spain are the most dynamic markets for call center services as measured by growth in the next 2 years.
41% of EU establishments allow the majority of their (office) staff to send and receive external e-mail. This corresponds to two third of all establishments which use e-mail. In Germany, Italy and France the ratio between establishments using e-mail and those that make e-mail accessible to more than half their staff is particularly unfavourable, while Finland, Denmark and Switzerland excel in this regard. This divergence is obviously due to marked differences in business culture.
In 31% of all establishments the majority of (office) staff can browse the Internet themselves. This corresponds to less than half of all establishments that have Internet access. In Germany, Internet access in an establishment is much more likely to be restricted to a minority of office workers than in the other countries. This result lends itself to the interpretation that the majority of German establishments value short term goals such as cost control at the workplace higher than the long-term increase in their employees’ IST user know-how. In contrast, Scandinavian establishments and those from Switzerland almost all behave exemplary - at or above 4/5 of establishments which have Internet access make this available to the majority of their staff. Familiarity with the medium gained through regular Internet use at work might be one reason for the good results of the Scandinavians regarding E-Commerce practice.
Access of majority of staff to intranet

In contrast to the Internet, with an intranet an organisation has far reaching control over the information available to employees. For this reason, possible reservations regarding employees’ access to the Internet should play a minor role with the intranet. Despite this a large proportion of establishments do not make their intranet available to all their office staff.
Presence on the Internet or other online service in Europe
1999 & 2001

Around 41% of EU establishments offer information on the Internet, most of them by means of a Website. Taking current plans into consideration, by 2001 around ¾ of establishments in the Scandinavian countries and in Switzerland will have a presence on the Internet. In Germany it will be at least two third of establishments, in Italy which lags behind only 42%.
Use of online services for advertising and marketing in Europe 1999 & 2001

The Internet is used as an important marketing tool for one third of all EU10 establishments already. In 2001, more than 50% will promote their brand, products and/or services on the Internet or an other online service. Finland and Switzerland have reached this level of take-up in 1999 already.
The Internet is rapidly becoming a mainstream distribution channel in more and more countries of Europe. Finland’s lead over the other EU countries and also Switzerland is outstanding, with almost one third of all Finnish establishments already selling online, supplemented by another 15% who plan to begin doing so in the next two years. In EU10 as a whole, 9% already conduct sales online and 14% will take it up until 2001. Three-digit growth rates like these show that a great share of Europe’s businesses realises the benefits of e-commerce and is willing to invest in e-commerce systems now.
Of those EU10 establishments that already are present on the Internet, 23% conduct sales online. The Internet is still primarily used as a marketing tool. Only in Finland do more than 40% of online establishments already sell online. Current plans, however, show that this share will by 2001 have risen above the 50% mark not only in Finland but also Ireland and the U.K.
Using the Internet to market, sell and distribute digital products is the ultimate aim of many e-commerce schemes because total abolishment of physical transfers enables companies to considerably diminish variable costs. At the same time, online delivery brings with it a whole set of regulatory issues regarding tax collection, jurisdiction etc. that national politics have to deal with, because the actual physical location of buyer and seller are often hard to identify. In some countries this problem is more pressing than in others: In Finland and Denmark, around 10% of establishments already distribute their products partly via online services. The EU10 average is 5%.
There is (still) a very high percentage of non-user establishments that give the lack of any need as the main reason for not selling online. In the light of current developments in the world of Internet commerce which show that the Internet can be used as a distribution channel for almost every conceivable product or service, this finding is disappointing.
Decision makers in establishments were asked to name the most important barriers because of which they do not offer online sales. Barriers mentioned most often are characteristics of products which supposedly make them unsuitable for online selling, and lack of demand by customers. The latter result indicates that the market for online sales in many sectors has still not reached critical mass, making it unattractive especially for small companies to invest in e-commerce systems. On the other hand, misgivings about data security, although often pointed out in the public debate, seem not to be very influential on the decision of non-users to stay away from e-commerce, at least not as a primary reason for non-action. This applies for the EU10 as a whole as well as for instance for Germany which is in general supposed to be very sensitive to data security infringements.
In the business-to-business field Electronic Commerce often takes the form of data exchange between establishments in a supply chain. Through optimisation of information exchange at the interfaces of the supply chain, organisations become more effective. Also, a gain in flexibility is a big plus as organisations can react more quickly to external impulses, e.g. fluctuations in demand. Data exchange represents the first step to such an optimisation, integration of business processes stretching across organisations' boundaries represents the second, advanced step. 20% of all EU10 establishments, i.e. 48% of all establishments with an online presence, have already recognised this potential and therefore practise data exchange with forward and backward linkages in the supply chain (suppliers and clients).
Joint business processes online in Europe 1999 & 2001

Reengineering business processes does not stop at individual organisations’ boundaries. Joint business processes that stretch across two or several companies are gaining ground. In contrast to simple data exchange between supply chain partners, joint processes mean continuous data flows where the required data is automatically made available to all those involved according to their individual needs. Implementation of joint business processes demands a higher design and organisational effort than simple electronic data exchange between establishments. Accordingly it is practised by a smaller number of establishments. However, 14% of EU10 establishments are involved and a further 18% have actual plans for implementation over the next 2 years. Growth rates here are higher than those for data exchange with suppliers/clients.
Between 12% (France) and 48% (Switzerland) of European establishments use online services for the purchase of goods and services. These percentages are significantly higher throughout than the proportion of establishments which already sell online (especially in Sweden, Southern Europe, and Germany), and will remain so in the near future. This shows that online services such as the Internet today are primarily used for transactions between organisations and only secondary in the business-to-consumer field.
A high share of non-user establishments gives “no need” as the reason for not using online-procurement. This is astonishing if one thinks of the cost savings potential of purchasing online, but speaks of the market’s inability so far to convince many potential users of the advantages of using the Internet for procurement.
Most important barriers to online procurement (EU10 and Germany)

The share of establishments who mention concrete barriers that keep them from using online services for procurement is considerably lower compared to online-shopping. Again, data security and fraud are not decisive in determining if establishments use online procurement or not. More important are product characteristics which in the opinion of respondents require traditional means of procurement, and the lack of supply on the market. As many companies have long-standing relationships to a small number of suppliers with whom they co-operate, suppliers must be the first to move onto the Net so that their customers realise they can (or must) do so, too.
More than a quarter of EU establishments are still offline and have therefore not yet reached the first stage of the E-Commerce-development model. In Germany and Southern Europe, this share is above average. A third of EU10 establishments can be described as “basic online users”. The proportion of those establishments which use the Internet solely for marketing purposes is 14%. Establishments which use online services as a distribution channel, but do not use the Internet or other online services for data exchange with suppliers and business clients is low in all countries and averages around 4%. 8% of all establishments use E-Commerce for sales as well as for the optimisation of their supply chain, i.e. represent the European E-Commerce elite.
Europe's establishments will move ahead considerably towards integration of e-commerce into their business strategy in the next two years. More than 50% of all establishments will be using the Internet at least for marketing purposes, 24% will conduct online sales as well as online data exchange with forward- and backward-linkages in the value chain. Nevertheless, those 40% of establishments that in 2001 still will use online services neither for marketing nor for production or distribution purposes should be reason enough to justify political action.
A projection (based on the developmental path of forerunner countries) of key variables of IST and e-commerce use among establishments comes to the conclusion that in 2003, 92% of all establishments will be able to access the Internet, 81% will have a Website or some other kind of presence on the Web and 39% will execute sales transactions online. Exchanging data online to make value chains more effective will become the usual way of doing business for 57% of all establishments. Projections like this are based on the current state of Internet technology. As Internet applications are becoming better, the case for using the Internet will be even stronger than today meaning that actual penetration rates will most likely be even higher in 2003 than calculated here.

ecg9020
4.2.2 Population Survey

An estimated 44% of Europeans (aged 15 and older) have access to a PC at home and 14% have access to a PC, which is connected to the Internet or other online service via a Modem or ISDN (i.e. roughly a third of those with PC access). Diffusion of PCs has progressed furthest in the Netherlands (71%), Sweden (60%) and Denmark (56%) while Spain (41%), Italy (38%) and most notably France (31%) lag behind. The share of individuals who have PC access and can go online from home is astonishingly low in the UK (44%), while the same share in Spain, Italy, and France is a quarter or less. Germany lies somewhere between these extremes. According to the plans of respondents, an additional 15% will gain access to a PC at home in the next 2 years, bringing the total share of individuals with PC access close to two thirds of the whole population. Growth in percentage points will be strongest in Ireland (25%) followed by Italy and France. Ireland will jump from today's seventh position in the ranking list to fourth if the Irish cling to their ambitious plans.
Between 23% (Italy) and 53% (Netherlands) of Europeans (aged 15 and older) use a PC at home. The ranking here only slightly differs from the one regarding PC access. Germany will fall from today's fifth position to seventh in 2001 because of stronger (in percentage points) growth in Ireland and Britain.
18% of all Europeans aged 15 and older have used e-mail at least once in the month before the interview. The Scandinavians, Switzerland, and the Netherlands are, again, the forerunners, but in the next 2 years, numbers will grow fastest in Italy and Spain where the e-mailing share of the population will (almost) double, but from very low bases. In percentage points, growth will be strongest in Ireland, which seems to be in something like an e-mail craze.
Use of Internet or other online service in Europe 1999 and 2001

Approximately 35% of Europeans are Internet users. This figure is based on the broadest definition of Internet users, i.e. people who have ever used the Internet (or other online service like Minitel, T-Online). However, this still leaves two thirds of Europeans who have never used the Internet. Furthermore, there are huge variations across European countries. For example, the Scandinavian countries, Switzerland, and the Netherlands clearly lead the field followed by France and the United Kingdom. All these countries achieve rates of Internet and online service usage beyond 40% of the population with the sole leader being Sweden with close to 60% of the population already using the Internet. France's share is rather high because of its Minitel users - half of all online service users in France have never used the Internet! Ireland and Germany each have around 35% users. Lagging behind is Italy and Spain with around 20% penetration rates. Internet use will grow considerably in the near future. The share of Europeans online will increase by nearly 15 percentage points, from 35% today to 50% in 2001, according to the plans of decision-makers interviewed. This means a growth of more than 40% in two years. By then, roughly two thirds of the population in countries like Sweden and Finland will use the Internet.
At European level, the Internet still seems to be a male phenomenon. Although the gap between the sexes is becoming smaller. In 1999, around 42% of the male population used the Internet or other online service whereas women accounted for 29% of users. Sweden achieves the highest penetration rates with an even smaller gap between males (63 %) and females (53 %) than on average, whereas in Italy and Spain, penetration rates for men are roughly twice as high as rates for women.
The higher qualified an individual is the more likely he or she is to use the Internet or other online service. This applies throughout the countries under review. There are a few remarkable results including the fact that in Finland (41%), Sweden and Ireland (34%) people with fewer qualifications use the Internet just as much as the average European (35%). Moreover, France rates surprisingly low with respect to Internet users with less education. Only 5% of this group are Internet users and another 10% use Minitel. In Italy, hardly any Internet users with low levels of education can be found.
Not surprisingly, the younger an individual is the more likely he or she is to use the Internet or other online service. While 57% of under 18 year olds make use of the Internet, this figure is only 8% for those aged 65 or older. Again, Sweden reaches the highest figures with more than 90% of those under 30 years using the Internet. In Sweden, almost 75% of the population aged 30 to 49 already use the Internet. Slightly behind these figures ranks Finland, followed by Denmark. Germany and Ireland reach average figures in all age groups. In the Netherlands and the UK, the average pattern can be found but at a higher level, especially among the younger population with in excess of 70% already using the Internet in under 18 year olds and less than 30 year olds.

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cg9007
Applications used by the highest share of online service users are the search for information applications on suppliers and their prices as well as looking for travel-related information. In the European average, more than 10% of all individuals aged 15 or older do search for information each month at least once. Compared to this, commercial transactions, i.e. e-commerce in the narrow sense of the word, do play a minor role.
Online banking includes giving a bank an order to transfer money as well as exchanging information with a bank, e.g. bank balances and other account information. Until today, a large share of online banking transactions has not been taking place on the Internet, but on older, usually Videotex-based systems like T-Online in Germany and, most prominently, Minitel in France. This will change soon as these systems are gradually being integrated with the Internet. The figure shows that huge growth is to be expected in the coming two years. The number of users will at least roughly double but in some countries grow six folds by 2001. Growth rates are largest in countries with low online banking practice today (Italy, Ireland), while in Finland only, more individuals are already using online banking than will be added in the next two years. Here, a phase of more modest growth has set in.
Online shopping, i.e. making orders online, is already quite common amongst European users. Already, more than 14% of Europeans state that they have ordered something online in the last three months and another 14% will have been added to today’s online shopping community by 2001. Again, variations between countries abound: the Scandinavian countries, Switzerland and the Netherlands will in 2001 have diffusion rates of more than 40% of the population (in Sweden, the rate will be 54%!), while Italy and Spain, also Germany and Ireland lag behind. France takes a middle position because of its Minitel-induced head start, but growth in the next two years is expected to be below average, so that the country will slip from third to fifth position in the ranking list.
In all countries surveyed*, a third or more of today’s non-users gave “lack of need” as reason for not shopping online. The hype around all things having to do with the Internet has masked that for many potential users, the added value of using the Internet for online purchases has not been made clear.

* no data for the Netherlands and Finland available
A third of respondents gave “lack of need” as a reason for not shopping online. Amongst concrete barriers (shown in the figure), the barrier most often mentioned is the inability to go online, followed by product characteristics, meaning that the interviewees found the idea of buying certain things without the possibility to touch them unsatisfactory. Dangers relating to fraud or data security rank fifth, although individual countries differ strongly in this regard. Costs for getting (and staying) online and the lack of anonymity in online transactions are (on average) at the bottom of the list.
Acceptance of online payment methods in Europe 1999: transmitting credit card/account number

A large share of those who either have shopped online already or are likely to do it in the near future do not want to transmit their credit card details through the Internet. As the credit card is the most widespread (and in many cases the only) method of payment offered by online shops today, this result puts further emphasis on the need to develop alternative, more secure payment technologies.
In comparison to payment by credit card, cash on delivery is accepted by a great majority of current and future users of online shopping. Suppliers, however, don’t like this payment method because of large transaction costs. For this reason it is unlikely that many Internet companies will take up or continue acceptance of cash on delivery.
Acceptance of online payment methods in Europe 1999: Internet currency / E-cash

Until now, none of the competing Internet currency technologies has been able to gain a foothold in the market. No wonder then that only between one third and half of all current and future users of online shopping are willing to accept paying by E-cash. 16% of Europeans are unsure about this issue, most likely because they have not come across a shop that might offer payment by e-cash.
Almost 40% of Europeans who have been looking for a (new) job the year preceding the survey used online services in the course of the job search. Most of them looked up information about potential employers and job advertisements.
A projection (based on the developmental path of forerunner countries) of key variables of IST use and e-commerce comes to the conclusion that in 2003, more than 60% of the EU population aged 15 and older will have used the Internet at least once. Individuals who occasionally or regularly shop online will represent 54% of the total population, while online banking will be used by 40%. Both online shopping and online banking will show rapid growth in the coming years, roughly doubling user numbers between 2001 and 2003.
Respondents were questioned about their experience of online e-commerce and asked how much they had spent the previous month for private purposes on goods and services ordered through the Internet or otherwise online. The results show that as of mid-1999, Europeans were already spending an annualised EUR 16bn online. The UK tops the league with an annualised total volume of over EUR 5bn leaving Germany - with its much larger volume of retail sales - and France - despite the long track record of Minitel and strong growth of France Telecom’s Wanadoo - in second and third place respectively.
The country league table concerning the volume of business-to-consumer online spending changes significantly when the basis is e-commerce activity per head: two out of three Scandinavian countries show much larger expenditure than even the UK. On both counts Southern Europe lags: In Finland the average e-commerce spend per capita is nearly 20 times that of Spain.
The bulk of consumer e-commerce is in travel, computer products, tickets (cinema, theatre etc.), publications (books, CDs, videos etc.), subscriptions, e.g. to magazines, webzines or online information services, and - at significantly lower volumes - groceries, clothing and electrical and luxury goods.
4.3 Key Case Study Research Findings

4.3.1 Introduction

Case studies were grouped into one of 8 categories highlighting the main business models of companies engaged in e-commerce today. Some of these models have existed prior to the Internet and are only technically enhanced and made more efficient by the Internet's inherent ability for interaction, like online shops, online reservation and booking, virtual malls and e-procurement systems. In most of these cases, products being sold and delivery are not different but the Internet allows for much more comfortable and effortless transaction and better pre- and after sales services.

However, when products to be distributed are intangible, i.e. in digital format, they can be transferred directly through the Internet. Online service distribution therefore has great potential to overthrow industry structures in those sectors that deal with products that are by their very nature intangible (e.g. consultancy) or can be liberated from materiality through digitisation (e.g. text, sound, pictures). The same applies to financial services, where the products being traded are rights of disposal. E-commerce has already been firmly established here long before somebody came up with a name for it, as everyone who has been using ATMs for decades can testify.

Infomediaries is a term conceived by John Hagel to describe the brand of new companies that set up information marketspaces on the Internet. They are intermediaries in the traditional sense of the word because they make money from mediating between market partners, but they differ from traditional intermediaries because they make use of a much improved ability to capture consumer information in real-time and developing profiles of individual customers made possible through the Internet. Online auctions could possibly also be classified as infomediaries but are treated separately here because of the significance the price-matching function gains here.

All of the e-commerce business models mentioned so far can be targeted at the consumer as well as the business market (although examples that belong to the former group usually get more publicity), as will be demonstrated in the ECaTT case studies. There is a group of applications, however, who are exclusively dealing with the business-to-business segment, that is value chain integration and e-procurement. Both aim at making business processes that stretch across individual companies' borders more efficient. Value chain integrators focus on an increase in control over forward and backward linkages to suppliers and distribution partners whereas e-procurement is a tool to streamline the purchasing process regarding so-called MRO goods (maintenance, repair, organisation).
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| 55 3M                            |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 56 3Suisses                      |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 57 Alma Media DIME               |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 58 Amazon                        |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 59 BauNetz                       |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 60 Bygge centrum                 |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 61 Castellana Subastas           |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 62 ChannelPoint                  |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 63 Charles Schwab                |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 64 Choix.com                     |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 65 Colllte Teoranta              |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 66 Colman Computer Services      |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 67 Crisol                        |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 68 DAF Trucks                    |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 69 Daiei Corp.                   |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 70 DELL                          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 71 DELL Ireland                  |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 72 DHL Ireland                   |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 73 Eagle Star Direct             |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 74 E base Afbouwbe middling      |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 75 Edificio Barrabes             |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 76 Fujita Construction           |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 77 Gacel                         |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 78 Gateway Ireland               |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 79 Göteborg Stads Upphandings B' NAIS |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 80 Hansica                       |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 81 Harald Nyborg                 |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 82 H&R Johnson Tiles             |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 83 Ibazar                        |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| 84 Ingram Micro                  |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |

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4.3.2 Types of E-Commerce

a) Online Shops & Service Distribution

Online shops are the most ‘visible’ of e-commerce applications although (or because) they represent only minor progress from traditional mail-order / catalogue sales business models: Usually only the order-taking part of the transaction is executed online, while payment and delivery are dependent on the infrastructure of the ‘old’ economy (e.g. credit card operations and parcel delivery services). Therefore, companies that already have an established mail-order business were the first to jump on the Internet bandwagon and are now among the most successful Internet retailers. A good example is 3 Suisses, a French clothing retailer that is not only one of Europe’s largest mail-order companies, but also has experimented with online shopping since the early days of the French Minitel system back in the early 1980s. For mail-order companies, the Internet presents the chance to reach a new clientele that would not use paper catalogues for purchases, but in general, the web presence is complementary to existing distribution channels.

3 Suisses (France)

3 Suisses is one of the leading mail order firms in France and in Europe. Its main activity covers all the steps in mail order selling: from buying and organising supply, the production of the catalogue(s), taking orders, right through to the logistics of order delivery. The idea of e-commerce is often limited today to the setting up of trading Websites. The difference with 3 Suisses, and with mail order firms in general, lies in the fact that the integration of the use of electronic means to help take orders from customers has already been in place for a long time. In the French market one thinks immediately of Minitel and also of Audiotel. In this context, the opening of Internet sites follows logically from previous developments and continues the policy of providing multi-channel means of communication. The opening of 3 Suisses’ Minitel and Audiotel sites goes back to the ‘80s, and the first Website was opened in June 1995. 3 Suisses is represented on the web by:

- the main website presenting the electronic catalogue
- around ten specialised sites more or less obviously recognisable as belonging to 3 Suisses.
- a team of 25 people with different profiles and new jobs (editor, project leader, graphic designer, etc.).

To summarise, for 3 Suisses Internet is both a new means of communication, which is complementary to but also in competition with the existing means and a new business.

Company URL: http://www.3suisses.fr
Full case study see http://www.ecatt.com

In other cases, large Internet shopping sites have been established by traditional brick-and-mortar retailers, sometimes with mixed results. MyWorld, the Internet operation of Karstadt (one of Germany’s largest retail corporations), has run into trouble recently because of very poor returns. Moreover, brick-and-mortar retailers might cannibalise their traditional sources of revenue when they make customers turn onto the Internet for purchases because of stronger price competition on the Web. Downward pressure on prices is resulting from Internet start-ups that compete for market share, most of them with very low overheads. The best known of these is, of course, Amazon in the USA. A large number of new online-shops have tried to emulate Amazon’s success. In almost any case, however, profits are far off.
### MyWorld (Germany)

My-world is the virtual department store of KARSTADT and HERTIE. It was launched on 28th October 1996. It was tested for one year, continuously modified, expanded with respect to its offers, and re-launched after one year of operation in November 1997 with a completely new user interface and structure now being much more service-oriented. There will be a third re-launch in 1999 in time for the IFA (Internationale Funk Ausstellung in Berlin). My-world is one (if not the) largest virtual department store (shopping mall) in Germany. It has been developed as part of an overall KARSTADT IT strategy with different types of offers addressed to customers thereby offering a very broad spectrum and variety of order possibilities and associated services used to maximise the number and frequency of interaction between department store and (potential) customers. My-world has started with 150,000 products on offer. In the meantime the figure of 1,800,000 was reached. The best sales are achieved with computers, CDs, videos, books and sports articles. The my-world customer can select between approx. 750,000 book titles, more than 160,000 CDs, 7,000 sports products and more than 10,000 products in the area of “technology and computers”. Currently the textiles and fashion offer in my-world is being expanded. In addition the customer can also order very exclusive products such as approx. 350 delicatessen products from the KaDeWe food department.

All the logistics and delivery tasks are dealt with by the KARSTADT sister company NECKERMANN. The latter also carries out the solvency checks to quickly identify so-called junk orders. Normally delivery times are less than 48 hours. The delivery costs in all shops except for groceries could be reduced from 7.50 DM to 5.50 DM. Deliveries of good exceeding the sum of 100 DM are free as are books. Only in 1998 around 2 million people visited my-world. Today the average number of daily visitors is around 6,000. The profile of visitors is developing in the direction that the share of females is increasing. The same holds true for the average age of the customers, which is also increasing, reflecting the fact that more and more visitors with higher purchasing power find their way to my-world.

Company URL: [http://www.my-world.de](http://www.my-world.de)

Full case study see [http://www.ecatt.com](http://www.ecatt.com)

### DELL (USA)

Dell Computer Corporation is the world’s largest direct-sales computer systems company now operating exclusively on the Internet. Its unique system, combining online ordering, just-in-time parts inventory control, and customised assembly and software installation has been crucial to its rapid growth. The core concept is that, by selling directly to customers, rather than through one or more intermediaries, Dell could best understand their needs and provide the most effective computing systems to meet those needs. Dell is enhancing and broadening the competitive advantages of this direct model by increasingly applying the efficiencies of the Internet to its entire business. Dell’s online activities have increased to the point where, by the first quarter of 1999:

- Online traffic had grown to more than 11 times its year-earlier value
- 24 percent of the company’s support operations were handled online
• Dell received 50,000 customer email messages monthly
• Dell received 100,000 order status requests each month
• Online sales exceeded $100 million weekly, 22 percent of which is from Europe, Africa and the Mid-East, and constituting more than 30 percent of overall revenue

The Dell initiative is one of the prime examples of the move to customer-centric commerce operations—both for corporate and individual customers.

Company URL: http://www.dell.com
Full case study see http://www.ecatt.com

As opposed to computers, other items are supposed to be very hard to sell online, especially groceries. Nevertheless, in the USA and some Nordic countries a number of Internet start-ups try to sell groceries via the Internet (see Ruok@.net case study). The main challenge here is to ensure that the goods are delivered to the customers’ door very fast and that no (high) charges for delivery are charged - irrespective of the customer’s location, that is.

Ruok@.net (Finland)

Ruol@.net is an online shop which was launched in February 1998. Products on offer range from groceries to household goods and other essentials. Ruok@.net is privately owned and it is not directly connected to any of the large wholesale companies. It has no physical stores and is not planning to expand its line of business to the traditional consumer goods business. Ruok@.net it determined to focus only on its core business and take full advantage of the knowledge that the founders have from traditional consumer goods’ business in Finland, e-commerce and the overall functions of the market situations.

Before buying from Ruok@.net, the customer must first make a registration. Registration itself does not cost or oblige the customer to anything. At the moment Ruok@.net has some 13000 registered customers, and the number is growing steadily all the time. Depending on the date and the place where the goods are delivered from, Ruok@.net has a selection of 7300 - 13600 products. The shopping customer can see all the time the total sum of his purchase. It is very easy to add or to remove goods from the shopping cart during shopping. Minimum purchase is 100 FIM. After choosing the goods customer must define the time and place of delivery. An order must be made at least two hours before the defined delivery time. Deliveries are made only on weekdays and the fee is minimum 30 FIM including the collecting and delivering of goods. Payment can be made by major credit and bank cards, WWW-paying services of banks and cash when goods are delivered. Companies have a possibility to make a billing contract. Ruok@.net grants a right of return for all of its goods and deliveries.

Company URL: http://www.ruoka.net
Full case study see http://www.ecatt.com

Many Websites targeted at the consumer market are very visible to the public because of the huge marketing budget that is necessary to promote such sites. Business-to-business Websites, on the other hand, are often only known to insiders in the respective industry but are much more likely to turn a profit in the medium term already. Vos Logistics from the Netherlands is another case altogether because it does not deal with tangible products but with a complex service, i.e. freight management and logistics. The Internet is used today as the backbone for communication with customers as well as complimenting long established IT systems that are used for internal fleet management and resource planning. The quality of the customer service has been much enhanced because real-time information on order fulfilment status (e.g. “at what location is my shipment at the moment and when will it arrive at the destination?”) can be pulled from a Website (Extranet). At the same time, the cost of
serving individual customer’s enquiries was reduced considerably, because the number of (very costly) enquiries by telephone is cut down.

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### Vos Logistics (Netherlands)

Vos Logistics, a large logistics and transport company, was the first company in Europe able to provide clients with almost real-time information on the location of a particular shipment using satellite communication with the trucks. Moreover, if necessary, action could be undertaken at driver level. Already in 1996 Vos started with a pilot together with a customer from the chemical industry. The pilot's objective was to provide the above-mentioned type of information through a Website. This would enable the client to organise its logistics process better thereby, for example, shortening waiting times for unloading. Using a satellite communications system, the trucks reported their position to Vos Logistics at least once an hour. The client could then use a password to log onto a separate database of relevant information through the Vos Logistics Website. This information was updated every 15 minutes and provided insight into the progress of the truck transporting the shipment and the truck’s estimated time of arrival at the address where it was to load or unload. Vos Logistics also saw this as an opportunity to profile itself as modern and innovative. The initiative was then expanded and Vos Logistics installed the LOVOS client software at several clients. The initiative resulted in a transparent information structure that now enables more efficient and effective working methods. Loading levels, an indicator for good performance, have increased dramatically.

Company URL: [http://www.voslogistics.com](http://www.voslogistics.com)

Full case study see [http://www.ecatt.com](http://www.ecatt.com)

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### E-Commerce Platforms/ Malls

Whereas single companies that conduct sales on their own account usually run online shops, e-commerce platforms provide the infrastructure for others on which to make business. In the business-to-consumer segment, such platforms often come in the shape of e-malls which emulate brick-and-mortar malls by giving customers access to a number of different specialist retailers through a single gateway, i.e. a Website. Examples are the Machiko Virtual Shopping Mall in Japan and French companies Choix.com and Télécommerce. Gacel in Spain and Hansica as well as the Norsjö Kommun project in Sweden show that virtual malls can be used by regional public agencies as a tool to help SMEs go online. Although the Internet technically allows for seamless, international trade, there is some evidence showing that consumers prefer web offers from companies in physical proximity to their location, because proximity helps to build trust.

### Machiko Virtual Shopping Mall (Japan)

Launched and managed by NTT Data, Machiko Virtual Shopping Mall began full commercial operations in March 1998. Although not the largest nor the most successful, its trajectory of management issues, contents development, and entire project design reflect some of the most noteworthy characteristics of B-C e-commerce players and markets in Japan. The Machiko shopping mall is constructed with a top page and a shopping page as entrance features. Shops are categorised according to type of sales and products. The basic elements of the commercial process are handled in the following way by the Machiko mall management:

- **Marketing:** Organised by an in-house marketing team.
- **Initial contact with customers:** Primarily through advertisement.
- **Ordering:** On the Web
• Pre- and post-sales support: E-mail and telephone customer support, plus each tenant's own customer support (e-mail address obligatory)
• Billing: Invoice sent from each tenant
• Payment: Credit card
• Delivery: Shipped from each tenant.

The mall is member based and membership is free of charge. The number of Machiko members was 58,263 by the end of May 1999 (up from 50,603 in January 1999). Consumer access varies considerably from month to month. The number of accesses in January 1999 was in the range of 62,000, March was 79,000, while May took a downward turn to 41,000.

Company URL: [http://www.nttdata.co.jp](http://www.nttdata.co.jp)
Full case study see [http://www.ecatt.com](http://www.ecatt.com)

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**Gacel (Spain)**

GACEL is a virtual shopping mall which started in November 1997, with a financial backing from the Regional Government, as an offer for Galician SMEs, without any restriction regarding their areas of activity. Companies, classified in nine broad areas, can offer their products either to private customers or to other companies. For each product the potential buyer can see a description and, if appropriate, an image. In collaboration with the Regional Government of Galicia (in the North West of Spain) more than 50 companies participate in GACEL. The online catalogue of products is updated from databases. Up to now, payments are done offline (on delivery, or by bank transfer or checks), although online payment procedures are being currently considered. GACEL has been the first multi-sector shopping mall for SMEs aimed to regional development in Spain.

Company URL: [http://www.gacel.net](http://www.gacel.net)
Full case study see [http://www.ecatt.com](http://www.ecatt.com)

Germany’s MODA is a business-to-business marketplace were clothing manufacturers can sell to retailers. Although the system is based on EDI, it is very easy to handle due to a Web-EDI-interface. This way MODA is able to reach a clientele that would not be able or willing to implement a traditional EDI ordering system because of their small size and lack of user expertise.

**MODA (Germany)**

MODA is an information and ordering system especially for small and medium-sized retailers in the textiles industry. The system provides facilities for manufacturers and suppliers to include their information in a standard format in the MODA databank on the Internet and also receive orders from retailers in the same format. It uses EDI as a standard for data transfer in both directions and an EDI converter for those not yet using EDI. The system has been developed for naive PC users and uses a very intuitive user interface. MODA contributes to the competitiveness of small and medium-sized retailers since it offers them the same possibilities in terms of information access and ordering options like the large competitors already had in place before outside the means of the www. MODA has been developed as a system to provide better and closer communication and distribution links between the textiles industry (manufacturers) and retailers, especially small and medium-sized ones. MODA provides all its functionality only to authorised retailers within a closed user group. The Website with more general information and registration options is available to anybody.
c) **Online Reservation and Booking**

In some business sectors, the main service provided by agencies is reservations and bookings. The Internet is an especially efficient tool to conduct transactions of this kind due to its real-time interactivity combined with the possibility to link up large databases to automatically provide enquirers with relevant information. One of the first sectors to make use of this potential was the hotel trade. The Website of Relais & Chateaux, a French hotel chain, is a typical example. It started as an effort to save money on sending out paper copies of the hotel brochure but has developed in one of the main distribution channels of the company. The same can be said of Scandlines’ Website: The Danish ferry operator has successfully created a very easy-to-use Website that has helped to reduce the number of (costly) telephone enquiries. This service has received an enthusiastic response from users.

### Relais & Chateaux (France)

Relais & Chateaux is an e-commerce scheme for a hotel chain. Beginning in 1995 with a classic Website, the scheme is now designed to allow online booking and in the near future, online payment will be implemented. It is both a “brochure” site and a trading site. The user obtains a description complete with photos of the establishment that s/he has searched for. S/he can send an e-mail to the establishment and connect to the establishment's site if one exists. Thus each R&C is equipped with its own electronic mail box, and can make contact with the visitors to its site and personalise the communication. To date, 140 R&Cs around the world have taken the step of developing a sub-server which presents their hotel in detail (virtual visit, restaurant menu, activities, etc.) and is regularly updated.

Company URL: [http://www.relaischateaux.fr](http://www.relaischateaux.fr)

Full case study see [http://www.ecatt.com](http://www.ecatt.com)

In Finland Travel.fi provides hotel reservation and ticket booking, supplemented by a tourism portal covering all facets of tourism in Finland. However, because Travel.fi is not associated with a hotel chain, it had to find external sources of revenue: Travel.fi is financed by a commission paid by hotels and other tourism organisations whose services can be booked through the Website.

### Travel.fi (Finland)

Travel.fi is the most comprehensive travelling and tourism oriented Internet service in Finland. It was launched in 1995, and at present it is published both in Finnish and in English. Travel.fi is a good forum for Finnish tourism companies to get both national and international visibility. It is also a member of an international travelling and tourism oriented Internet-based consortium Travelring.net which helps to get more visitors to Travel.fi pages, and it is also a good gateway for Finnish people to check foreign sites. Annually Travel.fi gets approximately 20 million web-page requests of which 65% come from Finland and the 35% come from over 60 different countries. Visitors leave annually over 30,000 requests for brochures and additional information. Travel.fi has plenty of information of Finnish travelling and tourism companies. It includes information on the resorts and also e.g. on different kinds of special vacations, sights, events and business and conference travels. From Travel.fi one can also find Webstores. The most advanced services in Travel.fi are its online reservation systems for accommodation. The system was first developed by a software company PEHMO-Kuusamo Ltd, and the companies have redeveloped it together and with JSOP's other partners from tourism branch.
Online Financial Services and Online Gambling

The most prominent online financial services are online banking and online brokerage. Online banking can already look back on a long history as it was one of the first (and in many countries the only) successful applications on the national Videotex systems like BTX in Germany and Minitel in France back in the 1980s. In fact, it took quite a while until online banking over the Internet was taken seriously by the larger public because of the Internet’s inherent security shortcomings. Videotex systems are superior in this regard because technically they are closed user groups.

Nevertheless, those banks that already had online banking schemes over proprietary networks running started to experiment with the Internet as a new distribution channel in the mid-1990s because of the lure of millions of young and affluent Internet users who were creating a market potential calling out to be exploited. One of these was Swedish SEB. The company’s Internet division has already won 250,000 online banking customers who can obtain information on their accounts, conduct money transfers to domestic and foreign accounts and trade stocks and funds over SEB’s Website.

SEB (Sweden)

SEB is today one of the leading Internet banks in Europe and has set an idealistic goal to have five million Internet customers within five years.

The banking group started in December 1996 with the opening of its Internet Office for private customers. In October 1997 the SEB opened the first company Internet Office. This one was a copy of the first one with some adjustments according to the company’s need. Now the SEB has 260,000 customers of which 20,000 represent companies. The growth rate is 900 new companies a month. The Internet Office for companies was from the beginning focused on SMEs.

The Internet bank Website is self-instructive and there is also a support function between 7 a.m. and 10 p.m. every day.

What the customer is able to do via Internet banking includes:

- to get account information
- to make domestic payments and transfers
- to make foreign payments
- to trade stocks and funds

A customer company pays 1,350 SEK for this service.

Company URL: http://www.sebank.se
Full case study see http://www.ecatt.com

The insurance sector has been even more hesitant to join the Internet business frenzy. This was due not only to the stress insurers put on trust-building and personal contact to customers, but also to some long-established structures in insurance distribution. The Internet might pose an enormous challenge for dependent insurance agents because these might be bypassed by selling directly over the Web. As all large insurance companies depend on their network of agents for distribution, they shrink from confronting agents head-on by focusing on Internet sales. At the same time, however, independent insurance agents as well as direct insurers have begun to penetrate the market, selling standard products like motor insurance
policies online to an Internet-literate clientele that is very hard to reach by traditional insurance agents. The UK's Eagle Star Direct was one of the first major insurers to react to this threat by selling online itself. The case study reflects some of the internal friction the addition of the Internet as a distribution channel has caused in the company, but also the success the company has had because of its head start over the competition.

**Eagle Star Direct (U.K.)**

Eagle Star Direct is the market leadership in the area of e-commerce - it was the first insurance company to offer a motor insurance on the World Wide Web. Another distinctive feature was its successful brand management and relations with subsidiary companies. Furthermore, the recent marketing research noted the Eagle Star Direct as the most responsive company in the industry regarding customer inquiries over the electronic media. Finally, Eagle Star Direct can be seen as somewhat of a pioneer in the business to business category of e-commerce in this industry sector.

The e-commerce initiative in Eagle Star Direct has focused on two areas. The most visible one is in the business to consumer category. It involves going directly to the consumer offering Quote and Buy Online insurance cover for homes, motor travel and boats. The other, less visible area where e-commerce is used is in the business to business category. Using the Internet, the company has linked with its partners. The ultimate aim is the enhancement of perceived value to the consumer, arising from improvements made in the supply chain. An illustrative example of this would be the cooperation between Eagle Star Direct's commercial department with engineering business in the area of employers' insurance covers. Whereas in the past the companies have had to rely on EDI for this type of co-operation, the Internet has provided an easy to use, ubiquitous and flexible co-operative tool.

The business to consumer category has focused on providing an additional choice to the consumer, offering another way of purchasing insurance cover. Free versions of Netscape and Microsoft Internet Explorer can be downloaded from Eagle Star Direct's user-friendly site, which facilitates online sales. Nearly 20% of new business is generated by the e-commerce scheme and the combination of a user friendly Website and some clever marketing are behind its success.

In the business to consumer category, the strategy was to offer the type of service which would be consistent with the existing telesales scheme (the company has been operating telesales service) yet without 'cannibalising' it. At the same time, the consumers were rewarded an incentive of 10 - 15% discount in price of the cover. This discount (in relation to conventionally booked cover) is not fictitious, given that it is more cost effective to run a Website as opposed to the call centre or brokerage service.

Company URL: [http://www.eaglestar.co.uk](http://www.eaglestar.co.uk)

Full case study see [http://www.ecatt.com](http://www.ecatt.com)

Not a financial service in the direct sense of the phrase, online gambling nevertheless shows many similarities with financial services like online trading (e.g. Charles Schwab in the USA) because of its reliance on access to real-time data. Online gambling got off to a very good start in some European countries. Oy Veikkaus, the Finnish state-owned lottery, was the first to start online-gambling in Europe (in 1997) and is now the largest direct-selling online business in the country.

**Oy Veikkaus (Finland)**

Oy Veikkaus Ab was the first national money game company in the world to use the Internet as a distribution channel. In terms of Finnish marks, gaming through the Internet is clearly the largest direct-selling online business in Finland.
Veikkaus already recognised the potential of the Internet while other national gaming companies still viewed it as a threat. Veikkaus started its Internet business - in other words, enabled distance gaming - in order to improve its services, to save in distribution costs, to acquire new customer groups and to respond to the threat of new competition. The planning of the project began in the early 1990’s. Self-service gaming was first launched through push-button telephones, but shortly afterwards the decision to also launch an Internet service was made. Gaming through the Internet has rapidly become very popular among the Finns, although OnNet gaming has hardly been advertised at all.

The OnNet gaming pages can be found on the Veikkaus Web site. These pages have been made simple and easy to use. First the player selects the desired game (e.g. Fixed Odds Betting or Multibet) and then the desired gaming targets, and enters the desired stake. Next, the player has to enter the personal ID code and password, and after the system has recognised the player, it asks the player to confirm the selected game. The system immediately informs the player whether the game has been accepted and, at the same time, also gives information on the real-time balance of the player’s games account after the game played.

The player can easily transfer money to the personal games account, for instance, through an Internet bank. Any prizes that are received in the personal games account can likewise easily be transferred to the player’s bank account. Veikkaus also sends statements on the players’ games accounts through the post.

The Internet is a clear strategic choice for Veikkaus and the company actually provides a good alternative to the competing games market invading Finland through the Internet. Veikkaus has observed that the reliability, service and product quality of the well-known company, as well as prizes that are legally exempt from taxes, are factors that can compete with the somewhat better betting odds and return rates of other companies.

Veikkaus has over 57,000 registered players of which some 35,000 are considered being actively playing ones. Different betting games are the most popular ones of all Veikkaus OnNet games. They account for about 70% of all OnNet gaming in Finland. The conventional Lotto ranks second in popularity, with a share of 10% (the share of Lotto in OnNet gaming has been constantly on the rise).


Full case study see [http://www.ecatt.com](http://www.ecatt.com)

e) Infomediaries

Infomediaries set up “marketspaces” on the Internet, most of which are sector-specific (business-to-business) or issue-specific (business-to-consumer). According to the initial idea of John Hagel, Infomediaries need to create virtual communities whose value for the members depends on the number and composition of participants. The business case for Infomediaries lies in exploiting the personal data they collect from the movements and actions of community members on the Website. Website operators can make money from this data e.g. through selling ‘intelligent’ banner space to advertisers or selling the data directly to third parties who then use it for direct selling etc. Many infomediaries do also exploit the traffic their sites attract by adding extra services or an online shop to sell goods and services on their own account.

Some Infomediary sites developed out of commercial information services that sell data to business users for a charge. In Germany, “Wer Liefert Was?” (“who supplies what?”) is one of the key players in this market segment. The company was faced with the problem that many of the data it had been selling to business customers for decades (and which contributed a lot to turnover) is now available free on the Internet. To make up for lost income, WLW had to devise services with added value to the customer. Consequently, a new business
model was put in place whereby the WLW Website acts as an intermediary between suppliers and buyers. Because of the well-known brand name of the company as well as its database expertise, the Website allowed WLW to fend off competition from start-ups.

### Wer Liefert Was? (Germany)

Wer liefert Was (WLW) is an international online platform for purchasing and sales and allows for the search of products from more than 290,000 companies in 13 European countries. WLW is offering a large number of additional services besides product search possibilities ranging from different advertising possibilities such as e-mail, homepage and electronic catalogue provision service, FAXLINE etc.

Since 1995 WLW offers its service on the Internet. In the meantime WLW is an international online platform for purchasing and sales. For the user of the system the whole search, up until the presentation of the name of the company offering the desired product and where the company is situated, is free of charge. Further company information retrieval including access to the complete data on the product offered is only free to the information seeker, e.g. purchasers, in cases where the company offering the product has paid an annual fee to WLW. These companies can also enable searching parties to get in touch with them at no extra cost either via fax or e-mail. The WLW offer is completed by additional services such as:

- links to homepages of companies offering their products in WLW,
- the integration of electronic catalogues and catalogue pages of these companies in the WLW online platform,
- different types of advertising possibilities such as banners and complete Internet presentations,
- access to and participation in the WLW-MARKET where product queries and offers are brought together in a virtual market place.

The average number of visits per month at the Website is around 500,000 in 1999.

Company URL: [http://www.wlwonline.de](http://www.wlwonline.de)

Full case study see [http://www.ecatt.com](http://www.ecatt.com)

Other examples in this vein are Byggecentrum in Denmark and Baunetz in Germany, both of which see their main role as portals for the building industry. As it is the case with most Infomediaries, there is no single source of revenue but a multitude of different sources together amounting to a business model which is still only in its infancy. Business-to-business infomediaries, however, have an advantage over business-to-consumer ones because of the fact that professional users are used to paying for specialised information (e.g. database access) whereas private households are not - they want it free.

### Byggecentrum (Denmark)

Byggecentrum is an example of an online industry platform - a portal to a comprehensive range of updated information relevant to all parts of the building and construction sector. The institution has been in operation since 1956 and now gradually supplements its services with online access via Internet.

With the emergence of the Internet Byggecentrum realised a possibility for improving the existing service - in particular provision of updates and news as well as fast access to information for the user-community. Consequently an Internet project was initiated in 1996 involving the managing director, the project leader, the current webmaster, an internal reference group and the sectoral organisation together with TeleDenmark and a consultant company.
In addition to being a fast channel and a necessary leading edge activity, the Internet based service provide a new framework for providers of information to create, publish and maintain their own information for the benefit of the whole sector avoiding much obsolete work. Development of the Internet based service was financed as part of the ordinary running cost budget. The design of Website and services involved the internal exhibition department, the bookstore and the publishing department monitoring the progress through monthly evaluation meetings.

Online activities started in 1997 with the simple mission statement: 'Byggecentrum shall be the place where the construction sector find the necessary information'. This business-to-business Internet service was marketed by means of banners on various Websites, advertisement in several professional magazines and press releases. Customers may shop and reserve facilities online. Online orders, like printed material or CD-ROMs, are delivered by mail and paid through ordinary invoicing.

Company URL: http://www.byggecentrum.dk
Full case study see http://www.ecatt.com

In almost every business sector, specialist Websites or “industry portals” are set up either by start-ups or by long-established industry players that want to exploit their clout in the market to get their fair share of the Internet windfall. An example of the former type is E-Base Af-bouwbehandeling in the Netherlands, whereas Finland’s Alma Media Dime is of the latter type.

Many Infomediaries operate in market segments that had not existed before the Internet, e.g. ChannelPoint, a US start-up that acts as an interchange for insurance products connecting product suppliers (insurance companies) with retailers (brokers, banks and other retail outlets etc). As ChannelPoint can not only let (business or private) customers apply for insurance and quote options from various plans, but also underwrite policies, it is able to save major administrative costs for brokers, thereby allowing them to spend more time with their clients. Insurance companies benefit because trading via Channelpoint gets rid of paper-based processing (the costs of paper-based distribution in the US insurance industry are believed to have exceeded $120 billion in 1999).

ChannelPoint (USA)

ChannelPoint® is the world’s first global Internet exchange devoted to helping reinvent the way businesses buy, sell and service insurance and benefits products. It acts as an Internet-based intermediary supporting a variety of insurance product and service transactions for businesses. In the process, it has the potential of saving billions annually in commissions and administrative expenses.

ChannelPoint’s technology serves as the Internet exchange connecting product suppliers and retailers so that they can conduct business electronically and eliminate the traditional—and expensive—paper-based processes. The exchange supports both indirect (that is, via broker) and direct-to-customer electronic marketplaces that are accessible via standard Web browsers. Not just a quoting and referral service, the exchange enables complete online marketing, selling and buying transactions—all with minimal technology investment required on the part of exchange participants.

The ChannelPoint Commerce Internet exchange initially supports all lines of insurance and benefits products including health, life, disability, dental, and vision. ChannelPoint has added support for property and casualty insurance recently. ChannelPoint works with national and regional carriers to collect the most up-to-date plan/policy descriptions, pricing models and business rules-collectively called “smart content” that can be dynamically tailored to targeted audiences. This content is delivered through sophisticated web-based applications that establish broker, work site marketing and direct-to-consumer e-markets. Retailers including brokerages, banks, financial institutions and web-direct companies participate in these e-markets via innovative pre-built or branded web-based storefronts (‘Webfronts’) used by brokers, consumers and businesses.
f) **Online auctions**

Online auctioneers have benefited enormously from Internet technology, which has made real-time matching of supply and demand more easy than ever before. From an economic point of view, auctions work better with a high number of participants. Whereas traditionally auctions have depended on the physical presence of buyers, online auctions have done away with that, resulting in an enormous extension of the number of potential buyers and sellers.

Consumer-to-consumer auctions like iBazar in France have shown exceptional growth in the last months, but it remains unclear what business model is needed to make them sustainable. Market leader eBay has introduced commission payments recently because revenues from advertising have not been sufficient to convince investors that the company would become profitable in the medium term. iBazar foresees that it might have to charge users, too.

**iBazar (France)**

The Telestore company was the first to open an auction site in France. Being the first, it also has the most experience in this area in France and its site is the one which generates the most traffic. Since the creation of Ibazar.com, three other similar sites have been created in France.

Ibazar.com is an auction site reserved for private individuals. The project was launched in 1998. After a period of legal and technical preparation, the site was opened on the 26th October 1998.

Telestore began its Internet activities with the chez.com and ecila.fr sites. Then Telestore looked for a way into the field of e-commerce. Auctioning proved to be the best way in because of the fun aspect and its strong growth potential (Internet allows trading between individuals and a high degree of interactivity). The company decided that an auction was a good way to accustom people to doing business on Internet. For Telestore, Ibazar.com is an extra site in their catalogue, with a new team to run it, exactly like the launch of a new magazine by a publishing house. This e-commerce site in fact remains fully integrated in the heart of Telestore's operation. The company is in the process of constituting a commercial group which will take charge of Ibazar.com, the Ibazar Group.

The Ibazar.com site is very wide and includes all sorts of products (apartments, vehicles, bottles of wine, jewellery, seats for shows etc.). For the moment the service is completely free, and therefore does not generate any revenue. At present it is 100% financed by the Telestore company. The aim is to create sufficient traffic before moving to a paying service.

At the moment, the site records more than 25,000 visits per month, which generate transactions of more than 2 million francs per month. Growth of the site is very rapid: the monthly rate of growth of auctions is more than 50%.

Company URL: [http://www.ibazar.com](http://www.ibazar.com)
Full case study see [http://www.ecatt.com](http://www.ecatt.com)

Business-to-business auctions, on the other hand, do not have these difficulties. In many industries like flowers (see Tele-Flower Auction case study) and wood (see Coillte Teoranta case study), auctioning of commodities as well as finished products of all kinds have made markets function more smoothly - economists speak of better allocation of resources which results in an increase in wealth of national economies.
Coillte Teoranta (Ireland)

Coillte Teoranta's Electronic Bidding System (EBS) is an example of an online auctioning system. Bidding for logs is operated electronically from remote sites around Ireland to a centralised system in Coillte's head office in Dublin. Coillte Teoranta is the recipient of the Excellence in Technology Award for its EBS system. The EBS system is unique throughout Europe.

In 1996 Coillte Teoranta and the Irish Timber Council embarked on an eighteen month project to rationalise the manual bidding system for the buying and selling of saw logs in Ireland into an online auctioning system, the EBS. Auctions occur every fortnight with an average of 25 buyers online. The system capacity equals 82 buyers but rarely does it exceed 25 buyers in practice. Buyers log on to Coillte's system via ISDN or PSDN and bid for lots of saw log over a 15 to 30 seconds gap. If a buyer meets or exceeds the reserve price in the system then a sale is made but if the reserve price is not reached then the lot is withdrawn and automatically presented at the next auction. The first online auction took place on 5th February 1997 and has followed Standard Operating Procedures since going online. An external auditor monitors procedures during the auction to ensure transparency and fairness in operation.

The benefit of online auctioning to Coillte has meant that 90% of the sawlog produced in Ireland is now transacted through the EBS. Over £60 million in revenue sales has been achieved in the system.

Company URL: http://www.coillte.ie
Full case study see http://www.ecatt.com

Auctions are also gradually being introduced in a high number of Websites as an add-on, but most likely this will be a passing fad as only those auctions that reach a critical mass of users will provide good value to participants.


g) Value chain integrators

The Internet offers manifold possibilities to optimise value chains by linking up co-operating companies. In general, value chain integration aims at improving the control of participants over all segments of the production process by automatically supplying them with relevant data that does not reside in their own corporate computer systems but in those of co-operating companies. Just-in-time production, i.e. a mode of production that adapts to changes in market conditions (= customers' behaviour) almost in real time, is only possible when all parts of the supply chain as well as the distribution chain are closely interlinked so that all relevant information can run seamlessly through them.

For many years now EDI has been the technology of choice for value chain integration purposes. EDI is a technology for electronic document interchange that is used for computer-to-computer transfer of data in a standard, pre-agreed format. Example of EDI messages are orders, invoices, payments, confirmations, design, and product specifications etc. One shortcoming of traditional EDI is that implementation of computer systems able to run EDI is costly and that the technology required specialist knowledge from users. Consequently, small companies have tried to avoid using EDI. As laid out in the case study of British tile manufacturer H&R Johnson, this severely affected the effectiveness of large companies' co-operation with small suppliers and distribution partners. In recent years, EDI over the Internet has been implemented in many cases to confront this problem. Because of the easy-to-use Web interface and inexpensive infrastructure requirements (just a PC with Internet access), SMEs are now much more likely to use EDI.

EDI is being used most often to optimise the backward linkages of large companies to suppliers (see DAF Trucks case study) and/or the forward linkages to distribution partners (see DHL Ireland case study). With the Internet there now is the possibility to integrate the
customers themselves into the data stream that runs along value chains: DHL Ireland and Transtec in Germany are examples of companies that allow their customers to track order fulfilment status in real-time.

### DAF Trucks (Netherlands)

DAF has applied e-commerce to parts of the purchasing process and after-sales activities. The aim was to fulfil the delivery times related to 9 framework contracts with Dutch suppliers through EDI. As part of this system a new delivery schedule for about 1000 components was sent in the form of an EDI message to the supplier every week with the order for the coming set period (about 4 weeks) as well as an indication of the expected orders for the following period (annually). The second EDI system component was the loading list used by supplier to indicate when the products were ready to be sent. Finally an invoice message is generated providing information whether the invoice is in accordance with the loading message.

EDI made the transition possible from ‘sales from stock’ to ‘build to order’ that was eventually introduced as company strategy within DAF Trucks N.V. in 1993. An enormous increase in efficiency was achieved with EDI. In addition and for the after sales service a catalogue of parts was developed on CD-Rom to replace the microfiches and books (RAPIDO). Dealers can now place their orders electronically via the Parts Logistics System (PLS).

The innovative aspect is that ‘just in time management’ can be further implemented into the assembly process. RAPIDO lets dealers use the easy reference graphic screens and simple search techniques much faster and more efficiently than the old microfiches and books. Moreover, it offers the possibility to connect with the dealer’s system for stock management, pricing, invoicing, ordering and delivering.

Delivery on demand via EDI reduces the time between ordering and delivering as much as possible so that few parts have to be kept in stock. This has resulted in a reduction of stocks by 70%. This means an annual saving of more than half a million Dutch guilders for DAF Trucks. The advantages of RAPIDO are in the ease of use for the dealer which results in an enormous increase in efficiency and the higher level of After Sales service experienced.

Company URL: [http://www.daftrucks.com](http://www.daftrucks.com)

Full case study see [http://www.ecatt.com](http://www.ecatt.com)

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### DHL Ireland (Ireland)

DHL International (Ireland) Ltd represents an example of a value chain integrator in both the business to business category of e-commerce and the business to customer category.

DHL has developed an Internet product called DHL Connect to achieve better customer service and operational efficiency. It was tested it in Ireland for Europe and Africa and is currently used by 40% of the customers. Customers are provided with software for booking documents and parcels and for tracking deliveries over the Web. Invoicing of clients is supported by EDI and payment is transacted using electronic funds transfers (EFT). SSL is used for security. 75% of the data exchange occurs through EDI, modems or over the Internet. Approx. 40% of revenue is achieved trough e-commerce solutions and the DHL aim is to make every process electronic.

Company URL: [http://www.dhl.ie](http://www.dhl.ie)

Full case study see [http://www.ecatt.com](http://www.ecatt.com)
Apart from EDI, the most important technology for integrating value chains is Extranets. These are extensions of local (in-house) IP networks that allows closed user groups of third parties (customers or business partners) to obtain select data that is of interest to them, as well as to send orders etc. through a Website interface. TV2/Reklame, the advertising department of the Danish broadcasting channel TV2, uses an Extranet to market airtime to advertising agencies. As the possibility to book and rebook airtime for commercials at the latest possible time is of paramount importance to advertisers, the Extranet solution had a very positive effect on the effectiveness of the transaction. Every member of the value chain has real-time access to the relevant data, which means that the capability for short-term planning is much improved.

**TV2 Reklame (Denmark)**

TV2/Reklame has developed an Extranet type of online booking, purchasing and auction system to improve sales and planning processes and reduce workload and time constraints.

One of the bottlenecks working with TV-commercials is planning for transmission. Advertisement and marketing companies are faced with both competition for placement and the need to book and rebook at the latest possible time. As verified by some of TV2’s customers, the traditional way of handling booking – by fax, telephone, e-mail etc. - is very time and work-consuming and deadlines used to be several days before the actual transmissions. Since marketing is a highly dynamic procedure of actions and reactions, any further degree of freedom is welcomed.

The idea of an Extranet solution grew out of the wish to reduce internal peak workloads, to increase efficiency and to allow operation closer to deadlines. The initial analysis showed that the internal database based planning system was suitable for adding new interfaces and functionality. The basic idea was to build a system where external customers could book placement of TV-commercials and change bookings when necessary, for example when programmes change for unpredictable reasons. Internet and browser technology was chosen for the client solution and the initial solution is based on a proprietary TCP/IP network.

Initially the idea was to offer only the booking and rebooking facility implementing TV2’s and the advertising companies’ placement policies concerning competing products. As development progressed the idea came up to include a facility to allow advertisers to ‘compete’ for certain time-slots by means of an embedded auction system.

One of the basic new facilities, waiting lists, is a mechanism where customers can book as framework orders and administer the final bookings as the transmission time approaches. The final bookings are only changed by TV2 in case of extraordinary conditions and derived programme rescheduling.

Company URL: [http://www.tv2.dk](http://www.tv2.dk)

Full case study see [http://www.ecatt.com](http://www.ecatt.com)

**h) E-Procurement**

E-Procurement systems have much in common with value chain integration applications, but they focus mainly on MRO-goods; especially in large companies where order procedures for these types of goods are very ineffective and result in high expenses which in many cases exceed the value of the transactions itself. E-Procurement systems usually consist of two parts: A workflow system that supports the internal processes in the client company so that employees entitled to make orders can do so through their computer; and an Extranet that connects this workflow system with one or a small number of suppliers. Employees can type in their orders in a special Website which are then automatically checked against pre-
determined rules (e.g. personal maximum of spending on a single item) and for availability, forwarded to the supplier via the Internet and processed.

E-procurement is a very effective tool to cut the costs of purchasing MRO goods as well as to improve control and monitoring of all parts of the procurement process. Companies that are spread over several locations, like public agencies (see the case studies of Göteborgs Stads Upphandlings AB and the Danish national procurement company SKI), benefit especially.

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<tr>
<th>Göteborgs Stads Upphandlings AB (Sweden)</th>
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<td>The city of Göteborg has implemented e-commerce at a large scale among its business partners in an effort to improve the efficiency of business dealings. The project called B’NAIS had different aims: to raise efficiency, rationalise the procedure of trading and lower the logistic costs. B’NAIS is a software product which supports Lotus Notes or an open www-standard. The product was developed for purchasers in the city administration, who use the B’NAIS product for sending orders electronically saving time and money. The software has a database connected. The database contains all the business partners and their products.</td>
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<tr>
<td>Company URL: <a href="http://www.upphandlingsab.goteborg.se">http://www.upphandlingsab.goteborg.se</a></td>
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<th>SKI (Denmark)</th>
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<td>The five years old SKI is a large-scale broker serving 5,600 public customers taking care of the procurement allowing public customers to order when needed without having to handle procurement on an individual basis. SKI is the result of a merger between The State Procurement Office and The Supply Office of the Local Authorities. Customers subscribe to SKI's services and order by means of telephone, fax, e-mail, online systems and mail. Goods are delivered directly to customers from suppliers at over 600 ordering addresses. In spring 1999 SKI's online systems comprised more than 85 suppliers and well over 250,000 articles ranging from toilet paper to IT equipment. Mid 1999 the total number of suppliers/dealers in all systems count 564 and the total number of articles are 1,287,066. Ordering is originally based on a paper-based catalogue, still existing, but gradually being complemented by online systems. In 1999 SKI has extended its range of suppliers with 10 major IT vendors through a tendering procedure. One of the prime requirements were that the new suppliers will be able to trade electronically by means of the EDIFACT standard for orders and invoices within less than one year.</td>
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<td>Company URL: <a href="http://www.ski.dk/english">http://www.ski.dk/english</a></td>
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<td>Full case study see <a href="http://www.ecatt.com">http://www.ecatt.com</a></td>
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4.4 The Way Ahead: Factors Promoting and Inhibiting E-Commerce

4.4.1 Potential

With very few exceptions, the Internet today is accessed through a desktop or mobile computer. This simple observation has far-reaching implications especially for people who do not
use a computer as they are extremely unlikely to have the chance to access the Internet. Today, not even half of the EU's population have access to a computer at home. A similar share do not use computers regularly. Therefore, a large percentage of the population is in no position to use the Internet as they haven’t even the chance to gain computer knowledge and “feel good” about conducting every-day tasks via the PC or Mac. For these reasons, the potential for e-commerce is severely limited by the lack of computer access and user knowledge from which a large share of consumers suffers. Internet access and e-commerce growth rates will not automatically reach all potential target users.

There are two major ways to remedy this situation: a) to boost computer penetration and usage in private households and b) to develop and open up other access paths for the Internet and e-commerce.

Ad a): Although computer penetration has been growing steadily over the last years, it will take some time until every household will be equipped with one, especially in the 'laggard' countries of Southern Europe. As getting accustomed to using a computer as a daily tool (like the telephone or microwave) is in most cases not a question of months but years, people who today have not even used a computer once are not likely to participate in e-commerce (as we know it) for years to come. But it must be stated here that the population segments that have no Internet access today tend to be the ones who are less attractive as customers because of lower spending power, with the notable exception of the elderly. If a “digital divide” opens between those linked up to the Internet and those who are not, suppliers in many sectors of the economy might not consider this a problem. The public interest, however, is in ensuring that all have equal access to e-commerce offers.

Ad b): As universal access to e-commerce via PC cannot be taken for granted for the near future, opening up alternative access paths is of special interest. Since mid-1999, mobile commerce (also dubbed m-commerce) has gathered a lot of attention. Equipment with mobile phones has grown at such high rates in recent years that it can be realistically assumed that almost every household will have access to mobile telephony early in the first decade of the 21st century. However, there can be no doubts that today's handsets are not suitable for accessing the kind of information most customers need before making a purchase because of small screen sizes (exceptions might be products that can be described very easily like tickets for travel, hotels and cultural events, and financial products like stocks, but these amount to only a very limited share of total sales).

If m-commerce is meant to take off, new devices have to be developed which might amount to a cross between today’s PDAs and mobile telephones. It will take some experimentation before technological solutions that suit consumers’ preferences will penetrate the market. The m-commerce hype could just as easily fall to earth if experience shows that sales via the mobile phone will only be accepted for very few products and by a small segment of all mobile phone users.

An access path that possibly would have much more success but is still underdeveloped is integration of Internet access into TV sets. People spend huge amounts of time in front of their TV sets and are accustomed to being exposed to commercial advertisements; consequently it should appear quite natural to supplement the one-directional flow of commercials by a return channel through which enquiries and orders can be sent. Until now, however, no technology has gained a foothold in the market.

The potential for e-commerce might also be limited due to product characteristics that require the customer to be physically present when conducting the purchase. This issue is dealt with below.

4.4.2 Promoting Factors

Real added value
Without doubt, the most important factor boosting e-commerce take-up is the added value it brings in comparison to traditional ways of purchasing and distributing goods and services.

E-commerce provides companies with considerable competitive advantages. The application of E-Commerce reduces transaction costs, i.e. the costs of the transaction for exchange of goods and demands on the market. Those businesses that began to develop E-Commerce strategies early on benefit in particular from cost advantages, increased control over forward and backward linkages to their suppliers and distribution partners as well as considerably improved opportunities for customer service. E-Commerce also opens new prospects for the development of innovative business models. New markets and new functions, particularly in the intermediate area (agency services), are created. A multitude of newly formed, small businesses (start-ups) arrived on the scene to make use of the opportunities presented by the Internet.

From a consumer's point of view, the advantages of e-commerce are comparable to those attached to buying from mail-order catalogues:

- ease of use (no dependence on opening hours, no travel to retail outlet required)
- bigger choice (than in retail outlets because goods can be shipped from central warehouses)
- anonymity (not towards the seller, but third parties)

and in addition go much further, for example:

- information supply according to the preferences of users
- more interactivity
- real-time information (e.g. on availability, new offers)
- personalisation (by shaping Website contents according to the preferences of users, either explicitly stated or implicitly derived from behaviour, i.e. movements and actions on the Website)

In the ECaTT population survey, the reduction in effort (by 68% of all current or prospective online shoppers), the speed of delivery (59%) and an extensive and interesting product choice (59%) were the advantages most often associated with online shopping. Much fewer (little more than 1/3) believe that online shopping saves money.

**Competition**

It would be wrong to give the impression that e-commerce is a panacea for companies, because it also presents an enormous challenge for established businesses: Many of the traditional markets have been shaken up to an extent that was inconceivable only a few years ago. Falling barriers to entry into markets and globalisation jointly lead to an increase in competition even in hitherto protected markets. The effect of e-commerce is felt in all sectors. No company can allow itself to sit back: E-commerce has evolved from an interesting way to supplement existing distribution channels just a few years ago to a strategic question of life or death today. On the other hand, many companies have e-commerce schemes not because they are convinced of its virtues, but because they don’t want to be left behind.

Competitive pressure is also felt on the capital markets. Stock valuations today depend to a large part on what a company is doing about e-commerce. Companies with strong commitment to wholehearted e-commerce strategies have high valuations almost irrespective of current earnings. Access to capital is another issue. Internet start-ups have been showered with capital up until only a few months ago, while brick-and-mortar companies from the “old economy” have difficulties in gaining capital.

**Technological progress, costs and availability**

A number of technological and market developments favour the spread of e-commerce. The most important are:
Additional to new access paths being opened up (see above), Internet usage will also be helped by broadband access technologies that are being introduced on the market. Among them, Internet services via cable-modem might have the best chances to attract large numbers of users. Other technologies with great potential are dedicated digital subscriber lines, ADSL, and Powerline. In some countries (especially Germany), the availability of ISDN for modest monthly subscription fees has helped Internet take-up.

Pricing structures of ISPs are becoming user-friendlier. Europe has long suffered from a lack of flat rate offers which allow users to stay online as long as they want without affecting monthly subscription fees (in the USA, flat rates for local telephony as well as Internet access are commonplace). Consequently, Internet users tend to stay online for much shorter periods in comparison to the USA, which of course affects the inclination to “shop around” for good offers. In 1999, flat rates were introduced in the U.K., with other countries like Germany following in 2000.

Strong competition on the Internet means that prices tend to be lower than in brick-and-mortar high street and supplier outlets which also has a positive effect on demand. Additionally, Internet retailers enjoy an unintentional advantage in some countries because they are liberated from paying certain taxes. In the USA, for instance, they don’t have to pay so-called local taxes when they are located in a different state to the recipient. Unequal treatment of companies according to their marketing channels is much in dispute today, so that changes e.g. in tax regiments might be around the corner.

Political support

Countries have been competing for e-commerce friendliness for some time now. The United Kingdom has declared its ambition to become “the world’s best environment for e-commerce”\(^{20}\). Of course, the depth and width of issues at hand are bound to cause disruptions between differing interests of the state, the public, Internet companies and established organisations from the “old economy”. But e-commerce until now has been an example of effective political support if not on the national, then at least on the supranational level, where the EU, the G7 group of nations and especially the OECD have been instrumental in pushing through urgent measures to deal with problems caused by the “border-transgressing” nature of business on the Internet.

Unfortunately, most of Europe’s national governments have failed to turn the public administration into a model case of Internet and e-commerce application. Exceptions only serve to prove the rule. Interaction between citizens and public agencies gives plenty of opportunities to use the Internet to make transactions more effective and customer-friendly. Moreover, it would act as a powerful multiplier of good practice because all companies and all citizens would come into touch with these applications, thereby experiencing the advantages of e-commerce first hand.

4.4.3 Inhibiting Factors

In spite of the fast growth of Internet access and e-commerce turnover, there are a number of issues, which act as barriers and constraining factors to faster diffusion of e-commerce. Some of these are described below.

Lack of awareness of added-value

Although the rapid development of the Internet is a real phenomenon, the media and opinion leaders have also exaggerated it considerably. This hype has overshadowed the fact that for

many potential users from private households as well as businesses, the value added of using the Internet for e-commerce is not at all transparent.

As far as business-to-consumer applications (online selling) are concerned, a large number of establishments do not want to get involved in the topic e-commerce. Slightly more than 40% of today's non-users, i.e. establishments which neither practice online selling at the moment nor plan to do so over the next 2 years, see no need for or benefit in online distribution. This applies to online sales as well as online procurement, and to a much higher degree to SMEs than large organisations.

Also among individuals, a high share of today's non-users in the EU does not see a need for online shopping.

Suitability of products for distribution e-commerce

Of course, not all products can be sold on the Internet because some require inspection (touching, tasting, smelling etc.), others need the customer to be physically present (e.g. many personal services). Around 1/3 of decision makers in German establishments are of the opinion that their products are not suitable for online selling.

However, if we apply a broad definition of e-commerce that goes beyond the business transaction itself to encompass pre-processing and post-processing stages (see chapter 2.2), it becomes much less obvious that e-commerce would be unsuitable for certain products. But it still has not been proven yet if there are profits to be made by selling, for instance, groceries online.

In the public debate about e-commerce, it is often assumed that there has to be a clear-cut decision between traditional distribution and Internet distribution. In fact, there are many possibilities to combine both so that the customer gets the best of both worlds. Brick-and-mortar retailers that also own an online shop, for instance, can benefit from their physical distribution network if they allow customers to order online at terminals located inside of retail outlets, or to physically inspect goods they have ordered online at a shop before purchasing, or to return goods they do not like or they have complaints about at a shop in their proximity, to name only a few possibilities. Innovative combinations of traditional and online distribution, however, are still all too rare today.

Costs and performance

The limitations of narrowband access have hampered e-commerce. For years, dubbing the WWW “world-wide waiting” was a running gag, which indicates that speed of data transfer was simply not high enough for the type of applications people wanted to use the Internet for. Of course, problems like this affect the willingness to use the Internet for online-shopping. Most of companies do not suffer from the same problems because they can afford broadband connections that deliver much higher data transfer speeds.

This problem was made worse by immature Website design that was not friendly to users and did not often take into account that colourful graphics and gimmicks exclude many users with narrowband access completely from using the service. There has been a lot of progress in this regard recently, which has been helped by the fact that innovations in Website design are very easy to emulate because they are out in the open, laid down in html code visible to the user.

The same cannot be said of the degree to which a Website (the “front office application”) is integrated with back-office systems for enterprise resource planning, warehousing etc. Back-office integration very much determines the performance of an online shop, i.e. the reliability, security and speed of delivery. In the early years of Internet-based e-commerce, many online shops had poorly integrated back-offices, which meant that the quality of services was bad, resulting in customer disappointment and disaffection with e-commerce as a whole. Industry leaders like Amazon in the USA have shown that control over back-office functions is the crux of success in e-commerce.
Surfing the Internet has long been a very expensive pastime for private users in Europe, with the notable exception of the Nordic countries. The OECD regularly calculates rates for so-called Internet access baskets. In 2000, the difference between the USA and the Nordic countries on the one hand and especially Germany on the other hand is still very apparent (see figure below).
Intense competition in all Internet-related markets means that the problems mentioned are being tackled. Applications for the Internet continue to become user-friendly, while companies explore new possibilities to benefit from the traffic their Websites attract on the one hand and from value chain integration on the other hand. Moreover, ISPs start to offer flat rates at reasonable prices even in countries that have traditionally suffered from very high access charges, like Germany.

**Data security concerns**

Because of its open architecture, the Internet is not well suited for transmission of confidential data. To make it possible to exchange data in a secure and reliable way, special technological measures have to be taken, e.g. encryption and use of public key infrastructure. These measures are adding costs to businesses that sell or purchase on the Internet, but much more important is the effect data security concerns have on the willingness of data owners to use the Internet for transactions. Recently, “denial of service” attacks on Websites have again made it clear that the Internet is an environment in which it is much harder to protect businesses from sabotage and malicious acts than the brick-and-mortar world we have grown accustomed to.

According to the ECaTT surveys, however, concerns regarding data protection and fraud are not crucial in the decision for or against selling on the Internet. We think, however, that they do exert an influence on the way establishments implement e-commerce, e.g. the range of products they sell.

**Consumer protection issues**

As the Internet is a fairly young technology which by its very nature and size appears to many as chaotic, building trust is essential if Internet shops want private and business customers to do business with them on the Web. In business-to-consumer e-commerce, trust
building requires measures that protect consumers from fraud, e.g. theft of credit card details. Customers also want to be sure that they are granted the consumer protection rights they are used to when making purchases from real shops or mail-order companies. In this regard, the Internet industry has not been entirely successful in creating trust. Disregard of basic consumer rights is still very commonplace especially among the thousands of small specialist e-shops. Also, in a business environment as hard to regulate as the Internet, there are always a few “black sheep” who, in search of quick money, bring online shopping into disrepute (on high street, such behaviour would be sanctioned quickly).

This problem is made worse by the possibilities the Internet provides regarding collection of personalised data. Technically it is very easy to record every move and action of a user and save the collected information in a database. If the user has logged into the site with a password after giving his name and address, the data file created can also be personalised. Many Internet ventures that offer free services to the public rely on revenues from the sale of personalised data to third parties. Here, consumer protection issues collide with vital interests of Internet companies that might not survive without this source of revenue. For the time being, reports about Internet sites frantically collecting data on users without the latter’s consent are doing harm to the image of the Internet as a place to do business.

The payment methods that are offered by Internet shops today are not sufficient. Results from ECaTT surveys show that many users and would-be-users reject paying by credit card because they consider transmission of credit card details on the Internet not to be secure enough. Cash on delivery is accepted by a much higher share of users, but this payment method is not offered by many Internet shops because of higher transaction costs. Although true Internet currencies might partly solve this problem, none of the available technologies has been able to gain a foothold on the market: there are doubts if consumers will accept any of the solutions any time soon.

Lack of critical mass

As with every other market, online marketplaces work the better the more participants take part. If the number of players on the market is too small, the number of instances where supply and demand do not match is high, discouraging both potential buyers and sellers. Eventually, the market might crumble and vanish.

According to the results of the ECaTT surveys, many business sectors online markets are still immature. Missing customer demand is the third often mentioned reason for not conducting sales online as well as for not using online-services for procurement. In many cases, online market demand seems to be too low to make e-commerce systems a viable option. From the perspective of potential (business or private) customers, this results in too few establishments making their products available online.

However, recent developments in e-commerce show quite clearly that e-commerce is penetrating increasingly diverse market segments. It is now safe to say that it is only a question of time until critical mass for e-commerce marketplaces will be reached in virtually every sector of the economy.

Regulatory barriers

The regulatory framework that defines the environment in which companies conduct business has evolved over decades and centuries. It is adjusted to the needs of the “old economy”. No wonder then that the Internet economy, characterised by no frontiers, intangibility and - to a certain degree - anonymity, requires adaptations of existing laws, rules and regulations. Because of the speed of the Internet development, the adaptation process in many cases lags behind, resulting in legal uncertainty. Discussion has focused on a number of issues:

- consumption taxes
- customs tariffs
E-commerce has brought to light a number of fundamental differences between the regulatory regimes of the USA on the one hand and the EU on the other hand. In the USA, businesses are much less regulated, whereas the EU has built an extensive legal framework for protecting consumers against fraud and infringements of privacy by the hands of companies. As e-commerce stretches across borders and American Internet ventures and their networks of foreign subsidiaries are conducting a high share of total international e-commerce, there has to be some kind of international agreement on a set of codes of conduct. Although the OECD has done some pioneering work in this field, there are still many open issues to be dealt with.

**Access to risk capital**

Stock markets all over the world have been enthusiastic about the Internet in the latter years of the 1990s. Stocks for Internet companies have been valued very high in proportion to turnover and especially to profits (which have mostly been absent anyway). In those countries with a mature market in venture capital, e.g. the USA, this has led to a very favourable business environment for start-ups with smart business models but lacking in capital. Internet start-ups enjoyed a huge advantage in this regard over companies from the “old economy”. In other countries, though, venture capital markets traditionally were much less developed so that start-ups have had a harder time to find capital (see figure below).

**Venture Capital Investments in Technology Companies 1998** *(Source: Price Waterhouse 1998a, 1999b, own calculations)*

![Venture Capital Investments in Technology Companies 1998](Venture_Capital_Investments_in_Technology_Companies_1998.png)

In the beginning of the year 2000, a chill-out set in that now makes it much more difficult for entrepreneurs to gain access to capital if their business models are not likely to achieve profits in the medium term. Stock market observers consider this development a rather healthy return to good old business values after it had seemed for several years that Internet start-ups would only need a good idea to get showered with money. Outside of the USA, however, this cooling off comes just at a time when venture capital markets were beginning to grow
steadily. In countries like Germany and France, venture capital markets expanded considerably in 1998 and 1999, not least because of investors’ eagerness to participate in the Internet start-up bonanza. It remains to be seen how the slump in Internet stocks will affect the chances of entrepreneurs to get financial backing.
5 The Political Dimension in Selected EU Member States, the USA and Japan

5.1 Overview of national differences in market liberalisation

Telwork as well as e-commerce depends (at least for the time being) largely on public telecommunications infrastructure. The costs of using telecommunications networks partly determine the economic case for telework and e-commerce. The great majority of businesses and individuals will only then adopt both when extra costs in direct comparison to traditional ways of working and doing business are considered moderate. For these reasons, rates for telecommunications services play a very important role for the spread of telework and e-commerce.

Although the liberalisation of the telecommunications markets has progressed in great leaps throughout the advanced capitalist countries, there are nevertheless large differences regarding the speed and rigour with which the process has been pushed by the national governments in the 1990s. In order to measure the stage of development and performance of telecommunications markets, Germany’s Mannesmann has developed the so-called Mannesmann-Index (MAX). Results have only recently and for the first time been published for eight European countries and the USA. MAX values will be updated every year. So far MAX only focuses on the fixed network market and leaves aside the mobile telecommunications market (which is in general much more competitive). MAX is composed of three sub-indices covering the issues of:

- liberalisation,
- competition and
- growth.

The arithmetical average of these sub-indices is used to generate the Composite-MAX, which evaluates the potential market development (liberalisation) on the one hand and the real market development (competition and growth) on the other.

According to MAX, liberalisation is most advanced in the UK and Denmark. Germany follows in third place together with the USA. Countries like France and Italy can be found at the bottom. The rather low index value for the USA comes as a surprise. Some European countries are ahead and more advanced here.
However, Europe is far away from real and complete competition in the telecommunications market with the exception of Sweden, which ranks top and even ahead of the USA. Germany can be found at the bottom. Only France, Switzerland, and Austria show lower levels of competition.

The low index values for European countries can in most cases be explained by the very low or not existing competition in the local loop.
Growth dynamics are high throughout the countries with Sweden and Germany ranking top. The USA can be found in the lower mid-field only, probably because deregulation and competition here have started already in the beginning of the 1980s, whereas in Europe markets are still very turbulent and immature.

Calculation of the composite index resulted in Sweden leading the field in front of the U.K. and the USA. All three countries have been amongst the first world-wide to liberalise their markets. France and Italy, both of which are still characterised by strong government intervention in the telecommunications market, as well as Austria and Switzerland still have a long way to go. Germany together with Denmark is in the middle field.
TABLE 1: MANNESMANN INDEX (MAX) 1999

<table>
<thead>
<tr>
<th></th>
<th>S</th>
<th>UK</th>
<th>USA</th>
<th>D</th>
<th>DK</th>
<th>CH</th>
<th>I</th>
<th>A</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberalisation</td>
<td>0.54</td>
<td>0.80</td>
<td>0.65</td>
<td>0.65</td>
<td>0.79</td>
<td>0.53</td>
<td>0.47</td>
<td>0.60</td>
<td>0.43</td>
</tr>
<tr>
<td>Competition</td>
<td>0.73</td>
<td>0.50</td>
<td>0.68</td>
<td>0.28</td>
<td>0.36</td>
<td>0.12</td>
<td>0.33</td>
<td>0.00</td>
<td>0.15</td>
</tr>
<tr>
<td>Growth</td>
<td>0.86</td>
<td>0.67</td>
<td>0.59</td>
<td>0.83</td>
<td>0.58</td>
<td>0.64</td>
<td>0.50</td>
<td>0.62</td>
<td>0.58</td>
</tr>
<tr>
<td>MAX</td>
<td>0.71</td>
<td>0.66</td>
<td>0.64</td>
<td>0.59</td>
<td>0.58</td>
<td>0.43</td>
<td>0.43</td>
<td>0.41</td>
<td>0.39</td>
</tr>
</tbody>
</table>

Source: Mannesmann

As telecommunications markets are very far from stagnation everywhere, further steps towards free competition are ahead. In particular, technological progress will cause major upheaval on the markets as soon as alternative access paths to online applications gain a foothold there, e.g. two-way cable, ASDL, mobile access. However, consumption and behavioural habits do not tend to change as fast as prices on the market. It takes some time until a marked decrease in prices is being translated into higher telework take-up as well as Internet usage. For this reason, today’s differences in market liberalisation (as illustrated by the MAX index) will continue to exert an influence on comparative diffusion rates in the years to come.

5.2 Overview of national policies and initiatives

5.2.1 Denmark

The Danish government set the agenda for introduction of the Information Society with the Info2000 plan in 1995. Info2000 is the Danish government's initial IT- strategy plan for leading Denmark into the Information Society. Since then the government and administration have been major locomotives in the process of transition. The government has the power to guide and aid development by technology push, in practice by setting up systems that are favourable to use, particularly in the areas of A-to-B and A-to-C communication. Another part of the strategy is digital accessibility to all information through national, administration, and authority Websites. A third part of the strategy is to focus on citizens' requirements and skills and finally to focus on how to shape technology and application of technology for the benefit of all citizens and citizen groups.

The effect of this initiative has been a systematic activity producing annual IT plans and other policy papers like
- “IT for all”,
- “IS - the Danish model”
- the “EDI - initiative, Electronic Commerce in Denmark – a national EDI action plan” and lately
- “Det digitale Danmark” (Digital Denmark/1999).

Danish policy, as it is implemented, is somewhat broader in its perspective than just establishing telework, new ways of work and e-commerce as it includes new ways of living, administrating and practising democracy.

One of the factors that have pushed development in Denmark was the decision to advance liberalisation of the telecommunications markets eighteen months year in advance of the EU directive. The regulation seeks to promote competition through minimisation of the entry barriers to the market. Market access is now completely open in Denmark, where all telecommunications operators, except for those providing public terrestrial mobile services, can enter the market freely, without the need to obtain individual licenses from the National Telecom Agency. This factor, among others, has resulted in around 50 operators providing telecommunications networks and/or services in Denmark - despite the relatively small size of the
country (see listings on Website of National Telecom Agency). The sale of the Danish State's shares in Tele Danmark underpinned the confidence in the political will to continuously promote competition in order to meet the goal “best and cheapest” (Source Teleprofile '99, Telestyrelsen). According to the MAX indicator explained above, Denmark together with the UK is leading regarding the degree to which the telecommunications market is liberalised.

Technology uptake has been advanced considerably in recent years. A big push for private PC ownership came in 1997 when the Danish tax law was modified so that a computer supplied by an employer for private use in an employees home is no longer subject to tax as long as it is also available to be used for work-related tasks. Employers rushed to pay or sponsor home PCs hoping that they would in exchange benefit from employees spending leisure time on developing their IT skills. The scheme has turned out an enormous success in Denmark, despite the difficulties with finding suitable tax arrangements for all groups of employees. Figures estimated recently indicate that around 275,000 participated in the arrangement.

While the business community has taken up B-to-B e-commerce very quickly, the B-to-C development has been very slow. Much of the reluctance seems to stem from anxiety and fear of fraud with online payments despite the Danish consumers being very well protected by legislation.

A handful of Websites have been put up by Government agencies to help consumers and to inform enterprises wanting to establish online shops:

- www.elektroniskhandel.dk and www.e-fokus.dk (purpose: to initiate concrete activities to aid development of e-commerce in Denmark)
- http://www.netfornuft.dk (purpose: answering FAQs about online trading)
- www.forbrugersikkerhed.dk (purpose: addressing security aspects of online trading)
- http://www.danmark.dk/ (purpose: first port of call for all public-authority-related matters)

At the end of 1998 nearly 50% of approx. 4,000 Danish educational institutions were connected to the Sektornet, the gateway to the Internet for more than half a million Danes. Schools invest in new computers and the pedagogical version of EPCDL is catching on aiding the implementation of IT in all subjects.

Some private-sector initiatives of significance comprise:

- In exchange for giving employees free home PCs, employers demanded participation in an EPCDL courses (PC user’s “driving license”). By November 1999 226,000 people have participated in formal training.
- Tele Danmarks published the “Guidelines to Flexible Work”, a comprehensive report accompanied by intensive promotion in 1998 that earned the European Telework Award ’99.
- The Association of Danish Internet Commerce (FDIH) is an organisation whose sole purpose is to promote the commercial and business-like related applications of the Internet. FDIH represents the e-commerce industry and plays a very active role in shaping development of e-commerce in Denmark.

The unions, traditionally very powerful in Scandinavia, have implemented telework in their formal agreements. The major change since the first agreements and telework contracts is that the rigid definition of telework being applied ‘at least one day at a fixed weekday’ has been softened somewhat with the growing understanding of the dynamics of telework. Regular telework is still a basic condition for a telework agreement. Current issues are the existing so-called 11-hours rule’s potential application to telework for protecting workers.
5.2.2 Finland

In terms of international comparison, Finland is in the absolute forefront of Information Society development. There are two processes going on in Finland in the area of new forms of work and e-commerce. First of all, the government, universities and other organisations work together with workplaces to improve the organisation of work. Most of the development activities, however, happen as a natural, often unconscious, part of the normal change of business and service activities. Work and new ways of doing business are increasingly based on information networks. This helps the integration between one’s own working environment and that of one’s clients and reference groups. Working in information networks is increasingly linked to the better utilisation of intellectual resources. ADP and information systems become an inseparable part of work arrangements, allowing the modification of time-related and spatial parameters. E-commerce for its part also requires new technologies and skills to use them. The core point in e-commerce, though, is to understand the nature of the new business environment and how to maximise the benefits it clearly offers. The manifestation of work, business and service activities in the information network dimension stresses the conceptual transfer to e-work and e-commerce.

In telework and e-commerce, the most important initiatives are:

- the National Telework Theme Group has fostered distance working since 1993 as part of the updating of the Information Society policy a spear-head programme of telework “eWork Today and in the Future” is targeted both at work life and regional development and takes into account the principle of sustainable development
- a campaign targeted at summer cottages and municipalities to promote telework. Information about this can be found for example at: [http://www.uta.fi/telework](http://www.uta.fi/telework) or [http://www.mol.fi/tyke](http://www.mol.fi/tyke)

- the aim of the e-commerce development project for which the Ministry of Transport and Communications is responsible is to promote, by means of the government, business practised in the electronic communications networks and introduction of new technologies. Linked to the above is, for example, the NetMate development programme, launched in autumn 1999, which aims to encourage SMEs to use the possibilities offered by e-commerce and to strengthen the link between academic research and SMEs’ everyday practice.

Many public reports and addresses have emphasised the importance of the skills and knowledge resources as the pre-condition for successful business and employment. In the IT branch, the development and marketing of services based on the Internet and networks continues. The Finnish high tech industry is very much based on applications related to telecommunications and the use of Internet connections.

It is believed that Finland has eligibility for operating in a key position when the technological solutions for the Information Society’s next stage, based on wireless communications, will be produced. Nowadays there are a lot of Finnish enterprises that are actively developing content products and services of new types that will be availed of in the electronic network. Similar activity can also be found in the public sector, among private citizens and other central actors of the society.

According to the national vision:

“Finnish society develops and utilises the opportunities inherent in the Information Society to improve the quality of life, knowledge, international competitiveness and interaction in an exemplary, versatile and sustainable way” ([Quality of life, knowledge and competitiveness, premises and objectives for strategic development of the Finnish Information Society, Finnish National Fund for Research Development, Sitra 211, Helsinki 1998](http://www.sitra.fi)).
5.2.3 France

Paradoxically, uptake of the Internet in France has been hampered by the early success of the Minitel system which was not only the first online-service world-wide taken up by large parts of the population, but also continues to generate very substantial revenues for France Telecom and service providers. 1998 was the year that saw the real take-off of the Internet in France (IP traffic has increased fourfold and PSTN traffic generated by the Internet has trebled) but France has still not caught up with its main European partners (Germany, United Kingdom) while the Internet remains still less used than the Minitel, which has kept on to its 15 million users (but with a downward trend in traffic volumes).

With over 70 fixed service licences issued by the end of 1999, the French market is now fully open. In January 2000, the market share of rivals to France Telecom raised 19.3% for international and long distance telephony. This trend, however, should be put into perspective in that the competition is focused on corporate services and long-distance traffic, while virtually all local traffic (excluding mobile) remains in the hands of the national operator. It is also to be recalled that while France was recognised by the European Union as the good boy of the class in regard to respect of the deadline for liberalisation, it seems to be lagging somewhat behind its major neighbours in areas such pre-selection, number portability and unbundling. Several scenarios are taking shape for the opening up of the local loop, some of which are:

- installation of more fibre optic local loops in the main business districts,
- development of telecoms services on cable networks,
- future allocation of wireless local loop operating licences (due by the end of the first quarter of the year 2000),
- partial unbundling of France Télécom's local loop for offering high-speed services

The French Prime Minister, Lionel Jospin, in 1997 identified some major barriers that have resulted in France being not on the forefront of Information Society developments:

- lack of quality French-language services on the new networks,
- insufficient amount of support available for small and medium-sized businesses, especially for the newest (start-ups) and innovative businesses and
- the marginal position of IST-related teaching in the French education system.

As a remedial measure, the government launched a national programme for the promotion of Information Society called PAGSI in 1998. One of the main objectives of the programme is to democratise the use of IST in France and, in particular, the Internet. The programme represents a budget of 5.76 billion FF (roughly 880 million EURO). Six priorities have been highlighted by the PAGSI:

- education,
- culture and arts,
- modernisation of public services,
- businesses and e-commerce,
- research and innovation,
- legislation.

Rather than create a centralised institution (e.g. a Ministry) responsible for new technologies, the decision was taken to involve all public services at both national and local level. The overall strategy is founded upon the following bodies:

- the Interministerial committee for the Information Society (CISI);
- "Information society correspondents" chosen within each ministry;
- "Ministerial action programmes for the Information Society" (PAMSI), drawn up for each ministerial department; and
the “Interministerial technical support mission for the development of information and communication technologies in Government administration” (MTIC).

The French government subsequently multiplied initiatives to make companies aware of the stakes of the Information Society, particularly with regard to e-commerce. The last step has been the adoption by the French parliament of a law on digital signature in February 2000. At European level, the French government also teamed up with the Spanish government in January 1999 to submit a demand to the Union that Internet access be included in universal service.

At the request of the Prime Minister, the Council of State prepared a report on the law and the Internet in September 1998. The Council did not recommend the drafting of specific legislation for the Internet but suggests that existing texts, modified where necessary, be applied. Early in 1999, however, current laws showed their limits in one case where a host provider, Altern, was found guilty by a French court of having hosted illicit images on one of its sites. As a result of this, an amendment to current laws was approved in the beginning of June 1999 by the National Assembly. In effect, the text relieves the host provider of the responsibility to actively control contents on hosted Websites.

In January 1999, the government softened its stand on encryption technology allowed for sale, with a view to promoting e-commerce in France. Also early in 1999, the government took a stand on the question of personal data protection on the Internet, notably by increasing the means and powers of control of the Commission Nationale de l’Informatique et des Libertés (CNIL). The CSA (Conseil Supérieur de l’Audiovisuel), in turn, has pronounced in favour of regulating audiovisual services disseminated on the Internet and is currently studying this subject in collaboration with regulators in other countries.

Currently, an Information Society Law is under consultation that addresses the main legal problem bound up with the use of the Internet such as copyright, cryptology, consumer protection, etc.

Telework is not taking off in France at the same rate as in other European countries. When talking about telework in France, it is always the same examples that pop up: for instance, in March 2000, IBM France unveiled its large initiative of neighbourhood centres in the Paris region. The comparison between telework practice and interest is particularly significant in this country. A lot of executives agree on the potential benefits of telework, but very few launch telework initiatives within their own establishments. Many stress the barriers that exist when implementing telework.

Looking at the PAGSI, telework is cited as an organisational mode to be supported but no specific budget is allocated to any supporting actions or initiatives. In summary, it is proving difficult for telework to be accepted in France but at the same time the widespread availability of the Internet is providing the opportunity for more and more people to work occasionally at home without being considered teleworkers.

The French government is very concerned with supporting schools and other educational organisations on their way into the Information Society. Some of the proceeds from the 1998 floatation of France Télécom shares were used to equip schools with computers and link them up to the Internet. In one year, the number of high schools connected to the Internet went up from 40% to 90%, of middle schools from 20% to 70% and of primary schools from 1% to more than 15% respectively. The pupil-computer ratio has also shot up to 7 for secondary schools, 17 for middle schools (compared to 30 the previous year) and 30 for primary schools. EDUCASOURCE and EDUCNET are major Websites set up by the government and targeted at teachers, training staff, pupils and students.

Moreover, according to a survey on behalf of Le Monde de L’Education, France is very advanced regarding the number of students in distance learning schemes, accounting for 400,000 participants out of 1.9 millions in the whole of the EU.
5.2.4 Germany

Over the past two years the telecommunications landscape in Germany has – due to strong liberalisation efforts - developed into a fast growing and increasingly competitive one. Germany now belongs to the top group in the world with respect to telecommunications infrastructure quality, penetration and use. It is moving in the same direction with respect to telecommunication prices mainly due to the heavy competition in this market resulting from the market liberalisation and subsequent emergence of many competitors to formerly state-owned Deutsche Telekom. Finally, free Internet access is starting to become more widely available in Germany. Today, Germany offers very good infrastructure prerequisites and preconditions for e-commerce and new forms of work such as telework.

In Germany, Federal and Federal state governments have, over the past years, heavily invested in awareness raising and funding programmes to improve the diffusion and penetration of e-commerce and telework and initiatives to pave Germany’s way towards the Information Society. The intention is to continue with these activities addressed to industry, public administration and the general population during the next years. In addition Federal government has announced a number of specific programmes to reach different set targets. In telework, the most important initiatives are:

- the initiative "Electronic Commerce" by the Federal Ministry of Economics; and the more wide-reaching initiative "Forum Info 2000", both started in 1996 mainly as awareness raising activities;
- the establishments of a network of “Electronic Commerce Competence Centres” in 1998, targeted at SMEs many of which are believed to badly need assistance in finding e-commerce adequate strategies;
- a number of “Pilot Projects Fostering Electronic Commerce Applications in SMEs”, an initiative by the Federal Ministry for Economics and Technology (BMWi);
- DATEL (“Secure Telework in Public Administrations”) addressing security issues which are believed to form a major barrier to telework uptake;
- union initiatives such as TELEWISA and Online-Forum-Telearbeit (OnForTe), also positively contributing to the wider spread of telework in Germany;
- the “Schulen ans Netz” (schools to the Net) initiative which aims at rapidly improving the IST infrastructure of schools.

The government is being supported by emerging private sector initiatives, namely the most relevant one called Initi@tive D21 that wants to support the transformation of Germany towards an information Society by way of a number of projects set up as public-private-partnerships. The "Transatlantic Business Dialogue (TABD)" by the European and US industry and "Global Business Dialogue for Electronic Commerce" by the CEOs of large international corporations, where large German corporations are also involved, seem to be an appropriate approach to develop recommendations, measures and appropriate actions to impact political as well as industrial developments in a positive way.

Despite excellent infrastructure, Germany has so far been rather slow in moving towards the Information Society - somewhat typical for Germans in the early stages of newly emerging developments. However, it appears as if the country is starting to move ahead more speedily now. In telework already, political initiatives together with a more competitive business climate have resulted in exceptionally high growth rates in the last few years. German Federal and Federal state governments have invested heavily in different telework awareness raising and funding activities aimed to support the implementation of telework generally and in SMEs Telework no longer lives in the shadow but has become an important topic in the media and the press.

It appears as if key players in policy at Federal as well as at Federal state level and among the social partners in Germany have learned their lessons over the past five years and are
now constructively and jointly working together to make telework a widespread reality in the country. Still, there is some way to go, as a comparison of Germany with Europe’s foremost telework countries like Finland, Sweden, Denmark and the Netherlands shows. As some existing laws and regulations still negatively impact the spread of telework, there is much room for additional measures which might further boost the uptake of telework. Counterproductive regulations include the current provisions concerning tax deductions of computers and work desks in private homes and the allowances paid to teleworkers by their employers which are currently taxed at the top rate - with social security payments also being paid on this sum.

Germany currently does not rank top when it comes to e-commerce usage in the b2c area. Germans are cautious when it comes to online shopping mainly because they do not see a need for it. However, the growth rates show some signs of (slow) change. The strength of Germany in e-commerce lies in the area of business-to-business applications. These include data exchange with suppliers and business partners over the Internet, joint business processes with partners and online procurement. German companies would be even more active in this area if more suppliers would provide their offers online.

5.2.5 Ireland

Overview of policy on teleworking and e-commerce in Ireland

Ireland's situation in relation to telework has seen significant increases in the number of companies implementing teleworking arrangements over the last two years. This increase is influenced by a more supportive government climate than previously existed. Prior to the establishment of the National Advisory Council on Teleworking (NACT) in 1998, the government's position on teleworking was relatively silent and growth in this area was impeded by a lack of organisational models of teleworking, poor data on patterns of teleworking, and little if any input into awareness raising, education and training. However, with declining connectivity charges, tightening labour markets and greater employee interest in more flexible forms of working arrangement government action has emerged under a number of forms. Firstly, in June 1998 the National Advisory Council on Teleworking was formed and after a period of one year presented eight recommendations under its four action areas - Awareness, Developing Employment Opportunities, Training, Education & Support, and Fiscal and Telecommunications Environment. The NACT recommended the establishment of a National Telework Forum (subsequently renamed the eWork Action Forum) and under its auspices, Enterprise Ireland will address many of the Council’s recommendations. It also released a Code of Practice on e-working in Ireland and it is hoped that this code will form the basis of most teleworking arrangements in Ireland. IBEC and the Irish Congress of Trade Unions have endorsed the Code of Practice. Secondly, Enterprise Ireland's three-year development strategy continues and develops the work started by the NACT in awareness raising and promotion of business teleworking in order to enhance business competitiveness. Other actions on teleworking are being continued by Telework Ireland, the Work Research Centre, and other ESF funded initiatives under the ADAPT programme. These initiatives should help to develop a culture of telework-centred organisations within three years.

Electronic Commerce

In Irish policy, e-commerce is defined in its broadest sense to include all aspects of business that take place over networks such as the Internet. It includes goods and services that are delivered over these networks, such as software and music, and goods ordered over the networks but delivered in some other way, such as personal computers. It covers the whole range of business functions required to support these activities from marketing to production to delivery and service and includes the hardware, software, content-generation, telecommunications, and support services that make all this possible.

E-commerce at policy level in Ireland is a tool for economic and regional development, which requires a multi-disciplinary approach if Ireland is to remain competitive in the medium and
long terms. Government action regarding education is aimed primarily at meeting the future IT skills needs of the economy. This action is supplemented by initiatives from the private sector, primarily in the software sector. Government and private sector players, e.g. IBEC, the employers’ body, the ECAI, and the Information Society Commission, have adopted the role of raising awareness of e-commerce. Sectoral initiatives are aimed at maximising the opportunities presented by e-commerce. Several initiatives have already begun in sectors such as software, food, tourism, logistics and fulfilment, etc. However, before industries can take full advantage of e-commerce certain actions are required to create a favourable environment. For example, the need for a regulatory and legislative framework, an immediate passing of the Copyright Bill, to bring forward a framework for voluntary certification, exploration of VAT options, etc.

The main players at policy level include the Department of the Taoiseach, which has overall responsibility and co-ordination of government efforts to develop and implement policy in e-commerce and IT. In January 1999, a broad action plan was launched which covered communications and infrastructure, the development of e-commerce and business opportunities, implementing enabling and legislative measures, and the delivery of public services. The Information Society Commission advises government actions in relation to shaping public policy in the Information Society in Ireland and more generally in raising awareness of the business opportunities from e-commerce and ISTs. At a government department level, the Department of Justice, Equality and Law Reform works to develop strategies on the illegal and harmful use of the Internet, the Department of Public Enterprise targets its efforts at developing a framework for national policy on electronic signatures, electronic contracts, certification service provision and other related matters. An integrated government approach to e-commerce has resulted in a number of achievements and draft legislation as follows:

**Government Achievements**

- Cryptography and electronic signatures
- Joint Ireland/US communiqué on e-commerce
- Publication of the Reports of the Advisory Committee on Telecommunications & National Competitiveness Council & Information Society Commission
- Technology Fund
- Schools and education initiative
- Public/private partnership for connectivity

**Draft Legislation**

- Anticipate electronic signatures directive
- No discrimination in Irish law against: electronic contracts, electronic signatures, electronic writing, or electronic originals
- Basis for certification service providers
- Enacted May/June 2000

Telecommunications policy in Ireland has been advancing rapidly since deregulation occurred over a year ago. Deregulation of the telecommunications industry resulted in the entry of many global players into the Irish market. Some of the major players include Eircom, which before deregulation was the sole telecommunications provider; MCI/Worldcom, BT/Esat and Stentor Communications. Telecommunications form a pivotal role in Ireland’s economic development strategy as evidenced by expenditure of US$ 5 billion in telecommunications over the last decade. In general, current government focus is on accelerating telecommunications competition and improving the existing infrastructure with a view to supporting the competitiveness of Irish businesses and attracting new inward investment.

At the end of 1998, an Advisory Committee on Telecommunications reported to the government on three areas pertaining to the creation of a fully open and internationally competitive
telecommunications market to stimulate investment; ensuring that Ireland becomes a global leader in information-based employment, Internet-based industries, and e-commerce; and enabling all citizens to have access to and fully participate in the Information Society. Practical recommendations by the Advisory Committee addressed telecommunications competition, Internet access and connectivity, e-commerce and citizen access, and human resources. Subsequently, the recommendations of the National Competitiveness Council have formed the basis of much government policy and subsequent action in the telecommunications area. In particular, a public-private partnership approach is being applied to encourage investment in key areas of infrastructure.

Two barriers have been identified which if not tackled will impede Ireland's development in e-commerce. Firstly, there is limited broadband infrastructure and secondly, limited international connectivity. Government policy in this area is aimed at accelerating investment in telecommunications on a partnership basis, encouraging competition, and monitoring Ireland's progress with other countries.

In conclusion, the Irish government's role in furthering the development of e-commerce and teleworking can be described as facilitative in terms of providing legislation and regulations, business models generally and from within the government itself in particular. Indications for the future are very positive as new types of e-commerce are looming in the form of online stock trading expected in August this year, and from September 2000 citizens will be able to file their taxes online.

5.2.6 Japan

Contrary to popular wisdom, Japan is neither at the forefront of IST penetration nor cutting-edge applications. In fact, the Japanese business environment is characterised by considerable conservatism in its approach to both e-business and innovative work arrangements.

Until the mid-nineties, the use of personal computers was not at all widespread in Japan. Accordingly, growth, while rapid, starts from a quite low base. In fact, it was not until June 1995 that the number of Japanese Internet users topped the one million mark. According to the 1998 Communications White Paper, there are now 16.94 million Internet users in Japan (11.0% of households, up from 6.4% in fiscal 1997). The 1998 Communications White Paper reports that Internet-based e-commerce reached JPY2,597.9 billion ($21.83 billion) in 1998, of which transactions of consumer goods doubled to JPY166.5 billion ($1.40 billion). With the boom in mobile phones (cell and PHS, 47 million as of fiscal 1998) and high sales of notebook and sub-note computers (2.55 million sales in 1996 or 153.7% year-on-year growth), mobile computing in Japan is projected to increase quite rapidly over the next few years.

In promoting new ways of working, the central government has been the major driving force with only limited interest displayed at either the prefectures or municipal (city, town, village) levels. Within central government, the main players to date are undoubtedly the Ministry of Posts & Telecommunications (MPT) and the Ministry of Labour (MOL), other institutions show occasional rather than sustained policy interest. Promotion of e-commerce is still in a very embryonic stage and dominated by awareness-raising campaigns and/or trial projects. The major government players are the Ministry of International Trade & Industry (MITI), Ministry of Construction (MOC) and the MPT.

The most recent attempt to assess the number of teleworkers in Japan is the Telework Population Survey conducted by the Satellite Office Association of Japan. This showed that, as of 1996, the number of full-time, white-collar teleworkers was 809,000, of which 680,000 - or 4.23% of all white-collar workers - were regular teleworkers. When calculated as a percentage of the total work force in 1996, this figure represents a telework level of 1.5%.

The main barriers and constraints to the uptake of new ways to work are the following:

Management culture barriers
Traditional Japanese corporate culture and traditional business practices are often cited as barriers to achieving stated telework objectives. The deep-rooted emphasis on face-to-face communication and poor evaluation skills of managers are two factors singled out specifically. Lack of manager awareness of telework and a preference for hierarchical management systems are additional factors. A lack of clear-cut missions and/or job descriptions is a further constraint. Elsewhere, a lack of awareness of the potential for micro-outsourcing in Japanese corporate circles is seen as another hurdle.

Technological constraints
Underdeveloped IT infrastructure, the need for better communication tools, and low levels of computerisation and/or computer literacy are the most frequently cited issues hampering the greater penetration of telework in the technological area.

Tariffs
High communications/Internet access costs are a serious barrier to the greater diffusion of new ways of working in Japan.

Legal and regulatory barriers
Despite the fact that the Ministry of Labour has reported officially in the Telework Promotion Council that there is no legal restriction on home-based or off-site working and that workers’ compensation, for example, would apply, many Japanese companies labour under the misconception that home-based working is not allowed. At the very best, many are unsure of how far they are permitted to let employees work off-site under existing labour legislation.

Housing constraints
Japanese housing is often cited as a further constraint, although this only affects the take-up of home-based telework, and mainly those living in inner urban areas. Nevertheless, the design of home-based workspaces is, indeed, more challenging in the absence of a dedicated room.

In spite of these barriers exerting a strong influence, the trend towards IST-facilitated new ways of working is gathering steam. However, a crucial factor particularly in the corporate sector will be whether management can embrace a radical departure from the status quo.

Big business in Japan has also been slow to enter the e-commerce market. Their activity is further characterised by a significant number of experimental projects and trial malls, but a dearth of fully-fledged business developments.

According to MITI/Andersen Consulting (1999), e-commerce relationships classified as B – B (business-to-business) dominate the market in terms of transaction value share (¥8.62 trillion). This value corresponds to an e-commercialisation percentage of approximately 1.5% (compared to 2.5% in the US). The B-B category also shows the largest predicted growth rate until year 2003 (¥68.4 trillion/11.2%).

Main drivers include:

- Business operations reform/rationalisation
- More effective buyer business negotiation operations
- Lower costs
- Inventory rationalisation/Lower cycle times

MITI/Andersen Consulting (1999) predict B-C trading value will double each year within the period 1999 – 2003. The current level represents approximately 1/35 of the American market (in value terms), with Japan estimated to be some 4 – 5 years behind the US. By 2003, this gap should close to around 1/7 of the US market or a 3-year lag.

Often-cited motivation for starting B-C e-commerce businesses include gaining more market space; more effective customer service; and lower sales and marketing costs. The current reality is much more experimental and takes the shape of pioneering the VSM concept.
Major barriers and constraints in the e-commerce domain include management culture issues (reluctance to use open computer networking; significant computerisation discrepancy between large and small enterprises; priority for face-to-face communication), technology issues (reliance on costly proprietary and customised solutions; low knowledge of EDI/CALS), and tariffs (high costs; absence of flat rates, etc.).

Given the small size of B-B and especially B-C e-commerce, it can only be concluded that there is considerable potential for growth. Andersen/MITI expect largest growth in Travel (highest growth rate), Cars & PC market sectors towards 2003. Others see new products and light-version mobile Internet shopping habits emerging.

Likely future technological trends include:

- The mass market end of the Internet will be telephone based (e-mail “pet” terminals may become a new teenager hit product, etc.)
- Video-conferencing on the move: PHS network 32kbps communication applied in dual handsets (opens up possibilities for new types of consumer dialogues and personalised Internet services)

With regard to the effect on business processes, the development of a workable, broadly adopted electronic money system would have an obvious impact on business processes, especially at the micro-commerce level. E-commerce also offers the chance to develop an open and advanced service environment on open business networks (OBN). This would represent a major shift in existing proprietary management systems in Japan.

In summary, the basis for the sound development of e-commerce and new ways of working are being laid in Japan by market forces, changing demand patterns and regulatory reviews and measures. While initial take-up is low, growth in supporting infrastructure is rapid. It therefore seems tenable to expect both Japanese EC and NWW efforts to expand in the future although they will still lag behind the U.S. for some time.

5.2.7 Netherlands

Over the past two years, due to strong liberalisation efforts, the telecommunications landscape in the Netherlands has developed into a market of rapid growth coupled with strong competition. Conservative forecasts indicate growth in Internet use from 1998 to 2002 by 100% a year and an average growth in mobile telephony of 60% a year. The Netherlands now belongs to the top group in the world with respect to the quality, penetration and use of telecommunications infrastructure. The government recognises the increasing pressure on the (broadband) capacity of the telecommunications infrastructure as a result of new user applications, and is monitoring it as a potential bottleneck.

Particularly during the first half of the nineties, the Dutch government was very active in the promotion and stimulation of teleworking. Examples of initiatives in this period are the establishment of the ‘Platform Telewerken Nederland’ (Netherlands Platform for Teleworking) with strong emphasis on using telework to achieve transport policy related objectives, and numerous telework projects within the government, at departmental, provincial and municipal levels. ‘Stichting Nederlands Telewerkforum’ (the Dutch Telework Forum), the successor to ‘Platform Telewerken Nederland’, is the main agent for awareness-raising campaigns today.

Major telework initiatives comprise:

- Fileverdunningsplan (Traffic Jam Reduction Plan) by the Ministry of Economic Affairs. Its goal: to let 25,000 people who travel by car between the cities of Amsterdam, Utrecht and The Hague work at home. The Plan (jointly financed by the government and the business community) would supply each person with a rapid Internet connection and a multimedia PC in exchange for a promise not to use the car during peak hours. The
Ministry for Transport & Public Works, however, has withheld the go-ahead for the plan until now.

‘Stimuleringsmaatregel Dagindeling’ (Timetable Programme Incentive) by the Ministry for Social Affairs and Employment. Under the heading ‘Our society is ready for new agreements’, experiments with flexible work timetables which enable people to better combine work and care are subsidised. The experiments can be set up by government agencies, companies and public organisations.

‘Actieplan Emancipatietaakstellingen Departementen’ (Departmental Action Plan for Liberalisation Objectives) by an interdepartmental working group. The plan studies the possibilities of an ‘availability scenario’ within the framework of the ‘Actieplan Emancipatietaakstellingen Departementen’. This entails that employees must be available, but can also carry out their work or part of it elsewhere. The plan again addresses the home/work interface. Telework plays an important role in this.

Over the last few years there was a gradual shift towards a more integrated approach to teleworking, through which the net asset value for organisations themselves was brought into the limelight. Mobility aspects are no longer of primary interest. Telework is now being promoted as a tool to help retain valuable staff and attract employees with scarce qualifications. Social objectives have been pushed aside in favour of the business community that is suffering from scarcity on the labour markets. Teleworking is being stimulated through tax benefits for employers who facilitate teleworking by employees.

Apart from telework, in the second half of the 1990s government attention broadened to policies concerning the Information Society as a whole. Concrete projects to stimulate the use of information and communication technologies were submitted through the ‘Nationaal Actieprogramma Electronische Snelwegen’ (National Action Programme for Information Superhighways).

Some of the main Information Society programmes are:

‘Nationaal Actieprogramma Elektronische Snelwegen’ (NAP, the National Action Programme for Information Superhighways) initiated in 1994. Through the programme, the government made financial resources available to enable the execution of the following lines of action:

- liberalisation of telecommunications infrastructure
- liberalisation of the Media Act
- definition of a public domain
- example projects in the public sector
- initiatives in the market sector

Sp.OED (‘Stimuleringsprogramma Opkomst Elektronische Diensten’ [Incentive Programme for the Development of Electronic Services]), a large-scale information programme based on six key objectives to accelerate the implementation of new telematics applications in the Dutch business community. Sp.OED is to give the Netherlands a leading role in the development of new IST applications. To this end, Sp.OED carries out an incentive programme with the objective of advising 3000 companies on the use of the information superhighway over a period of three years, up to the end of 2001. SMEs receive advice free or for a small fee. Besides providing advice and information, Sp.OED is also involved in training and has also developed a scan on electronic business.

The success of the NAP was re-evaluated in 1998. A result was that although the most important condition - access to networks for a large proportion of the population - appears to be better fulfilled in the Netherlands than in many other countries researched in the benchmark, the development on both the demand and the supply side in the market still continues to lag behind. Subsequent government action focused on the role of the state as
legislator and regulator, safeguarding a number of fundamental values and standards in the electronic environment; model, striving to make the best possible use of the opportunities offered by ISTs, such as services to citizens and companies; fostering knowledge and accessibility, especially through IST training programmes (e.g. through ‘Onderwijs Online’ [Education Online]) stimulate the use of information superhighways by citizens, companies and the government (e.g. through MediaPlaza, a demonstration centre for the information superhighway that aims to familiarise 100,000 business users with the opportunities offered by ISTs) monitor the state of the telecommunications infrastructure according to its readiness to cope with future demands, and foster technological progress (e.g. through the GigaPort project).

De Digitale Delta, Nederland oNLIne, set up in 1999 as a successor of the NAP, is intended as a five-year plan to co-ordinate all IST-related government activities. One of these is the e-commerce action plan. The objective of this plan is to further develop the Netherlands into one of the leading countries in the area of e-commerce, an ‘Information Gateway to Europe’. Key objectives are:

to create a favourable business environment for the rapid development of e-commerce;
to ensure clarity concerning the legal framework for e-commerce;
to develop and implement a perspective on international co-operation, from both a multilateral and a bilateral point of view.

In keeping with Dutch tradition, many initiatives that have been resulting from these programmes involve a collaboration between the government and the private sector. One successful example is the Twinning initiative. With this project, new businesses in the IST sector are financed, supported and accommodated in one of the two Twinning Centers in the Netherlands by the ‘Twinning Start Fonds’. A total of around 80 companies are located in these centres.

5.2.8 Spain

E-commerce

In Spain the Internet is taking longer to be recognised as a tool for reshaping the way of doing business than in other European countries. Acceptance among the general public is also still low. It will be some time before IST usage becomes commonplace in companies as well as private households. It will also take a while until the Internet’s potential as an efficient channel for exchanging goods and services will meet the expectations of those Spanish firms that have begun to invest in e-commerce.

E-commerce is treated as a “distance sale” in Spain, and therefore adheres to the Ley de Ordenación del Comercio Minorista. The new law concerning “digital signatures” is already in place and the new Spanish Penal Code sorts out any illegal activities committed while using electronic tools or communication. The general Telecommunications Law authorises coded messages, but leaves the door open to possible mandatory controls.

In 1998, the European directive concerning the protection of personal data was created, and brought about the related Spanish legislation, LORTAD (Law Regulating the Treatment of Personal Information Online), a law that for many appears very inflexible. For this reason, entities such as La Asociación Española de Comercio Electrónico (AECE - The Spanish Association of Electronic Commerce) have implemented some initiatives for the self-regulation of the e-commerce sector. One of these initiatives is the creation of a code of ethics to dealing with the use of personal data of consumers obtained over the Internet. This will be im-
plemented through ‘a label of guarantee’ that can be used by those companies willing to adhere to the principles of the code.

The New Digital Signature Law (14/1999) is already in place, the Royal Decree concerning the Electronic Signature is operating and eighty percent of its content is already in direct application. The new law permits that the electronic signature has the same legal validity as the written signature, it also defines the role and requirements of the certification entities, and allows for the electronic completion of buying and selling contracts, which is particularly useful for Business-to-Business e-commerce. The primary benefit of the law is that there will finally exist a form of material identification that the signer and the document will be identifiable and recorded. This will have a positive effect on take-up of e-commerce in Spain. Smart cards will play a large part in the dissemination of the electronic signature, facilitating e-commerce.

The Spanish public administration has a double role in regard to e-commerce: as both user and promoter. Most of the effort goes to promoting the use of e-commerce among governmental institutions and companies, primarily in regard to purchasing and contracting. Among the services that are already using online services to conduct business are customs, tax collection, social security, employment services, official registries, and public service contracting. The Administration, however, still lags behind in using new technology to streamline organisational structures and regulations. In 1998, an Advisory Group on the Industry of the Information Society created by the Ministry of Industry and Energy put forth a series of recommendations to help further develop the use of information technology within the Spanish administration: stimulation of demand, improvement of infrastructure and setting a good example by means of internal projects in which ISTs are made us of. With these and other recommendations and steps, they intend “to convert the civil service into leading users of information technology”.

Some outstanding examples of IST use by the public sector:

The Spanish Mint (Fabrica Nac. de Moneda y Timbre) identified a need for a national infrastructure to ensure secure electronic transactions. With different government organisations developing different systems, citizens and companies would be forced to register separately for each one, creating unnecessary duplication of effort. From 1997, the Spanish Mint began work on the conceptual design, processes and technology infrastructure required to ensure security, authenticity and confidentiality for electronic data communications and to address the issue of legal validity of electronic transactions. A National Certification Authority, CERES (Certificación Española), was created to design and develop a new system based on the Public Key Infrastructure (PKI).

Spanish citizens are now able to deliver Income Tax Reports to the government via the Internet using the CERES infrastructure. Spain is world leader in this regard. By June 1999, already around 20,000 citizens had submitted their reports using this service. Since then, additional related services have been put in place, including online query of tax information, settlement status and tax information update. A tax return service for companies will soon be available with an estimated user base of over one million citizens.

The citizens of 10 Spanish provinces can also report offences to the Police via the Internet. In the current first phase of implementation, one can only report offences such as damages, misleading documents or items, vehicle theft, withdrawal of documents or items, and theft from homes or shops.

In Spain, the use of the Internet by academic institutions is growing steadily. According to the latest data from the NIC (Network Information Centre) of RedIRIS (the provider of the National Network for research and development that established the first Internet connections in Spain), all Spanish universities have at least an official Website. Practically all of the country’s autonomous communities have initiated Internet-related projects focusing on education,
representing a total investment of more than 300 million Euros. The “La educación en Red” or the (Online Education Agreement) has also been instrumental. It was signed on the 13th of July 1998 between the Education and Culture Ministry, Telefónica, S.A, and other entities related to education, and offers primary and secondary education centres in Spain free ISDN lines, Internet access and ISDN cards/ modems. The duration of the agreement is for three complete academic years, renewable for a further three years.

There are many other Internet initiatives being started in Spain. Virtually all of the autonomous communities in Spain have begun Internet projects of their own, totalling more than 300 million Euro investment in education. Infoville is a world-renowned initiative begun by the Valencian Government. The residents of the various municipalities of Valencia can read the local newspaper, view the grades of their children, and request an appointment with their doctor all via a computer. INFOCOLE, an extension of Infoville, is designed to educate students about the Information Society and teach them how to use the tools and programs necessary to be competitive in that society. Comparable initiatives have been started in Catalonia, Andalucia as well as the Canary Islands.

**Telework**

Telework is a little-known phenomenon in Spain, among both the public and business community owners. The interest in teleworking that seems to have has been aroused in Europe still does not seem to have penetrated very strongly in Spain, e.g., with its the growth rate in this area is observed somewhat below that of its European neighbours.

The development of telework in Spain is centred around two principal stances: the theoretical (pilot projects defined by community initiatives) and the practical (independent teleworkers, due to the growth of self-employment in Spain).

In Spain, the availability of communication services and computer equipment is greater every day with prices continuing to fall. This situation is likely to continue to progress, especially with regard to the speed and capacity of networks.

The institutional support in Spain that favours the extension of telework has proven fruitful, especially in regard to advanced telecommunications services in underprivileged regions and the push for a creation of networks for small businesses. These actions should be continued with the assurances of involvement from the private sector, to be used as an initial push, but also as a way to eliminate the “subsidy culture” that is so deep-rooted in Spain.

Telework and self-employment, a common combination in the Spanish case, demand a high level of qualification and imply the appearance of new professionals and personal competencies. Continued training in these competencies will be fundamental in the future development of telework in Spain.

Telework is beginning to acquire “legal status” in Spain. The Plan de Empleo del Reino de España (Employment Plan of the Kingdom of Spain) published on April 15, 1998, mentions Telework as a means of improving the workplace environment given that employees are not forced to be present in a traditional office. It is also being proposed that aspects such as working hours and general conditions of security and health in the workplace should be subject to specific regulations. However, these regulations have yet to be implemented. The current Spanish labour laws do not explicitly deal with teleworking, although they do permit a satisfactory level of regulation of the employer-employee relationship in these cases. The applicable legislation will depend upon the precise type of working relationship that is established between the employer and the teleworker.

There is a feeling that it would be more beneficial for the diffusion of telework in Spain to develop new legal norms related to teleworking (on both a national and international level) in order to regulate the working relationships brought about by ISTs.
5.2.9 Sweden

According to all relevant international studies, Sweden is in "the ivy league" concerning the use of ISTs in general and specific IST applications like telework and e-commerce especially. One major underlying factor may be that the country’s telecommunications market liberalised in July 1993. Today there are more than 60 companies competing on each of the both main markets, for network capacity and for telecommunications services. Liberalisation has resulted in a dramatic drop in prices, first for international and long-distance calls, but more recently also in the local loop, where new competitors are using alternative access paths such as municipal networks to connect end users to their networks.

Sweden has a sophisticated telecommunications network structure all over the country. About 170 municipalities (out of 288) have their own city network. The government now has a vision of providing all companies and households in Sweden with broadband (5Mbits) access within five years, at equal costs around the country. There is a strong social push for universal access being extended to include advanced and broadband telecommunications services. The debate has been focused on whether the state should or should not be responsible for the availability of these services in areas that are commercially not attractive enough. In 2000, the Swedish government will present a bill on an IST policy that is expected to contain a standpoint on this issue.

Sweden is among the best-equipped in Europe in terms of PC penetration and use in private households. One important factor for this has been the so-called "PC reform", which was introduced by the government in 1996, giving employers tax deductions in return for equipping their employees with PCs for private use. The number of PCs and Internet subscriptions sold because of the policy is high. Computer literacy, consequently, is also high.

Gender differences in IST usage, although much lower than the EU average, are still a cause for concern, e.g. the decreasing share of women applying for IST related university courses. There is also a huge question mark whether Sweden has managed to involve, and make use of, the massive knowledge and skills hidden among immigrants or not.

The Swedish government has been proactive to exploit the country’s favourable characteristics (mainly its high household incomes, egalitarian social structure and high educational standards) to embrace Information Society developments. The main goals of the Swedish government’s IS policy, as laid down in the 1996 bill on a national IST strategy, are:

- to use ISTs in an active way to create growth and employment that makes Sweden competitive as a nation.
- to protect everyone’s equal right to use ISTs as a tool for skill improvement, democracy and justice,
- to make use of both women’s and men’s specific experiences and competencies in developing ISTs,
- to use ISTs to develop the welfare state and to improve quality of life,
- to use ISTs to support groups with special needs,
- to ensure broad access to public information to involve citizens in decision making and to enhance proficiency and skills,
- to keep up and develop the Swedish language and culture in a more and more boundless world,
- to use ISTs to increase the efficiency of the public sector and to improve the quality of service provision by public agencies.

To these ends, initiatives to support and raise the use of e-commerce and telework have been started. On the national level the most important have been:
GEA (The Group of E-commerce), consisting of the Swedish Association of Local Authorities, the Swedish Federation of County Councils, the Swedish Agency for Administrative Development, the Federation of Swedish Industries, the Swedish Federation of Trade, the Federation of Private Enterprises, the Swedish Bankers Association and the Swedish IST-companies Organisation. GEA is the main body to develop, introduce and promote e-commerce programmes in the public sector as well as in public-private-partnerships. GEA works within the areas of policy (such as legislation, certification, and procedures), education, awareness and standardisation.

SVEA, a new project within the framework of GEA. The aim is to raise the use of e-commerce in SMEs and smaller municipalities and to find possible forms of co-operations.

SWIT-project (Sweden Information Technology), a non-profit association created by the Federation of Swedish Industries and the Swedish IST-companies Organisation to educate 10,000 unemployed persons in IST usage. This action is expected to at least partly solve the problem of a lack of IT-related skills on the labour market. However, the Swedish business community thinks that the money should have been invested on IST-related education on university level plus that the money should have been used on computers in schools instead.

SME-link, a project aimed at SMEs to help them use the Internet to be more efficient and to develop the company. Most interesting is a scheme that uses university students as "SME-link navigators". These students visit SMEs for a certain amount of time to introduce them to the Internet and discuss practical barriers for uptake of IST as well as possible ways to overcome these obstacles.

ICT@SMEs, a two year project run by NUTEK (the Swedish National Board for Industrial and Technical Development) that aims to promote the use of ISTs in small and medium sized companies by identifying what kind of support SME’s need from the public sector.

Following Sweden’s strong federalist tradition, regional initiatives have played a role as important as the government’s in fostering IST usage. One example are regional IT-boards (e.g. IT-Norrbotten), usually set up as public-private partnerships with a focus on finding adequate IST-based solutions for local SMEs and population needs. The Government is right now dealing with all 21 regions over the country concerning the so-called “Regional growth agreements”. ISTs are an integral component here. In 15 of the 21 regions, there are serious plans to build local/urban area networks, and in some cases, to connect these into regional networks – all with broadband capacity.

IST policies have also been integrated as a result of Nordic co-operation. Upon the initiative of the Swedish government, a Nordic Group for E-Commerce has been created. This group has exchanged experiences from each country, gathered proposals from trade and industry parties and delivered proposals to the ministers of trade and industry in the respective countries as to what kind of measures would best support and encourage e-commerce.

5.2.10 Switzerland

E-commerce

The Swiss Federal government has in 1998 issued policy statements and broad actions plans to focus and streamline government’s agencies’ activities in the face of the digital economy in general and e-commerce in particular.

The Swiss action plan “e-commerce” is based on the general principles of (1) subsidiarity, (2) non-discrimination (regulatory solutions apply equally to online and offline activities), (3) technological neutrality (governmental interventions do not rely on specific technologies), (4) international compatibility, and (5) high degree of private-public participation.
The Swiss action plan “e-commerce” is not only principle-based, but also focused: the Federal Department of Economic Affairs picks out eight conditions for a wide-ranging development of electronic trading in Switzerland. These are:

- the availability of high-quality communications infrastructures
- access for all to modern information and communications technologies with equal opportunities
- wide acceptance of the application of modern information and communications technologies by the population and the private sector
- guaranteeing the necessary professional skills
- guaranteeing the necessary financing, incl. for SMEs
- availability of trustworthy security solutions for electronic transactions
- adequate and reliable regulatory environment
- intensive use of IT solutions by public administrations.

The most important aspects of this action plan can be described as follows:

With respect to telecommunications infrastructure, use of the Internet and PC density, Switzerland is ranking at the top in a world-wide comparison. The liberalisation of the Swiss telecommunications market on 1.1.1998 has resulted, at least partially, in essential cost reductions.

While the infrastructure in Switzerland is largely in existence, its use still too often founders on lack of confidence and insufficient experience on the part of users of modern information and communications technology. Education and knowledge about how to deal with modern information technology must therefore be promoted more efficiently, particularly through basic and advanced education as well as on-the-job training. Here government and private sector have been trying to co-operate more effectively.

In order to increase confidence of users in business transactions on the Internet, the confidentiality, authenticity and integrity of digitally transmitted data must be guaranteed. In Switzerland, with the possibility of free use of strong encryption systems, a substantial requirement for safe electronic trading is fulfilled. Corresponding technological solutions such as Secure Electronic Transaction Protocol (SET) are also available. The reliable application of technological solutions requires also a minimal legal framework. In Switzerland, the legal basis for the infrastructures necessary for the use of digital signatures, the Public Key Infrastructures (PKI) has been put in place since May 1, 2000.

In addition, the Swiss government has been checking the existing legal framework as to whether it corresponds to the requirements of e-commerce. What is required is clarity about the applicability and enforceability of the existing regulatory framework for electronic transactions. This is particularly the case in fields such as data protection, contract law, taxation, labour regulations, company law, competition and intellectual property. Banking and stock trading law too are also challenged by the surge of e-commerce.

Alongside regulatory activities, Swiss government plays a role in promoting the use of Internet:

- In the field of professional education, federal Government has recently approved a credit of about 7 Bio. SFr over 4 years for professional education, a large share of which will be devoted to filling the gap of IT-specialists on the labour market.

R&D Programmes. The main objectives of this programme are design, development, implementation and trials of distributed applications and associated networks. The programme has four modules (engineering of distributed applications and networks, quality and security aspects, management of distributed systems, demonstrators). The group of experts selected 33 projects, and a sum of approximately CHF 10 million was dedicated to a first series of projects of 24 months’ duration. All projects include private business
partners in order to achieve technology transfer. A second call for submissions took place in 1997, and additional projects were defined. In 1998, a last initiative of the programme was to set up a networked competence centre for applied R&D on e-commerce.

The spread of the use of IT-technologies, particularly through SMEs, is supported by government measures. For instance, the Swiss Federal Office for Education and Technology is running a software databank called "Softnet" where demand and supply of software applications are brought together. This considerably facilitates access to applied software technologies by SMEs. In addition, an ambitious electronic portal and a practical Internet guide for the specific needs of this particular size of firms have been initiated and partially supported by government money.

Finally, the Government itself will increasingly use e-commerce- applications, (as for instance in the field of public procurement, in the fiscal and administrative domains), in order to create confidence and acceptance.

**Telework**

As far as is publicly known there are no particular government programmes or initiatives dedicated to promote and support telework in particular - beyond those more general activities within the framework of the ISPS mentioned - on a Swiss Confederation level. And there is no record of such activities at the level of Cantons (Federal States) and municipalities or communities.

However, two parliamentary questions (motions) within the Swiss Federal parliament, and the official replies to them by the responsible members of the Swiss government, give some telling indications as to the basic attitude of the Federal Council towards telework in this country. Thus, in his answer to a motion which demanded the use of the “new possibilities of ICT for telework in peripheral regions of the country”, instead of “rationalising away” decentralised jobs of the Federal administration in these regions, Mr. Villiger, as late as 1996, gave a rather cautious, wait-and-see evaluation. He stated that the “technical, financial and social problems (of telework) should not be underestimated”. He pointed out the “isolation of tele-workers at home”. The Federal Councillor also mentioned that some singular, ad hoc solutions are being tested within a few offices of the Federal administration and within an external satellite office of the government’s Translation Services in the Italian speaking part of Switzerland. Again, this reflects the prevalent dilatory stance rather than a comprehensive and coherent, systematic programme, which did not exist at that time and as of today is still not in effect.

A new motion, recently submitted by a parliamentary commission under the chairmanship of the Social Democrat party representative Andreas Gross (29 May 2000) is, with reference to the “protection of workers”, aiming at legally limiting or regimenting telework (or at least some forms of it, namely, “electronic homework”), rather than promoting it. This motion asks what new forms of work would be created by the future economic development and demands that the Swiss Government proposes all possible measures necessary to protect workers from deterioration of working conditions and salaries, provoked by the “New Economy”. The Swiss Government accepted the motion in principle, but with low priority and promised to "closely observe and analyse the further development" within the existing financial and personal restraints.

**5.2.11 USA**

The United States is currently the world leader in both e-commerce and new ways to work. It has generally been conceded to be years ahead of the rest of the world in innovation and adoption of these initiatives, although the gap is closing. The electronics and computer industry in the US has been by far the fastest growing component of the US GDP for decades. Much of this growth is the result of a combination of high levels of education and a pervasive risk-taking attitude in both business and government.
Ever since personal computers were first produced commercially in the US in 1975, annual growth in the industry has been in the double digits. By 1998 94.1% of US households had telephone service, 42.1% (43 million) had computers, and 26.2% (27 million) had Internet access, according to the US Census Bureau. The annual growth rate in households with computers was 15% and the growth rate in household Internet use was 41%. Businesses of all sizes have exceeded households in their use of IST throughout that period.

Government at all levels in the US—federal, state, regional, and local—have generally adopted a laissez faire attitude toward both e-commerce and new ways to work. The underlying philosophy is that, since the implementation of both e-commerce and new ways to work are primarily market driven, the government should generally eschew interference in the process, except where the market fails to act in the best interests of the public. The primary initiatives affecting these have been:

- the federal 1996 Telecommunications Act, with the objective of increasing competition in the telecommunications industry;
- the national Clean Air Act, which focused attention on the need to reduce automobile use—particularly for commuting—in order to reduce urban smog;
- the adoption of EDI (electronic document interchange) by the federal General Services Administration, to boost e-commerce; and
- various telework implementation projects by federal, state, and local government agencies.

The United States is currently the world’s largest developer of both e-commerce and telework programs, both of which depend increasingly on the Internet as a primary communications link.

E-commerce began in the US, as in other countries, as a means for reducing the costs and improving the effectiveness of transactions between large manufacturing companies and their suppliers. By 1998 more than 1.2 million jobs were Internet-related in the US, with roughly 40% or more of medium to large sized organisations having one or more modes of electronic interaction with suppliers and/or customers. Average large corporation investment in web advertising was €667,000. Small businesses were not far behind, except in the fraction with Websites (10% versus 68% for larger businesses). Among the 58,000 medium and large firms involved in e-commerce, 11,000 were firms with at least 500 employees.

According to the Center for Research in Electronic Commerce at the University of Texas, 1998 Internet-based revenues in the US were €95.2 billion. Forrester Research, Inc. claims a lower total of €66.3 billion. Of that amount, 7.5 billion euros were for Internet retail (that is, business to consumer) transactions, with 18.5 billion euros for business to business services and the remaining 40.3 billion for goods. The Forrester estimate is that e-commerce will reach a total of €1.55 trillion in 2003, €1.45 trillion of which will be in business to business e-commerce.

B2B e-commerce has begun to produce some major changes in US industry. As one example, Dell Computers has grown from the campus business of a University of Texas student to a powerhouse leading the personal computer industry in sales volume to both businesses and consumers. Furthermore, new variants of traditional intermediary firms are developing—the infomediaries—to supplant the role of wholesalers. While a relatively small fraction of commercial transactions in 1999, e-commerce is expected to grow to constitute a major share of all commerce in the next decade.

Although business to consumer e-commerce tends to get the most press coverage in the US, with firms such as amazon.com leading the way, its sales totals lag far behind business to business e-commerce, and will probably continue to do so. Still, such innovations as online stock trading and auctions have produced major changes in traditional industries. Although at one extreme pundits predict the doom of the brick-and-mortar store, as even grocery suppli-
ers go online, the reality is likely to be some balance between “feel the goods” shopping and
the electronic version. As turned out to be the case with the Minitel system, the largest seg-
ment of the business to consumer e-commerce market may be pornography.

The primary barriers to further growth of e-commerce in the US are:

- Technological: the lack of a low cost uniform transaction language and protocol; system
  reliability issues; inadequate Internet search capabilities; Internet throughput; and data
  storage limitations.
- Financial: the potential crash of high flying e-businesses as reality sets in.
- Legal and regulatory: constraints on encryption technology and authentication methods
  such as acceptance of electronic signatures; potential taxation of e-commerce transac-
  tions; rationalisation of international e-commerce duties and regulations; privacy and in-
  tellectual property protection, and e-crime.
- Market access: the lack of broadband access for small enterprises and consumers; a
  widening gap between haves and have-nots in e-commerce.

Although the details vary, estimates by various market researchers forecast a growth in e-
commerce values by a factor of about 16 between 1998 and 2002—roughly doubling annu-
ally. Many of the technological barriers to e-commerce will be eliminated or substantially re-
duced by 2003 although elimination of the psychological barriers will take longer. One key to
this growth, at least for business to consumer e-commerce, may be the broad acceptance of
a system for micro-payments on the Internet among the several current contenders. Related
to that is the practical solution of the security and authentication issues; solution of these two
problems will go a long way to increasing the rate of acceptance of e-commerce.

E-commerce promises to materially change the way many businesses operate, moving the
focus from emphasis on production details to consumer orientation. It also will affect the lo-
cation of the brick and mortar assets of businesses, moving from local to regional distribution
centers.

Most variants of new ways to work in the US, on the other hand, involve some form of tele-
work, either on a local or regional to global scale. Beginning in a formal way in the early
1970s, telework has grown to the point where 22% of the US workforce is expected to be
regularly engaged in some form of telework by the end of 2003, with about 21 million tele-
workers, most of them telecommuters, by the end of 1999, according to our estimates. There
are four main variants of teleworking: telecommuting; intra-organisational teleworking; inter-
organisational teleworking; and teleservices. These variants can be applied to traditional or-
ganisational forms and can also enable new forms such as network, evanescent, and virtual
organisations.

Like e-commerce, the rise of telework is the natural consequence of a number of other ge-
eral trends in the world. In the case of telework, these trends are the growth of the informa-
tion economy; the rapid pace of development of telecommunications and information tech-
nology, the pressures of increasing urban traffic congestion, and intensifying economic com-
petition at all levels of the economy. The primary business motivations to adopt telework
were in 1973, and still are: office space savings; increases in productivity of teleworkers
compared with in-office workers; and enhanced employee retention and/or recruitment rates.

By far the most powerful and important barrier acting to regulate the rate of diffusion of tele-
work is tradition; 19th century management style and methods. The overwhelming majority of
companies, when queried about their attitude toward telework, answer with words to the ef-
fect of: “how do we know that they’re working if we can’t see them?” In short, there is an in-
nate lack of trust between supervisor and employee or an automatic reaction based on long
familiarity with the standards of the industrial revolution. Although it has repeatedly been
shown that these concerns are groundless in well-managed telework programs, they persist.
Information and communications technology available today throughout much of the world is entirely adequate for the support of much higher levels of telework than are now being practised. Yet, technology limitations are often cited by prospective employers of teleworkers as being either inadequate, or too expensive, or both, to support effective teleworking. At current levels of technology available in the US these constraints are valid only for some very data intensive tasks. Since the cost of telecommunications is the primary operating cost of telework, it can act as a constraint for some bandwidth-intensive forms of telework, such as high level graphics and engineering design work.

There are few legal and regulatory barriers to telework in the United States other than those relating to telecommunications regulation. Those that do exist tend to be local in nature. The most prevalent barriers are local restrictions on home-based work. These are being—or recently have been—lifted in major US cities.

If telework acceptance rates continue according to our forecasts, there will be almost 29 million US teleworkers by the end of 2003. Most of them will be home-based telecommuters and will telework only part time, with the rest of their work time spent in their employers’ or clients’ facilities. At least three of every five teleworkers will be employed by SMEs. The proportion of teleworkers who are not telecommuters will also increase as a consequence of growth in teamwork among distributed organisations and in the expansion of multi-regional and multi-national telework-enabled trade. Part of the growth rate will depend on the extent to which telecommunications costs are reduced by increased availability of broadband services to households.
6 Recommendations: Where Further Progress Is Needed

The present chapter provides the recommendations derived from the work in the ECaTT project in 1999 and 2000. Some of them are generic, i.e. are of primary importance for Information Society development as a whole, while the rest are broken down by telework and e-commerce recommendations.

Policy-makers on the EC, national and regional level, have basically 5 kinds of instruments at their hand to influence developments in the field of Information Society participation, new ways of working and e-commerce. They can:

- initiate public debate & promote awareness raising by various measures, most of them on the level of national programmes which are then adapted and put into effect on the regional and local level;
- provide infrastructure, e.g. physical networks of telecommunication infrastructure, schools, universities, but also know-how and technology transfer services;
- demonstrate best practice, either by implementing innovative applications in public administration itself or by promoting best-practice cases from the private economy;
- adapt the regulatory framework, i.e. legislation or other kinds of regulation including encouragement of self-regulation by the industry;
- promote research to gain a deeper understanding of issues at hand which is indispensable in order to make sure measures to be taken are targeted, effective and inline with other areas of policy-making.

We think that all of these tools have to be used, most of the times jointly, to steer developments in a socially beneficial and sustainable direction.

6.1 Generic Recommendations

The rapid development of main pillars of the Information Society, in particular the manifold applications of the Internet, is in danger of masking underlying problems having to do with the preparedness of large parts of the EU population to master IST. There is a real threat of a digital divide opening up between parts of the population (as well as the economy) that take an active part in the Information Society and other that do not. The Europe Community should not be willing to accept that new reasons for inequality gain ground. Such a development would be very hard to turn around again in the future.

Of course there is also the danger that Europe as a whole falls back against its international competitors, in particular the USA, because the EU population does maybe not take to using the Internet and other IST as enthusiastically as US-Americans.

Against this background, we recommend action along the following lines:

A. Boost IST penetration and usage in the home

R1 Deregulation of the local telephone network: The cost of innovation is of crucial importance for any decision in its adoption. The major costs for consumers in the context of e-commerce – apart from payments for content - are the usage costs, i.e. telecommunications costs. The same applies for telework with the differences that here it usually is the employer who has to pay the telecommunications bill. While local calls are usually free of any cost in the USA, Internet access in Europe have until only recently been charged at local call rates, which differ significantly across European countries. Every year, the OECD calculates the average telecommunications costs for companies and private households and those for Internet access (ISP plus PSTN charges). In each case, the prices of the market leaders are taken. The latest data still show that Internet access is much more expensive in most EU
countries compared to the USA. Germany in particular ranks at the very top. This does not come as a surprise since Germany is one of the countries in Europe with least competition in the local loop. Since the beginning of 2000, introduction of flat rates has begun in some European countries, too.

Deregulation of local telephone call market might speed up this process considerably by introducing new competition to the fold. The implementation of this recommendation means to continue the work already started by the telecommunication and postal services regulation authorities, as defined by the legislators, in order to achieve competition in the local telephone network. At present Germany, together with France, Switzerland, and Austria, are furthest away from competition in the local loop. Urgent action is needed especially if these countries do not want to miss the connection at an international level.

### ECaTT: Overview of generic recommendations

<table>
<thead>
<tr>
<th>Instruments</th>
<th>Areas</th>
<th>initiate public debate &amp; promote awareness raising</th>
<th>provide infrastructure</th>
<th>demonstrate best practice</th>
<th>adapt regulatory framework</th>
<th>promote research</th>
</tr>
</thead>
<tbody>
<tr>
<td>[A] boost IST penetration and usage in the home</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>R1, R2</td>
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<tr>
<td>[B] support development of user know-how</td>
<td></td>
<td></td>
<td></td>
<td>R3, R4</td>
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<td>R5, R5</td>
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<tr>
<td>[C] close the Digital Divide</td>
<td></td>
<td>R7, R8, R9</td>
<td></td>
<td>R6</td>
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<td>R9</td>
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<tr>
<td>[D] support peripheral &amp; disadvantaged regions</td>
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<td>R9</td>
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<td>R9</td>
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</table>

R2 PC/Internet equipment initiative (free of tax): In Sweden and Denmark, some minor changes in taxation regulations have had a very positive impact on PC penetration and presumably teleworking and Internet take-up: companies can give PCs to their employees under favourable conditions, i.e. full or partly reduction of the tax value of PCs made available for work-purposes at home – or training. The purchase of a PC for an employee is fully cost-deductible for the employer and tax-neutral for the employee (he does not have to declare the PC as “financial advantage” to tax authorities). Governments in other Member States may want to start an activity similar to this so-called “Home - PC arrangement” to speed up the spread of IST applications.

In Denmark, the initiative started about 3 years ago with formal implication from the income-year of 1997. Because of this programme a constantly increasing number of companies offer home PCs to their employees. The figures from a survey carried out jointly by the Ministry of Research and Information Technology and 'Danmarks Statistik' show that 29% of enterprises with twenty or more employees have to some extent offered home PCs to their employees while a further 8% expect to offer home PCs before the end of 1999. At the same time, it should be noted that three out of ten companies have made the offer of a home PC to more than half of their employees.

In other countries like Germany, large organisations such as Bertelsmann and Ford moved ahead without the advantage of such tax relief measures: They made public their plans to give PCs free to every employee. The impact of these schemes on tax payments on the es-

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tablishment’s as well as employee’s side is still under negotiation with tax authorities. However, SMEs will not do anything like that without obvious financial advantages and clarity of tax implications. Businesses with less than 200 employees account for two thirds of employees in the EU, that means that in order to achieve positive effects on a wider scale, SMEs must also be put in a position to give away PCs to their employees for free or at very low cost.

It is recommended to start such initiatives in all EU Member States where it has not yet been launched as an initiative for a limited period to set a further incentive for a quick and immediate reaction by organisations and employees. The implementation of this recommendation should have high priority.

B. Support development of user know-how

R3 Internet and E-Commerce train-the-trainer measures at school: Internet based technologies offer challenges to the providers of education and life-long learning. For example, it is obvious that the adoption and usage of ISTs place new demands on teachers and the providers of IST skills. National governments in Europe have over the past years set up initiatives to equip schools with PCs and Internet access, but they have largely neglected the need for training teachers so that the equipment be put to best use in teaching pupils. Many existing teachers will have to be provided with the option of reskilling and upskilling so that all sectors of education, people in employment, the unemployed, and the older person will have access to appropriate IST training.

Train-the-trainer measures have to be implemented on a large scale. To some extent there also exists a generation problem, i.e. the majority of teachers in the EU is already past the age of 40 and are no longer willing to educate and train themselves in these qualifications. It appears as if in all Member States there is the need for a rejuvenation of teaching staff to counter negative developments likely to emerge.

R4 Connect primary schools to the Internet: The right time for children to start being acquainted with the PC and the Internet should be the primary school. However, in most Member States we are still far away from equipping primary schools with PCs and training the teachers to provide appropriate guidance. Ireland, the UK, and the Scandinavian countries are commendable exceptions. In the UK for instance the pupil:PC ratio in primary schools improved from 18 : 1 to 13 : 1 from 1998 to 1999 and in secondary schools from 9 : 1 to 8 : 1. Other European countries are far away from such penetration rates. European schools should also include simple IST skills, e.g. keyboarding skills, in their curricula.

R5 Stronger orientation of education policy towards IST: The education systems and their contents as well as the qualification and skill demands but also the job profiles need to be continuously adjusted to the changing requirements of the new economy and Information Society in order to better suit emerging and changing labour market demands. For this, continuous assessment of labour market trends and close co-operation between research organisations, trade associations and the education system is necessary. However, educational policy should not be used to close short-term bottlenecks and shortages but develop long-term solutions in a sustainable way. As labour markets especially in IST specialists are more and more stretching across borders, harmonisation and co-operation of national schemes and education systems is called for.

C. Close the Digital Divide

R6 Internet access for disadvantaged groups: In order to counter an emerging digital divide in access and use of ISTs which are at the same time necessary and important tools for working and arranging daily life for everybody, we recommend the implementation of specific measures to provide Internet access for disadvantaged groups. Examples of such initiatives already exist in some countries, e.g. the initiative of the British industry to provide low-income households with surplus PCs free of cost.
R7 Annual EC “Digital Divide Report”: We recommend the development of an annual “Digital Divide Report” along the same lines of those already developed in the USA by an independent group of experts\(^{21}\). The report should be based on empirical evidence from secondary data, supplemented by fresh data collection where necessary, and analyse the existence of a gap between those who have access to technology and information skills and those who do not. As ECaTT findings already point to a sizable gap existing, we recommend a Digital Divide Network made up of experts and practitioners of all relevant social spheres that discusses, develops and oversees measures to counteract the Digital Divide. Public debate about the issue should be stimulated. Both Report and Network are aimed at international monitoring, comparison, and foresight including the largest possible number of countries in the world.

R8 European “Digital Divide Clearing House”: In addition to the EC Digital Divide Report it is recommended to establish a “Digital Divide Clearing House”. The aim of this clearing house should be to develop and co-ordinate all relevant European and national activities in this area at European level, act as a knowledge centre, and develop strategies together with the relevant national institutions. Existing competent, well-known and prestigious foundations at European level should take this role.

R9 Redefinition of Universal Service in the face of deregulation of the telecommunications market: In all EU Member States liberalisation activities and market developments in the areas of IT and telecommunications in the past few years have resulted in drastic price reductions very much to the benefit of the business and private customers. In general, there seems to be no sign that government intervention in this area is warranted. However, one field where market developments have to be monitored very closely and action taken if found necessary is the hollowing out of Universal Service obligations. Without regulation, there are doubts if peripheral and disadvantaged regions of the EU will gain access to up-to-date telecommunications services (e.g. ADSL). Traditionally, universal service (as laid down in national laws regulating telecommunications) encompassed basic telephony services. A redefinition of Universal Service is now needed to ensure that telecom operators are forced to provide the whole range of their services to all parts of the EU, at non-prohibitive prices. Unless action is taken, market developments could threaten cohesion principles and widen the gap between densely and sparsely populated areas.

D. support peripheral & disadvantaged regions

R10 Review of research on spatial impacts of IST applications: In spite of IST’s potential to support a more geographically balanced economical development, IST applications like telework (and most likely also e-commerce) have until now benefited almost exclusively agglomerations. Many of the teleworking schemes established with the express purpose of supporting peripheral regions have failed. A study aiming at a careful evaluation of reasons for failure but also success factors in those cases where such schemes have been successful and still operate in the market is recommended. Findings of such a study could set decision-makers in the position to judge if countries should continue to focus regional development policies on the implementation of ISTs, and develop policies accordingly.

6.2 Telework

The European Commission has started to provide funds for setting up and promoting telework in EU Member States since the early ‘90s. These either constituted projects in large-scale R&D programmes such as RACE and ACTS or were implemented as specific pro-

Programmes on telework like for instance ORA and the Telework Stimulation Action or as a specific area in programmes like the Telematics programme. Initiatives for the promotion of telework also started in many Member States either in parallel or with a time delay of a few years and in countries like Germany only in the second half of the '90s. All these have contributed to the rapid development if not boom of telework in Europe over the past years.

Many of these programmes and initiatives have ended, others are up and running. The current impression is that no further ones will follow, at least no support programmes under the heading of “telework”. This indicates that the European Union as well as the national and regional governments have come to the conclusion that they have fulfilled their roles in supporting the take-up of telework and that things now (or after completion of ongoing programmes) have to move ahead on their own.

However, ECaTT revealed that there are still areas where government activity and intervention in the area of telework is required to ensure that existing problems and shortcomings are solved, no further bottlenecks and problems created and positive as well as socially acceptable developments and results of a sustainable nature in this area are achieved. While problems relating to the set-up of formal teleworking relationships in cases where the employee has a permanent contract of employment have been tackled, ECaTT survey results show that the focus of telework is somewhat shifting towards informal types of telework (e.g. supplementary telework) on the one hand and the self-employed on the other hand. The rising number of self-employed teleworkers and the use of telework to boost self-employment in the economy have far-reaching implications for labour market policies and the functioning of social security systems. These issues have scarcely been addressed yet in policy-making regarding telework. More important even, public debate about the issues surrounding a possible large-scale transfer of dependent employment into self-employment has not begun seriously. Much remains to be done.

Telework is not a way of working which should be promoted for its own sake, but for the benefits it can bring to all stakeholders. For this simple reason, policy makers on the European Community as well as national and regional level should focus on not just boosting, but shaping the development of telework so that it suits current political objectives. The following table shows the main areas to be addressed and the instruments policy makers have at hand for doing so. Recommended measures are indicated in the table.
### ECaTT: Overview of recommendations concerning telework

<table>
<thead>
<tr>
<th>Instruments Areas</th>
<th>initiate public debate &amp; promote awareness raising</th>
<th>provide infrastructure</th>
<th>demonstrate best practice</th>
<th>adapt regulatory framework</th>
<th>promote research</th>
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<tbody>
<tr>
<td>[A] make supply of teleworkplaces better match demand</td>
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<td>R1, R2</td>
<td>R3</td>
<td>R3, R4, R5</td>
<td>R5</td>
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<tr>
<td>[B] support new self-employment</td>
<td>R6, R7</td>
<td>R7</td>
<td>R7</td>
<td>R7, R8</td>
<td>R9</td>
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<tr>
<td>[C] support job creation &amp; relieve skill shortages</td>
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<td>R10</td>
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<tr>
<td>[D] adapt human resource management &amp; boost employability</td>
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<td>R11</td>
<td>R3</td>
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<tr>
<td>[E] ensure health &amp; safety and employee rights</td>
<td>R12</td>
<td>R12</td>
<td>R3</td>
<td>R5</td>
<td>R13</td>
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<tr>
<td>[F] adapt city planning and real estate markets</td>
<td>R14</td>
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<td>R3</td>
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<td>R14, R15</td>
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<tr>
<td>[G] relieve the strain on traffic systems</td>
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<td>R3</td>
<td></td>
<td>R16</td>
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<tr>
<td>[H] support environmental sound ways of working</td>
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<td>R17</td>
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</table>

### A. Make supply of teleworkplaces better match demand

**R1 Initiatives to foster trust and security in telework:** Trust and security in telework technologies are of crucial importance for fostering the further diffusion of telework, as the ECaTT surveys have shown. Many organisations are currently refraining from telework introduction because of the perception of a lack of security in using IST and telecommunications networks for teleworking purposes, but also the Internet in general. The provision of cost effective and easy to use technologies like Smart Cards – an area where Europe is leader in the world – in combination with a public security infrastructure (like the one already established for digital signatures) would contribute to an increased willingness to practise telework among businesses. The EC as well as national governments are well advised to speed up their activities in this area. European industry should see this area as one of the very close future markets, which they should tap with corresponding products immediately. Note: there are close relationships to some of the activities on security in the telecommunications networks relating to e-commerce.
R2 “Underground Guide to Telework”: With respect to telework there does not seem to be the need for further guides to telework implementation addressed to organisations that plan to introduce it, because a great number of handbooks are already available on the market. What is missing, however, is what might be called an “underground guide to telework” that provides help and guidance to would-be teleworkers employed in organisations that have no formal teleworking schemes. Such a guide would give help to employees that have problems to convince their employers to allow them to telework. In Ireland, a guide of the above type has already been published, prepared by Work Research Centre and Eircom and specifically aimed at assisting an employee prepare a case for introducing telework.

R3 Public administration as telework frontrunner: It is recommended that public authorities throughout Europe should try hard to act as shining examples and frontrunners in teleworking by setting themselves ambitious goals with respect to intended achievements. These could include objectives like the achievement of 10% of the employees in public administrations to become teleworkers within five years or similar. As employee-side demand for teleworking is very high in the public sector, such a target would be easy to meet if teleworkplaces were offered. Appropriate measures to speed up such a process include national and European-wide telework competitions and contests where national governments and/or the European Commission award prizes and financial support to those public administrations submitting the best ideas and concepts for telework implementation which they then put into practice.

R4 Teleworking tariffs: Specific teleworking telecommunications tariffs could become a means to foster the spread of telework in Europe. Telecommunications network and service providers are likely to start thinking about specific tariffs and pricing structures for specific market segments, e.g. teleworkers, the more these market segments develop and reach a certain size. These could include flat-rate tariffs comparable to those beginning to be offered by ISPs for Internet access now (flat rates for Internet access themselves will not benefit teleworking much because most remote access solutions do not use the Internet - at least today). The public sector could play an important role here by negotiating favourable contracts with telecommunications providers for its own teleworking schemes and demanding that they are extended to third party teleworkers, too. National teleworker associations should also point out to telecommunications providers that demand from teleworkers might rise considerably if cheaper rates for permanent remote access were offered.

R5 Reduction of legal barriers to telework: There are still a number of barriers to telework, some of which consist of legal regulations that in the past may have made sense but are acting as barriers for the development of innovative ways of working today. We recommend some well targeted activities to identify, discuss, and if applicable remove the key legal barriers to telework. These include, amongst others, the reduction of depreciation periods for PCs and related technologies, the removal of restrictions in the laws governing tenancy (e.g. strict rules regulating under which conditions living space may be converted into a home-office; rules regulating that computers given by companies to their employees are subject to tax) which act as a barrier in cases where companies want to make available PCs and Internet access to their employees free of cost, etc. All these factors still act as impediments and slow down the current speed of innovation take-up in Europe.

B. Support new self-employment

R6 Extending the scope of telework awareness raising initiatives to include other “new ways of working”: It is recommended to continue with and complete the multitude of awareness raising activities at all levels, especially those aimed at the familiarisation of multipliers (e.g. industry associations, professional associations, unions) with telework and new ways of work to enable them to give advice to their members. However, the current focus on only facet of the total teleworking landscape (i.e. telework under permanent employment contracts) is too narrow in the face of developments which point towards the emergence of a new, self-employed teleworker workforce that brings up new demands on social security systems,
worker protection etc. There is a real danger that policy-making goes on pretending that the traditional, post-war model of employment is still in place while some fundamental changes in the labour markets go unnoticed. Governments have the duty to initiate public debate on these issues and prepare employers and the general population for the requirements resulting from the changes in the labour market.

R7 Redefinition of Europe’s position towards self-employment and entrepreneurship: The vast majority of the workforce in Europe is still working under permanent employee status, although untypical forms of work gain in importance and number. In Europe, an employment contract, which encompasses social security contributions partly being paid by the employer, is considered as the norm. Other forms carry the stigma of being atypical or at least less desirable which is underlined by social security systems being geared to the requirements of dependent work. The readiness for self-employment, although slightly improving over the past years, is still not very strongly developed among Europeans. We are faced with a "culture of dependence", also showing in the way self-employed individuals who failed with a business idea are looked down upon as “losers” (instead of admiring their courage). Without judging about the advantages and disadvantages of individual against communal organisation of social security and employee rights (to name just two issues), it seems crucial that entrepreneurship is given stronger support by policy-making. Here again, public debate is not sufficiently developed so that critics can claim without meeting with much opposition that Europe is simply lagging behind the USA in setting free its entrepreneurial spirit. EU member countries should strive to agree on a set of “European values” that might form the backbone of a “European way” towards labour market issues surrounding the move towards the Information society.

In any case, it is essential to ensure that the next generation is well prepared for the emerging developments. It will be necessary to sensitise and motivate interested individuals for a business start-up as an alternative to an increasingly insecure workplace, and give guided support to setting up on their own, or at least in considering the possibility. It is also necessary already to prepare pupils for the developing needs and to provide them with relevant qualifications that will ease the way to creating the entrepreneurs of tomorrow. These changes in attitude will only slowly develop and diffuse but are likely to become key factors to competitiveness of the European workforce and industries in the future.

R8 Social security system for self-employed (tele)workers: An essential part of a policy towards giving support to entrepreneurs is the set-up of a social security system for the self-employed. As many more teleworkers are self-employed than non-teleworkers, such a policy would particularly contribute to the spread of teleworking: according to the results of the ECaTT surveys 30% of teleworkers are self-employed compared to only 17% of non-teleworkers. Many of these self-employed teleworkers but also non-teleworkers have problems in securing and financing their pensions and preparing themselves for periods of unemployment since they do not pay into the national social security system for different reasons. Alternative models do not exist in most EU Member States. One could envisage a social security system for the self-employed with some sort of minimum protection. Of course, such a system would require new sources for financing, e.g. a shift to a consumer-based tax. It is recommended to carry out a major study on the different social security systems in the Member States covering the self-employed business-owners but also comparable groups of workers (e.g. artisans) for which specific insurance schemes have been developed. It is expected that from a comparison of these systems one may gain further knowledge to develop creative social security models which may provide a solution for self-employed (tele)workers. Such a solution would set the fast spread of self-employed telework which is already under way on a more solid footing regarding the degree of social protection awarded to teleworkers.

R9 Study on definition and demarcation of “new ways of working”: As already described above telework can be seen as one example of upcoming changes in the ways we work, i.e.
only one facet of new ways of working. Currently a multitude of changes is about to take place in this area. However, there is still no clear understanding of what the term “new ways of work” includes. There is an apparent lack of a definition and clear demarcation of this term. In the early nineties, the EU played a pivotal role in defining terms, developing policy and RTD in the area of telework. It is recommended that such an approach should be mirrored in a study on newly emerging labour market issues. The EC should commission a study to a group of international experts to deal with this subject. One of the main questions the group of expert would have to tackle is what kinds of new ways of working are in line with current political objectives on EU and member state level and which are counter-productive.

This study could again become a groundbreaking and decisive initiative significantly influencing all future work and strategy development in this area. It would also ensure that EC policy-making is targeted at those new ways of working which positively contribute not only to European competitiveness, but also to social cohesion and well-being.

C. Support job creation & relieve skill shortages

R10 Assessment of teleworking’s contribution to new solutions to meet labour and skill shortages: Teleworking is seen as a means to fight labour and skill shortages since it provides the opportunity to employ people with the right skills no matter where they are located - economists speak of an “improvement of allocation of resources”. With telework, scarce qualifications can be imported from foreign locations, thereby improving competitiveness of EU companies. But telework does also take the form of “offshore office work” which means that companies use it to reap the benefits of cheaper labour for instance in third world countries by employing them at a distance. “Offshore telework” is the substitution of offshore labour for domestic labour, i.e. its direct employment effects are negative from the viewpoint of EU Member States whereas indirectly positive effects might accrue as a result of increased competitiveness in the global market.

Little is known whether and how different types of telework contribute or do harm to the quantity and quality of employment in the EU as well as the solution of skill shortages. The same applies to our lack of understanding of the mechanisms which make one company scheme a success and another a failure. Mostly no technological issues and reasons can be made responsible for this. A major research initiative is required to shed further light on these issues and provide European policy makers as well as organisations with a better understanding of the related mechanisms. This will put them in the position to make best use of the benefits and avoid making mistakes when setting up international cross-border teleworking schemes to counter labour and skill shortages but also to operate more cost-effectively.

D. Adapt human resource management & boost employability

R11 Support services encouraging and supporting employers for telework: Despite extraordinary high levels of interest in teleworking among the workforce, managerial knowledge, attitudes, and skills still present important barriers to telework. Support services should focus especially on this area. Topics needing to be covered include:

- Management issues relating to the introduction and successful implementation of teleworking. These will include Human Resource issues monitoring, controlling, leadership, and communication issues.
- Practical aspects of implementing teleworking arrangements, including questions of individual requirements and task division.
- Assessment of tasks and jobs suitable for teleworking
- Making a business case - assessment of costs and benefits of teleworking
- Deciding upon the form of teleworking
- Assessment of training needs of potential teleworkers
- Assessment of training needs of managers of teleworkers
Assessment of human resource management issues
Implementation of teleworking project
Planning of teleworking project.

This especially applies to managers in SMEs who are seriously lagging behind when it comes to telework implementation. SMEs usually do not have a dedicated human resource management division, which could contribute the necessary know-how. It would therefore be of help if telework guidelines, a hotline service etc. could be developed and staffed respectively by experienced HRM experts to assist in the implementation of telework. Further services should be addressed to senior managers motivating them to become teleworkers themselves. The thinking behind such a strategy is that once the decision makers in an organisation have been convinced and are practising teleworking on their own, the step towards company-wide introduction becomes much smaller.

E. ensure health & safety and employee rights

R12 Enforcement of legislation in areas such as employment, health and safety and finance: Employment, health and safety and financial legislation needs to extend present terms and conditions, rights and benefits on a pro-rata basis to cover all forms of contingent labour. For example, additional measures to protect teleworkers from hidden exploitation might be necessary. In general, however, it seems that adequate legislation is already in place but enforcement in real life is lagging behind because teleworkers are not educated properly about their legal rights and obligations. This problem could be dealt with using a public information campaign consisting of brochures, a dedicated Website and call centre support services. Issues, which need to be resolved, include payments, the tax treatment of IST infrastructure, working hours, and compliance with health and safety legislation. A call centre-based pilot scheme in this area has been set up in Germany with OnForTe supported by the Federal Ministry of Education and Science, Deutsche Telekom and the trade unions IG Metall and Deutsche Postgewerkschaft. OnForTe addresses and provides services to employees actually teleworking and those interested in doing so. OnForTe may build an example of how to proceed for other players in other countries.

R13 Research on teleworking’s potential to offer new family-friendly solutions: Telework has in the past been put forward and propagated by many as a way to ideally combine work and family demands. However, we now know of many examples where just the opposite happened mostly due to insufficient designs and implementations of the working arrangements. In order to thoroughly analyse and evaluate the possibilities and positive aspects on the one hand and the problems and downsides on the other, a major research effort is still needed. The findings from the ECaTT survey and research also point out that overwork and stress might turn out to be a problem for teleworkers who do not manage to keep their working hours from chipping away at their leisure time.

F. Adapt city planning and real estate markets

R14 Intelligent (Smart) Houses as a prerequisite for future telework: Most European residential flats and houses are not suitable for teleworking purposes, and it is probable that those being built currently will be no different. It is recommended that specific awareness raising actions be taken to inform and convince architects and investors about the future design requirements of living and working in residential buildings.

The same holds true for the technological infrastructure needed to optimally work from home. Access to powerful telecommunications networks and services from any place in a building, either via cable from any corner and/or wireless will become necessary. Further requirements for an optimal set of Smart Home / House technologies necessary for performing future telework need to be identified and system requirements specified to ensure that a Smart Home industry provides the appropriate solutions in the market at competitive prices. In addition, architects and investors need to be convinced of the need for such infrastructures to
ensure that the upcoming demand can be satisfied. It is possible to foresee a situation whereby home offices are fitted out to standard IST and social specifications just like many commercial properties are today whereby, for example, raised flooring is the norm.

R15 Research on impacts on the real estate market (both business and residential): Many believe that the likely further diffusion and resulting massive penetration of telework will have a significant impact on developments in the area of real estate. This applies to both business as well as residential real estate. Some experts believe that as a result of increasing telework diffusion, the city centres and central business districts (CBD) will experience profound changes and (further) migration since businesses will reduce central office space and some may even move away completely from the expensive inner city locations. What is required if this becomes true are pro-active and longsighted inner city development schemes countering such negative developments. In addition, telework will contribute to a move of work locations to residential areas resulting in an increase of the coexistence of working and living in the flats and houses of the employees. This again requires new residential building concepts for flats and houses to better accommodate home offices and the requirements of SOHOs. It may also be that the above changes will also impact existing neighbourhoods since people will spend more time there compared to today. Further changes will be required in the (re-) design and (re-) building of new but already existing offices and office buildings, since employees are likely to spend less time there but for fulfilling different tasks. The offices will increasingly develop into places for communication. A major research effort is required in this area starting with the development of visions and scenarios of future development over a period of at least 10-20 years together with the development and evaluation of concepts and partial implementations.

G. Relieve the strain on traffic systems

R16 Long-term empirical studies on teleworking’s effects on traffic patterns: Teleworking is seen by many as a means to reduce mounting traffic problems due to its potential to reduce the total number of commuting trips required. Others believe that it will induce even more traffic but only at other times during the day since teleworkers will use their car when spending their increased leisure time. Still no clear and reliable judgements can be given, although some very valuable empirical contributions have been made to the debate. We need to build on this empirical work and start initiating long-term studies that take into account effects of telecommuting that appear after the lifestyle of teleworkers has adapted to the changing requirements of the job.

H. support environmental sound ways of working

R17 Development of complex models to gain knowledge about environmental impact of telecommuting: Apart from teleworking’s effects on traffic patterns which are still not analysed thoroughly enough to act as a basis for policy-making, other environmental effects should also be taken into consideration. Here there is a need for developing a complex model that encompasses not only changes to commuting behaviour, but also other traffic effects and impacts on resource consumption as well. This work is still in its infancy, but urgently needed to decide about how the support of different types of telework could contribute to meeting EU aims and obligations concerning achieving sustainability.

Based on these recommendations, crosscutting policies should be developed that address the various policy lines of relevance. Appropriate stimulatory activities should then be initiated.

6.3 Electronic Commerce

The following table shows the main areas to be addressed concerning recommendations aimed at fostering e-commerce, and the instruments policy makers have at hand for doing
so. Recommended measures are indicated by number in the table and explained in the subsequent text.

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<tr>
<th>Instruments Areas</th>
<th>initiate public debate &amp; promote awareness raising</th>
<th>provide infrastructure</th>
<th>demonstrate best practice</th>
<th>adapt regulatory framework (e.g. legislation)</th>
<th>promote research</th>
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<td>R1, R4, R5</td>
<td>R1, R3, R6, R7</td>
<td>R6</td>
<td>R23, R5</td>
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<td>[B] boost entrepreneurship</td>
<td></td>
<td></td>
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<td>[C] reduce costs of take-up for businesses</td>
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<tr>
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</tbody>
</table>

A. Support adaptation by organisations from the “Old Economy” &

B. Boost entrepreneurship

The following measures are targeted at traditional companies that have to face the challenges resulting from e-commerce, as well as start-ups that want to exploit Internet-specific business cases. In general it can be said that the latter group does not need to be convinced of the virtues of Internet business, but often lack access to (financial, human etc.) resources. On the other hand, established companies from the “old economy” often do not see the need for engaging in e-commerce although they might be in a position to invest in e-commerce systems. Here, awareness raising is of prime importance.
R1 Successful E-Commerce examples and showrooms: Experiences from different countries show that an important prerequisite for diffusion of e-commerce in SMEs is making them aware and familiar with concrete applications and examples of e-commerce, particularly those in the B2B area which they then try to emulate. Such examples can be set up as showcases in special showrooms. For this purpose, a European-wide network of e-commerce centres of competence should be implemented. Examples of this approach already exist in Germany. In 1998, a national network of 24 such centres, evenly distributed across all Federal states, was already established. Most of these competence centres are associated with regional chambers of commerce allowing them to also use the infrastructure of these institutions.

Experience has shown that continued development of E-Commerce centres of competence on a regional basis would be desirable. Decision makers in SMEs in particular are involved in the day-to-day business to such a large extent that they should be provided with low level user opportunities from these centres closer to where they operate, i.e. the location of the company. This aim could also be reached by deploying mobile showrooms that take up residence temporarily at locations where companies accumulate, e.g. in technology parks or town centres.

R2 Multiplier appeal and motivation: In order to reach a wide range of businesses, cooperation on E-Commerce targeted to specific industries, sectors, trades and other relevant associations is advisable. Its aim should be to interest SMEs from different sectors in the topic and to facilitate their first steps towards its realisation. The existing communication channels to the above mentioned associations could be used for this. An even better way would be an effective publicity drive by the associations together with the national ministries of economic affairs, set up as a public-private-partnership.

R3 E-Commerce competition for SMEs: The experience made with best-practice competitions in various EU Member States shows that these can play an important role in awareness raising, especially if co-operation with the media in the form of media partnerships takes place. Costs can be kept at a manageable level with the help of sponsors from industry, and additionally with certain topics – such as E-Commerce - the media have a personal interest in comprehensive reporting, especially so when a Minister acts as patron; hence, substantial results can be achieved with limited financial input. Competitive tendering should be repeated annually, until the results of the international E-Commerce Monitoring and Benchmarking Project suggested below show that pre-defined targets have been reached (one would be 70% of SMEs practising E-Commerce).

R4 Help from an SME advisor with infrastructure requirements: SMEs that decide to enter the e-commerce marketplace suffer from the difficulty to select the right infrastructure for their needs, e.g. an adequate e-commerce system. It is recommended to set up an organisation independent from IST providers that helps with this task, comparable to consumer protection associations. This task might also be in the responsibility of regional e-commerce competence centres described above.

R5 Evaluation of national e-commerce technology-transfer structures: In all Member States, national and regional governments have started to provide technology-transfer services to support SMEs by giving them access to advice and expertise related to the business use of the Internet and e-commerce. Unfortunately, too often policies of this kind are not properly assessed so that no clues exist as to their effectiveness, especially in reaching businesses that traditionally recoil from innovation. We recommend establishing an EU-wide assessment and benchmarking scheme that supplies regional agencies, that control technology-transfer measures, with adequate, standardised evaluation tools.

R6 Public administrations as e-commerce pioneer and frontrunner: Public administrations and authorities should invest in becoming e-commerce frontrunners since this will positively affect many other parts of industry with respect to the adoption of e-commerce, particularly...
SMEs. They should take the lead in adopting and practising means like “digital signatures” on a broad scale. In those cases where public authorities have already moved ahead with ambitions schemes (e.g. use of digital signature for all data exchange between public authorities in the German Federal State of Lower Saxony), they have earned a lot of publicity. It is also recommended that the public sector - in close co-operation with private sector companies - should pilot e-commerce solutions in sectors traditionally deemed unsuitable for online business. This could help to convince decision-makers in organisations that there is a potential for e-commerce in each sector of the economy.

R7 Online public procurement: We strongly recommend to develop a step-by-step plan with associated timing and clear deadlines for the migration of European as well as all national public authorities and administrations towards online procurement, tendering and ordering. Due to the large turnover generated by procurement from the public sector, it is perfectly suited for gaining large-scale benefits through e-procurement systems. Public authorities will have the chance to stay at the front of developments with this strategy. In addition it will impact on SMEs, known for being rather slow movers when it comes to adopting e-commerce, in a way that they will at a certain and defined point in time only be able to participate in public tendering processes when practising e-commerce.

It is recommended to bundle recommended activities addressed to information provision and awareness raising for SMEs in an overall programme or campaign at national or even European level.

C. Reduce costs of take-up for businesses

R8 European standard product nomenclatures and online catalogue formats: Business-to-business e-commerce is still hampered by the lack of commercial standards, e.g. for classes of products, that might be used for business partners to communicate effectively and to integrate e-commerce systems with long-established enterprise resource systems. The development of standards is often considered a typical case for intervention by the government or at least industry associations because the free market itself does often not provide enough incentives for companies to co-operate and do the work by themselves. A successful example of standard-setting by an industry association (and supported by public agencies) is Germany’s eCl@ss, a standardised product nomenclature that can be used for trading electronically for 12,000 products and services in the wholesale and retail area. There still is a need for an initiative to standardise the numerous catalogue formats, which are currently used for business on the Internet (approximately 160 alone by German companies). Standardising, European product nomenclatures (catalogues) and catalogue formats for the Internet will ease the selling, sourcing, and purchasing of products and services over the Internet.

R9 Support of online marketing for SMEs: Marketing via the Internet strongly deviates from other forms of marketing using traditional media. This is known by experts, however SMEs in particular – when starting to go online and setting up and operating their own Website - do not take advantage of the possibilities of the Internet. Many just proceed by developing an online version of their company brochure and wait for new customers to arrive. Apart from a guide on new ways of (online) marketing that should be part of a free information brochure given to SMEs, public authorities in co-operation with partners from the private economy (e.g. ISPs) can help SMEs by setting up a virtual mall. This mall attracts traffic by aggregating the offers from many different SMEs and making them available to Internet users under a single URL. Publicly supported virtual malls might play an important role in creating Internet services that are targeted at regional communities. They also reduce the cost of SMEs for going online for the first time.

E. Support development of user know-how and usability

R10 Information campaign “Data security and contract law issues in E-Commerce”: As part of a European-wide awareness raising campaign, solutions to data security and contract law
issues brought up by E-Commerce need to be communicated to decision makers in organisations, especially SMEs. This can best be done by way of best practice examples where the advantages of using means like the digital signature in day-to-day business operations and the associated benefits gained by doing so, are presented.

R11 Targeted measure to make senior citizens aware of the Internet: In order to also empower older people in Europe, known as those not very much acquainted with PCs and the Internet (see results from the ECaTT surveys), with the possibilities offered by e-commerce, we recommend the organisation of a series of awareness raising and motivation activities. Possible activities range from the establishment of Internet cafés for the elderly to media competence centres specifically targeted at seniors. These centres might be the most effective if they are constructed to be mobile so that senior citizens can be visited where they live (e.g. old people’s homes, health resorts).

As senior citizens of the EU account for a large (and increasing) share of total consumer spending, it should be possible to set-up public-private-partnerships in this field from which both sides benefit.

R12 E-Commerce for the delivery of public services via public access points: We recommend the establishment of public access points (e.g. kiosk systems, public terminals) that can be used by every citizen for online interaction with public authorities. These should offer a large variety of online public services, especially those that usually require the personal presence of enquirers. Access points should be located at places that are not only open to the public but used by citizens extensively, e.g. libraries, post offices, supermarkets, to ensure that target groups are reached (additional research is necessary to identify optimal location points). Due to lack of user know-how, individuals who have no experience in using computers might need personal assistance in handling these access points, such as a person who can answer questions and act as a guide to first-time users. Funding should be achieved from public-private partnerships like the initiatives that have supplied schools with Internet access in various EU Member States.

F. Adapt consumer protection

R13 “Code of Conduct” for consumer protection in E-Commerce: For business-to-consumer e-commerce, establishing trust is essential. The higher the level of consumer protection on the Internet is (and the more consumers are aware of it), the more attractive e-commerce becomes for them. Promotion of a “code of conduct” would positively contribute to an actual improvement of security on the Internet, and to the subjective perception of security by potential users. This code of conduct should include a set of quality criteria for offers on the Internet to provide more transparency to the consumer, a legal right of return of goods purchased via the Internet etc.

A set of consumer rights for online purchasing already exists in the EU including an assertion period of 2 years. Further relevant issues are currently dealt with at different levels. The OECD has also given its recommendations for guidelines which is in line with EU legislation, but has not been transformed into national law in many other countries yet. The overall objective is to give online-consumers the same rights as they have in conventional purchasing and shopping processes22.

Another measure to increase consumer trust in online shopping is the awarding of seals of quality. They have been pioneered in the USA and are now available from European providers too. The insurance company Gerling has developed the “Trusted Shop” seal of quality.

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The European Retail Institute (EHI) has started to award the “tested/verified online shop” seal of quality European-wide.

We recommend the integration and concentration of these and previous activities for consumer protection into a Code of Conduct, which should then be developed into a world-wide basis for E-Commerce. We can safely assume that at this stage of e-commerce development, almost every effort to increase security on the Internet will contribute to further diffusion of E-Commerce particularly on the demand side.

R14 World-wide data protection regulations following the EU example: The EU data protection regulations on E-Commerce represent a solid legal foundation. Given that demand for government regulation following the EU example is increasing in the US population, the chances are currently good for the development and adoption of world-wide data protection regulations following the European example. If necessary, the pressure on the American negotiating partners must be intensified as the trust which can be gained with the help of satisfactory data protection regulations in the security of E-Commerce applications is of decisive importance for further diffusion in Europe.

G. Increase data security and protection from sabotage

R15 “Disarmed“ forms of the digital signature: To support a rapid diffusion of E-Commerce we recommend speeding up the process of getting the necessary national laws (currently under development on the basis of directives developed and given by the EC) passed through legislation and also trying out the introduction of "disarmed" and cheaper forms of the digital signature besides already existing solutions. The aim should be for a graded system of digital signatures with varying security and input levels where the selection is left to individual users. Again, the US government has been faster in implementing necessary rules and regulations in this important area for the further development and diffusion of e-commerce. Europe formerly had good chances to lead developments here, but since the “Millennium Digital Commerce Act” passed the US-Senate in mid-June 2000 and will be in force from 1st October 2000, the USA is back in the lead. The key message of the US law is that digital signatures have the same validity as hand-written ones. The EU Member States will follow with very similar legislation in the next months.

H. Support market functions

R16 Support to the creation of a “critical mass” in e-commerce sub-sectors: It should be an urgent aim of politics to rapidly create a critical mass for supply and demand of E-Commerce applications. Here again well-targeted support measures aimed at SMEs as already carried out by the EC and various national governments are required. The existing programmes should be continued and if possible intensified and their content expanded. In this connection, it would be worth considering expansion in the direction of E-Commerce competitive tendering. The German Federal Ministry of Economy and Technology has already made positive experiences in this area with the topic “telework”.

R17 Careful interpretation of patent law: As can be seen in practical examples (e.g. the clash over the “one-click-shopping” patent of amazon.com) a market leader can, through patenting of a commonplace technology, obstruct competition in a whole area and thereby probably gain an unfair competitive advantage. We recommend a very careful interpretation of patent law in order to avoid “misuses”.

R18 Evaluation of further requirements regarding copyright protection: We recommend awaiting the outcome of the manifold activities by different actors in Europe and the USA and then deciding whether and which further action is needed.

R19 Examination of regulatory barriers to E-Commerce relating to competition law: The effect of the current regulatory framework on the diffusion of E-Commerce must be analysed in detail for all sectors of the economy. Its results can highlight measures for further progress for example in the areas of book price fixing, discount law, and laws regulating auctions to
pave the way for the faster development of online markets in Europe. Currently rules and regulations in these areas act as constraining factors in many European countries while they do not exist or at least to a much lesser extent in countries like the USA, thereby taking away online business from Europe and transferring it to the USA.

I. increase availability of scarce qualifications on the labour market

R20 Opening of labour market to foreign specialists: The lack of qualified IT personnel has become more than obvious in the recent past. EU Member States have belatedly grown aware to this situation and are not scrambling to put legislation in place to attract qualified experts from abroad, e.g. from third world and East European countries, to work in EU companies.

R21 IT Qualification Initiative: But improving access to skills pools outside of the EU can only be a short-term solution. It has become obvious that there is a need for a large-scale IT qualification initiative in each European country. As companies might be forced to invest more into qualifying young people to the benefit of tomorrow’s labour market, joint action under the lead of the EU commission is called for. Those economic sectors that are suffering more than others from lack of personnel are already globalised to such an extent that national measures alone would not be suited to the nature of the problem.

R22 Evaluation of education structures in European countries: The OECD and others have developed proposals for long-term and demand oriented training and education of IT specialists. The national training systems should be evaluated with the aim of optimising these according to the OECD set of proposals.

J. Smooth international e-commerce trade

R23 Supranational harmonisation and creation of an international legal framework: Various European Federal governments and the EC are already trying very hard to develop an internationally valid legal framework and suitable regulations for E-Commerce in agreement with the governments of their trade partners (e.g. in the areas of tax law, copyright law, consumer protection, custom and trade regulations). However, considering the extensive effects of E-Commerce on existing trade relations it is not surprising that there is still a lot to be done. The efforts made so far should be continued and intensified as clear and binding statements and regulations contribute considerably to generating trust between the agents in E-Commerce and in turn will contribute to an acceleration of its diffusion.

K. Evaluate and co-ordinate EU and national policies

R24 Analysis of current Internet/E-Commerce supportive programmes by national ministries and EC: We recommend a thorough evaluation of EU and national programmes and initiatives on e-commerce carried out in the past and currently underway. Such an evaluation should supply evidence about which initiatives and activities have achieved their goals and which ones failed or achieved sub-optimal results only. In addition, it can contribute to learning from each other, providing guidance for action especially to governments in those countries currently lagging behind, and helping them to avoid mistakes others have made in the past.

R25 Co-ordination of actions and initiatives of individual departments of the EC, national governments and governments of the regions: Initially, and when considering the different Member States, activities must be co-ordinated at a Federal level and attempts must then be made to convince the regions to co-operate voluntarily in order to create synergies, to avoid conflicting activities and to guarantee efficiency. The establishment of a Government E-Commerce officer, which could be located at an appropriate ministry (e.g. in the Ministry of Economics), is worth considering. The co-ordination of government E-Commerce activities is already regarded as a priority by some Member States. In the United Kingdom, for example, the “Performance and Innovation Unit” introduced by the Cabinet has recommended urgent measures to that effect, culminating in a demand to appoint an “e-Minister on Information
Age Issues” immediately and so make the political co-ordination of E-Commerce and E-Government activities a task of the highest importance.

R26 E-Commerce and New Ways of Working market monitoring and foresight: Effective policy-making depends on reliable and up-to-date data. The EC as well as national governments need adequate statistics as a basis for decision-making on matters concerning E-Commerce. For this, continuous market observation and monitoring of supply and demand parameters in e-commerce is necessary. At present the severe lack of the data hampers political decision making to a great extent. In order to analyse and judge the different member state’s relative performance in Europe and world-wide, monitoring must not be limited to the national area but must also include the USA, Japan, and European key competitors in the world. Only such an undertaking can allow exact benchmarking analysis and enable political and economic agents to adopt adequate measures to influence Information Society developments according to current political objectives.
7 Conclusions: Europe Goes E

Europe, some may say belatedly, is on its way to becoming an Information Society with all its positive connotations, but also some threats to long-established structures which this implies. There can be no doubt that the most visible of Information society developments - the growth of Internet usage - and also the way in which labour has shed its former locational ties, will have pronounced effects on the structure of markets for labour and goods. Some of these effects are already showing, making it necessary for policy-makers to decide on strategies to deal with them. Policy-making, however, is made difficult by the diversity of sometimes parallel, sometimes opposing developments which do not lend themselves easily to generalisation. This report has shed light on some of these developments.

The spread of e-commerce

More than is the case with telework, e-commerce will spread regardless of intervention by governments, but empirical evidence shows that certain parts of the economy need assistance to adapt to the challenges of Internet business. Without political support, economic disruptions with possibly severe implications for labour markets would result, especially for the large group of SMEs that supply the majority of jobs in Europe. On the other hand, e-commerce has contributed to a wave of entrepreneurial activity which has never seen before. These opposing tendencies hint at the kind of polarisation that may take place between different parts of the economy and society: between companies and sectors that participate in the possibilities opened up by e-commerce and others that do not. In the general population, such a “digital divide” seems to be developing along the lines of gender, age, qualification, region etc., disadvantaging the elderly, the less qualified, and remote regions. As long as Europe does not manage to also empower these potential users and customers to access and make best use of the new technologies and applications, the market potential will not be fully exploited. In addition, there could also be effects such as an increase in social tension and injustice and the related problems created by these.

The spread of teleworking

Telework has benefited strongly from the political support it has attracted in the last decade, but is developing somewhat differently than expected. Permanent home-working continues to be rare, whereas the numbers of alternating teleworkers (spending no more than one day per week at home) and supplementary teleworkers (spending even fewer hours outside of the office) has grown considerably. Teleworkers are not necessarily recruited from segments of the population that many think would benefit most, namely women and mothers/fathers of young children. Rather it seems that teleworkers are generally hard-working, highly qualified men. Teleworking is being used as a means to flexibilise work, to make it more in line with the demands of present-day business. More flexibility also often seems to mean more physical mobility, casting doubt on the original hope that telework might decrease traffic volumes.

The European leaders

The data presented in this report shows that some European countries (mainly the Nordic countries, Switzerland and the Netherlands) have achieved high rates of penetration of ISTs in homes and establishments for both work and commerce that rival those of the world’s most innovation-friendly countries. The large EU Member States still have some catching up to do, in particular Spain and Italy, but also France and Germany. The following figures show how a measure for economic wealth (GDP) correlates with penetration rates for regular use of online services and regular teleworking respectively for the countries in our survey. Although the stability of regression graphs shown in the figures is weak due to large variability, diversion from these graphs can be loosely interpreted as a measure of performance in comparison to the EU10 average, adjusted for the influence of gross domestic product. Indeed, Sweden and Finland and - to a lesser degree in case of e-commerce - the Netherlands are
far above the trend graph whereas Denmark and the UK are right on it and the rest of the countries below it.
For the workplace, the rank order of countries regarding access to the Internet and use of e-commerce and teleworking is very similar to the above. Here, much of the differences between countries can be explained by the gap in national penetration rates in small and medium size establishments, while large establishments behave much the same regardless of the country they are located in. For this reason, policy measures must focus on giving support to SMEs. One important area of action is the removal of artificial barriers, many of which are remnants of a bygone era before the globalisation of commerce and rapid changes in product markets. Because Europe traditionally has a more regulated economy than the USA, the number of regulations that must be adapted is larger in Europe. This alone gives a head-start to the USA, but Europe under the lead of the European Commission has moved ahead with great speed to shape its regulatory framework according to the requirements of e-commerce.

The causes of national differences

<table>
<thead>
<tr>
<th>Variables used for construction of e-Europe E-COMMERCE INDEX</th>
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</thead>
<tbody>
<tr>
<td><strong>Usage Index</strong></td>
</tr>
<tr>
<td>1. Internet infrastructure:</td>
</tr>
<tr>
<td>- Internet hosts</td>
</tr>
<tr>
<td>2. Internet access:</td>
</tr>
<tr>
<td>- Internet use in establishments</td>
</tr>
<tr>
<td>- Internet presence of establishments</td>
</tr>
<tr>
<td>- private use of Internet in households</td>
</tr>
<tr>
<td>3. E-Commerce offer/supply:</td>
</tr>
<tr>
<td>- establishments practising marketing via Internet</td>
</tr>
<tr>
<td>- online sales by establishments</td>
</tr>
<tr>
<td>- online data exchange with suppliers etc.</td>
</tr>
<tr>
<td>4. E-Commerce demand:</td>
</tr>
<tr>
<td>- online purchasing by establishments</td>
</tr>
<tr>
<td>- online shopping by population</td>
</tr>
<tr>
<td>- online banking by population</td>
</tr>
<tr>
<td><strong>Potential Index</strong></td>
</tr>
<tr>
<td>1. Personal preferences:</td>
</tr>
<tr>
<td>- turnover in mail order shopping</td>
</tr>
<tr>
<td>- credit card use</td>
</tr>
<tr>
<td>- TV consumption</td>
</tr>
<tr>
<td>2. media competence / qualification/ education:</td>
</tr>
<tr>
<td>- PC penetration</td>
</tr>
<tr>
<td>- Knowledge of English language</td>
</tr>
<tr>
<td>- Percentage of population with higher school education</td>
</tr>
<tr>
<td>3. economic structure:</td>
</tr>
<tr>
<td>- share of employees in business services</td>
</tr>
<tr>
<td>- transport volumes / GDP</td>
</tr>
<tr>
<td>- export rate</td>
</tr>
<tr>
<td>4. Technical infrastructure:</td>
</tr>
<tr>
<td>- investment in telecommunications</td>
</tr>
<tr>
<td>- broadband access by households</td>
</tr>
<tr>
<td>- ISDN in households</td>
</tr>
<tr>
<td>5. Conditions for delivery of goods:</td>
</tr>
<tr>
<td>- level of urbanisation</td>
</tr>
<tr>
<td>- service quality of postal services</td>
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</tbody>
</table>

To analyse to what extent national differences can be explained by differences in the potential for e-commerce, two indices were calculated:

the **Potential Index** consists of the following variables: personal preferences (turnover in the mail order trade, diffusion of electronic payment, TV usage); educational level/media competence (PC usage, knowledge of the English language, general educational level/schooling); economic structure/interconnections in the economy (importance of the finance and business services sector, inland goods transportation services, export quotas); technological infrastructure (investment in telecommunications infrastructure;
households connectable to the broadband cable TV network; ISDN connections); conditions for delivery (degree of urbanisation; postal delivery times).23

The Usage Index consists of the main ECaTT e-commerce variables for which data has been supplied by the ECaTT surveys, supplemented by the number of Internet hosts. The outcome of a comparison of the results of both indices is striking. The table below shows Index values (the benchmark in each Indices, Finland in the Usage Index and the USA in the Potential Index, has the value 100). Some countries have a Potential Index value that is clearly above average, but only manage to achieve a poor, below-average Usage Index value, for instance Germany. Finland, on the other hand, excels due to its status as benchmark in the Usage Index and only average position in the Potential Index.

<table>
<thead>
<tr>
<th>E-COMMERCE USAGE AND POTENTIAL INDICES</th>
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<tbody>
<tr>
<td>DK</td>
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<tr>
<td>Potential Index</td>
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<tr>
<td>Usage Index</td>
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</table>

Attitudes towards e-commerce and teleworking

On the level of individual establishments, attitudes towards e-commerce are still generally characterised by ignorance of the possibilities the Internet offers for innovative marketing. Similarly, telework is hampered by an inertia that keeps businesses from rethinking the need to have employees physically present at the office during working hours. In both cases, lack of user know-how and insufficient management skills are partly to blame. Telework suffers especially from a lack of tele-management skills which also hinders tele-co-operation between companies. Since 1985 this has been one of the foremost reasons given by decision makers for not implementing telework throughout the European countries.

The development of e-commerce has suffered a number of setbacks at the hands of saboteurs who have attacked Websites and cast doubt on data security. In addition, Internet companies who have been eagerly collecting data on consumers and sold them to third parties have contributed to user wariness. If the Internet is to become a truly mainstream way of doing business with consumers, the Internet community must create the levels of reliability and trustworthiness that consumers have grown used to in bricks-and-mortar retailing. Building trust may be the most urgent requirement, together with the development of user know-how.

Many current Internet users first made contact with the medium at the workplace. Access to the Internet at the office works as a powerful tool for improving user know-how. This benefits not only employers, but also increases the willingness of individuals to use the Internet for private purposes. In view of this finding, it is unfortunate that many organisations do not allow the majority of their employees to have access to the Internet at the workplace. This may be termed “intolerance and censorship” with respect to Internet access in European organisations. Although it might be expected that companies are wary of the hidden costs Internet access at each workplace might cause, in the Nordic countries about 4/5 of all establishment with connection to the Internet supply Web access to the majority of their staff which shows that it is possible to overcome concerns about costs. It is more likely that concerns about supervision and relatively low levels of trust of employees explain this reluctance.

The future

E-commerce is bound to grow at extremely high rates in the coming years, although some of the optimistic expectations of 1999 may have to be modified in light of recent developments which show that most up-and-running Internet companies might never become profitable and therefore will vanish sooner or later. In the first years of Internet commerce their seemed to be a polarisation between Internet start-ups that seemed free from the constraints affecting traditional business on the one hand, and the established base of companies that struggled to cling to their market shares on the other. However, it has now become clear that Internet companies are subject to identical business imperatives as traditional enterprises. Moreover, mergers and co-operation between Internet start-ups and well-established bricks-and-mortar companies imply that only those companies that manage to combine the best of both worlds, already dubbed "click-and-mortar companies", will succeed in the long term. Whatever, the exact conformation of and relationship between new and traditional companies, it is certain that new business models must be developed and adopted if e-commerce is to have a stable future.

Telework will increasingly become a normal work form for Europeans in the coming years in view of rapid technological development, significant decreases in costs, businesses’ urge for more flexibility and employees’ willingness to work outside the traditional office. Whereas making work locationally flexible was considered a technological problem in the 1980s and an organisational and management problem in the 1990s, in the first decade of this century we expect the main focus of the telework debate to shift to the issues surrounding self-employment, with possibly much more far-reaching (and controversial) implications for the social status quo in the European union.
Annex
1 ECaTT General Population Survey Questionnaire

INTRODUCTION
PROCEDURE TO IDENTIFY RESPONDENT IN HOUSEHOLD
INTRODUCTION II

BACKGROUND VARIABLES

Q1  ASK ALL / AN ALLE
May I ask you how old you are?

☐☐☐
(-9) no answer

Q2  ASK ALL / AN ALLE
How many people live in your household, yourself included?

☐☐
(-9) no answer

Q3a  WENN ANTWORT Q2 > 1
How many are under 18??

☐☐
(No one = 0)
(-9) no answer

Q3b  WENN ANTWORT Q3a > 0
How old is the youngest?

☐☐
(-9) no answer

Q4  ASK ALL/ AN ALLE
What is the highest (academic) qualification that you have? Is it primary school or secondary school or do you have further education?

(1) secondary school: O levels
(2) secondary school: A levels
(3) further / university education
(8) none of the above qualifications
(9) no answer
Q5 **ASK ALL/AN ALLE**
Would you say you lived in a large city, in a suburb or near a large city, or in a mainly rural area?

A "large city" is one with **more than 100 thousand inhabitants**

(1) in large city  
(2) suburb / near large city  
(3) mainly rural area  
(9) no answer

**PC USAGE/ACCESS**

Q6 **ASK ALL/AN ALLE**
Have you used a PC or any other computer - in the past month?

(1) yes  
(2) no  
(9) no answer

Q7 **WENN Q6 (1)**
Did you use one at your place of work?

(1) yes  
(2) no  
(9) no answer

Q8 **ASK ALL/AN ALLE**
Is there a PC or other computer at your home?

(1) yes  
(2) no  
(3) sometimes (notebook etc.)  
(8) don't know  
(9) no answer

Q9 **WENN Q8 = (1) oder (3)**
Is the computer used to make online connections to anywhere else, perhaps using a modem or ISDN?

INTERVIEWER: Network connections within the house are to be excluded!

(1) yes  
(2) no  
(9) no answer

Q10 **WENN Q9 (1)**
Do you have ISDN?

(1) yes  
(2) no  
(8) don't know or not sure  
(9) no answer
Q11  **Wenn Q8 (1) und Q6 (1)**
Have you used a computer at home - in the past month?

(1) yes
(2) no
(9) no answer

Q12  **Wenn Q11(1)**
Did you use it in the past month for business or for private purposes or for both?

(1) for business
(2) for private purposes
(3) for both business and private purposes
(4) for neither business nor private purposes
(9) no answer

Q13  **Wenn Q6 = (2) oder (9)**
Is it likely or unlikely that you will use a computer over the next 1 or 2 years?

(1) likely
(2) unlikely
(3) don't know
(9) no answer

Q14  **Wenn Q8 (2) oder (8) oder (9)**
Is it likely or unlikely that there will be a computer at your home in the next one to two years?

(1) likely
(2) unlikely
(3) don't know
(9) no answer

Q15  **Wenn Q14= “likely” (1)**
Are you likely to use this computer yourself?

(1) likely
(2) unlikely
(3) don't know
(9) no answer

Q16  **Wenn Q15 = likely (1)**
What are you likely to use the PC for: for business, for private purposes or for both? (ONLY ONE ANSWER)

(1) for business
(2) for private purposes
(3) for both business and private purposes
(4) for neither business nor private purposes
(8) don't know
(9) no answer

Q17  **Wenn Q14 (2) oder (3)**
Do you use the VIDEOTEXT on your TV?

(1) yes
(2) no
(3) not available
(4) don't know what VIDEOTEXT is
## E-MAIL USAGE/ACCESS

**Q18**  
**WENN Q6 (1)**  
Did you send or receive any e-mail last month, either at your place of work, at home or elsewhere?  
(ONLY IF UNSURE) By e-mail I mean electronic correspondence, messages that can be sent or received by computer, but not fax.  
(1) used e-mail last month  
(2) no use of e-mail last month  
(9) no answer

**Q19**  
**WENN Q13 = (1) oder Q18 = (2) oder (9)**  
Is it likely or unlikely that you will use e-mail in the next 1 or 2 years?  
(1) likely  
(2) unlikely  
(3) don't know  
(9) no answer

**Q20**  
**WENN Q18 (1)**  
What did you use e-mail for, did you mainly use it for business, or private purposes, or both?  
(1) for business  
(2) for private purposes  
(3) for both business and private purposes  
(4) for neither business nor private purposes  
(5) no answer

**Q21**  
**WENN Q20 (2) oder (3)**  
How many e-mails did you send last week for private purposes - roughly?  
(9) no answer

**Q22**  
**WENN Q20 (1) oder (3)**  
How many e-mails did you send last week for business purposes - roughly?  
(9) no answer

**Q23**  
**WENN Q19 (1)**  
What will you probably use e-mail for, will you use it for business, for private purposes, or for both?  
(1) for business  
(2) for private purposes  
(3) for both business and private purposes  
(4) for neither business nor private purposes  
(9) no answer
### ONLINE SERVICES USAGE

<table>
<thead>
<tr>
<th>Q24</th>
<th>AN ALLE</th>
<th>Have you ever heard of the Internet?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2) no</td>
<td></td>
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<tr>
<td></td>
<td>(9) no answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q25</th>
<th>WENN Q24 (1)</th>
<th>Have you ever used the Internet?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) yes</td>
<td></td>
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<tr>
<td></td>
<td>(2) no</td>
<td></td>
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<tr>
<td></td>
<td>(9) no answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q26</th>
<th>AN ALLE</th>
<th>Do you use any other online service such as [alternative online service] - maybe for banking services, for e-mail or to find information?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) yes</td>
<td></td>
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<tr>
<td></td>
<td>(2) no</td>
<td></td>
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<tr>
<td></td>
<td>(9) no answer</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Q27</th>
<th>WENN Q26 (1)</th>
<th>Which service do you use?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) service not listed: ...........................................</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3) Minitel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4) T-online</td>
<td></td>
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<tr>
<td></td>
<td>(9) no answer</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Q28a</th>
<th>WENN Q25 (1) oder Q26 (1)</th>
<th>Did you use the Internet or other online service last month?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2) no</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3) don’t know</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(9) no answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q28b</th>
<th>WENN Q28a (2)</th>
<th>...in the last 3 months?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) yes</td>
<td></td>
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<tr>
<td></td>
<td>(2) no</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(9) no answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q29</th>
<th>WENN Q28a (1)</th>
<th>Can you usually get Internet or online access 7 days a week?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2) no</td>
<td></td>
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<tr>
<td></td>
<td>(9) no answer</td>
<td></td>
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</tbody>
</table>
**Q30**

**WENN Q29 (1)**

Is this paid for by yourself, by someone else in your household or family, by someone else or is it a free service? **CODE FIRST APPLICABLE**

- (1) pay myself
- (2) paid for by someone in family
- (3) paid by someone else (including employer, university)
- (4) free service
- (5) other answer / not applicable
- (8) don’t know
- (9) no answer

---

**Q31**

**WENN Q25 (2) oder Q28a (2) oder(9)**

Is it likely or unlikely that you will use the Internet in the next 1 to 2 years?

- (1) likely
- (2) unlikely
- (8) don’t know
- (9) no answer
<table>
<thead>
<tr>
<th>Q32</th>
<th>WENN Q25 (1) oder Q26 (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>You can use the internet (or other online services) to search for things or even order things. I’m going to read you a list of things you can do online and ask you whether you have ever done this online for your private purposes.</td>
<td></td>
</tr>
<tr>
<td>For your private purposes, have you ever used the Internet (or other online service)... (READ ITEM AND MAKE ENTRY &quot;Used at all&quot;)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q33</th>
<th>WENN Q32 (2)&quot; : Is it likely or unlikely that you will do so in the next 1 to 2 years? (CODE &quot;yes&quot; for &quot;likely&quot;)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Q34</th>
<th>WENN Q32 (1)&quot; Did you (do this) last month?</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Q35</th>
<th>WENN Q34 (1) (bei g,h,i,k,m,o,p,q) : Roughly how much did you spend (in this way) last month? (CODE DK/NA as &quot;9999&quot;)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Used at all</th>
<th>Likely to use</th>
<th>Used last month</th>
<th>Spend last month in [national currency unit]</th>
</tr>
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<tbody>
<tr>
<td>a</td>
<td>(1)yes (2) no</td>
<td>(1)yes (2) no</td>
<td>(1)yes (2) no</td>
<td>(1)yes (2) no</td>
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<td>b</td>
<td>(1)yes (2) no</td>
<td>(1)yes (2) no</td>
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<td>(1)yes (2) no</td>
<td>(1)yes (2) no</td>
<td>(1)yes (2) no</td>
</tr>
</tbody>
</table>
Q36  WENN 34 a oder b (1)

Thinking now about all the non-cash payments you make – by this I mean payments that you make by cheque, credit card, bank transfer and direct debit. Approximately what percentage of non-cash payments do you make online?

___ ______ %
(-9) no answer

Q37  WENN [Q24 = (2) oder (9) oder Q25 = (2) oder (9)] und Q26 (2) oder (9)

"Online banking" is using a computer or specially equipped TV online to your bank to make payments, rather than using the phone or paper forms. How interested are you in using online banking? Are you....?

(1) very interested
(2) interested
(3) not interested
(9) no answer

Q38  WENN [Q24 = (2) oder (9) oder Q25 = (2) oder (9)] und Q26 (2) oder (9)

"Online shopping" is where you use a computer or specially equipped TV online to the Internet to find out about goods or services and to place orders, rather than using the phone or paper forms. How interested are you in using online shopping? Are you....?

(1) very interested
(2) interested
(3) not interested
(9) no answer

Q39  AN ALLE

What is the main reason why you do not use online shopping, or if you do use it, why do you not do so more often? By this, I mean placing orders and making payments online (DO NOT READ)

(1) Ability - does not have necessary equipment or service
(2) Need - sees no need / use/ reason for it, does not want to change current behaviour
(3) Cost - does not want to buy necessary equipment, to pay for service or for use
(4) Comprehension - Equipment or service is difficult to understand or use
(5) Dangers related to privacy, unwanted disclosure of information
(6) Dangers related to fraud or other unintended loss of money
(7) Disadvantage, e.g. product can not be touched or tried on
(8) Other, please specify: ________________________
(9) No answer / don't know

Q40  WENN Q25 (1) oder Q26 (1) oder Q38 (1) oder (2)

Using online shopping, how likely do you think it is that you ... (READ EACH ITEM) Do you think that it is very likely, likely or unlikely?

very likely    likely    unlikely    n.a.

GPS.SHOP11a  will find more interesting things to buy? (1) (2) (3) (9)
GPS.SHOP11b  will get what you want faster? (1) (2) (3) (9)
GPS.SHOP11c  will find shopping less effort? (1) (2) (3) (9)
GPS.SHOP11d  will save money? (1) (2) (3) (9)
### Q41
**Wenn Q25 (1) oder Q26 (1) oder Q38 (1) oder (2)**
Online shopping often requires new ways of paying. Would you accept typing your credit card number or account number into an online form, where it would be encrypted automatically, if this was the only way of paying for online orders?

- (1) would accept
- (2) would not accept
- (3) don’t know
- (9) no answer

### Q42
**Wenn Q25 (1) oder Q26 (1) oder Q38 (1) oder (2)**
If it was the only way of ordering online, would you accept cash on delivery?

- (1) would accept
- (2) would not accept
- (3) don’t know
- (9) no answer

### Q43
**Wenn Q25 (1) oder Q26 (1) oder Q38 (1) oder (2)**
And would you accept cybercash, e-cash or Internet currency if that was the only way of paying online?

- (1) would accept
- (2) would not accept
- (3) don’t know
- (9) no answer

### Q44
**An alle**
Over the past year have you spent time looking for a (new) job?

- (1) yes
- (2) no
- (9) no answer

### Q45
**Wenn Q44 (1) und (Q25 (1) oder Q26 (1))**
Did you try to use the Internet or another online service in your search?

- (1) yes
- (2) no
- (9) no answer

### Q46
**Wenn Q45 (1)**
What did you do online? Did you...

<table>
<thead>
<tr>
<th>Q46a</th>
<th>search for information about potential employers?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) yes</td>
<td>(2) no</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q46b</th>
<th>look at job advertisements?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) yes</td>
<td>(2) no</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q46c</th>
<th>publish information about yourself on a website</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) yes</td>
<td>(2) no</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q46d</th>
<th>submit information about yourself to an online employment agency or other specialist service</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) yes</td>
<td>(2) no</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q46e</th>
<th>send an application to an employer</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) yes</td>
<td>(2) no</td>
</tr>
</tbody>
</table>
### E-Commerce (Model)

**Q47**  
**ZUFALLSAUSWAHL: 15% DER JENIGEN, DIE SOWOHL BEI Q25 ODER Q25 ALS AUCH Q26 MIT "NEIN" ANTWORTEN**

You can use the phone or a fax to ask for information or mail-order things. I’m going to read you a list of things you can do and ask you whether you have ever done this by using a phone or a fax for your *private* purposes.

For your *private* purposes, have you ever used mail-order or fax ... (READ ITEM AND MAKE ENTRY "Used at all")

**Q48**  
*WENN Q47 "ja": Did you (do this) last month?*

**Q49**  
*WENN Q48 "ja" (used last month": Roughly how much did you spend (in this way) last month?*  
(CODE DK/NA as "9999")

<table>
<thead>
<tr>
<th>Item</th>
<th>Used at all</th>
<th>Used last month</th>
<th>Spend last month in local currency unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>(1)yes (2) no</td>
<td>(1)yes (2) no</td>
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<tr>
<td>b</td>
<td>(1)yes (2) no</td>
<td>(1)yes (2) no</td>
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<td>c</td>
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<td>(1)yes (2) no</td>
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<td>d</td>
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<td>e</td>
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<tr>
<td>f</td>
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<td>h</td>
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<td>j</td>
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<td>l</td>
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<td>Description</td>
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<td>------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Q50</strong></td>
<td>Are you currently in paid work, a school pupil, or full-time student, on a training course, unemployed, looking after home or family, are you retired, or doing something else?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Q51</strong></td>
<td>Would you like to be in paid work now?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Q52</strong></td>
<td>Is your job mainly manual or mainly non-manual?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Q53</strong></td>
<td>Do you have managerial responsibility or supervise work done by other people?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Q54</strong></td>
<td>Does your work require special professional training?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Q55</strong></td>
<td>Do you have a permanent contract of employment, a temporary, i.e. short term contract of employment or do you not have a contract because you are a freelancer or self-employed?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q56  WENN Q50 – (1) – “in paid work”

Work normally includes a number of different tasks to be performed.
In your work, do you on average spend more or less than 6 hours a week doing any kind of office work?

(1) more than 6 hours
(2) less than 6 hours
(3) don’t know
(9) no answer

Q57  WENN Q56 (2) oder (3)

Do you on average spend more or less than six hours a week doing work which could be done at a desk - paperwork, writing, reading, working with pictures, or using the telephone?

(1) more than 6 hours
(2) less than 6 hours
(3) don’t know
(9) no answer

Q58  WENN Q57 (2) oder (3) UND Q6 (1)

Do you on average spend more or less than six hours a week doing work on a computer or using a computer-controlled machine?

(1) more than 6 hours
(2) less than 6 hours
(3) don’t know
(9) no answer
**TELEWORK**

**Q59**  
**WENN Q50 (1) ODER Q51 (1)**  
With the help of modern technologies, many types of work can now be done at home: so-called telework. Using telephone, fax and computers many people will be able to avoid a daily commute from home to work.  
Before this interview today, had you heard of telework?

- (1) yes  
- (2) no  
- (9) no answer

**Q60**  
**WENN Q59 (1)**  
Have you considered telework as something you might do yourself?

- (1) yes  
- (2) no  
- (9) no answer

**Q61**  
**WENN Q60 (1)**  
Do you telework from home at all?

- (1) yes  
- (2) no  
- (9) no answer

**Q62**  
**WENN Q61 (1)**  
Do you spend at least one full working day a week teleworking from home?

- (1) yes  
- (2) no  
- (9) no answer

**Q63**  
**WENN Q62 (1)**  
In a typical working week, approximately what percentage of your total working time do you spend teleworking?

- (9) no answer

**Q64**  
**WENN Q62 (2)**  
How many hours do you spend teleworking from home in a typical working week?

- (9) no answer
Q65 WENN Q61 (1)
How long have you practiced telework, less than a year, less than 2 years, less than 5 years or 5 years or more?

(1) Less than a year
(2) Less than 2 years
(3) Less than 5 years
(4) 5 years or more
(9) no answer

Q66 WENN Q61 (1)
When you are teleworking, do you have an online connection to your main place of work?

(1) yes
(2) no
(9) no answer

Q67 WENN Q66 (1)
When teleworking at home, for approximately what percentage of the time is your computer connected to your main place of work??

_______%
(-9) no answer

Q68 WENN [Q50 = (1) oder Q51 = (1)] und nicht Q61 = (1)
If you could telework, how interested would you be in doing almost all your work teleworking at home?
Would you be very interested, interested or not interested in doing almost all your work teleworking at home?

(1) very interested
(2) interested
(3) not interested
(9) no answer

Q69 WENN [Q50 = (1) oder Q51 = (1)] und nicht Q61 = (1)
How interested would you be in telework where you did not spend all your working time, but at least one full working day, at home?
Would you be very interested, interested or not interested in spending at least one full working day a week teleworking at home?

(1) very interested
(2) interested
(3) not interested
(9) no answer

Q70 WENN [Q50 = (1) oder Q51 = (1)] und nicht Q61 = (1)
How interested would you be in telework where you spent your regular working time away from home but did additional work and preparation teleworking at home?
Would you be very interested, interested or not interested in telework for additional and preparation work?

(1) very interested
Q71

**WENN Q50 (1) ODER Q51 (1)**

There is also a kind of telework where you do not work at home, but in an office provided near your home, a so-called telecottage or telecenter. You do all your work there, in the company of teleworkers from other departments or companies.

Do you work in a telecottage/telecenter?

(1) yes
(2) no
(9) no answer

Q72

Q71 (2)

Would you be very interested, interested or not interested in working in a telecottage/telecenter?

(1) very interested
(2) interested
(3) not interested
(9) no answer

**WORK FLEXIBILITY**

Q73

**WENN Q55 = (1) oder (2) oder (9)**

How many hours per week does your contract oblige you to work on average?

(89) 89 hours or more
(91) hours are not fixed in contract
(98) don’t know

Q74

**WENN Q55 (1) oder (2) oder (9)**

Do you do any other paid work outside this employment?

(1) yes
(2) no
(9) no answer

Q75

**WENN Q74 (1)**

And do you also have a contract of employment for this other paid work that you do?

(1) yes
(2) no
(9) no answer

Q76

**WENN Q75 (2) oder (9)**

Which is your main paid working relationship, is it the work you spend most time on which you have a contract for, or is it for the other paid work you do without a contract?

(1) main work is employment with contract
(2) main work is without contract
(9) no answer
Q77  WENN Q55 (1) oder (2) oder (9)
Are you employed by a temp-agency or other firm that finds you temporary jobs?
(1) yes
(2) no
(9) no answer

Q78  WENN [Q55 (1) oder (2) oder (9)] und [Q77 (2) oder (9)]
Do you own or have shares in your employing organisation?
(1) yes
(2) no
(9) no answer

Q79  WENN Q78 (1)
Do you have a significant say in the way the company is run?
(1) yes
(2) no
(9) no answer

Q80  WENN Q79 (1)
Can you decide your own terms of employment?
(1) yes
(2) no
(9) no answer

Q81  WENN Q50 (1)
Depending on all sorts of factors, people have more or less control over the times they work.
For each of the following statements please say whether it is mainly untrue or mainly true for your work.

<table>
<thead>
<tr>
<th>Statement</th>
<th>mainly untrue</th>
<th>mainly true</th>
</tr>
</thead>
<tbody>
<tr>
<td>I cannot work outside the hours 6 a.m. to 6 p.m.</td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>The times I work depend on what other people decide</td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>I have to start work within half an hour of a fixed time</td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Any work I do outside set working times is not paid</td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>I can change the time I am allowed to start or finish work at short notice</td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>I can reduce my average working week by 10 hours or more if I want, so long as I inform people in good time</td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>I have very little influence on how long I have to work in a week</td>
<td>(1)</td>
<td>(2)</td>
</tr>
</tbody>
</table>
Q82  WENN Q55 (3) ODER Q80 (1)
Does anyone work for you on a regular basis (excluding housework or other private purposes)?

(1) yes
(2) no
(3) don’t know
(9) no answer

Q83a  WENN Q82 (1)
Are any of the people who work for you normal employees, with formal employment contracts?

(1) yes
(2) no
(9) no answer

Q83b  WENN Q83a (2) oder (9)
Does anyone else outside your family work for you regularly?

(1) yes
(2) no
(9) no answer

Q84  WENN Q82 (1)
How many people work for your organisation altogether?

_________ employees, other people and family members

Q85  WENN Q82 (2) oder (3) oder (9)
Do you work with a partner, or for another member of the family, or do you work mainly on your own?

(1) works with partner
(2) works for member of family
(3) works mainly on own
(4) none of the above
(9) no answer

Q86  WENN Q50 (1)
How many hours do you actually spend on your paid work in a week, on average, including all forms of paid work and any paid or unpaid overtime?
Q87  

**WENN Q50 (1)**

If you could improve your income or reduce your hours by changing your work, which of the following features would you like your new work to have? Suppose (READ LIST ITEM HERE). Would you dislike it a lot, dislike it a little, like it a little or like it a lot, or wouldn’t you mind?

(1) dislike a lot (2) dislike a little (3) don’t mind (4) like a little (5) like a lot (9) no answer

a) you are paid as soon as you deliver a result and only then  
(1)  (2)  (3)  (4)  (5)  (9)

b) you have a contract of employment with regular fixed payments and fixed hours to work  
(1)  (2)  (3)  (4)  (5)  (9)

c) you work for and are paid by **two or more** organisations at the same time  
(1)  (2)  (3)  (4)  (5)  (9)

d) you work for **one** organisation only  
(1)  (2)  (3)  (4)  (5)  (9)

e) you have **two or more** tasks or projects to do each week  
(1)  (2)  (3)  (4)  (5)  (9)

f) you have **one** task or project to do over several years  
(1)  (2)  (3)  (4)  (5)  (9)

g) you choose people to work for you and your income depends on their work  
(1)  (2)  (3)  (4)  (5)  (9)

h) you work with the people you are told to work with  
(1)  (2)  (3)  (4)  (5)  (9)

i) the work you are commissioned to do takes less than a year to do and pays enough for 2 months without work  
(1)  (2)  (3)  (4)  (5)  (9)

j) an agency finds you several tasks to do for different organisations  
(1)  (2)  (3)  (4)  (5)  (9)

**INTRO 4**  
Please answer the following questions for your main job only.
Q88  WENN Q50 (1)
Which industry sector does the organisation you work for belong to? (READ OUT AND CODE FIRST TO APPLY)

(1) agriculture
(2) mining, energy
(3) manufacturing
(4) construction
(5) distribution
(6) hotels, restaurants
(7) transport, communication
(8) banking, insurance
(9) business services
(10) public administration
(11) education
(12) health and social work
(13) other personnel or social services
(14) employed in households
(99) no answer

Q89  WENN Q50 = (1) AND NOT Q80 = (1) AND NOT 55 = (3)
How many employees work in your organisation? (IF NECESSARY READ OUT AND CODE FIRST TO APPLY)

(0) none
(1) 1
(2) 2-4
(3) 5-9
(4) 10-19
(5) 20-49
(6) 50-99
(7) 100-249
(8) 250-499
(9) 500-999
(10) >=1000
(-9) no answer

CONTACTS/ TELE-COOPERATION

Q90  WENN Q50 (1)
In the course of your job, do you yourself have regular external contacts, I mean do you exchange information and communicate with people outside your organisation, with customers or clients, suppliers, or other business partners, perhaps in projects?

(1) yes
(2) no
(9) no answer
Q91  WENN Q90 (1)
How frequent are your phone calls, meetings, mail and other communication with external contacts? Is it 10 or more a day, at least one a day, at least one a week or less than one a week?

(1) 10 or more a day
(2) at least one a day
(3) at least one a week
(4) less than one a week
(9) no answer

Q92  WENN Q90 (1)
Are most of your external contacts with customers or potential customers, with suppliers, or with other people?

(1) (potential) customers
(2) suppliers
(3) other people
(4) (potential) customers and suppliers
(5) (potential) customers and other people
(6) suppliers and other people
(7) all about equal
(9) no answer

Q93  WENN Q90 (1)
When you communicate with your external contacts, do you sometimes use .. (READ LIST ITEM)

(IF "YES":) How often is this? (FOR FIRST ITEM AND THEN AS NECESSARY) Do you use (READ FROM LIST) 10 or more times a day, at least once a day, at least once a week or less often?

<table>
<thead>
<tr>
<th>Item</th>
<th>Use</th>
<th>&gt;10 daily</th>
<th>&gt;1 per day</th>
<th>&gt;1 per week</th>
<th>&lt;1 per week</th>
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</thead>
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<tr>
<td>GPS.CO2-a e-mail</td>
<td>yes/no (2) (3) (4) (5)</td>
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<td></td>
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<td></td>
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<tr>
<td>GPS.CO2-b fax</td>
<td>yes/no (2) (3) (4) (5)</td>
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</tr>
<tr>
<td>GPS.CO2-c audio conference</td>
<td>yes/no (2) (3) (4) (5)</td>
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<td></td>
</tr>
<tr>
<td>GPS.CO2-d video conference</td>
<td>Yes/no (2) (3) (4) (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPS.CO2-e file transfer or other computer access</td>
<td>yes/no) (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q94  WENN Q55 (3) ODER Q80 (1)
Do you use a computer system which is shared with any customer or supplier, perhaps a shared database, file server or extranet?

(1) yes
(2) no
(3) don’t know

Q95  WENN Q55 (1) ODER (2) ODER (9) ODER Q82 (1)
Does everybody who regularly works for the organisation you work for work with you at the same site, or do some regularly work at another location?

INTERVIEWER: Clarify as necessary: “at least one person regularly works at a different location to one where you regularly work?”

(1) at least one person regularly works at a different location to me
(2) no-one regularly works at a different location to me --> WEITER MIT Q99
**Q96**
*Wenn Q95 (1)*
Are you in contact with the people at the other location(s) at all?

(1) yes
(2) no  --> WEITER MIT Q99

**Q97**
*Wenn Q96 (1)*
When you communicate with the people at the other location(s), do you sometimes use ..
(READ LIST ITEM)

(If "YES"): How often is this? (FOR FIRST ITEM AND THEN AS NECESSARY) Do you use
(READ LIST ITEM) 10 or more times a day, at least once a day, at least once a week or less
often?

<table>
<thead>
<tr>
<th>use</th>
<th>&gt;10 daily</th>
<th>&gt;1 per day</th>
<th>&gt;1 per week</th>
<th>&lt;1 per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPS.COSITE2a - e-mail</td>
<td>yes/no (2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPS.COSITE2b - fax</td>
<td>yes/no (2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPS.COSITE2c - audio conf.</td>
<td>yes/no (2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPS.COSITE2d - video conf.</td>
<td>yes/no (2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPS.COSITE2e - file transfer or other computer access</td>
<td>yes/no (2)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Q98**
*Wenn Q95 (1)*
Do you use a computer system which is shared with the people at the other location(s), perhaps
a shared database, file server, intra- or extranet?

(1) yes
(2) no
(3) don't know

**Q99**
*Wenn Q50 (1)*
Is your main place of work less than 1 km away, less than 5 km, less than 20 km, less than 50
km, less than 100 km or more than 100 km away from your home?

(1) at home
(2) up to 1km
(3) up to 5 km
(4) up to 20 km
(5) up to 50 km
(6) up to 100 km
(7) more than 100 km
(8) don't have a main place of work

**Q100**
*Wenn Q50 (1)*
Do you spend any of your working time away, from your home and from your main place of
work, e.g. on business trips, in the field, travelling or on customer's premises?

(1) yes
(2) no

**Q101**
*Wenn Q100 (1)*
How much of your working time do you spend away from home and main place of work, is it
less than 10 hours a month, less than 10 hours a week, less than half your working time or
more than half your working time?

(1) less than 10 hours a month
(2) less than 10 hours a week
(3) less than half working time  
(4) more than half working time

<table>
<thead>
<tr>
<th>Q102</th>
<th>Wenn Q101 (2,3 Oder 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>When you are out of your office on business trips, in the field, travelling or on customer’s premises, do you ever use a notebook or any other computing device?</td>
</tr>
</tbody>
</table>
|        | (1) yes  
|        | (2) no  |

<table>
<thead>
<tr>
<th>Q103</th>
<th>Wenn Q101 (2,3 Oder 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Do you ever use online computer connections when travelling?</td>
</tr>
</tbody>
</table>
|        | (1) yes  
|        | (2) no  |

<table>
<thead>
<tr>
<th>Q104</th>
<th>Wenn Q103 (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Do you use the online connection at least once a month to...</td>
</tr>
<tr>
<td></td>
<td>access the Internet?</td>
</tr>
<tr>
<td></td>
<td>transfer e-mail?</td>
</tr>
<tr>
<td></td>
<td>make other online connections?</td>
</tr>
<tr>
<td></td>
<td>connect your computer via GSM or other mobile networks?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q105</th>
<th>Coded by Interviewer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gender of respondent</td>
</tr>
</tbody>
</table>
|        | (1) male  
|        | (2) female  |
2 ECaTT Decision Makers Survey Questionnaire

QA ALL
Interviewer: Code respondent's position in establishment (ask to confirm if necessary)

(1) Owner/Proprieter
(2) Managing Director/Board Member
(3) Head of Establishment/Site
(4) Head of IT/DP
(5) Other member of IT/DP Department

Q1 ALL
Which industry does your organisation belong to? (READ OUT AND CODE FIRST TO APPLY)

(1) agriculture 
(2) mining, energy 
(3) manufacturing 
(4) construction 
(5) distribution 
(6) hotels, restaurants 
(7) transport, communication 
(8) banking, insurance 
(9) business services 
(10) public administration 
(11) education 
(12) health and social work 
(13) other personnel or social services 
(99) na

Q2A ALL
Does your organisation have only one site, or has it more than one establishment?

(1) only one site 
(2) more than one establishment 
(8) don't know 
(9) na

Q2B IF Q2A = (2)
How many employees does your organisation have in total in this country?

[NOTE TO TRANSLATORS: employee means those with a work contract]

(888) don't know 
(999) na
Q2C  IF Q2A = (2)

From now on, we would like you to consider only this establishment when answering questions about your organisation.

How many employees and how many freelancers work for your organisation at this establishment? [INTERVIEWER: ADD IF ONLY ONE NUMBER IS GIVEN: And how many of these are freelancers or self-employed, i.e. do not have a contract of employment?]

a) employees □□□□□□ (888) don't know (999) na
b) freelancers/ self-employed □□□□□□ (888) don't know (999) na

Q2D  IF Q2A IS NOT (2)

How many employees and how many freelancers work for your establishment? [INTERVIEWER: ADD IF ONLY ONE NUMBER IS GIVEN: And how many of these are freelancers or self-employed, i.e. do not have a contract of employment?]

a) employees □□□□□□ (888) don't know (999) na
b) freelancers/ self-employed □□□□□□ (888) don't know (999) na

Q3  ALL

Would you say your establishment site is in a large city, in a suburb or near a large city, or in a mainly rural area?

[INTERVIEWER: IF INTERVIEWEE IS UNSURE, ADD: A “large city” is one with more than 100 thousand inhabitants]

(1) in large city
(2) suburb / near large city (including medium and small cities that are adjacent to a large city)
(3) mainly rural area (including medium and small cities that are not adjacent to a large city)
(8) don’t know
(9) na

Q4  ALL

Does your establishment use e-mail?

(1) yes
(2) no
(8) don’t know
(9) na

Q5  WENN Q4 = (2) or (8) or (9)

Are there concrete plans to introduce it in the next one to two years?

(1) yes
(2) no
(8) don’t know
(9) na
<table>
<thead>
<tr>
<th>Q6</th>
<th>AN ALLE</th>
<th>Does your establishment have access to the Internet?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) yes</td>
<td>(2) no</td>
<td>(8) don't know</td>
</tr>
<tr>
<td>(9) na</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q7</th>
<th>WENN Q6 = (2) or (8) or (9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>... and what about the next one to two years?</td>
<td></td>
</tr>
<tr>
<td>(1) yes</td>
<td>(2) no</td>
</tr>
<tr>
<td>(9) na</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q8</th>
<th>AN ALLE</th>
<th>Does your establishment have an Intranet?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) yes</td>
<td>(2) no</td>
<td>(8) don't know</td>
</tr>
<tr>
<td>(9) na</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q9</th>
<th>WENN Q8 = (2) or (8) or (9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>... and what about the next one to two years?</td>
<td></td>
</tr>
<tr>
<td>(1) yes</td>
<td>(2) no</td>
</tr>
<tr>
<td>(9) na</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q10</th>
<th>AN ALLE</th>
<th>Does your establishment use video-conferencing?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) yes</td>
<td>(2) no</td>
<td>(8) don't know</td>
</tr>
<tr>
<td>(9) na</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q11</th>
<th>IF Q10 = (2) or (8) or (9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>... and what about the next one to two years?</td>
<td></td>
</tr>
<tr>
<td>(1) yes</td>
<td>(2) no</td>
</tr>
<tr>
<td>(9) na</td>
<td></td>
</tr>
</tbody>
</table>
Q12  **AN ALLE**
Does your establishment use other groupware tools like Microsoft Outlook or Lotus Notes?

(1) yes  
(2) no  
(8) don't know  
(9) na

Q13  **IF Q12 = (2) or (8) or (9)**
... and what about the next one to two years?

(1) yes  
(2) no  
(8) don't know  
(9) na

Q14  **AN ALLE**
Does your establishment use electronic data interchange (EDI)?

(1) yes  
(2) no  
(8) don't know  
(9) na

Q15  **IF Q14 = (2) or (8) or (9)**
... and what about the next one to two years?

(1) yes  
(2) no  
(8) don't know  
(9) na

Q16  **AN ALLE**
Does your establishment use a call center, i.e. a unit whose sole purpose is telephone marketing and telephone customer services?

(1) yes  
(2) no  
(8) don't know  
(9) na

Q17  **IF Q16 = (2) or (8) or (9)**
... and what about the next one to two years?

(1) yes  
(2) no  
(8) don't know  
(9) na
Q18 What applications can be accessed by the majority of your office workers? Can the majority of your office workers ...  

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Yes</th>
<th>No</th>
<th>Don't Know</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>IF Q4 = (1) or (8) or (9) send E-mails to internal addresses</td>
<td>(1) yes</td>
<td>(2) no</td>
<td>(3) don't know</td>
<td>(9) na</td>
</tr>
<tr>
<td>b</td>
<td>IF Q4 = (1) or (8) or (9) send E-mails to external addresses</td>
<td>(1) yes</td>
<td>(2) no</td>
<td>(3) don't know</td>
<td>(9) na</td>
</tr>
<tr>
<td>c</td>
<td>IF Q6 = (1) or (8) or (9) browse Internet sites</td>
<td>(1) yes</td>
<td>(2) no</td>
<td>(3) don't know</td>
<td>(9) na</td>
</tr>
<tr>
<td>d</td>
<td>IF Q8 = (1) or (8) or (9) browse Intranet sites</td>
<td>(1) yes</td>
<td>(2) no</td>
<td>(3) don't know</td>
<td>(9) na</td>
</tr>
<tr>
<td>e</td>
<td>IF Q10 = (1) or (8) or (9) communicate via video conferencing</td>
<td>(1) yes</td>
<td>(2) no</td>
<td>(3) don't know</td>
<td>(9) na</td>
</tr>
</tbody>
</table>

Q19 ALL  
In many companies there are some employees who spend a considerable part of their working time away from their employer's premises, i.e. in the field or at customer's premises. Does your establishment have employees who do so for approximately more than 10 hours a week?  

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) yes</td>
<td></td>
</tr>
<tr>
<td>(2) no</td>
<td></td>
</tr>
<tr>
<td>(8) don't know</td>
<td></td>
</tr>
<tr>
<td>(9) na</td>
<td></td>
</tr>
</tbody>
</table>

Q20 IF Q19 = (1)  
Today mobile workers can be given online access to company information systems. Are some of your mobile workers equipped to have online access to company information systems from outside of the organisation's premises?  

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) yes</td>
<td></td>
</tr>
<tr>
<td>(2) no</td>
<td></td>
</tr>
<tr>
<td>(8) don't know</td>
<td></td>
</tr>
<tr>
<td>(9) na</td>
<td></td>
</tr>
</tbody>
</table>

Q21 IF Q20 = (1)  
Roughly, how many of your mobile workers are equipped to have online access to company information systems from outside of the organisation's premises?  

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(88) don't know</td>
<td></td>
</tr>
<tr>
<td>(99) na</td>
<td></td>
</tr>
</tbody>
</table>

Q22 IF Q19 = (1) or (8) or (9) AND Q20 = (2) or (8) or (9)  
Are you interested in equipping some of your current or prospective mobile workers with online access?  

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) yes</td>
<td></td>
</tr>
<tr>
<td>(2) no</td>
<td></td>
</tr>
<tr>
<td>(8) don't know</td>
<td></td>
</tr>
<tr>
<td>(9) na</td>
<td></td>
</tr>
</tbody>
</table>
Q23  IF Q22 = (1)
... and are there already concrete plans to do this in the next one to two years?

(1) yes
(2) no
(8) don’t know
(9) na

Q24  ALL
Teleworkers in general are those who
- work at a distance from the premises of their employer
- use computers in their work
- transmit work results using telecommunications

Q24  ALL
I am now going to list five forms of teleworkers
Please tell me whether any of the following currently work for your establishment:

Q25  IF Q24a-e = 1
Do you think your establishment would be interested in extending this form of telework?

Q26  IF Q24a-e = (2) or (8) or (9)
Do you think your organisation would be interested in introducing this type of telework.

Q27  IF Q25/Q26 a-e = 1
...and are there already concrete plans for this?

...
Thinking now about all these types of teleworkers: roughly, how many teleworkers do you currently employ in total?

[NOTE TO TRANSLATORS: Make sure that the translation of “employ” does not only include relationships based on a work contract but also client/contractor relationships in case the teleworker is self-employed]

☐ ☐ ☐ ☐ ☐
(88) don’t know
(99) na

Q29  ALL
There is also a kind of telework where the employees do not work at home, but in an office provided near their home, a so-called telecottage or telecenter.

Do some of your employees work in such a telecottage/telecenter?

☐ ☐ ☐ ☐ ☐
(1) yes
(2) no
(8) don’t know
(9) no answer

Q30  IF Q29 = (1)
Roughly, how many employees of your establishment work in telecottages or telecenters currently?

☐ ☐ ☐ ☐ ☐
(88) don’t know
(99) na

Q31  IF Q29 = (2) or (8) or (9)
Would you be interested or not interested in this type of telework?

☐ ☐ ☐ ☐ ☐
(1) interested
(2) not interested
(8) don’t know
(9) na

Q32  IF Q29 = (1)
Are you interested in extending this kind of telework?

☐ ☐ ☐ ☐ ☐
(1) yes
(2) no
(8) don’t know
(9) no answer
Q33

IF Q31 = (1) or Q32 = (1)

... and are there already concrete plans for it in the next one to two years?

(1) yes
(2) no
(8) don’t know
(9) na

Q34

IF Q24a = (1) or Q24b = 1 or Q24c = 1 or Q24d = 1 or Q24e = 1 or Q29 = (1)

In what areas does your establishment practice telework?

<table>
<thead>
<tr>
<th>Area</th>
<th>(1) yes</th>
<th>(2) no</th>
<th>(8) dk</th>
<th>(9) na</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. IT and programming</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. distribution and customer services</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. supportive tasks like data entry and text processing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. secretarial tasks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. clerical tasks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. other qualified tasks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. managerial tasks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. other not mentioned</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IF Q34a = (2) And Q34b = (2) And Q34c = (2) And Q34d = (2) And Q34e = (2) And Q34f = (2) And Q34g = (2)

other not mentioned, please specify: ___________________________

(1) yes
(9) na

Q35

If Q24a = (1) or Q24b = (1) or Q24c = (1) or Q24d = (1) or Q24e = (1)

OR

If Q26a = (1) or Q26b = (1) or Q26c = (1) or Q26d = (1) or Q26e = (1)

Which of the following tasks would you consider feasible for telework in your establishment?

<table>
<thead>
<tr>
<th>Task</th>
<th>(1) yes</th>
<th>(2) no</th>
<th>(8) dk</th>
<th>(9) na</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. IT and programming</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. distribution and customer services</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. supportive tasks like data entry and text processing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. secretarial tasks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. clerical tasks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. other qualified tasks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. managerial tasks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q36

IF Q24a = (1) or Q24b = (1) or Q24c = (1) or Q24d = (1) or Q24e = (1) or Q29 = (1)

How many years has your establishment practiced telework?

☐☐ years
(88) don’t know
(99) na
Q37

Now I am going to read out a list of possible **barriers** to the further spread of telework. Please say for each whether you regard it as very important, important or not important as a **barrier to telework**.

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Very Important</th>
<th>Important</th>
<th>Not Important</th>
<th>DK</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>a insufficient knowledge among managers of how to plan and organise telework</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(8)</td>
<td>(9)</td>
</tr>
<tr>
<td>b the expense of computing equipment and telecommunications services</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(8)</td>
<td>(9)</td>
</tr>
<tr>
<td>c reasons relating to productivity or work quality</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(8)</td>
<td>(9)</td>
</tr>
<tr>
<td>d the difficulties of managing and supervising tele-workers</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(8)</td>
<td>(9)</td>
</tr>
<tr>
<td>e problems organising communication with teleworkers</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(8)</td>
<td>(9)</td>
</tr>
<tr>
<td>f health, safety, insurance or legal problems</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(8)</td>
<td>(9)</td>
</tr>
<tr>
<td>g data security problems</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(8)</td>
<td>(9)</td>
</tr>
<tr>
<td>h lack of any pressure to change current practice</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(8)</td>
<td>(9)</td>
</tr>
<tr>
<td>i employees would not want to telework</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(8)</td>
<td>(9)</td>
</tr>
<tr>
<td>j resistance from trade unions</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(8)</td>
<td>(9)</td>
</tr>
</tbody>
</table>

Q38

Does your organisation offer information on the Internet or another online service like .... 24?

- (1) yes
- (2) no
- (8) don’t know
- (9) no answer

Q39

IF Q38 = (2) or (8) or (9)

Are there any concrete plans to do so in the next 1 to 2 years?

- (1) yes
- (2) no
- (8) don’t know
- (9) no answer

Q40

IF Q38 = (1)

What kind of presence do you have on the Internet or in an other online service? Do you have ...

<table>
<thead>
<tr>
<th>Presence</th>
<th>Yes</th>
<th>No</th>
<th>DK</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>a a website with own URL or own pages in ... 25</td>
<td>(1)</td>
<td>(2)</td>
<td>(8)</td>
<td>(9)</td>
</tr>
<tr>
<td>b a presence in an electronic shopping mall together with other suppliers</td>
<td>(1)</td>
<td>(2)</td>
<td>(8)</td>
<td>(9)</td>
</tr>
<tr>
<td>c an entrance in electronic &quot;yellow pages&quot; or other trade directory</td>
<td>(1)</td>
<td>(2)</td>
<td>(8)</td>
<td>(9)</td>
</tr>
<tr>
<td>d some other kind of presence, please specify: .......................</td>
<td>(1)</td>
<td>(2)</td>
<td>(8)</td>
<td>(9)</td>
</tr>
</tbody>
</table>

---

24 NOTE TO TRANSLATOR: LIST NATIONAL ALTERNATIVE ONLINE SERVICE(S). BE CAREFUL TO FIND THE RIGHT TRANSLATION FOR "PAGES", I.E. INFORMATION OFFER SIMILAR TO WEBSITES, BUT IN ALTERNATIVE ONLINE SERVICE SYSTEMS.

25 NOTE TO TRANSLATOR: LIST NATIONAL ALTERNATIVE ONLINE SERVICE(S)
Q41  
IF Q38 = (1)  
What is the purpose of these activities? Do you use your online presence for ...

Q42  
IF Q41a-f = (2)  
Are there concrete plans to use it for this in the next 1 to 2 years?

<table>
<thead>
<tr>
<th></th>
<th>Q41 use currently</th>
<th>Q42 in 1-2 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>advertising and marketing purposes</td>
<td>(1) yes (2) no (8) dk (9) na</td>
</tr>
<tr>
<td>b</td>
<td>offering information free to the user</td>
<td>(1) yes (2) no (8) dk (9) na</td>
</tr>
<tr>
<td>c</td>
<td>distribution of information with charge to the user</td>
<td>(1) yes (2) no (8) dk (9) na</td>
</tr>
<tr>
<td>d</td>
<td>making sales online</td>
<td>(1) yes (2) no (8) dk (9) na</td>
</tr>
<tr>
<td>e</td>
<td>data exchange with suppliers and customers</td>
<td>(1) yes (2) no (8) dk (9) na</td>
</tr>
<tr>
<td>f</td>
<td>joint business processes with suppliers or cooperation partners</td>
<td>(1) yes (2) no (8) dk (9) na</td>
</tr>
</tbody>
</table>

Q43  
IF Q39 = (1)  
For what purposes? For ...

<table>
<thead>
<tr>
<th></th>
<th>Q43a-f = (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>advertising and marketing purposes?</td>
</tr>
<tr>
<td>b</td>
<td>offering information free to the user?</td>
</tr>
<tr>
<td>c</td>
<td>distribution of information with charge to the user?</td>
</tr>
<tr>
<td>d</td>
<td>making sales online?</td>
</tr>
<tr>
<td>e</td>
<td>data exchange with suppliers and customers?</td>
</tr>
<tr>
<td>f</td>
<td>joint business processes with suppliers or cooperation partners?</td>
</tr>
</tbody>
</table>

Q44  
IF NOT Q41c = (1) And NOT Q41d = (1) And NOT Q42c = (1) And NOT Q42d = (1) And NOT Q43c = (1) And NOT Q43d = (1)  
Lately there is a lot of talk about online shopping, i.e. the sale of products via online services. What are your main reasons for not offering online shopping to your customers? (DO NOT READ)

(1) **Demand** - no demand from actual and potential customers for e-shopping  
(2) **Need** - sees no need/ use/ reason for it, does not want to change current behaviour  
(3) **Cost** - expensive to implement, return on investment not high enough  
(4) **Know-how** - technology is difficult to implement, lack of know-how, lack of understanding  
(5) **Dangers** related to data security, unwanted disclosure of confidential information  
(6) **Dangers** related to fraud or other unintended loss of money, security of intellectual property rights  
(7) **Product characteristics**, products are not feasible for online sales, e.g. product needs to be touched or tried on to be sold, personal services that require presence of the consumer  
(8) **External conditions** - no clarity about legal and political conditions, insecurity about future developments  
(9) **Other**, please specify: ________________________  
(88) don’t know  
(99) na
Q45  ALL
Do you use the Internet or other online services for procurement purposes, i.e. to purchase goods or services?

(1) yes  
(2) no  
(8) don’t know  
(9) no answer

Q46  IF Q45 = (2)
Are there concrete plans in your establishment to start using online services for procurement purposes in the next 1 to 2 years?

(1) yes  
(2) no  
(8) don’t know  
(9) no answer

Q47  IF NOT Q45 = (1) And NOT Q46 = (1)
What are the main reasons why you do not use online services for procurement purposes (DO NOT READ)?

(1) Supply - procurement partners do not offer online transactions, not enough products available online, no compatibility of computer systems  
(2) Need - sees no need/ use/ reason for it, does not want to change current behaviour  
(3) Costs / Returns - expensive to implement, return on investment not high enough  
(4) Know-how - lack of know-how, technology is difficult to implement, lack of understanding  
(5) Dangers related to data security, unwanted disclosure of confidential information  
(6) Dangers related to fraud or other unintended loss of money, security of intellectual property rights  
(7) Product characteristics, products are not feasible for online purchases, e.g. procured goods need to be touched or otherwise examined before purchasing, “it wouldn't work”  
(8) External conditions - no clarity about legal and political conditions, insecurity about future developments  
(88) don’t know  
(99) na
3 Interview protocol and reporting structure for ECaTT case studies
(6th April 1999)

Contact:

Richard Wynne
Work Research Centre Ltd.
Dublin
3.1 Introduction

This document is the final text of an interview protocol and reporting structure for the case studies which are to be undertaken in the ECATT project.

The protocol and structure which is proposed is based on the work which was undertaken in the TELDET project. However, there are some new elements to these documents which reflect the following issues which need to be reflected in the current work:

There will be a need to revisit some teleworking case studies from before, and we should try to emphasise the evolution of these cases since 1993.

The technological base for teleworking has moved on since 1993, and this needs to be reflected in our questioning.

We need to develop a complete set of questions which focus on e-commerce, which reflect the latest developments in the area.

In effect, we will need two distinct, but overlapping interview protocols, one for each of the main themes of the project. The reporting structure will be similar in structure, but will obviously have different content.

The interview protocols have been integrated into one instrument, but with a number of dedicated sections for both teleworking and e-commerce cases. No significant work has been done on the layout of the instrument as yet, as I expect that it will need to be translated for use in each country.

3.1.1 Approach taken to the protocol and the report format

The approach taken to the interview protocols stems from the technical annex, where the objectives of undertaking the case studies is essentially to describe the history, operations and future plans of the telework or e-commerce initiative. The interview protocols are therefore primarily descriptive in nature.

However, it is not intended that we produce 40 case studies which bore readers to distraction because of their homogeneity. Analysis of the information collected will proceed at two levels. Firstly, each investigator will synthesize the information collected in producing their account of the case study, written according to the report format provided below. This format requires that each author integrate the information and also that they evaluate the information in a number of ways. Secondly, a synthesis chapter will be written in the final report or book from the project, which will seek to draw conclusions on the basis of the case study
material. For this reason, it is essential that each author follow the structure provided, even if it appears that some areas may not apply or are redundant.

3.1.2 Structure of the protocols

The proposed structure of the protocols for each type of case study is outlined below:

A. Description of the organisation

- Company demography
- Interviewee demography

B. ICT infrastructure for the initiative

- Hardware infrastructure
- Software infrastructure
- Network usage
- Problems and successes
- Future plans

- Will the initiative remain/reduce/extend
- Why?

C. Description of the history of the initiative

- Who was involved?
- Why was the initiative set up?
- When was it set up?
- How was it organised and managed

D. Description of the current state of the initiative

- Numbers and type of people involved
- Business functions involved
Centrality of the initiative to the organisation

E. New ways of working

- Contractual relationships
- Social security
- Working time
- Location of work
- Business practice

F. Assessment of the initiative

- Was the initiative successful?
- Was it evaluated?
- Which objectives did it meet/fail to meet?
- Main impacts on employees, employers and the organisation
- Main barriers and facilitating factors for the initiative
- Lessons learned to date

G. Future plans for the initiative

3.1.3 Instructions for using the protocols

The protocols are not intended as a rigid set of questions, all of which must be asked of each respondent. Instead, interviewers will have to use their experience to focus on the most important issues for each case. It is important to remember that interviewees will be busy and will not tolerate answering a set of questions which are slavishly administered. In addition, the overall purpose of the case studies is to target the interesting parts of each case, not to provide comparative data where none exists.

It is likely that the interviewee will serve in the role of HRM manager within the telework case study organisations. In smaller organisations, it is possible that the managing director/company owner will be the interviewee. In either case, it is important to interview someone who has a good overall knowledge of the teleworking scheme. Beware of IT managers, as they tend to have a narrow focus.
Within the e-commerce cases, the appropriate interviewee will be someone who is intimately involved with the e-commerce project, either at a strategic or an operational level. This might be a marketing or sales manager, or in some cases, an IT manager. In smaller companies, it is probable that you will target the owner/managing director.

We do not have a time for undertaking the interview - this is something which will have to be calculated in each country. However, the interview should be kept to an absolute maximum of 20-30 minutes, especially if it is conducted by telephone.

The preferred method of interviewing is face-to-face. However, it is recognised that this is unlikely to be possible in all countries, especially in the larger ones, or where a consortium member is responsible for more than one country. In these cases interviews should be conducted by telephone.

In all cases, copies of the interview protocol should be pre-circulated to interviewees, as this enhances the likelihood of response and it enables the interview to proceed more quickly and it facilitates a focus on the important issues.

Try to avoid administering the questionnaire postally (though this method may be used in combination with telephone interviewing). Postal responses alone will reduce the quality of information obtained.
3.2 Protocol for teleworking cases

This protocol is intended for use in the telework cases. In all, there are 62 questions organised into 7 sections. The indented (bulleted) points under some questions are intended as prompts, rather than as formal questions.

A. Description of the organisation

This section aims to provide some basic descriptive information about the company in general.

1. Name:

2. Location of company HQ and other plants/establishments:
   - If 'Virtual' is it: National
     - Trans-European
     - International

3. Date of creation:

4. Turnover in 1998:

5. Main products or services:

6. Number of employees:

7. Main factors affecting company development over the next 3 years:

8. Name of interviewee:

9. Job Title:

10. Telephone, fax and e-mail:

11. Involvement of the interviewee in telework/virtual organisation
B. ICT infrastructure for the initiative

This section aims to characterise the main ICT infrastructure which is used to support the telework scheme. Be careful here or you may get more detail than is needed.

1. What computer hardware is used to support the telework scheme?
   - terminal, PC (type), workstation (type)
   - printer
   - fax machine
   - PC fax board, modem, ISDN board
   - telephone, answering machine, videophone
   - other please specify ......

2. What computer software is used to support the telework scheme?
   - text processing
   - spread sheet
   - business presentation
   - database
   - terminal emulation
   - remote LAN access
   - remote control
   - file transfer
   - PC fax
   - e-mail
   - joint editing
   - GroupWare
   - voice mail
   - other please specify ......

3. What telecommunications networks are used as part of the telework scheme?
   - analogue telephone network
   - X.25
   - leased lines
   - digital leased lines
4. Does the teleworking scheme imply modifications of the company's infrastructure?
- Communications server
- ISDN line
- Adaptation of software
- Other, please specify …

5. What are the communication requirements of teleworkers?
   Access to company's:
   - host based central data
   - LAN based central data
   - Mainframe based email system
   - LAN based email
   - GroupWare system
   - Public telephone network
   - File transfer to other PC
   - Voice or video contact to other people
   - Other, please specify…

6. What problems, if any have you experienced with ICT infrastructure?
- How have these problems been overcome?

7. What have been the most successful aspects of ICT infrastructure?

8. Have you any development plans for ICT infrastructure?

9. Are there any specific procedures in place to safeguard confidentiality and security of data?

10. How are communications between teleworkers organised and between other fixed colleagues?
C. Description of the history of the initiative

This section aims to provide a brief history of the initiative. In particular, it seeks to chart its evolution and to provide a context for the current state of development of the initiative. Please note that for ‘virtual organisations’ the reason why the organisation was set up is of special interest and interviewees may need to probe deeper than the questions here permit.

1. Who was involved in setting up the telework initiative/virtual organisation?

   - Inside the organisation?
   - Outside the organisation - such as Trade Unions, public authorities, consultants?
   - Any collaborative partners involved?
   - Was there an existing company policy in place and was it referred to?
   - If no formal policy in place, does it refer to an ‘implicit’ policy favouring such policies?

   - Interested parties - please identify by job function

2. Why was the teleworking initiative initially set up?

   What was the initial strategy of the teleworking initiative?

   (What were its objectives?)

   - Were the initial objectives different from the present ones?

   - Have these objectives changed over time?

OR

Why was the virtual organisation set up in this format?

What was the initial strategy of the virtual organisation?

(What were its objectives?)

   - Were the initial objectives different from the present ones?
Have these objectives changed over time?

3. How was it financed?

4. How was it organised and managed?
   - Planned formally or informally
   - Ad hoc arrangement

5. Describe the different implementation phases of the initiative.

6. During implementation were there any specific problems along the way?
   - How were these overcome?

7. Was it ever evaluated? - Under what terms
   - What were the main findings?

8. Were any changes made to the initiative since it began?
   - Why were these changes made?

D. Description of the current state of the initiative

This section aims to provide a detailed description of the telework initiative at present.

1. Start and finish dates

2. Status of the telework initiative/virtual organisation (pilot scheme, ongoing, completed pilot and expanded, abandoned, finished initiatives)

3. How many people in the organisation work as teleworkers? (Numbers and/or percentages)
   - What is their profile? (Age, gender, skill level)

OR
How many people are in the virtual organisation? (Numbers and/or percentages)

☐ What is their profile? (Age, gender, skill level)

4. In what departments do the teleworkers work in the organisation?

5. What form of teleworking is used?
   (Home-based, satellite centre, neighbourhood centre, telecottage, off-short telecentre, mobile, alternating or full-time)

6. What kinds of tasks do they undertake?

7. What are the current objectives of the telework scheme/virtual organisation?

8. How important is the telework scheme to the organisation's functioning?

9. Who is involved in managing the telework initiative?

10. How are management activities undertaken?

   ☐ Supervision, management and control
   ☐ Crisis and workload management
   ☐ Equipment failure

11. How are communications between manager and employee operated?

12. How are communications between employee and client operated?

13. How are communications between teleworkers and teleworkers managed?

14. Have there been any organisational or HRM problems in setting up and running the scheme?

   ☐ How have these been overcome?

15. Have there been any organisational or HRM successes in setting up and running the scheme?
16. How were teleworkers selected for the scheme?

☐ What kinds of criteria were used? (E.g. self-motivation, attitude, time management skills, productivity, ability to work alone etc.)

17. How far from the office do the teleworkers generally work?

Contractual arrangements and working conditions

18. Do teleworkers have a special work contract?

☐ If so, in what ways?
☐ How has this been developed?
☐ With regard to the working conditions of the teleworker, as defined in the work contract, what are the specific ways in which they differ from ‘normal’ employees? (For example)

• place of work (where is the teleworker allowed to perform work: telework room at home, alternating between home/office?)
• working hours (can the teleworker work at any time of the day?)
• reachability (must the teleworker be reachable at certain times of the day?)
• absence and holidays (how are they reported and managed?)
• interruption of work (illness, accident at work, maternity, and death: how are they managed?)
• mode of payment and minimum income
• working practice (are there any instructions given as to how work is to be done?)
• reimbursement of costs (IT&T and office room equipment, insurance, electricity, heating, telecommunications)
• security
• respect for privacy
• appraisal and career development

☐ Are the contractual arrangements different to national norms - if so, how

E. New ways of working

The aim of this section is to assess the extent to which the teleworking initiative has led to new forms of work organisation. Some of the information sought here may have been collected already (in Sections B and C), so the questions outlined below should mainly be used as a checklist.
1. Have there been any changes in the following aspects of contractual relationships as a result of the telework initiative?

- Time limited employment contracts
- Temporary employment contracts
- Use of external contract labour
- Part time contracts

2. Have there been any implications for the social security coverage of employees as a result of the telework initiative?

3. Have there been any changes in the working time of employees as a result of the telework initiative?

- Introduction of shiftwork, i.e. formalised working outside of 0800-1800 hrs
- Informal shiftworking
- Working at weekends (formal or informal)
- Employee control over working hours
- Flexitime

4. Have there been any changes in the location of work as a result of the teleworking initiative?

- Full or part-time working from home
- Working from clients premises
- Mobile working

5. Have there been any changes in business practice or processes as a result of the teleworking scheme?

- Changes in management methods, e.g. MBO, Quality Management procedures, continuous improvement
- Changes in supervision methods
- Changes in customer relationships, e.g. use of partnerships

6. Have there been any changes in organisational structure as a result of the telework initiative?

- More focus on business processes
7. Overall, what are the most important effects of the telework initiative on the organisation and the employee?

F. Assessment of the initiative

This section aims to evaluate the impacts of the teleworking initiative on the organisation, the individual and the client. Obtain any formal evaluations which may have been undertaken, if possible.

1. Has the initiative recently been evaluated?

☐ What were the main findings of the evaluation?

2. Has the initiative been successful in your view?

3. Which objective(s) has/have the initiative met or failed to meet?

4. Having experienced the telework scheme/virtual organisation, what would you say are main advantages and disadvantages?

5. What are the main facilitating and constraining factors to telework initiatives/virtual organisations in your view?

6. What are the main lessons you have learnt from operating the telework scheme/virtual organisation?

7. What has been the impact of the initiative on the following:

☐ Community level
☐ Individual level
☐ Individuals' skills and competencies
☐ Employee Relations
☐ Productivity
☐ Product and Market Development
☐ QWL, i.e. Quality of Working Life
G. Future plans for the initiative

1. Are there any plans to make changes to the initiative in the future? (extension, reduction, termination)

   - What changes will be made?
   - Why are these changes being made?
   - What will be the evolution of telework within your organisation?
      - Expansions of the number of teleworkers please give reasons…
      - Stagnation of number of teleworkers, please give reasons…
      - Reduction of number of teleworkers, please give reasons…..

   - For additional tasks concerned with telework
      - Specify tasks to be concerned and give reasons of extension of telework …

   - Generally speaking, do you think that telework/virtual organisational practices will increase in the near future? If yes, for what reasons?
3.3 Protocol for e-commerce cases

*This protocol is intended for use in the e-commerce cases. In all, there are 51 questions organised into 7 sections. This is probably too many questions, and will need to be reduced. The indented (bulleted) points under some questions are intended as prompts, rather than as formal questions.*

A. **Description of the organisation**

*This section aims to provide some basic descriptive information about the company in general.*

1. Name:

2. Location of company HQ and other plants/establishments:

3. Date of creation:

4. Turnover in 1998:
   - Turnover related to e-commerce

5. Main products or services:

6. Main products or services offered via e-commerce

7. Number of employees:

8. Main factors affecting company development over the next 3 years:

9. Name of interviewee:

10. Job Title:

11. Telephone, fax and e-mail:

12. Involvement of the interviewee in e-commerce
B. ICT infrastructure for the initiative

This section aims to characterise the main ICT infrastructure which is used to support the e-commerce scheme. Be careful here or you may get more detail than is needed.

1. What computer hardware is used to support the e-commerce scheme ?

   - On site
   - On site and off-site

2. What computer software is used to support the e-commerce scheme?

   - Billing
   - Invoicing
   - Credit Card Transactions
   - Direct Bank Transfers
   - E-Cash (e.g. Microsoft Wallet)
   - Security

   - On-site
   - Off-site (i.e. through a 3rd party)

   - What is the underlying operating system (e.g. Linux, Microsoft, UNIX, etc.)?
     - On-site
     - On-site/off-site

3. What telecommunications networks are used as part of the e-commerce scheme ?

4. What problems, if any, have you experienced with ICT infrastructure ?

   - How have these problems been overcome ?

5. What have been the most successful aspects of ICT infrastructure ?

6. Have you any development plans for ICT infrastructure ?
7. Are there any specific procedures in place to safeguard confidentiality and security of data and transactions?

C. Description of the history of the initiative

This section aims to provide a brief history of the e-commerce initiative. In particular, it seeks to chart its evolution and to provide a context for the current state of development of the initiative.

1. Who was involved in setting up the e-commerce scheme?

   - inside the organisation?
   - Outside the organisation - such as Trade Unions, public authorities, consultants?
   - any collaborative partners involved?
   - Was there an existing company policy in place and was it referred to?
   - If no formal policy in place, does it refer to an 'implicit' policy favouring such policies?

2. Why was the initiative initially set up? (What were its objectives?)

   - Have these objectives changed over time?

3. How was it financed?

4. How was it organised and managed?

   - Involvement of internal departments
   - Involvement of external consultants

5. Was it ever evaluated?

6. Were any changes made to the initiative since it began?

   - Why were these changes made?

D. Description of the current state of the initiative

This section aims to provide a detailed description of the e-commerce initiative at present.
1. Start and finish dates

2. Status of the e-commerce scheme (pilot scheme, ongoing, completed pilot and expanded, abandoned)

3. How many people in the organisation work on the e-commerce scheme? (numbers and/or percentages)
   - What is their profile? (age, gender, skill level)

4. What are the current objectives of the e-commerce scheme?

5. How important is the e-commerce scheme to the organisation's functioning?

6. Who is involved in managing the e-commerce initiative?

7. How are communications between employee and client operated?

8. Have there been any organisational or HRM problems in setting up and running the scheme?
   - How have these been overcome?

9. Have there been any organisational or HRM successes in setting up and running the scheme?

10. How are the following elements of the commercial process handled?
   - Marketing
   - Identification of and initial contact with customers
   - Ordering
   - Pre- and post-sales support
   - Billing
   - Payment
   - Delivery

11. What percentage of company turnover is conducted by the methods of e-commerce?
12. Which kinds of business transaction are covered by the e-commerce project?

- Business to business
- Internal company transactions
- Business to consumer

E. New ways of working

The aim of this section is to assess the extent to which the e-commerce initiative has led to new forms of work organisation. Some of the information sought here may have been collected already (in Sections B and C), so the questions outlined below should mainly be used as a checklist.

1. Have there been any changes in the following aspects of contractual relationships as a result of the e-commerce project?

- Time limited employment contracts
- Temporary employment contracts
- Use of external contract labour
- Part time contracts

2. Have there been any implications for the social security coverage of employees as a result of the e-commerce project?

3. Have there been any changes in the working time of employees as a result of the e-commerce project?

- Introduction of shiftwork, i.e. formalised working outside of 0800-1800 hrs
- Informal shiftworking
- Working at weekends (formal or informal)
- Employee control over working hours
- Flexitime

4. Have there been any changes in the location of work as a result of the e-commerce project?

- Full or part-time working from home
- Working from clients premises
- Mobile working
5. Have there been any changes in business practice or processes as a result of the e-commerce project?

- Changes in management methods, e.g. MBO, Quality Management procedures, continuous improvement
- Changes in supervision methods
- Changes in customer relationships, e.g. use of partnerships

6. Have there been any changes in organisational structure as a result of the e-commerce project?

- More focus on business processes
- Reduction in levels of the hierarchy
- Devolution of decision making

7. Overall, what are the most important effects of the e-commerce project on the organisation and the employee?

F. Assessment of the initiative

1. Has the e-commerce initiative recently been evaluated?

- What were the main findings of the evaluation?

2. Has the initiative been successful in your view?

3. Which objectives has the initiative met or failed to meet?

4. Having experienced the e-commerce scheme, what would you say are main advantages and disadvantages?

5. What are the main facilitating and constraining factors to e-commerce schemes in your view?

6. What are the main lessons you have learnt from operating the e-commerce scheme?

7. What has been the impact of the initiative on the following:
G. Future plans for the initiative

1. Are there any plans to make changes to the scheme in the future? (extension, reduction, termination)

- What changes will be made?
- Why are these changes being made?

3.4 Reporting structure for teleworking and e-commerce cases

The reporting structure for telework and the e-commerce cases follows the interview structure closely. Bear in mind that we are seeking answers to some basic questions - the emphasis is on accurate description rather than analysis. However, there is some room for analysis, especially in the last two sections of the case study description.
The following structure is proposed for both of the cases:

**CASE STUDY REPORTING STRUCTURE**

1. Name of Company

2. Function of Company, i.e. what business are they in?

3. Distinctiveness of the Case, i.e. why was this case selected?

4. Description of the Initiative
   
   Include the following:
   
   - Genesis of the Initiative, Strategy/Response developed and Implementation:
     
     - Describe the process of implementation,
     - Highlight technical and organisational solutions
     - Problems encountered and how they were dealt with

5. What changes, if any, have taken place since the scheme started?

6. Innovative aspects, of/ the Initiative

7. Benefits of the Initiative

8. Barriers to the Initiative

9. Impact(s) of the Initiative

10. Lessons Learned from the Case Study

11. Expectations and Future Organisational Plans

12. Contact Information: Name of national organisation

   - Contact Name
   - Tel, Fax and email details
   - Website URL
<table>
<thead>
<tr>
<th></th>
<th>Company Name and Function, i.e. who are they and what business are they in?</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Short Description of the initiative</td>
</tr>
<tr>
<td>3</td>
<td>Innovative aspects</td>
</tr>
<tr>
<td>4</td>
<td>Benefits</td>
</tr>
<tr>
<td>5</td>
<td>Barriers</td>
</tr>
<tr>
<td>6</td>
<td>Contact Information:  Company Name and Country, Contact Name, + ☎ + email address + URL</td>
</tr>
</tbody>
</table>
4 LIST OF ECATT CASE STUDIES

4.1 Telework and new ways of working

4.1.1 Denmark

Danica Forsikring A/S
Danica Forsikring is an example of an enterprise in the financial sector – insurance - introducing radical changes in ways of working (and trading) in order to meet the fierce competition of the sector. The strategic development plan currently in the implementation phase comprises telework/mobile work with accompanying slimming of the organisation, establishment of a call and service centre, and the first steps towards e-trading standard products.

NTD International A/S - North Sea Technology Development.
This case illustrates how a new enterprise was built by splitting up a traditional shipyard business into the material and the immaterial processes concentrating on the knowledge based parts by extensive use of IT and telecommunication. As a result the enterprise operates world wide instead of locally involved in considerably more projects. NTD started off as a true virtual enterprise with a few people. In a few months however the enterprise grew from 2 to 22 employees and changed from being a virtual enterprise to becoming a teleworking and mobile SME.

Densen Audio Technologies
Densen Audio Technologies is an example of a producing SME that changed from a traditional organisation to a ‘networked’ organisation. Production has been outsourced and freelancers working from home handle design, construction and occasional support. Products are distributed world-wide through a network of around 30 dealers. The company experienced immediate growth and efficiency as result of the change.
Konsulent Thomas Frovin Jensen

Thomas Frovin Jensen is a self-employed/one-person enterprise typically working with several partners and contractors teleworking in project based ad hoc virtual organisations.

TeleDanmark A/S

TeleDanmark is an example of a telework - and in particular flexible work - concept developed as a promotion case for the solutions offered by a telecommunication company and as a pilot for the company itself. The project acts as a forerunner for internal larger scale implementation.

4.1.2 Finland

A-Group

A-Group is a virtual enterprise which produces, markets and sells ready-made software products and carries out customised information system projects. A-Group is comprised of six micro-size enterprises. Four one-man companies operate in joint premises in the “place of domicile” of the network, Jyväskylä in Central Finland. One person teleworks in Laitila in Southwest Finland, and two persons work for the same enterprise in Mikkeli in the Savo region. The network has, in addition, other co-operating partners who support the development and marketing of the main product in different parts of the country.

FlexiNet Networking Project / FlexiMarketing Association

The goals of FlexiNet included the development of the business activities, service abilities and effectiveness in the archipelago and rural areas of Southwest Finland. The project focused on finding, testing and developing new approaches, products and methods that could help to organise work flexibly. Another purpose was that the results and experience gained in the various sub-projects could be widely used and applied to improve the employment and livelihood of people living on the islands, in rural areas and also in towns and cities.

SIEMENS

Telework started off at the end of 1994. The management at the Siemens Group started a pilot project with the goal of studying the suitability of telework for Siemens and principles and guidelines needed therein.
Suomen M-Rakennuskeskus Oy

Telework was began at the end of 1995 at Suomen M-Rakennuskeskus. At the beginning of 1999 seven (about 58%) of the company’s permanent employees are at least part-time teleworkers.

Team R & V Koivisto Ay

Team R & V Koivisto Ay was founded in 1997. Riitta Koivisto and her husband both had their own companies already since 1993, but it was only after four years that the tax authorities allowed the combining of two companies operating in totally different fields of business. The couple had for many years made their living from agriculture, but since the recession started at the beginning of the 1990’s they started to supplement it with a new kind of entrepreneurship. This was the time Riitta Koivisto started teleworking as a translator.

4.1.3 France

INTEL

INTEL has developed a teleworking scheme among its salesmen. Beginning in 1993, with 22 employees, the home-based telework scheme has gradually been generalised to all the sales engineers of the company’s French site.

Telespace Vercors

“Telespace Vercors“ ia a telecentre which has both a role of hosting teleworkers as well as organising awareness-raising activities for the inhabitants of the area. Telespace is today occupied by telecommuters from large companies as well as individual teleworkers. It was stared as part of an initiative called „Vercors Connect“ which aimed at setting up projects in rural regions to counteract an economic decline by developing teleworking and uses of ICTs in various domains.
BSL Industries

In 1993 BSL Industries has started the development of virtual services at every level of the production process (commercial, planning, manufacturing, etc.). This was the reaction of a crisis in the boiler-making industry. Combined with a policy of buying small companies about to go bankrupt, BSL achieved an increase in productivity and a reduction of costs.

Electricité de France and Gaz de France Group

Telework implementation at EDF and Gaz de France was used as a means to better respond to the reorganisation needs of the two companies. Starting in 1993 both have continuously refined their telework policy through the implementation of a multitude of small telework projects. Today, about 50 telework projects are in operation, some concerned with collaborative work in a networks (e.g. DIESE project), others dealing with mobile working for staff members frequently travelling (e.g. “telework and small jobs” project).

Préfecture de la région Aquitaine

The Préfecture de la région Aquitaine has set up a regional inter-Prefecture multi-site video-conferencing network between the cities of Bordeaux, Agen, Périgueux and Mont-de-Marsan. The innovative aspects can be seen both in the use of a new communications medium between state services and in the search for a more efficient organisation of work.

4.1.4 Germany

LVM – Versicherungen, Münster (LVM)

LVM is an insurance company which implemented telework on a large scale (with almost 500 teleworkers by 1999) thereby reacting on the request of its employees for new forms of work organisation and working time flexibility and also solving the problem of threatening construction of and subsequent move to new company premises saving around 100 million DM (approx. 50 million Euro).
**Rauser Advertainment AG**

The Rauser Advertainment case study describes the development and operation of a virtual organisation with a small group of core staff members employed by the company under contracts of employment and sourcing staff (freelancers) world-wide to work on projects to develop entertainment and advertising products (e.g. computer games, screen savers) for customers coming from a variety of different countries.

**Technische Konstruktionen Pollozek**

Technische Konstruktionen Pollozek is an example of what can be described as “new self employment”. A formerly employed woman moved location for different reasons, therefore had to terminate her job and started a new carrier as a freelancer from her home-base on a farm in a very remote area without any other job opportunities. In the meantime she runs a rather successful own one-person company which occasionally also uses subcontractors for specific tasks and has developed a solid customer base.

**Württembergische Versicherungsgruppe**

Württembergische insurance company started telework of top-level managers after having successfully established different teleworking schemes for clerical staff members, mobile teleworking by insurance agents and in the area of claim handling, software developments and dp maintenance over the past years. The top-level managers of the DP division got installed a dp equipment enabling them to “work where they want and when they want”.

**4.1.5 Ireland**

**Kite Ltd.**

Kite Ltd. is an illustrative example of teleworking potential for rural areas. If can also be inferred what kind of support and strategy is required in order to ensure success of teleworking initiative in this setting.
The Examiner

This case reviews two types of non-conventional working in a media company. The first initiative concerns mobile work of company's correspondents, while the other describes new working arrangements in the Advertising section.

Translation Craft

This case illustrates how teleworking arrangements can facilitate entrepreneurial undertaking. It also highlights the beneficial aspects of having industry standards in place for the operation of the scheme.

CIRCA Group Europe LTD

CIRCA is an example of a virtual or organic organisation. With the exception of the ‘Managing Director’ (a nominal position) who works in the company’s office, all the directors work from home or other remote locations.

Nortel Networks Ireland Limited

At the telecommunications company Nortel Networks teleworking was implemented in response to a crunch point for space in one of its branches in the short term.

4.1.6 Japan

IBM Japan, Ltd

IBM Japan implemented mobile work on a large scale (3,800 workers as of 1999) in order to respond to radical changes in the economic environment. Specific targets included higher customer satisfaction, higher productivity, a more worker friendly environment, and cost reduction.
NEC

NEC as a world-renowned communications/computer equipment manufacturer has implemented different models of telework. Since 1992 the Company has established a number of in-house telework centres within a 30-40 kilometre radius of central Tokyo. More recently, it has been developing mobile work with 500-600 of its sales force currently involved.

Price Waterhouse Consultants Co., Ltd

The consulting company Price Waterhouse implemented telework on a large scale. Over 90% of its staff are eligible (around 800). It also unusual in that the teleworkers have complete discretion over when and where they work. The main objective of the program is to allow the consultants to choose the best work environment for creating optimum value.

Pasona, Inc.

Pasona, a leading Japanese temporary staffing agency has implemented a large scale Home Office Network (with some 500 home-based workers by the end of 1998). It is a good example of how ICT advances are supporting business based on growing labour market flexibility. Its addition of home-based and SOHO workers to its temporary staff portfolios represents a new departure from traditional temporary staffing agency practices.

Kansai Electric Power Company

The regional power utility Kansai has implemented a unique telework program by offering three different types of teleworking facilities: a state-of-the-art telework centre; two alternative offices set up in corporate housing apartments; and home offices. Kansai will expand and telework will be adopted as a legitimate in-house work option much earlier than originally planned.
4.1.7 The Netherlands

**Interpolis, Tilburg**
Interpolis as a large insurance company applies various forms of flexibility to work processes on a large scale to change the behaviour of its employees in order to motivate them. It is partly due to this that turnover has increased significantly over the last five years.

**Inspectie Milieuhygiëne Oost, Arnhem (IMH-Oost)**
At IMH-Oost 30 ambulant environmental inspectors and their director started teleworking from their home base as a result of the merging of different divisions, combined with new accommodation at one location. The inspectors only come to their new office for meetings and communication. The office is small and specially equipped for that purpose.

**Polyglot, Broekhuizenvorst**
The text and translation agency Polyglot started as early as 1985 with a new form of work organisation for a group of foreign university graduates who find it difficult to get work. In view of irregular demand and the fact that the employees live throughout the country, working remote with the help of modern technologies fitted in well with its concept.

4.1.8 Spain

**Telecentro Gordexola**
This initiative constitutes the first, and up to now the most developed, rural telecentre in Spain. It is widely considered as an example for many other rural areas in the country that as trying to use this kind of institutions as instruments to overcome situations of structural crisis by offering new opportunities of economic activity.
CEPES
Confederación Española de la Economía Social

Telecentro Cepadite is a pilot telework project for disabled people, promoted by CEPES and other partners.

Yolanda Velasco

Yolanda Velasco is a freelance teleworker working from home providing graphic design, publicity design and web design services

IBIT Fundación

Within the BIT Strategy, promoted by the Govern Balear under the framework of the European project TEM&TeN, three telecentres have been created in the islands with all the necessary telework tools to also allow holiday makers to telework from their holiday resorts on the islands.

4.1.9 Sweden

DIAL

Dial insurance company started to employ 13 teleworkers in 1997 in the remote municipality of Lindesberg some 250 km away from the company headquarters. The teleworkers perform telemarketing as well as insurance sales tasks via the telephone connected to the central computer system. Today 120 of the 250 employees of Dial work from a home base. This teleworking initiative was originally initiated by the municipality of Lindesberg with the objective to create more qualified jobs and employment opportunities in a remote area. The individuals were trained for their jobs in an education centre (“Masugnen”) in Lindesberg and afterwards received a job at Dial.

Teleworking in the county of Västerbotten, Sweden

The project is an example of how to telework in the public sector. The initiative is managed by the County Government Board of Västerbotten

Skärgårdskontoret Ljusterö AB

Skärgårdskontoret Ljusterö AB – teleworking is an example of telework in a “remote area” close to a big city in the archipelago of Stockholm. It includes a network of women within Ljusterö Enterprising Association operating as an administrative service company on Ljusterö island in the archipelago of Stockholm. Though the use of ICT the project has enabled peo-
ple to work and stay on the island with strong support and backing from the people living on the island.

**BIT-Värdshus i Blekinge**

The project is an example of how to make ICT accessible to everyone in a local community.

### 4.1.10 Switzerland

**Alcatel (Switzerland) Ltd**

The case study shows that setting up this outside satellite office with 6 software development engineers in a subalpine region, in the small village of Mollis (population 2'900), Canton Glarus, ca. 60 km south-east of Zurich, was prompted by the initiative of a young software engineer. By accepting his proposal the company could, firstly, meet the demands and needs of this university graduate. He and his team members, all residents of nearby villages, were sick and tired of the daily commuting to the Company Headquarters in Zurich. Secondly, it contributed -- to a limited extent -- towards securing employment and maintaining jobs in an otherwise economically rather depressed rural area. Interestingly, Alcatel does not offer teleworking opportunities to employees at Headquarters.

**Swiss Reinsurance**

At HQ in Zurich about 10 % of the total workforce are involved in an ongoing, well-managed and -controlled project of doing alternating telework one day per week at home. Staff come not just from banking and insurance backgrounds, but from all kinds of disciplines (such as lawyers, engineers, physicists, economists, mathematicians, IT specialists, criminologists etc.). The case illustrates that these diverse backgrounds make the task of managing the telework programme quite a demanding one. However, working climate, satisfaction with teleworking and productivity of staff have been systematically assessed and measured with attitude surveys among employees. The results so far are encouragingly positive.
Zutt & Partner Advertising Agency

It all began some 20 years ago, when Peter Zutt, the founder and owner and a techno-freak, wanted to reconcile work and job and installed high tech infrastructure at his vacation location, a hut in the Swiss Alps. When he initiated telework at that time he became one of the very first pioneering teleworking firms in the country and received much publicity and also attention from researchers. Founded as a small advertising agency, it gradually evolved into today’s communications and Internet consulting firm - the “Net Agency”, as it calls itself. It has today a staff of 35, most of them doing alternating telework. This case study looks into the changes and further developments initiated during the last few years after the pioneering phase by the son of the founder.

Compaq AG Switzerland

After Compaq’s recent merger with DEC, it has acquired a strong 2nd market position in Switzerland. The case is interesting because at the same time it also acquired psychological problems when trying to extend its accepted working culture to the new employees of the absorbed company. Mobile telework and desk sharing has been introduced and is performed now by ca. 100 outside sales reps at Company Headquarters in Zurich only. But the former DEC staffs among the workforce, still somewhat resent the loss of their former individual small offices and resist change to the new “Bürolandschaft”.

UBS AG

This renowned financial service corporation developed and introduced its “REMAX” (Remote Access System) initially for communication with clients in E-Banking. It is now being expanded to be used for teleworking at the same time. The case study describes how UBS is merging E-Commerce and telework, which is today performed by managers, technicians and supporters.

4.1.11 United Kingdom

AA Automobile Association

The type of teleworking practised in the AA Call Handling Division is full-time home working. Teleworking was first introduced in 1997. The success of the pilot programme led to an expansion of the programme and there are now 25 teleworkers and 3 mobile managers who manage the remote relationship.
Hertfordshire County Council

The County Council in Hertfordshire, England implemented a whole new way of working through introducing open plan offices and mobile flexible working in order to make better use of space, further develop IT capabilities and save money whilst maintaining the quality of service delivery.

ICL

At ICL teleworking, aligned with other non-standard work practices, has become a company policy. It is also illustrative of the fact that innovativeness in non-standard work practices is inextricably linked to innovativeness in the field of electronic commerce.

BT

Although teleworking has been well established at BT already some time ago, it was felt that demand for teleworking arrangements from the employees has outstripped the company’s supply of it. Hence the launch of new initiative of teleworking arrangements opened to all white-collar workers.

4.1.12 USA

AT&T, Inc.

Starting with preliminary studies in the 1980s and test projects in the early 1990s telecommuting has expanded to the point where half of AT&T’s managerial and professional staff (= 55,000) now have telework arrangements.

Autodesk, Inc.

Beginning with a 1996 pilot project Autodesk developed its Future Work-Now program, which has since expanded to include telecommuting and hoteling for half of its employees.
CIGNA Corporation.

In 1991, CIGNA launched its flexible work arrangements (FWA) policy. The policy included an extensive manager’s guide as well as standard written agreements to use for documenting individual flexible work agreements. Telecommuting became part of the FWA and was developed to respond to employee needs for flexibility.

State of California Telework Program

The State of California Telework Program is the first planned, large scale telework program in the public sector. Beginning with a 1987 pilot project involving more than 200 teleworkers and their managers, and 20 different departments of state government, the program has expanded so that there are now at least 3,200 official and at least 9,000 unofficial teleworkers, from more than 150 departments of state government.

Georgia Power Company

This case illustrates the development of a private sector telework initiative that has grown and evolved gradually, in large part due to space consolidation issues, and in the past few years, because of air quality issues. The program formally began in 1993 with 35 participants and has grown to include 180 telecommuters with a potential for another 700.

4.2 Electronic Commerce

4.2.1 Denmark

Firma Harald Nyborg A/S

Harald Nyborg A/S is a chain of 11 department stores, i.e., superstores dealing with hardware, tools, home and garden as well as leisure articles approached e-trade. In addition, the company has operated an extensive mail order service for several years now and is gradually exploiting e-commerce as well. In 1997 H.N. initiated development of their online store launching with a reduced selection of articles and a medium level of ambition. Over the following two years H.N. has developed the online store to become an effective full range virtual mail order shop.
Firma Byggecentrum
Byggecentrum is the prime source of information for the building and construction sector in Denmark comprising legislation, regulations, recommendations, best practice and state-of-the-art knowledge and general information about the sector and its current conditions for example price indexes. The organisation serving a business community with information has started the transition from paper based services to online services. Today Byggecentrum provides an online industry platform - a portal to a comprehensive range of updated information relevant to all parts of the building and construction sector supplementing its services with online access via Internet.

SKI, Statens og Kommunernes Indkøbsservice A/S
The five years old SKI is a large-scale online broker serving 5.600 public customers taking care of the procurement allowing public customers to order when needed without having to handle procurement on an individual basis.

TV2/ Reklame
TV2/Reklame has developed an Extranet type of online booking, purchasing and auction system for TV commercials to improve sales and planning processes and reduce workload and time constraints.

Scandlines
Scandlines provides a user friendly online ferry-reservation system based on an existing voice response service thereby having developed a value added customer service.

4.2.2 Finland

Oy Veikhaus Ab
In March 1997 Veikkaus launched its Internet-based gaming service OnNet and even before that it was already possible to play via push-button telephone. Veikkaus was actually the first national gaming company in the world to employ the Internet as a distribution channel.
Oy Wulff Ab

WulffNet is an online ordering system launched in 1997 enabling clients to make orders via Internet. The system also automatically informs clients whether the needed item is available in their own Minibar or must be re-ordered from Wulff.

Ruok@.net

Ruok@.net is an online shop which was launched in February 1998. Products on offer range from groceries to household goods and other essentials. Ruok@.net is privately owned and not directly connected to any of the large wholesale companies. It has no physical stores and is not planning to expand its line of business to the traditional consumer goods business.

Alma Media DIME

DIME, developed by Alma Media is the first and most extensive Finnish marketplace for housing, rental apartments, office space and leisure sites which operates in the Internet. It is a neutral marketplace for real estate brokers and their potential customers. It operates in an open Internet environment, and for the customers who are looking for housing etc. it is free of charge.

Travel.fi

Travel.fi is the most comprehensive travelling and tourism oriented Internet service in Finland. It was launched in 1995, and at present it is published both in Finnish and in English.

4.2.3 France

CHOIX.COM

CHOIX.COM is a virtual supermarket on the web independent from dealers. Starting in February 1998, Choix.com has now (1999) 1,500 mass-marketing items and offers sale and delivery of products from local hypermarkets and specialised shops in the Montpellier area.
France Télécom

Télécommerce offered by France Télécom since 1998 is an electronic commerce platform and service intended for suppliers of goods and services, particularly SMEs. Télécommerce’s aim is to facilitate and make secure the sale via Internet of goods, services and information.

Telestore – Groupe iBazar

Telestore was the first to open an auction site called ibazar.com for private individuals in France. Being the first, it also has the most experience in this area in France and its site is the one which generates the most traffic. Since the creation of ibazar.com, three other similar sites have been created in France.

3 Suisses

3 Suisses is one of the leading mail order firms in France and in Europe which started already in 1995 to provide its offers online.

Relais & Châteaux

Beginning in 1995 with a classic web site, the Relais & Châteaux Website now allows online booking and online payment.

4.2.4 Germany

transtec AG

Transtec as a medium-sized system builder and computer seller has managed to (1) provide website visitors and potential business customers with custom-made systems and computers via the www, (2) provide an intranet server which is in major parts identical to the internet offer addressed to (authorised) customers but enhanced by all information relevant for this customer (e.g. all invoices, offers) (3) the same intranet server but enhanced by further data-
banks, analysis options, etc. (= access to the complete system) to its staff in the headquar-
ters and branch offices in different European countries and (4) act as a value chain integrator
since it provides direct access to all relevant parts of the above intranet to its suppliers ena-
bling these to promptly deliver missing parts to Transtec.

my-world by KARSTADT

This case illustrates the multimedia activities developed and operated by KARSTADT, one of
the largest German department store chains, which contains different elements: Cyberb@rs
and my-world, the virtual department store in the in www.

Lufthansa AirPlus Servicekarten GmbH

Lufthansa AirPlus provides an extranet development combined with a WebEDI solution for
the document exchange with partners via XML which is being accessed using a smart card
via a public key infrastructure with LH AirPlus operating as a trusted third party.

MODA – Fashion Direct Online

MODA is an information and ordering system especially for small and medium-sized retailers
in the textiles industry. The system provides facilities for manufacturers and suppliers to in-
clude their information in a standard format in the MODA databank in the internet and also
receive orders from retailers in the same format. It uses EDI as a standard for data transfer in
both directions and an EDI converter for those not yet using EDI. The system has been de-
veloped for naive PC users and uses a very intuitive user interface.

BauNetz Online-Dienst GmbH & Co. KG

BauNetz is an online industry platform for the building and construction industry in Germany
combining the offers of 22 content providers used by around 30,000 architects, building en-
gineers, etc. Many of the services offered are free of any charge with the exception of the so-
called premium services.
Wer liefert was? (WLW)

Wer liefert was? is an online information provider in the www operating an international online platform for purchasing and sales and allows for the search of products from more than 290,000 companies in 13 European countries.

4.2.5 Ireland

Coillte Teoranta

Coillte Teoranta’s Electronic Bidding System (EBS) is an example of an online auctioning system. Bidding for logs is operated electronically from remote sites around Ireland to a centralised system in Coillte’s head office in Dublin.

DHL Ireland

DHL International (Ireland) Ltd represents an example of a value chain integrator in both the business to business category of electronic commerce and the business to customer category.

DELL (Ireland)

DELL is known as the world’s largest direct sales computer systems company. The objectives of DELL’s on-line sales initiative in Ireland have been to scale for rapid growth, to reduce costs, to enhance business service capabilities, to enhance customer requirements, and to acquire new customers.

Colman Computer Services

Colman Computer Services provides electronically conducted maintenance and servicing of the previously installed business to business solutions based on EDI.

Colman Computer Services conducts a significant proportion of its maintenance work online, electronically. This was facilitated even further by ‘going on line’ i.e. using the Internet to integrate their operations and achieve more effective communications with their customers. Furthermore, by going on line, the company is now able to deliver its products electronically to its customers.
Gateway
Gateway offers PC related product and services online consistent with their business philosophy. The company has been renowned for its direct-to-the-consumer approach.

4.2.6 Japan

NTT Data/Toshiba
This case illustrates a co-ordinated initiative to develop an Internet-mediated backward-forward supply chain integration in the computer industry and its most intimate component suppliers. It reports the background, co-operative set up, and next-stage development issues embodying a state-of-the-art system to be implemented by one of Japan’s largest electronics manufacturers.

MilliCent Microcommerce System
This case illustrates a “micro-commerce system” that provides a new way to buy and sell (primarily) content in very small amounts over the Internet. It demonstrates how trials are conducted in the field of Internet trade, as well as how alliances are made among corporate players to lift such an initiative.

Fujita Construction
This case illustrates how one of Japan’s major construction companies is at the forefront of establishing industrial EDI standards, exchange online purchase and project task estimate information. By introducing its purchase quotation EDI system, the company claims to have achieved some 70% operation time reduction, some 35% communication costs savings, and approximately a doubling of estimate and tender submissions.

Daiei
The large-scale retailer and distributor Daiei has applied the Internet to introduce a Web-based EDI business negotiation system. Its plan is to switch its network among primary transaction partners from the Internet to a generally standardized open business network (OBN) in the near future, which is expected to generate total yearly rationalization effects in the range of several billion yen.
Machiko Virtual Shopping Mall

Machiko Virtual Shopping Mall is one of the first examples of a virtual shopping mall in Japan. Launched and managed by NTT Data, it began full commercial operations in March 1998. Although not the largest nor the most successful, its trajectory of management issues, contents development, and entire project design reflect some of the most noteworthy characteristics of B-C e-commerce players and markets in Japan.

4.2.7 The Netherlands

E-Base Afbouwbemiddeling, Maarssen

With low investment, this Internet company was established to mediate through the web in employment in the finishing sector.

Pharma Company (anonymous)

This case study illustrates how in a business unit of a concern active in the pharmaceutical and medical markets e-commerce activities can be applied within a business-to-business concept. The logistics service-provider acts as re-intermediator in the offer of suppliers of health and care products. These suppliers have access to the market through a Website.

Jobnews BV, Baarn

Jobnews is an example of a company that has succeeded in developing a new form of job finding via the Internet.

Tele Flower Auction B.V., Amstelveen

This is an illustration of how a Dutch importer of flowers grown in Africa, East African Flowers (EAF), was the first to succeed in developing and introducing an electronic auction, Tele Flowers Auction (TFA), in response to a boycott by co-operative auctions aimed at keeping out foreign-grown flowers during the high season.
DAF Trucks N.V., Eindhoven

This case illustrates how electronic commerce is applied to parts of the purchasing process and after-sales activities.

Vos Logistics, Oss

This case study illustrates how Vos Logistics supplies clients with adequate information by integrating communication software through the Internet. It also shows that this is the next step towards new forms of logistics service.

4.2.8 Spain

Edificio Barrabés s/n

The Barrabes Website first launched in 1996 is considered as the best and most successful specialised online shop of its kind for mountaineers and skiers in Spain. In the meantime its activities have been expanded to organising training courses and mountain expeditions

Gacel

GACEL started in November 1997, with a financial backing from the Regional Government, as a virtual shopping mall for Galician SMEs. The companies in this shopping mall can offer their products either to private customers or to other companies. For each product the potential buyer can see a description and, if appropriate, an image.

ANSORENA Subastas

The Spanish jewelery/art auction and art gallery Ansorena has started to offer a bidding service (auction) through the Internet.

Crisol

The online branch of bookstore chain Crisol, www.crisol.es is a virtual bookshop that also acts as an interest of community for booklovers in Spain.
4.2.9 Sweden

Bokfynd

Bokfynd is a web-service that allows the user to search for specified books among all major Internet-bookstores.

SEB (Skandinaviska Enskilda Banken)®

SEB is today one of the leading internet banks in Europe and has set an idealistic goal to have five million internet customers within five years after having started with internet banking already in December 1996.

Göteborgs Stads Upphandlings AB - The B`NAIS project

This case illustrates how a city can implement electronic commerce at a large scale among its business partners in an effort to improve the efficiency of business dealings. The B`NAIS project is one of four finalists in the “Global Bangemann Challenge” in the Electronic Commerce category.

The project Hansica

The case study a way of making a small municipality use Internet and e-commerce.

Närhet i Glesbygd Nearness in a sparsely-populated area

This case illustrates how a small community in a remote area is developing local online services for businesses and citizens in the entire community.

4.2.10 Switzerland

UBS Internet Card

UBS, one of the leading financial intermediaries in Europe, offers a so-called “Internet Card” to her customers since March 2000. This new application of SmartCard technology offers customers the possibility to transact funds and manage their portfolios without using uncomfortable scratch lists. The new product is the result of an infrastructure project conducted to-
together with IBM and Swisskey. The development has occupied nine full-time employees about a period of nine months. The following departments were participated: ICT, security, product management and marketing. UBS expects the Internet Card to foster the gratification of her customers, to act as a platform to various applications including financial and possibly other products and services. The Internet Card will also lead to a reduction in transaction costs, thereby boosting profitability.

Kuoni Reisen Holding AG

Kuoni is one of the leading European travel agents. The firm recognised the potential of the Internet in the early nineties. Since this time a number of pilot projects were conducted, most of them within the production department. As a result of these projects an e-commerce-solution evolved in 1997 offering the possibility to integrate all existing reservation systems by using Internet-technology. As the turnover of the e-commerce channel has increased continuously, especially in the new markets, the firm plans to integrate the different efforts in a new business unit. These plans are motivated by recognising that combination of new technology and established old organisation results in an “expensive old organisation” (Thomas Stirnimann, CEO Kuoni Switzerland, 08.02.2000). There are no fears that the new business unit will cannibalise the traditional business: Kuoni is convinced that the coexistence will give incentives to both branches.

Lecureux SA

Lecureux SA, a middle sized manufacturer of screw drivers and other technical equipment for the industry, established his own e-shop as one of the very early pioneers in 1996. Although the costs of this e-shop were much higher than its turnover initially, it broke even in 1999. Due to a broad range of products and specifications, the process of ordering was very costly and complicated. As a result there were many incorrect orders producing substantial costs (e.g. double postal fees, investigation efforts, etc.). The e-shop reduced these costs by offering the customers a medium to specify the own wishes more accurate without the need to order some printed catalogues. Beyond that, since the installation of the e-shop turnover has increased significantly. Licureux states that a substantial part of the orders were done using information from the e-shop. So orders through the e-shop not only substitute a part of the traditional orders, but also generate additional turnover.

Net-tissimo AG (NTAG)

NTAG, a joint venture of the Bon Appétit Group (a Swiss retailer) and Artificial Life (an US-American software house), offers products in the areas wellness, lifestyle, leisure and pleasure on an interactive website. Using elements like variable prices, lotteries, auctions and an Internet agent which communicates with the customer in natural language, NTAG attracts the customer with a mix of entertainment, information and advertisement. NTAG tries to build up a stable relation to customers using information collected during their visits for a highly customised marketing. Together with a high level of technical innovation, this strategy implies hefty investments and high risks. Not least due to an extraordinary rise of the stocks of Bon appétit Group after the foundation of NTAG, the joint venture enjoys strong support from the senior management of the parent company.
Raeber Information GmbH (RIM)

RIM is a young start-up running the Website search.ch, one of the major search engines and Internet portals in Switzerland. Founded in 1995, RIM is the realisation of the idea to provide regional structured search routines for the Internet users. Without any investment capital the founders - who are representing the type of young entrepreneurs which are linking their own life with their business idea - established a firm which broke even in 1998 and today offers employment to seven full-time and several part-time employees. Searching for the reasons of the success of RIM one can find an excellent but flexible business idea, strategic alliances with a major hardware provider and a local software house, strong personal involvement of the firms’ staff and an early market entry. Today the firm is growing rapidly and continuously developing new products including tools needed for customised marketing via the Internet.

4.2.11 United Kingdom

Eagle Star Direct

Eagle Star Direct is the market leader in the area of electronic commerce - it was the first insurance company to offer a motor insurance on the World Wide Web. Another distinctive feature was its successful brand management and relations with subsidiary companies. Furthermore, the recent marketing research noted the Eagle Star Direct as the most responsive company in the industry regarding customer inquiries over the electronic media. Finally, Eagle Star Direct can be seen as somewhat of a pioneer in the business to business category of electronic commerce in this industry sector.

H and R Johnson Tiles

This case illustrates the successful application of electronic commerce in the manufacturing industry with the aim of achieving value chain integration. It also illustrates how the company successfully integrated the EDI and Internet based business to business electronic commerce transactions into one strategic and extremely successful initiative.

Retail Company (anonymous)

This case study describes an integrated approach towards the usage of electronic commerce in retail business, whereby the company's business to business electronic commerce scheme is closely integrated with a novel business to consumer scheme featuring home ordering service and loyalty card scheme.
3M

This case illustrates how the company, which has already extensively used one aspect of electronic commerce based on EDI, is increasingly using the Internet to communicate with consumers directly.

4.2.12 USA

Amazon.com, Inc.

Amazon sells its products exclusively over the Internet. Starting from nothing in 1995, Amazon.com has become one of the major players in the retail e-commerce revolution, with 10 million cumulative customer accounts and a stock market valuation exceeding $10 billion at the end of 1998—and $20 billion in mid-1999.

DELL (USA)

Dell Computer Corporation is the world’s largest direct-sales computer systems company. Now operating exclusively on the Internet, Dell was founded as a one man operation in 1984, but has grown to have more than 26,000 employees globally, with annual revenues exceeding $19 billion.

Charles Schwab Corporation

This case reviews the development of a company that began in 1971, became a pioneer in the discount stock brokerage business in 1975, went online in 1994, on the Internet in 1996, and subsequently grew to leadership internationally in online brokerage and financial services.

ChannelPoint, Inc.

ChannelPoint® is the world’s first global Internet exchange devoted to helping reinvent the way businesses buy, sell and service insurance and benefits products. It acts as an Internet-based intermediary supporting a variety of insurance product and service transactions for businesses. In the process, it has the potential of saving billions annually in commissions and administrative expenses.
Ingram Micro, Inc.

Ingram Micro, Inc., of Santa Ana, California, is the world’s leading wholesale distributor of technology products and services, and a leading provider of assembly and integration services. It offers more than 200,000 products over the web to reseller customers in 130 countries.
5 Note

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