





## Towards the Information Society in Europe and the US

SIBIS Benchmarking  
Highlights 2002

This booklet has been prepared by empirica Gesellschaft für Kommunikations- und Technologieforschung mbH, Bonn (Germany) and the Work Research Centre Ltd., Dublin (Ireland) in the context of the IST-26276-SIBIS project ("SIBIS Statistical Indicators Benchmarking the Information Society") in co-operation with the other partners in the project. All publications of the SIBIS project – including this booklet – are available in electronic format on the internet at: [www.sibis-eu.org](http://www.sibis-eu.org)

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A great deal of additional information on the European Union is available on the internet. It can be accessed through the Europa server: <http://europa.eu.int>

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## Foreword

For some years now statistical indicators on the Information Society have been central in the policy making process. This has been best demonstrated through the benchmarking exercise of the eEurope 2002 Action Plan, and its further inclusion as a key activity in eEurope 2005. Having recognised this need and driven by the difficulties in obtaining reliable and appropriate statistics, the IST programme supported a pan-European research effort during Framework Programme 5. The prime objective has been to develop and make available methodologies, tools and new statistical indicators which can help remedy the deficit in this field.

It is in this context that the SIBIS project was launched (IST-26276, Statistical Indicators Benchmarking the Information Society", [www.sibis-eu.org](http://www.sibis-eu.org)). This document, "SIBIS Benchmarking 2002 Highlights", presents some of the project's main findings so far.

There are at least two main reasons that make this document interesting. First, it is one of the few original attempts to have a coherent and comprehensive approach in measuring the Information Society. As such it is expected to stimulate further debate and research among the professional statistical community, leading to an improved statistical competence in Europe. Second, it provides a unique single source of data in real time which supports many of the new IST research areas, at the launch of Framework Programme 6.

Building on the original SIBIS research, in particular on the results of the indicator surveys, the project has also produced 9 Topic Reports, selected from those addressed by e-Europe.

The SIBIS work attracts further interest since it also supports the e-Europe 2005 initiative. SIBIS is carrying out an evaluation and a benchmarking of the eEurope 2005 initiative for the 15 EC Member States and the 10 Accession countries which will become available later in 2003. Both the Topic Reports and benchmarking results can be obtained from the SIBIS web site.

The publication of the SIBIS project results is a timely and direct contribution to benchmark progress on key issues of the information society in general and the e-Europe initiative in particular.

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DG INFO-C6

## 1 Introduction

About SIBIS...

SIBIS **1** is an IST Programme project aiming to produce new methods and data that will contribute to the European effort to measure and benchmark the Information Society. As the Information Society extends to all aspects of social and economic life, good indicators are needed to track its evolution and its impacts.

...state-of-the-art

SIBIS has approached the task of developing and testing such indicators in a systematic manner. To begin with, an assessment was made of the state-of-the-art in Information Society benchmarking. Available indicators were collated and analysed, including ones that have been used for actual benchmarking purposes, ones that have been used in small-scale and non-representative studies and ones that have been proposed but not yet applied in practice.

...new indicators

A core set of "SIBIS" indicators were then developed, with the emphasis on those aspects of the Information Society that have been the focus of attention in the eEurope context. These indicators were tested and applied in benchmarking surveys in all EU Member States and in the USA and Switzerland.

...new data

The surveys collected robust and representative data for benchmarking purposes, enabling comparisons to be made across the EU Member States and, for the first time, between the EU and USA on exactly the same set of indicators at the same point in time.

...eEurope 2005 evaluation

The SIBIS work on indicator development and testing has helped advance our understanding of what aspects of the Information Society should be benchmarked and how best to benchmark these. This is currently being used in an evaluation of the eEurope 2005 benchmarking proposals.

...indicator handbook

Apart from this direct contribution to the eEurope exercise, SIBIS will also make the methodological developments from its work more generally available for others to use. To facilitate this, the SIBIS indicators will be compiled into a handbook to support the benchmarking activities of EU and national agencies.

Benchmarking surveys

This report focuses primarily on presenting some highlights from the SIBIS benchmarking surveys. The survey fieldwork was carried out in April – May 2002. A representative General Population Survey (GPS) was conducted in all 15 EU Member States, as well as Switzerland and the USA, involving a total achieved sample size of 11,832. A representative survey of establishments - the Decision Maker Survey (DMS) - covered 7 EU Member States, including the five largest Member States (Germany, UK, France, Italy and Spain) as well as Finland, expected to be an information society frontrunner, and Greece, expected to be less well advanced. This involved a total achieved sample size of 3,139 establishments.

Methodology

Annex 2 of this report presents details of the samples and other methodological aspects of the surveys. In the main body of the report each chart provides a reference to the relevant question number(s) in the survey instruments. The actual questions themselves can be found in the survey questionnaires which are made available on the SIBIS website: <http://www.sibis-eu.org/statistics/questionnaires.htm>.

### Nine key topics

The initial results of the benchmarking surveys have been presented in a series of reports on nine aspects of the Information Society in Europe <sup>2</sup> :

- Telecommunications and access
- Internet for research and development
- Security and trust
- Education
- Work, employment and skills
- Social inclusion
- eCommerce
- eGovernment
- eHealth

### Integrated portrait of the Information Society

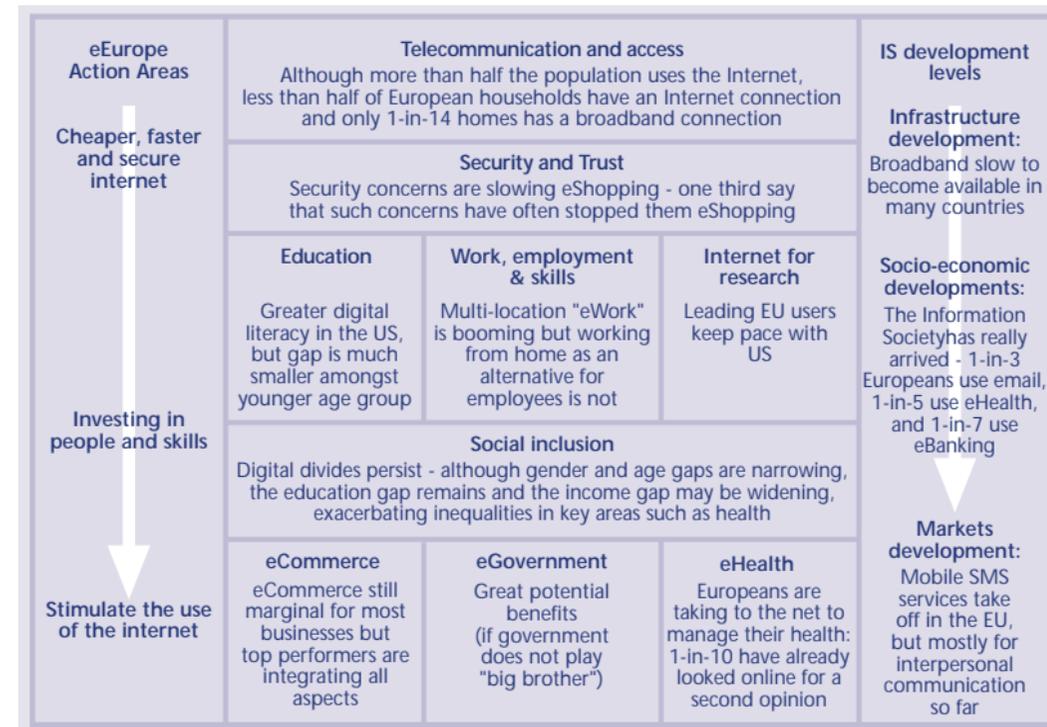
The remainder of this report draws on these topics to present an integrated portrait of the Information Society in Europe and the US and a benchmarking of EU and Member State performances.

## 2 Benchmarking highlights

This chapter provides an overview of some of the key results from the SIBIS survey. More detailed data is presented and discussed in subsequent chapters.

The results of the SIBIS surveys show that the Information Society really has arrived. Most European organisations are online to some degree and more than half of the adult population uses the Internet on a regular or occasional basis. One in three uses e-mail, one in five looks for health information online, one in five has done eShopping and one in seven regularly does eBanking.

### Overview of key results



The Information Society has arrived...

...but not everywhere, at least to the same extent...

...and not for everyone

eCommerce has positive impacts...

...but still relatively marginal.

EU population overall lag behind their US counterparts...

However, the Information Society has been slow to arrive in some Member States. Greece and Portugal in particular, but also Spain, Italy and France lag behind the rest of Europe in many respects. Comparatively low levels of digital literacy amongst the younger age group in some of these countries suggest that catching up may be difficult without targeted intervention.

Digital divides also persist across demographic and socio-economic groups. Older people, the less educated and those in unfavourable socio-economic circumstances are all a lot less likely to have access to or to use the new services of the Information Society. Men are also more likely to be online than women, although the gender divide is declining and is much reduced amongst the younger age group.

Most organisations in the countries surveyed are online in some form, but eCommerce is still marginal for the majority of these and only about 5% of the total volume of organisations sales and purchases are done online. Despite this, a majority of organisations report that eCommerce has had positive impacts for them although some have difficulty in assessing what the impacts have been.

On most indicators of the Information Society, the EU lags behind the US. Europeans are less likely to have home access to the Internet, to use it regularly and to do things online. Even the frontrunners in Europe lag behind the US on most indicators.

...but not those in full-time education...

...and sometimes EU countries take the lead

The more people online... the more they do online

However, Europeans in full-time education are just as likely as their US counterparts to use the Internet regularly. And, although digital literacy levels are higher overall in the US, the gap is considerably lower for young people (aged 24 years or under). Austrian youth seem especially advanced, with levels of digital literacy very close to those of their US counterparts.

On some indicators, also, EU frontrunners take the lead. The Dutch are far more likely than their US counterparts (and their counterparts in other Member States) to eWork from home at least one day per week; and the Finns are far more likely to regularly do their banking online.

Finally, a clear pattern was apparent across countries - as Internet penetration increases so does the likelihood that Internet users will do things like shopping, banking and health management online. In other words, the more advanced countries are characterised not just by having more people online but also by the fact that those who are online are more likely to be gaining practical benefits from this.



## 3 Basic access and usage

Integrated snapshots  
enable better  
benchmarking

Benchmarking data is often presented separately for what are in fact related indicators. To add value to such approaches, the results of the SIBIS surveys have been analysed and presented in a series of integrated "snapshots" that enable easy understanding of inter-related indicators and patterns across Europe. Such snapshots have been prepared for mobile telephony, internet usage and migration to higher bandwidth connections by home users. They show that trends are not always linear and that both individual countries and clusters of countries can have differing development and migration paths depending on national circumstances.

## 3.1 Mobile telephony

France and the  
US lag behind

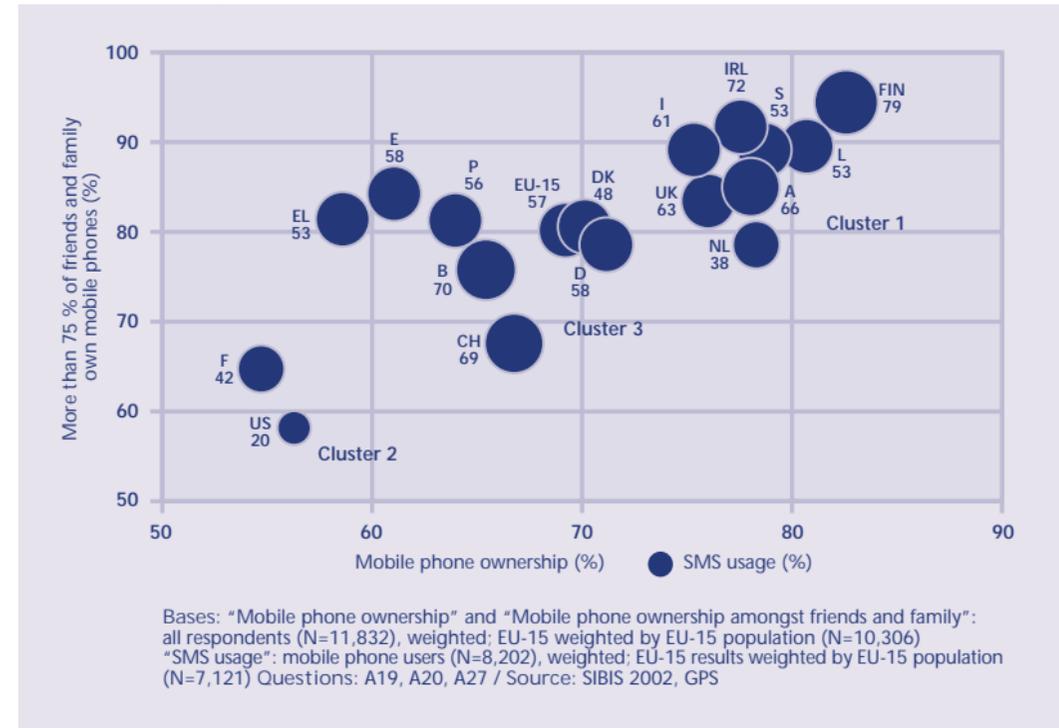
The mobile snapshot shows the expected strong positive association between individual mobile phone ownership and extent of ownership amongst one's family and friends. At the time of the SIBIS survey, France and the US clearly lagged behind on both counts <sup>3</sup>.

Differing rates  
of adoption of new  
mobile services

Although there is some tendency for countries with greater mobile penetration to have more usage of SMS by mobile phone owners there is enough divergence to suggest that other factors also play a role. Some countries in the cluster with intermediate levels of mobile penetration (e.g. Belgium and Switzerland) have SMS usage levels as high as those in the high penetration cluster. Overall, levels of SMS usage by mobile phone owners are almost three times higher in the EU than is in the US. Even in the EU countries with the lowest levels of usage (Netherlands and France), mobile phone owners are around twice as likely to use SMS compared with their US counterparts.

Three mobile  
clusters

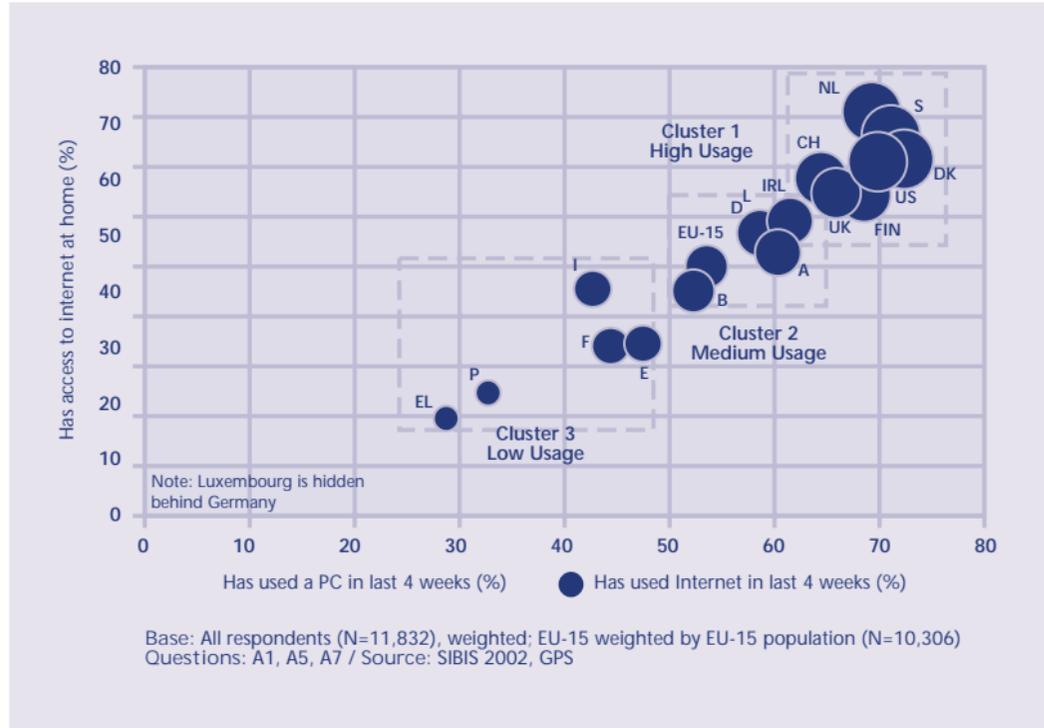
## Mobile telephony snapshot



### 3.2 Internet usage

Three internet clusters

#### Internet snapshot



The SIBIS data also indicates three Internet clusters, with some overlap with and some divergence from the mobile clusters. For the Internet snapshot, Greece, Portugal, Italy and Spain join France in the low penetration cluster, and the Netherlands, Denmark and Switzerland join the forerunners. As might be expected, there is a clear positive association between PC usage, home access to the Internet and recent/regular Internet usage.

### 3.3 Migration to higher bandwidth

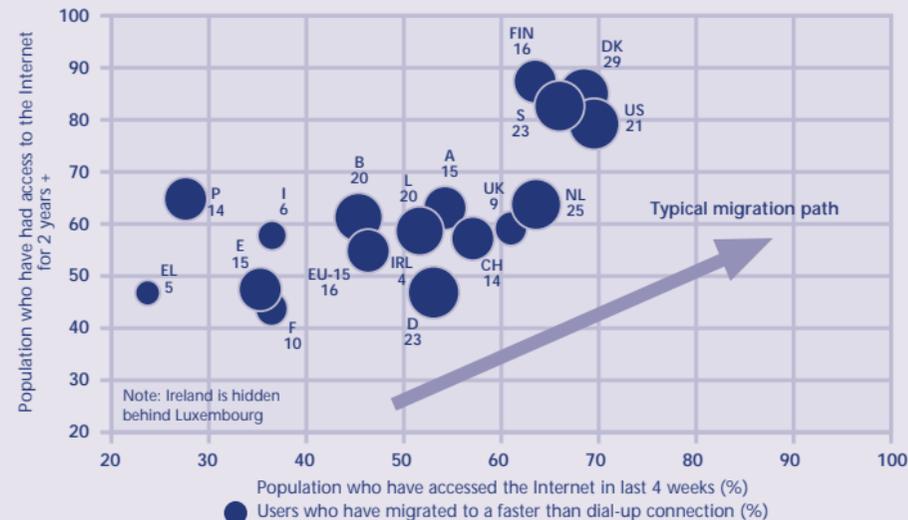
The importance of online tenure

The snapshot shows a clear association between regular usage of the Internet and the proportion of users with longer (2 or more years) usage histories. It also indicates a tendency towards more migration to a faster connection in the forerunner countries, although there are some exceptions.

Those who move to higher bandwidth seek a better online experience, for example, through quicker downloads or always on connections that enable better exploitation of the potential benefits of the Information Society.

The path to higher bandwidth

#### Migration paths



Bases: "Population who have accessed the Internet in the last 4 weeks": all respondents (N=11,832), weighted; EU-15 weighted by EU-15 population (N=10,306)  
 "Population who have had access to the Internet for 2 years +": all Internet users (N=6,905), weighted; EU-15 weighted by EU-15 population (N=5,828)  
 "Users who have migrated to a faster than dial-up connection": respondents with Internet access at home (N=5,550), weighted; EU-15 weighted by EU-15 population (N=4,655)  
 Questions: A7, A8, A10, A12 / Source: SIBIS 2002, GPS

## 4 Digital Literacy

Skills for the Information Society

Participation in the Information Society requires more than just physical access. Skills to use the new tools and services, and to manage the vastly increased availability and access to information are especially important.

SIBIS has developed an index that combines four types of skills in using the Internet into an overall "digital literacy" score. The skills included are:

- Communicating with others (by e-mail and other online methods)
- Obtaining (or downloading) and installing software on a computer
- Questioning the source of information on the Internet
- Searching for the required information using search engines.

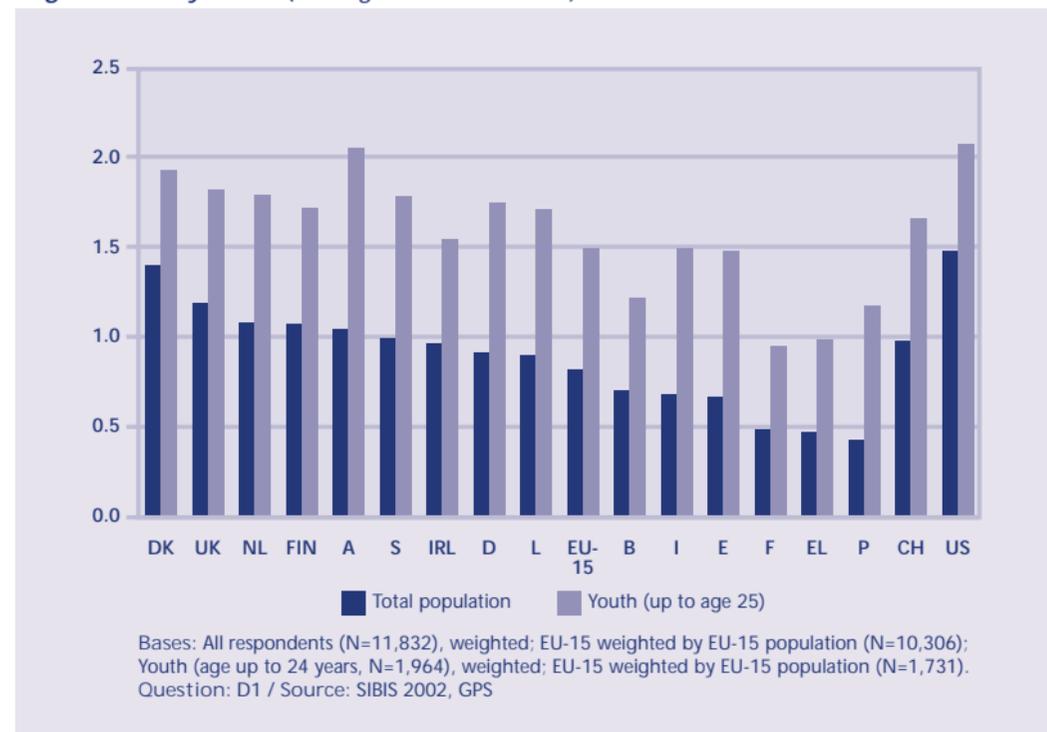
The "COQS" index combines these items into a single scale with a range from 0 to 3, with "0" representing the lowest possible digital literacy score and "3" representing the highest. The overall EU average score on the COQS scale was 0.8 compared with the US score of 1.5.

EU lags behind the US...

Digital literacy levels are a lot higher amongst the overall adult population in the US than they are in the EU. Within the EU, there are wide differences across the Member States, with the score in the highest country (Denmark) being three times greater than in the lowest. Although no EU country reached the US benchmark, Denmark was not far behind.

...and Member States very widely

Digital Literacy Index (average national values)



EU-US gap  
lower amongst  
younger people

In both the EU and US, digital literacy levels are considerably higher amongst younger people (aged 24 years and under) and the EU-US gap is a lot lower amongst this age group. There is also less variation amongst younger people than amongst the adult population overall across the Member States.

...although still  
some notable  
EU laggards

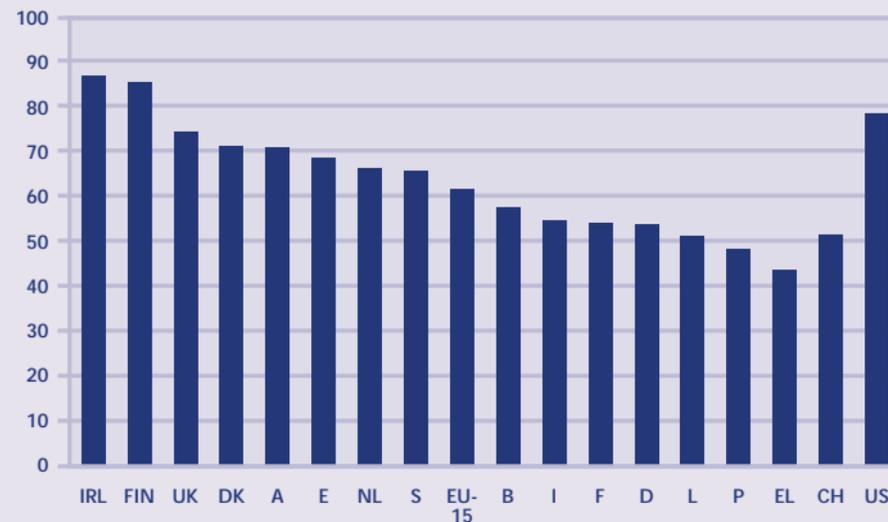
Despite this, there are some notable laggards (especially France and Greece, and also Belgium and Portugal) in relation to digital skills amongst the youth population. These give cause for concern and the underlying factors warrant further exploration and attention.

Gender gaps  
are a lot lower  
amongst younger  
people...

In all the countries surveyed, women on average score lower on the digital literacy index than men. However, the gender gap is often a lot lower amongst young people (aged 24 years and under) and even reverses slightly in one country (Ireland). Also, some countries (Germany and Luxembourg) that have relatively wide gender gaps amongst the total population show a better than average picture amongst younger people.

...but they  
still persist

*Digital literacy gender gap (female COQS score as % of male)*



Base: All respondents (N=11,832), weighted; EU-15 weighted by EU-15 population (N=10,306)  
Question: D1 / Source: SIBIS 2002, GPS

## 5 The importance of the workplace

### 5.1 Internet access at the workplace

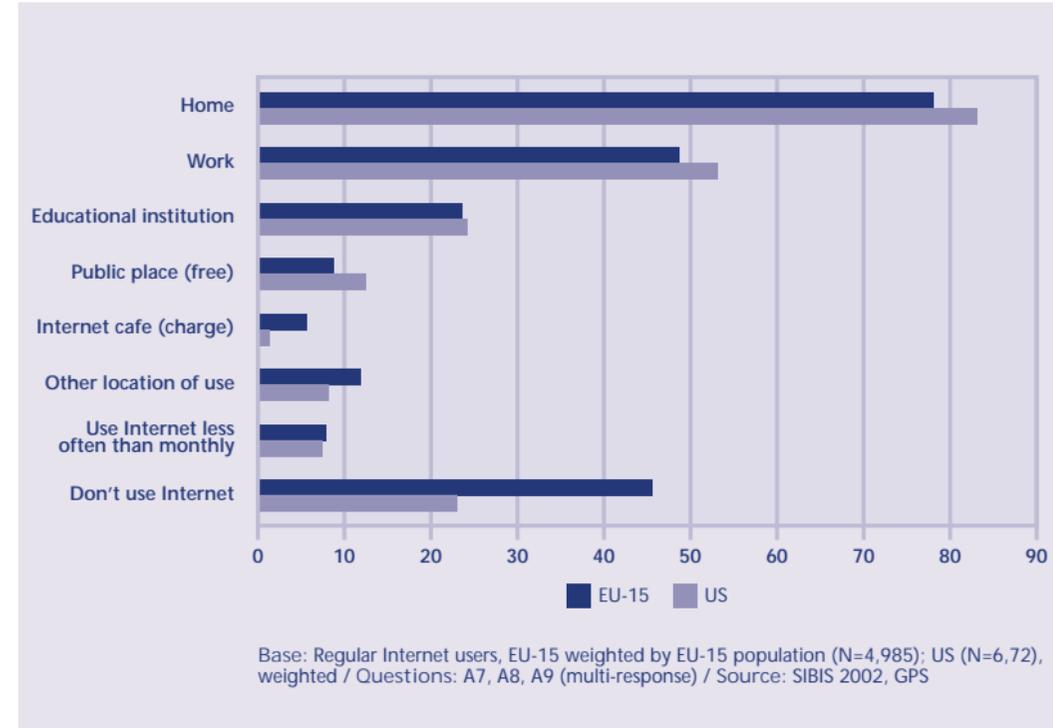
One of the points highlighted by the SIBIS survey is the importance of the workplace as a location for Internet access and usage, and for the development of digital and other skills. After the home, the workplace is the most important place of usage of the Internet, with nearly half of EU Internet users using it at work at least once per month.

In fact, for 1-in-7 regular Internet users in the EU, the only place of usage is at work. This is an important issue for policy and raises questions about how much and what types of "private" usage are taking place in the workplace and what should be the policy positions of the relevant stakeholders in relation to this.

In both the EU and US retired people have lowest levels of Internet usage, followed by those who are unemployed. In absolute terms, all groups in the US except those who are still in education have higher rates of Internet usage than their EU counterparts. In relative terms, the gap for those in retirement is a lot greater in the EU than the US, whereas the gap for those who are unemployed is a little lower in the EU.

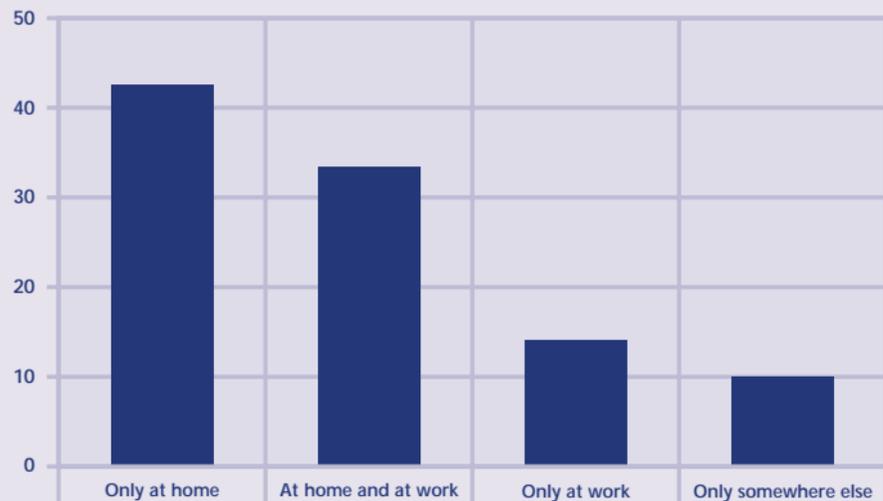
Many use the Internet at the workplace...

*Where regular users use the Internet*  
(used at least once a month; % of regular Internet users)



...and work is  
the only place of  
usage for 1-in-7

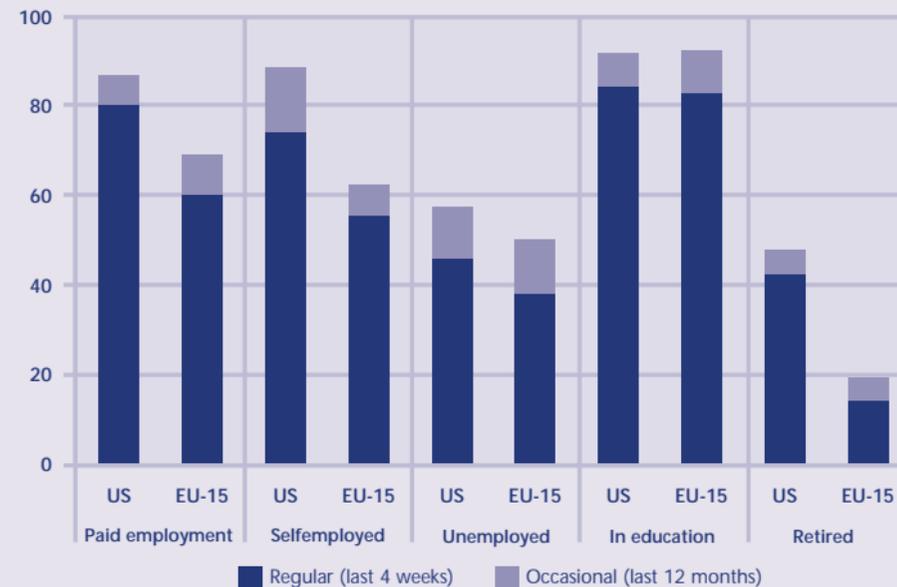
*Internet use in Europe by location (% of regular users in EU-15)*



Base: Regular Internet user in EU-15 (N=4,985), weighted  
Questions: A7, A8, A9 / Source: SIBIS 2002, GPS

Unemployed  
and retired less  
likely to use  
the Internet

*Internet usage by Employment status (% of population)*



Base: All respondents, EU-15 (N=10,306), US (N=1,004), weighted  
Questions: A7, A8, IN4, IN7 / Source: SIBIS 2002, GPS

## 5.2 Work-related training and eLearning

By avoiding reliance on disparate national approaches, the SIBIS surveys allow a better benchmarking of participation in work-related training than existing Labour Force Survey data. SIBIS results suggest that rates of participation are higher than have been estimated up to now and that Member States vary a lot in relation to the relative importance of formal training versus self-directed learning amongst the labour force.

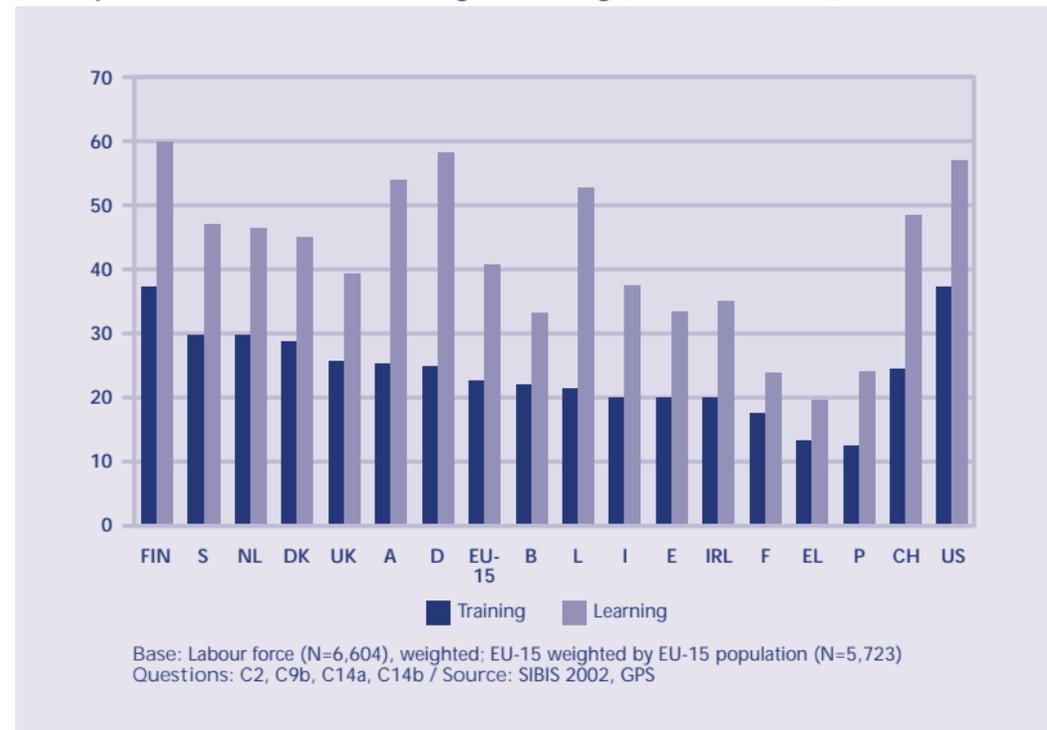
More participation  
in training than  
expected...

Overall, a little under one in four of the EU labour force reported participating in work-related training and almost twice this number reported engaging in less formal self-directed work-related learning in the 4 week reference period. Both figures are a lot lower than the corresponding US figures. Only Finland reached the US benchmark for training, whilst only Finland and Germany exceeded the US levels for self-directed learning. Some EU countries (Portugal and Greece and, to a lesser extent, France) are clearly lagging behind.

...and many more  
do self-learning...

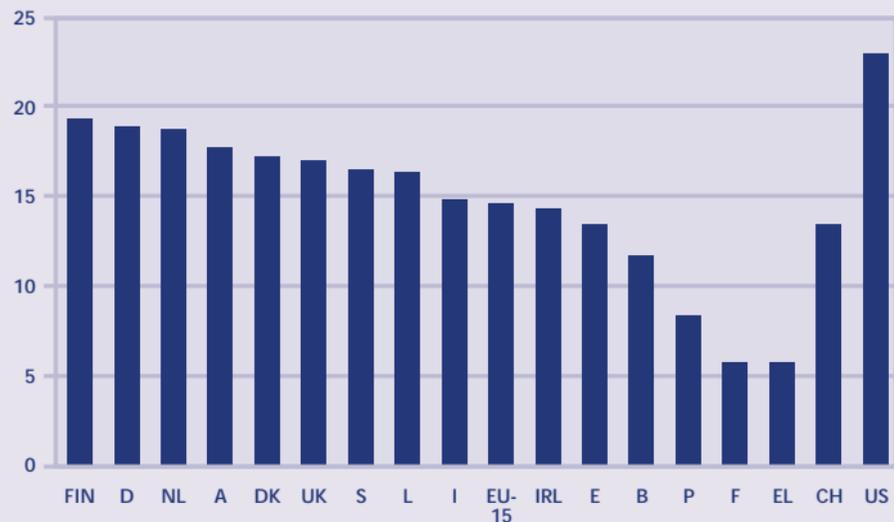
...but some  
countries  
lag behind

Participation in work-related training or learning (% of labour force)



About one in seven of the EU labour force used eLearning...

*Use of eLearning (% of labour force)*



Base: Labour force (N=6,604), weighted; EU-15 weighted by EU-15 population (N=5,723)  
 Questions: C2, C9b, C14a, C14b, C18a / Source: SIBIS 2002, GPS

...but more eLearning in the US...

More than one third (35.4%) of those in the EU who had engaged in some form of work-related training or self-directed learning in the 4 weeks before the survey had used electronic learning materials for this and almost one in four (23.1%) had used online materials. This translates into about one in seven of the European workforce overall (14.5%) who had used some form of eLearning in the last four weeks and one in ten (9.5%) who had done so online. However, higher rates of eLearning overall (22.9%) and of online eLearning (17.5%) were reported amongst the labour force in the US.

...and more by students

Although these levels of eLearning amongst the labour force are substantial, it is not surprising that considerably higher levels were found amongst those in full-time education. Overall, more than two in five (44.5%) students in the EU reported using some form of eLearning in the last 4 weeks, with about one in three (33.4%) reporting using online materials.

Men use more eLearning than women

Amongst the EU labour force, men (42.3%) were just a little more likely than women (38.9%) to have engaged in work-related training or learning in the last 4 weeks. They were much more likely to report eLearning, however, with two in five (41.3%) reporting eLearning of all types and more than one in four (27.3%) reporting online eLearning. The corresponding figures for females were just over one in four (27.6%) for eLearning of all types, and fewer than one in five (17.5%) for online eLearning.

## 6 eCommunication

One of the most significant impacts of the Information Society has been on the ways that people communicate with each other. Apart from the increasingly ubiquitous usage of mobile telephony, e-mail and mobile text messaging have perhaps been the most important of these changes to date.

### 6.1 E-mail

More than  
1-in-3 Europeans  
use e-mail...

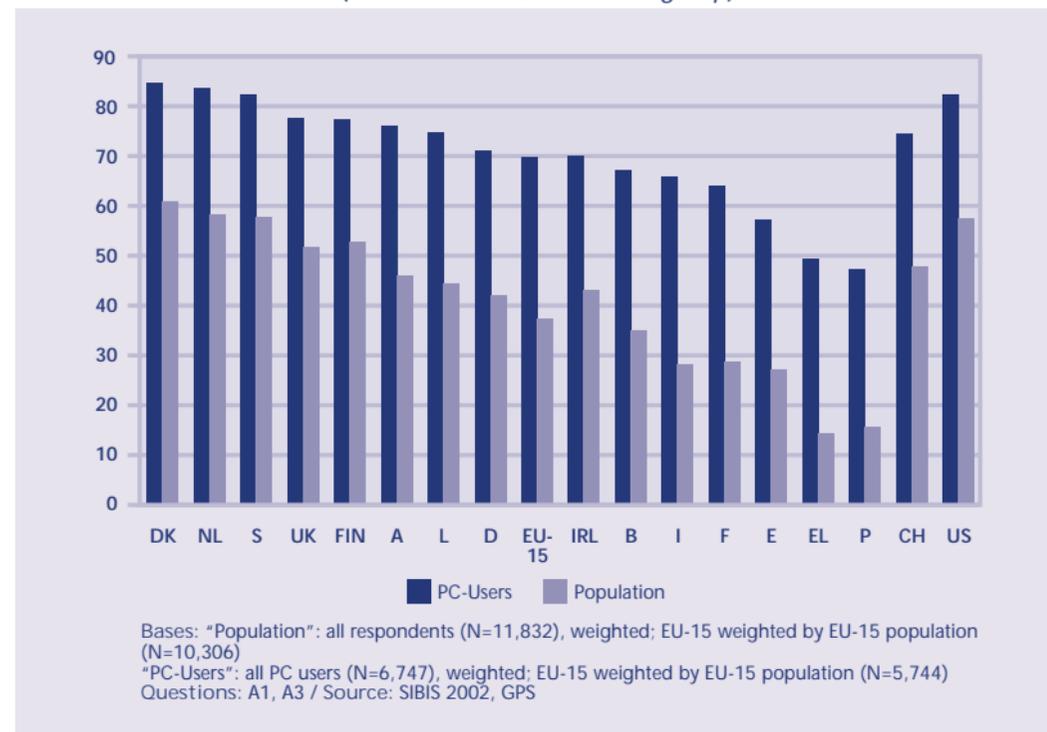
The SIBIS data clearly shows that the era of eCommunication has arrived. Overall, more than one in three Europeans (37.4%) sent or received an e-mail in the four weeks prior to the survey, although this is a lot lower than the almost three in five Americans (57.3%) who did so. There was wide variation across the EU Member States, with some countries (Denmark, Netherlands and Sweden) surpassing the US benchmark and some countries (particularly Greece and Portugal) having very low levels of e-mail usage.

...more use e-mail  
in the US...

...except for  
Denmark, the  
Netherlands  
and Sweden...

...but usage very  
low in Greece  
and Portugal

Sent or received an e-mail (in last 4 weeks; % of each group)



**Regularly communicate with three quarters or more of friends/relatives by e-mail**  
 (% of e-mail users with friends/relatives who have e-mail)

E-mail communications with the majority of one's friends and relatives...

...2-in-5 e-mail users do in the US...

...1-in-4 in the EU



Base: E-mail users, whose friends/relatives have an own e-mail address (N=4,420), weighted; EU-15 weighted by EU-15 population (N=3,666) / Questions: A4a, A4b / Source: SIBIS 2002, GPS

Disadvantaged groups less likely to use e-mail

The importance of e-mail communication is further illustrated by the fact that one in four e-mail users in the EU regularly communicates with three quarters or more of their friends and relatives by e-mail, although this is considerably lower than the two in five in the US who do so.

Finally the likelihood of e-mail usage in the EU increases with increasing household income, educational attainment and occupational status and older people are less likely to use e-mail.

## 6.2 Mobile texting

2-in-5 Europeans text each other

Two in five Europeans communicated with each other by mobile text messaging (SMS) in the four-week reference period. This was a lot higher than the one in ten who did so in the US. These higher EU rates result from a combination of a much higher propensity to use text messaging amongst mobile phone owners and a much higher rate of mobile phone ownership in the first place.

Younger age group do most of the texting

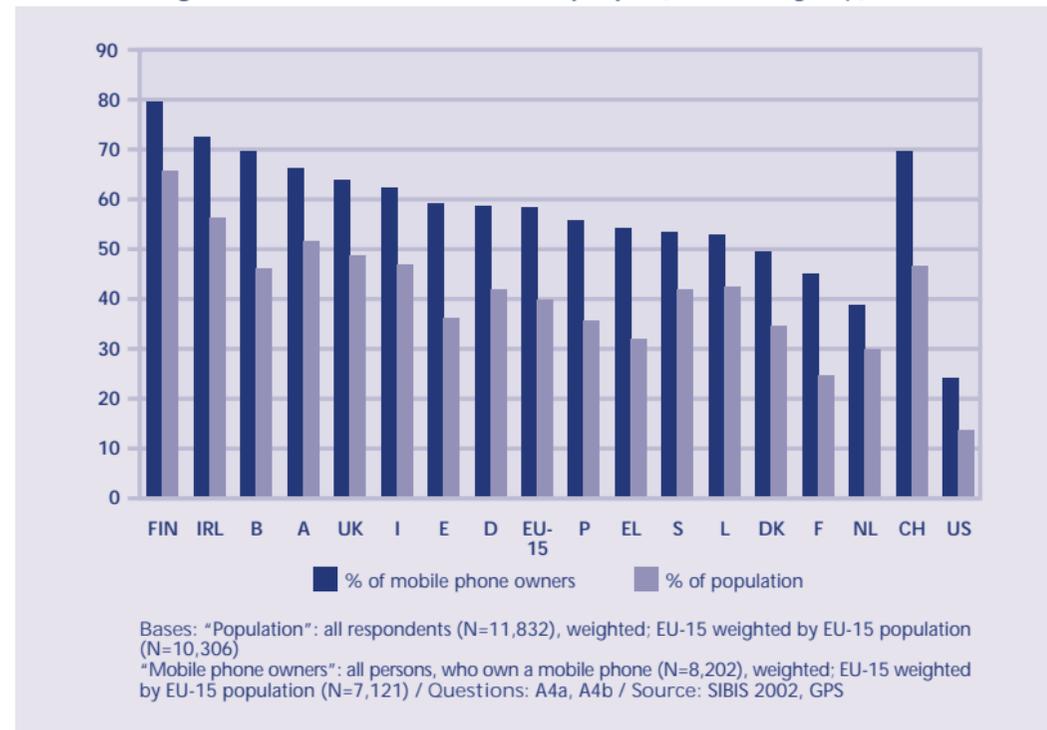
Within the EU, text messaging is especially prevalent in Finland (65.2% of the population aged 15 and over) and is a lot less common in France (23.1 %). More generally, there is a strong association between text messaging and age, with texting being used by more than four in five mobile phone users aged 24 years and under, by just under half of those aged between 25 and 49, by fewer than one quarter of those aged between 50 and 64, and by fewer than one in twenty of those aged 65 years and over.

Mobile texting for communication with other people (% of each group)

Texting much less common in the US...

...Finns do it the most...

...French the least

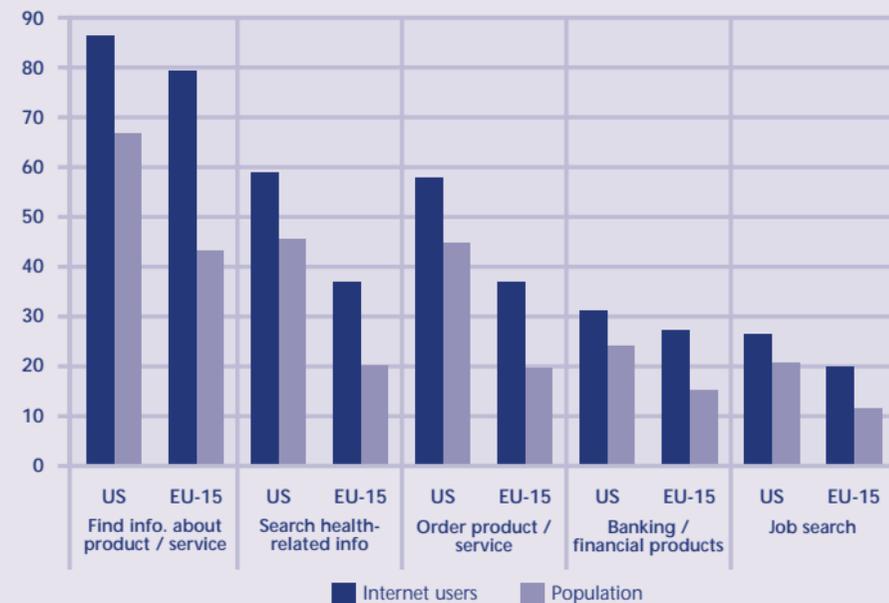


## 7 What people are doing online

In both the EU and US, the most common online activity is finding information about products and services, followed by searching for health information and ordering products/services, online banking, and job search. US Internet users are more likely to do each of these online activities and the higher rates of Internet usage in the US in the first place mean that all of the online activities are a lot more prevalent amongst the general population in the US than in the EU.

Finding information about products and services is most common

Online activities done in last 12 months (% of each group)



Bases: "Population": all respondents (N=11,832), weighted; EU-15 weighted by EU-15 population (N=10,306)  
 "Internet users": all Internet users (N=6,905), weighted; EU-15 weighted by EU-15 population (N=5,828)  
 Question: B1 / Source: SIBIS 2002, GPS

## 7.1 eCommerce

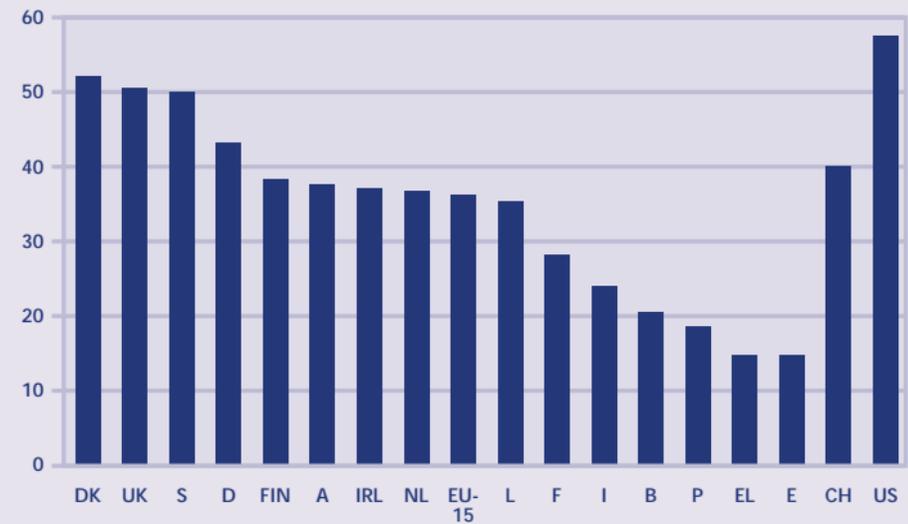
In the EU overall, more than one in three Internet users have engaged in interactive eCommerce in the last 12 months, having ordered a product or service online.

In comparison to the EU overall, US Internet users are a lot more likely to have done this. However, although no EU country reached the US benchmark (57.6%), users in Denmark, the UK and Sweden were close to the US levels. Usage of eCommerce by Internet users in Spain and Greece is very low. The same holds true also, albeit to a lesser degree, in Portugal and Belgium.

More than one  
in three EU Internet  
users have purchased  
online...

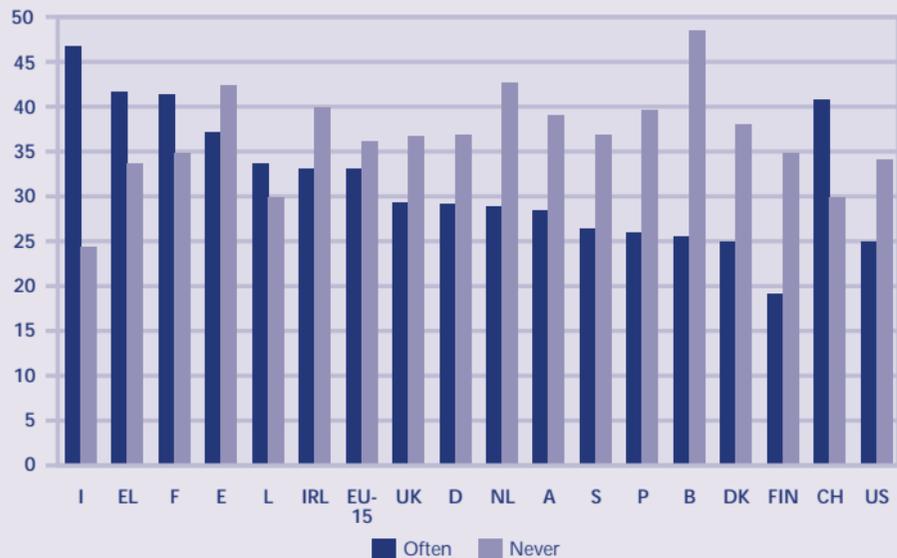
...but Americans  
do it more

*Online Interactive buyers by country (% of Internet users)*



Base: "Internet users": all Internet users (N=6,905), weighted; EU-15 weighted by EU-15 population (N=5,828) / Question: B1 / Source: SIBIS 2002, GPS

*Effects of Security Concerns on eCommerce behaviour by country  
(% of respondents with concerns about privacy and data security)*



Base: Respondents, who are very or somewhat concerned about data security and privacy and confidentiality on the Internet (N=4,936), weighted; EU-15 weighted by EU-15 population (N=4,117)  
Question: J2 / Source: SIBIS 2002, GPS

Security concerns are important

One in three Europeans reported that security concerns often stop them from buying goods or services online and this is higher than the one in four in the US who reported this. However, users in some EU countries are as unfazed by security concerns as their counterparts in the US, whilst Finns are even less fazed than their US counterparts.

## 7.2 eHealth

eHealth activity is significant in EU

A little over one third of Internet users in the EU (36.4%) reported using the net to search for health-related information during the 12 months reference period. This translates into about one in five (19.8%) of the European population aged 15 years and over when non-Internet users are taken into account. Online searching for health information is thus of growing importance within the repertoire of health-related activities of the European public and consequently for public health policy in Europe.

...but more do it in the US

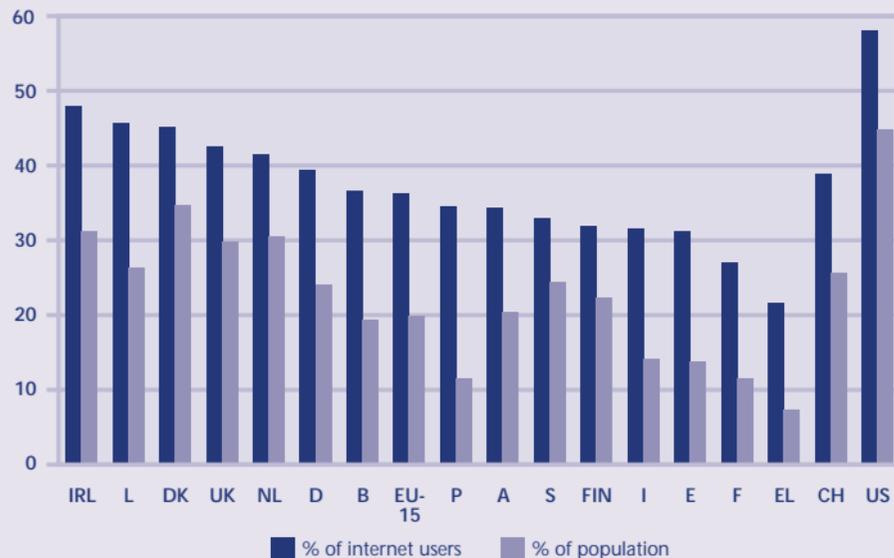
However, online searching for health information is more prevalent in the US than the EU. This was reported by more than half (58.3%) of US Internet users, a figure that translates into more than two in five (44.9%) of the US population. Overall, at the population level, this form of eHealth activity is more than twice as prevalent in the US as it is in the EU and the gap remains large even when adjusted for differential rates of Internet usage.

There are variations across the EU Member States

Within the EU, the prevalence of online health information seeking varies considerably across the Member States. Amongst Internet users, Ireland had the highest percentage (48.1%) and Greece the lowest percentage (21.6%). At the population level, when cross-country differences in Internet usage are taken into account, Denmark had the highest percentage (34.7%) and Greece again had the lowest (7.4%).

1-in-5 of the population does it

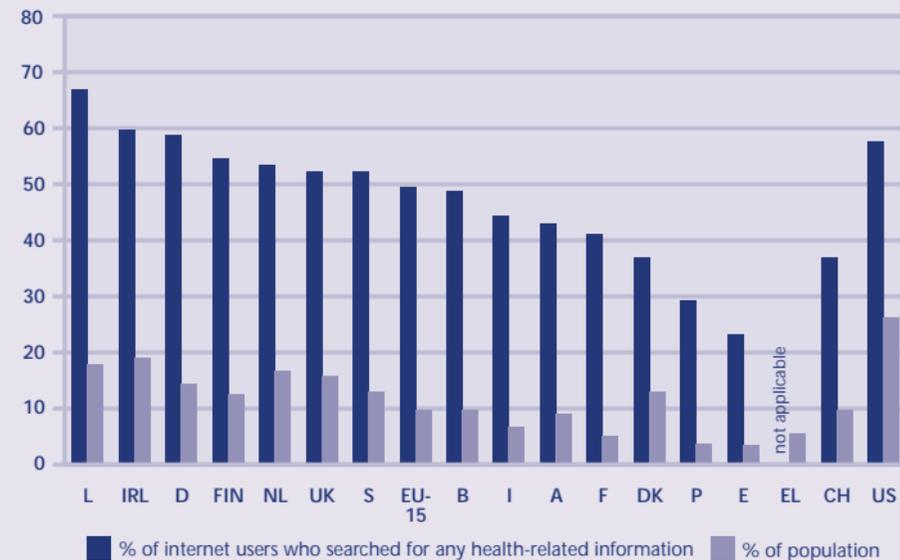
Search for any health-related information on Internet (last 12 months; % each group)



Bases: "Population": all respondents (N=11,832), weighted; EU-15 weighted by EU-15 population (N=10,306)  
 "Internet users": all Internet users (N=6,905), weighted; EU-15 weighted by EU-15 population (N=5,828)  
 Question: B1 / Source: SIBIS 2002, GPS

1-in-10 looked for second opinion...

eHealth usage to seek a second opinion on medical diagnosis (% of each group)



Bases: "Population": all respondents (N=11,832), weighted; EU-15 weighted by EU-15 population (N=10,306)  
 "Internet users, who searched for any health-related information" (N=2,712), weighted; EU-15 weighted by EU-15 population (N=2,149) / Question: L4 / Source: SIBIS 2002, GPS

...posing  
new policy  
challenges

About half of those who searched online for health-related information did so to get a second opinion on a medical diagnosis. This translates into one in ten of the EU population overall. Such trends will pose increasing challenges for policy, both in the regulation of the quality of information on the Internet and in helping healthcare providers and their patients to benefit from the new possibilities for sharing decision-making. The differences across Member States may reflect various factors, such as cultural tendencies towards getting a second opinion and/or in relation to trust in one's doctor, and this is something that warrants further investigation in future studies in the area.

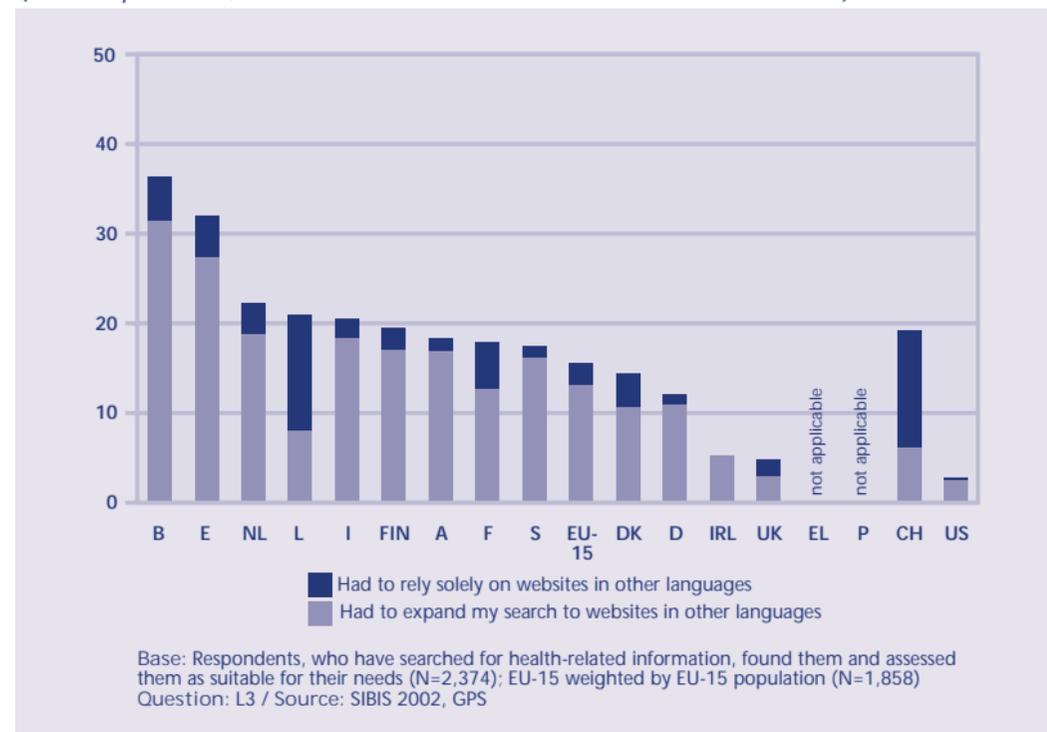
Overall, about one in six (15.5%) of those in the EU who searched online for health information had to extend their search to sites in languages other than their mother-tongue in order to find the information that they needed. This was a lot higher than the corresponding US figure (2.6%). Usage of non mother-tongue websites was particularly likely in Belgium (36.3%) and Spain (32.0%), and also in Greece and Portugal (although sample sizes for these countries were too small to ensure statistical reliability).

In both Europe and the US, private health insurance companies and pharmaceutical companies were a lot more likely than other information sources (universities, hospitals, professional associations and patient advocacy groups) to be rated as untrustworthy by those who used the Internet to search for health-related information. Interestingly, however, there was considerable variation across countries in the relative ratings of the different sources, with Germans being especially sceptical of pharmaceutical companies and French of private health insurers.

### Language and eHealth information

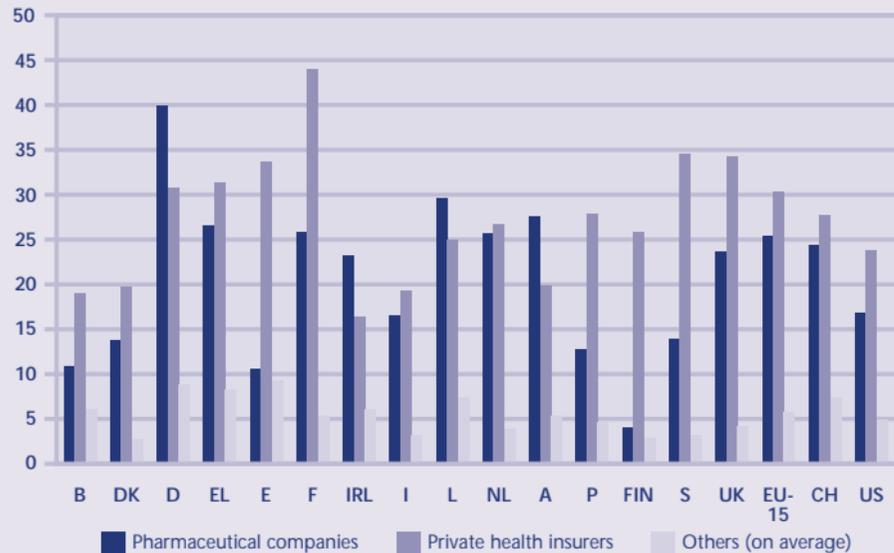
(% of respondents, who have found suitable health-related information)

Language a  
factor for one  
in six Europeans



**Ratings of types of health-information provider as “not trustworthy”**  
 (% of Internet users, who searched for any health-related information)

Less trust in private health insurers and pharmaceutical companies



Base: “Internet users, who searched for any health-related information” (N=2,712), weighted; EU-15 weighted by EU-15 population (N=2,149) / Question: L5 / Source: SIBIS 2002, GPS

### 7.3 eGovernment

The SIBIS survey found that people's expressed preferences for online or traditional access to government services varied according to the type of service in question. Although the numbers of actual users of many of the services is still low, generally it appears that services that do not require users to reveal much personal information about themselves are more popular than those that do.

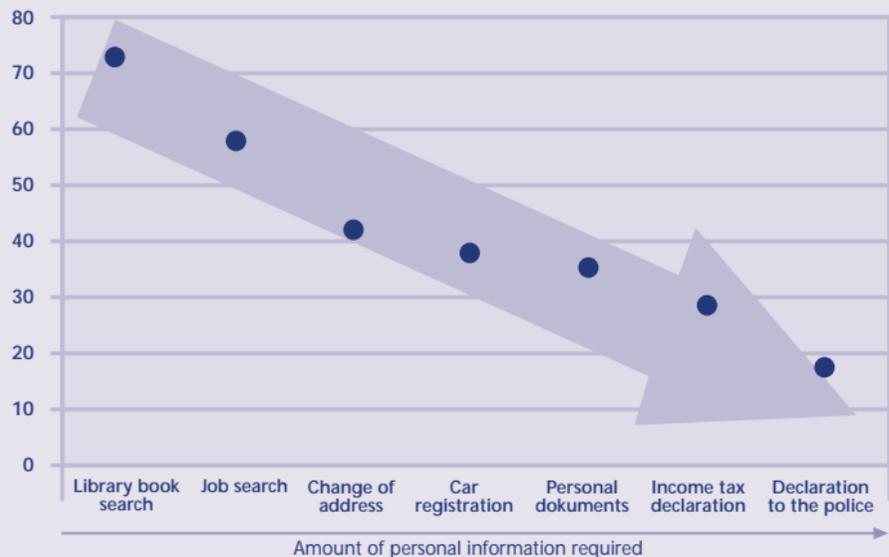
Variations across the EU...

...but EU more positive than the US

The SIBIS data also enabled an aggregate attitude indicator to be compiled, based on people's combined responses to a series of questions on perceived usefulness, advantages and disadvantages of eGovernment services <sup>4</sup>. The scale ranges between 1 and 5, with a score of 5 indicating a very positive attitude towards eGovernment. Overall, there was a lot of variation across Member States, with Danish citizens giving the most positive ratings and the UK the most negative. Respondents in the EU overall, and in all individual Member States except the UK, gave higher ratings of eGovernment services than did their counterparts in the US.

Citizens may be wary of disclosing personal information online

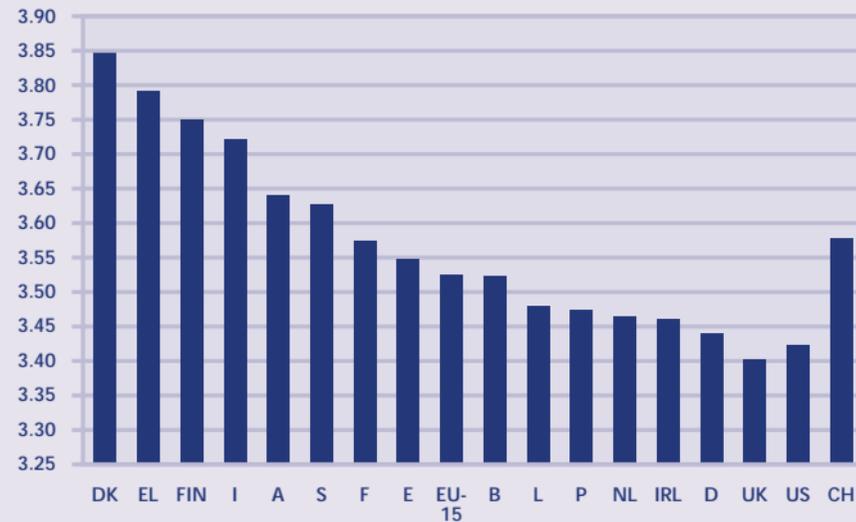
Preference for Online Government Services (% of regular Internet users)



Base: Regular Internet users (N=5,944), weighted; EU-15 weighted by EU-15 population (N=4,985)  
Question: K1 / Source: SIBIS 2002, GPS

Variations across countries

Attitudes towards electronic government services by country



Base: Regular Internet users (N=5,944), weighted; EU-15 weighted by EU-15 population (N=4,985)  
Question: K4 / Source: SIBIS 2002, GPS

## 7.4 eWorking

Growth in multi-location eWorking...

A considerable share of the EU workforce now make use of ICTs to enable “multi-locational eWork” – that is, working from more than one location while staying connected to the company and work colleagues. In 2002, more than one in eight of Europe’s workforce did this, reflecting a two-fold increase since 1999.

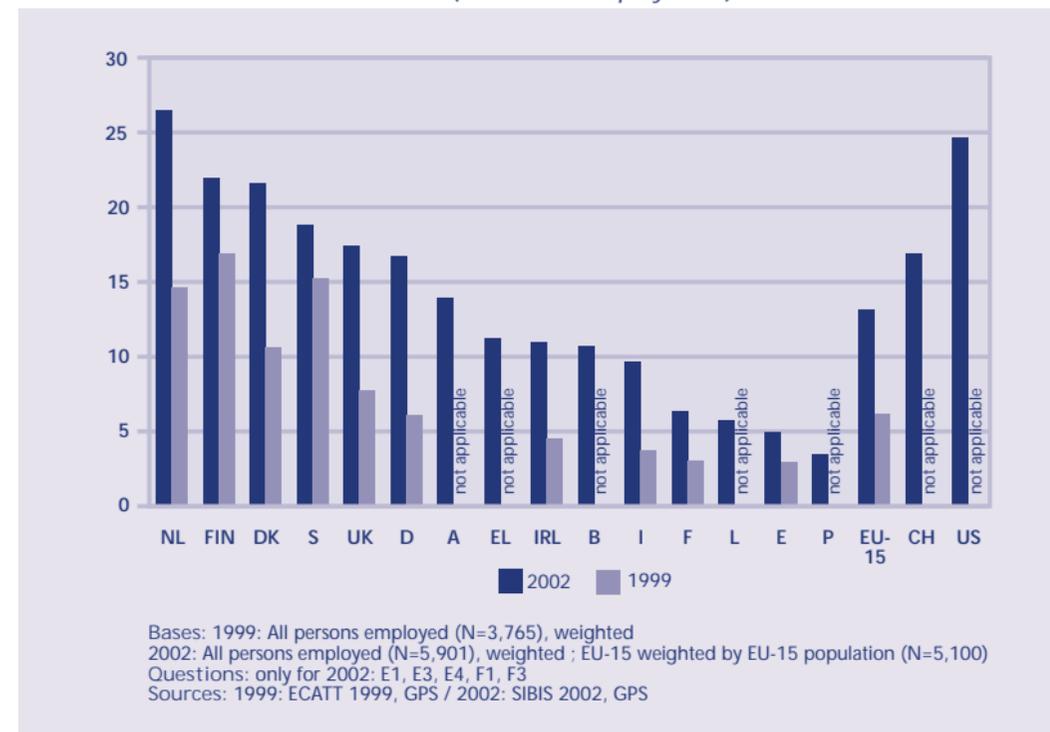
...but wide variations across countries

The number of eWorkers varies widely across the EU Member States, from a high of more than one in four in the Netherlands to a low of one in thirty in Portugal. The US has an average figure that is much higher than in the EU, but trails behind the Netherlands, the clear leader in this field.

Different kinds of eWork have developed very differently in recent years. Home-based telework and telecommuting, which had been given most attention in the past, have not developed as expected whereas other types of eWork have boomed – almost without anybody noticing.

1-in-8 of the EU workforce does it

Multi-locational eWork 1999-2002 (% of total employment)



Stronger growth  
in some forms  
of eWork

The proportion of employees working at least one full day per week at home has risen little since 1999 and remains just over one in fifty of the workforce. This suggests that teleworking is not being widely used as a solution to work-life balance challenges or the burden of the daily commute, at least amongst employees.

On the other hand, there has been significant growth in self-employed people working from a home-base with the support of ICTs (so-called SOHOs), rising from less than one in one hundred to one in thirty of the workforce between 1999 and 2002.

There has also been significant growth in other forms of teleworking, including people working online from home after hours and people working on the move, such as during business travel. Further research is needed to assess the impacts of these trends, for example, whether they are voluntary, are primarily intended for productivity gains, or allow free time at other times for family or other personal purposes.

The home-based  
alternative has  
not fulfilled  
its promise...

... but significant  
growth in  
home-based  
businesses...

...and in bringing  
work home  
and working  
on the move

### Spread of Multi-locational eWork in EU-15

Spread of Multi-locational eWork in EU-15		
	1999 in %	2002 in %
Home-based telework (>= 1 day per week)	2.0	2.1
Home-based telework (< 1 day per week)	2.0	5.3
Mobile telework	1.6	4.0
Self-employed in SOHOs	0.9	3.4
All types	6.1	13.0

Bases: 1999: All persons employed (N=3,765), weighted  
2002: All persons employed, weighted by EU-15 population (N=5,100)  
Questions: only for 2002: E1, E3, E4, F1, F3  
Sources: 1999: ECATT 1999, GPS / 2002: SIBIS 2002, GPS

Tele-cooperation  
now part of the  
work practices  
of more than  
1-in-3 in EU

*Tele-cooperation (% of total employment)*



Base: All persons employed (N=5,901), weighted; EU-15 weighted by EU-15 population (N=5,100)  
Questions: G1 / Source: SIBIS 2002, GPS

"Tele-cooperation" refers to work-related communications within and across organisational boundaries (with colleagues at other locations, customers, clients, suppliers and so on) that are supported by e-mail, videoconferencing or EDI. The SIBIS survey found that more than 1-in-3 EU workers now engage in some form of tele-cooperation as part of their work practices. Although more prevalent in the US than in the EU overall, Denmark and Finland are setting the international benchmarks with even higher rates of tele-cooperation than in the US. Workers in Portugal and Greece and, to a lesser degree, Spain and France reported considerably lower levels of tele-cooperation.

## 8 Who does what online

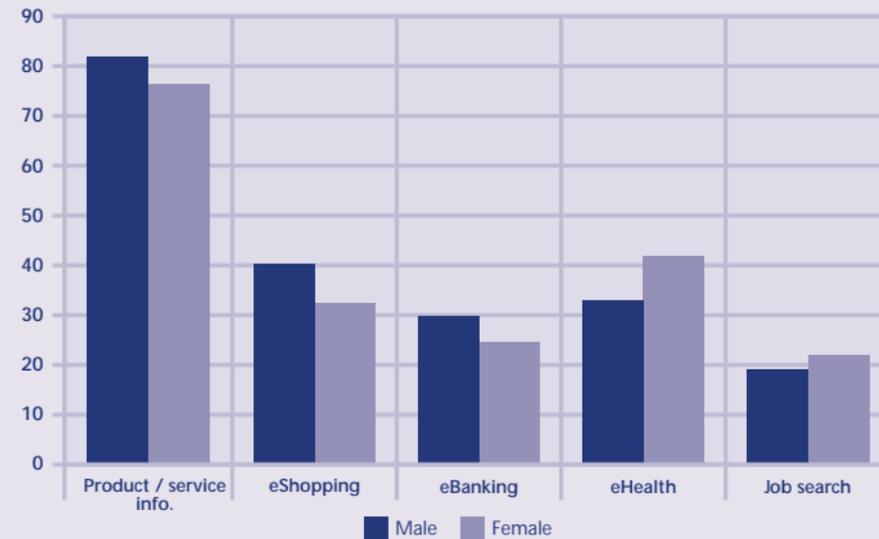
Variations in  
online activities  
across sub-groups

Amongst those who use the Internet in Europe, different sub-groups are more likely to do particular things online. Variations can be found in relation to gender, age, household income, employment status and presence or absence of an activity-limiting illness or disability.

*Online activities by Gender in EU-15 (% of Internet users)*

Men do more  
eShopping and  
eBanking...

...women do  
more eHealth

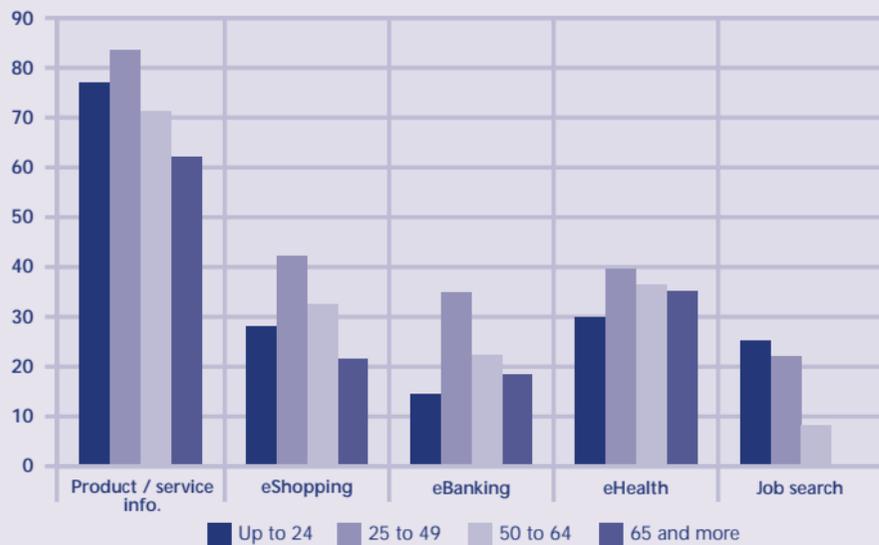


Base: All Internet users in EU-15, weighted by EU-15 population (N=5,828)  
Questions: B1, Z21 / Source: SIBIS 2002, GPS

25-49 year olds  
do more eShopping  
and eBanking...

...older age groups  
do less online  
job searching

Online activities by Age in EU-15 (% of Internet users)



Base: All Internet users in EU-15, weighted by EU-15 population (N=5,828)  
Questions: B1, IN1 / Source: SIBIS 2002, GPS

Better off do  
more eShopping  
and eBanking...

...less well off do  
more online  
job searching

Online activities by Household income in EU-15 (% of Internet users)



Note: "++" refers to highest income quartile, "+" to second quartile, "-" to third quartile, and "--" to lowest quartile.

Base: All Internet users in EU-15, weighted by EU-15 population (N=5,828)  
Questions: B1, Z19 / Source: SIBIS 2002, GPS

Online activities by Employment status in EU-15 (% of Internet users)

Those at work do more eShopping and eBanking...

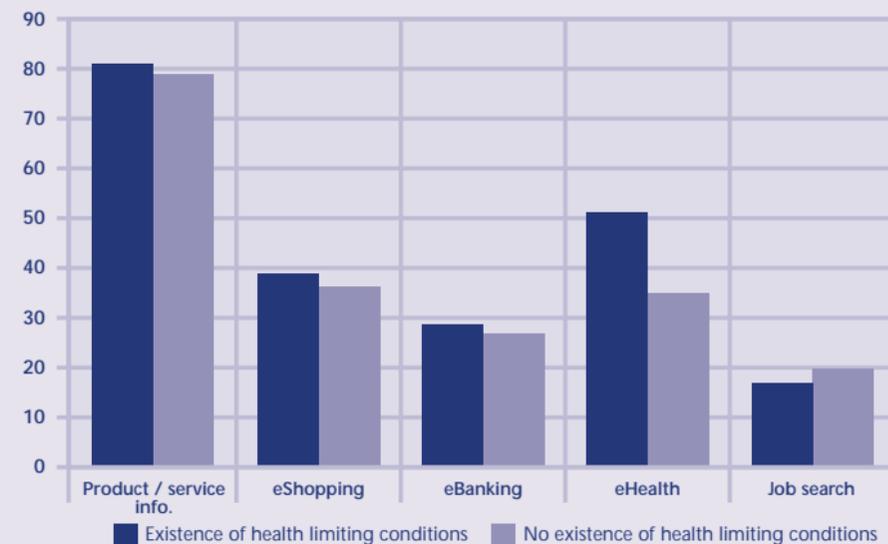
...unemployed do much more online job searching



Base: All Internet users in EU-15, weighted by EU-15 population (N=5,828)  
 Questions: B1, IN4, IN6, IN7 / Source: SIBIS 2002, GPS

Online activities by Presence of activity restricting illness/disability in EU-15 (% of Internet users)

Those with long-standing illness/disability do more eHealth



Base: All Internet users in EU-15, weighted by EU-15 population (N=5,828)  
 Questions: B1, Z14 / Source: SIBIS 2002, GPS

## 9 Digital Divides

There are still large digital divides in relation to Internet usage patterns across socio-economic and demographic groupings. These digital divides are also found in the US but are smaller for all groups except for the unemployed and early school-leavers.

### 9.1 A Digital Divide Index

SIBIS developed a Digital Divide Index (DIDIX) to enable the manifestations of digital divides in EU Member States to be quickly compared. This index combines the divides by gender, age, education and income in relation to computer use, Internet use and Internet access at home. It measures the relative adoption of ICT by potentially deprived societal groups - relative as compared to the population as a whole.

The lower the DIDIX value, the greater the gap between the risk group and the population average. If the ICT adoption rate of a risk group is equal to that of the population average then the DIDIX value would be 100.

The most apparent divide is in relation to education. Age leaving school turns out to be the major determinant, the most powerful predictor in multivariate analyses of ICT usage. ICT diffusion among people having left school under the age of 16 is only about one fourth of that in the whole population. And even when allowing for the fact that older people are on average less well educated than younger people, education appears to exert greater effects than age.

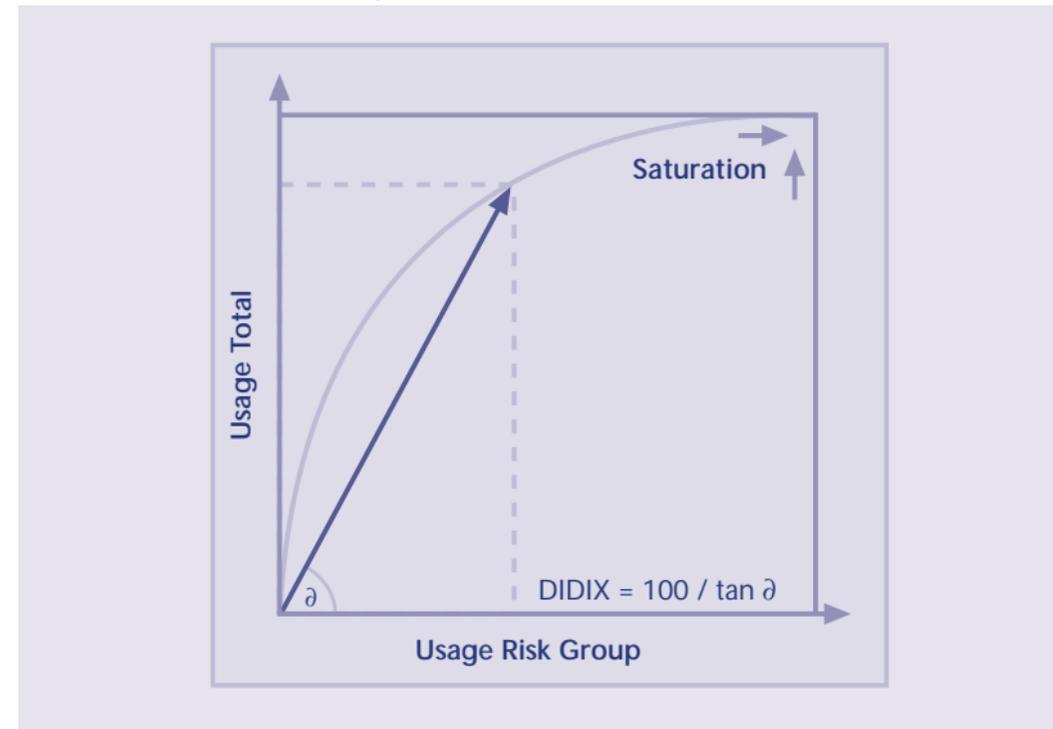
The DIDIX indicator

Educational divide poses major societal challenges

DIDIX measures relative adoption...

... that is, the adoption rates of at risk groups compared with those of the overall population

*DIDIX – Curve of relative adoption*



In the EU there are still large divides by age, household income and age finishing education...

...and smaller but significant divides by gender and employment status

*Internet usage in EU-15 (in last 12 months; % of population)*



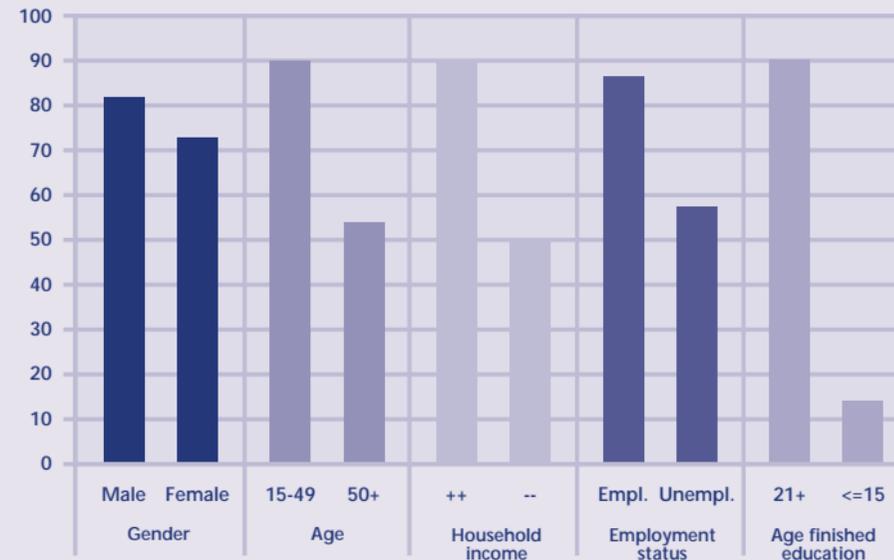
Base: All respondents in EU-15 (N=10,306), weighted by EU-15 population  
 Questions: IN1, IN3, IN4, IN6, IN7, A7, A8, Z19, Z21 / Source: SIBIS 2002, GPS

In the US, the age divide is a lot smaller ...

...the gender and income divides are also smaller...

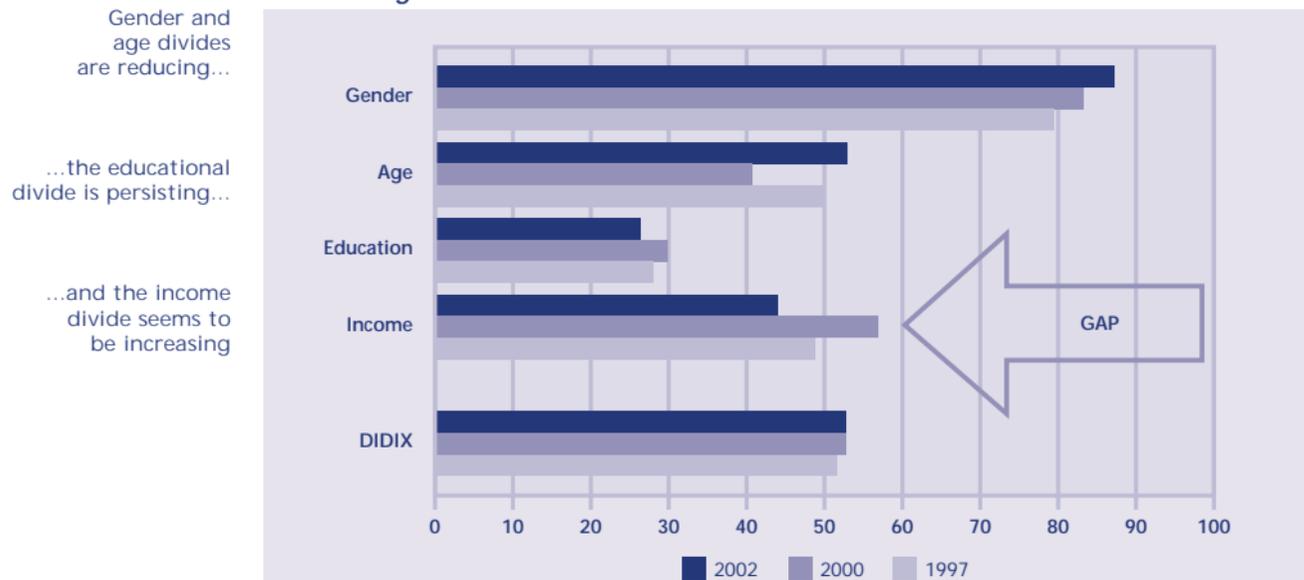
...but the unemployment and educational divides are wider

*Internet usage in US (in last 12 months; % of population)*



Base: All respondents in US (N=1,004), weighted  
 Questions: IN1, IN3, IN4, IN6, IN7, A7, A8, Z19, Z21 / Source: SIBIS 2002, GPS

### DIDIX – Digital divide indices for total EU



Bases: 1997: N=15,900, weighted by standard Eurobarometer country and EU-15 weights  
 2000: N=15,900, weighted by standard Eurobarometer country and EU-15 weights  
 2002: N=10,306, weighted by EU-15 population  
 Questions: only for 2002: IN1, IN3, Z19, Z21 / Sources: 1997: Eurobarometer 47.0, Jan-Feb 1997  
 2000: Eurobarometer 54, Oct-Nov 2000 / 2002: SIBIS 2002, GPS

Gender and age divides are reducing...

...the educational divide is persisting...

...and the income divide seems to be increasing

### Digital Divide Indices for total EU-15



Bases: 1997: N=15,900, weighted by standard Eurobarometer country and EU-15 weights  
 2000: N=15,900, weighted by standard Eurobarometer country and EU-15 weights / 2002: N=10,832, weighted; EU-15 weighted by EU-15 population (N=10,306)  
 Questions: only for 2002: IN1, IN3, Z19, Z21 / Sources: 1997: Eurobarometer 47.0, Jan-Feb 1997  
 2000: Eurobarometer 54, Oct-Nov 2000 / 2002: SIBIS 2002, GPS

Forerunner countries move towards participation for all...

... in others divides seem to be widening

Not much change  
overall in EU

Time series data for DIDIX based on SIBIS and earlier Eurobarometer surveys show that the overall magnitude of the digital divide in Europe has remained more or less constant at a DIDIX value of about 50 since 1997. This means that ICT uptake amongst the combined at risk groups has remained only half as advanced as it is in the whole population. However, there are indications of changes in some of the specific divides.

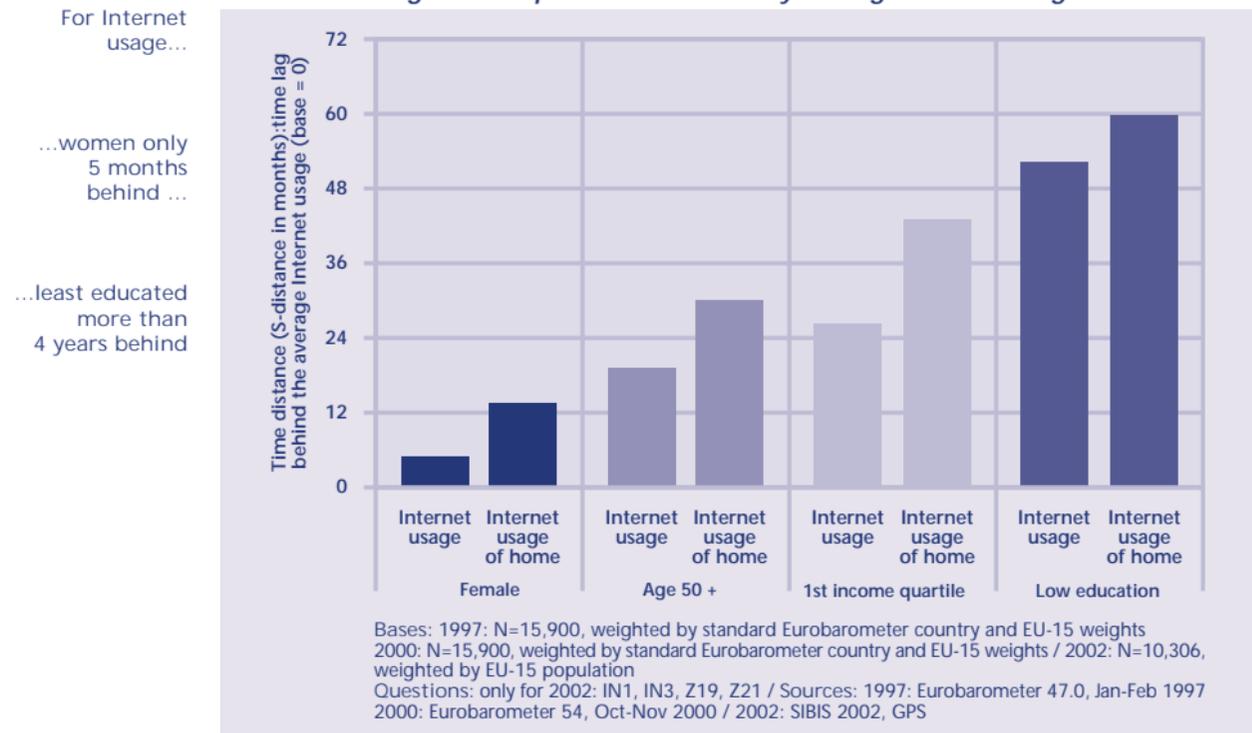
Differences between  
Member States  
are increasing

There are also indications of changes in national divides, with apparently increasing divides in the Southern European countries compared with apparently reducing or at least stable divides in the forerunner countries (the Nordic countries, Netherlands and the UK) and in countries that have had a recent surge in uptake (Ireland and Austria). Further research is needed to investigate possible implications of these trends for the future evolution of the Information Society and for the likelihood of achieving an Information Society for all in the different countries <sup>5</sup>.

## 9.2 Divides expressed as time lags

The magnitude of such digital divides can also be expressed in terms of time lags, that is, in terms of the time delay for particular sub-groups to achieve the same level of Internet usage as the population on average.

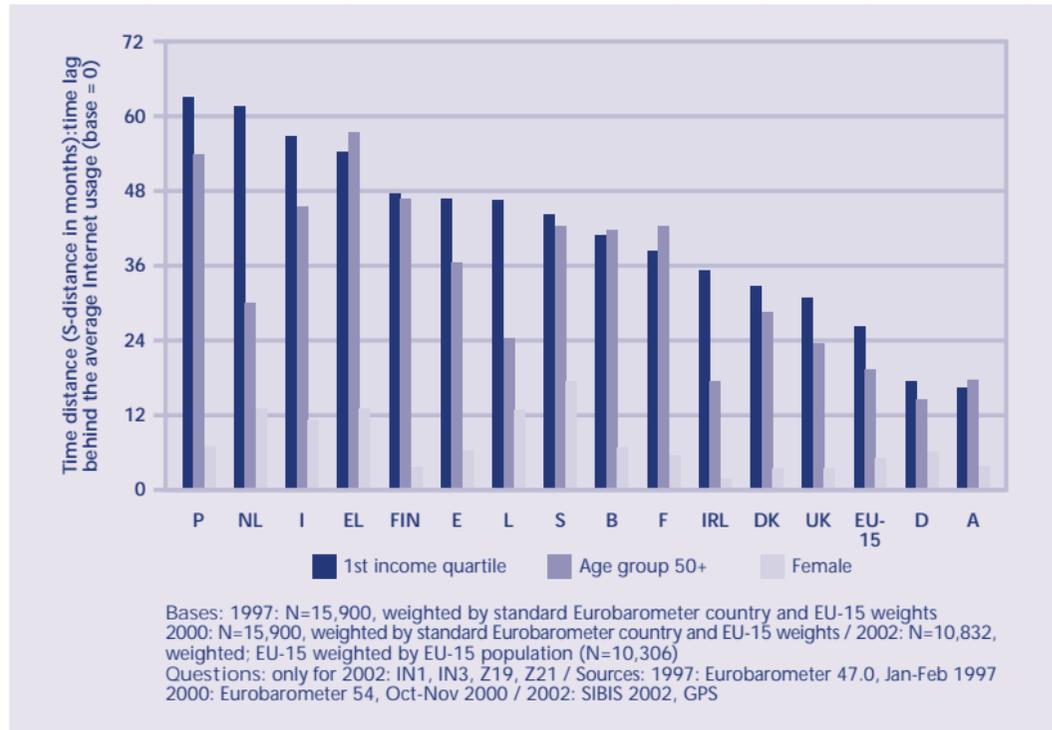
*Digital divide in EU-15 in time (S-distance): How many months earlier was the level of selected categories in April 2002 attained by average Internet usage*



**Digital divide by countries in time (S-distance): How many months earlier was the level of Internet usage of selected categories in April 2002 attained by average country Internet usage**

Patterns generally similar for the individual EU countries...

...but some exceptions



Digital divides expressed in terms of time lags

Time lag greater for Internet usage a home

Such time distances (S-distances) <sup>6</sup> were calculated between the April 2002 levels of Internet usage for the selected socio-economic and demographic groups and the (earlier) time when corresponding levels had been achieved by the population overall. The smallest time lag was that for gender, followed by age (50+), income (lowest quartile) and low education (early school-leavers) <sup>7</sup>. The gender time lag for Internet usage overall is only about 5 months, meaning that the population overall reached the April 2002 levels of usage by women five months earlier, whilst for the low education group it was more than 4 years. Time distances can also be used to compare penetration rates for different indicators and different categories. For example, the time lag for total Internet usage at home behind total Internet usage was generally about 8 months although for some groups it was slightly longer.

Digital divide patterns expressed in time distances for total Internet usage in the separate EU countries lead to similar conclusions with some variation. In all cases the gender gap is the smallest by far and the time distance is again the largest for the low education group, with the exception of Austria and Spain. Germany and Austria show the smallest average value of time distances for the four groups analysed.

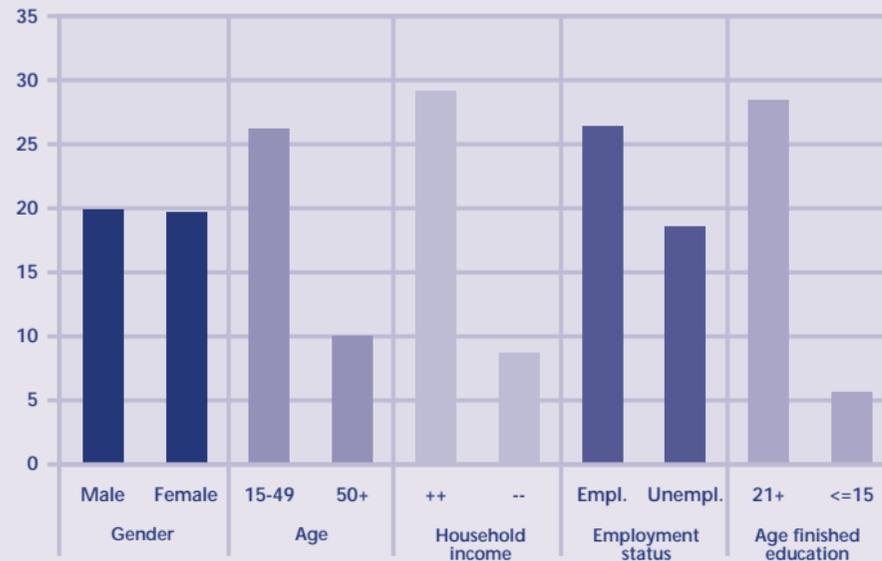
### 9.3 Persisting divides have important implications

Implications include...

These digital divides have important consequences in key areas of life, such as health-care and financial management. Older people, those who are less educated and those apparently in disadvantaged socio-economic circumstances are less likely to avail of eHealth and eBanking services.

...health inequalities exacerbated...

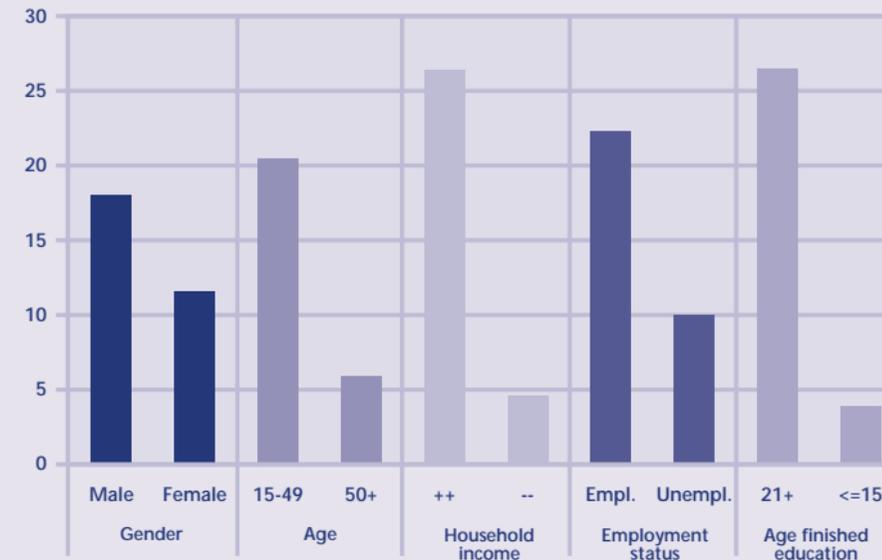
**Online searching for health information in EU-15 (in last 12 months; % of population)**



Base: All respondents in EU-15 (N=10,306), weighted by EU-15 population  
 Questions: IN1, IN3, IN4, IN6, IN7, B1, Z19, Z21 / Source: SIBIS 2002, GPS

...and exclusion from new efficiencies in daily life

**Online banking in EU-15 (in last 12 months; % of population)**



Base: All respondents in EU-15 (N=10,306), weighted by EU-15 population  
 Questions: IN1, IN3, IN4, IN6, IN7, B1, Z19, Z21 / Source: SIBIS 2002, GPS

## 10 Psychological barriers

Apart from tangible barriers like costs or lack of access in the workplace, psychological factors are also inhibiting usage of the Internet.

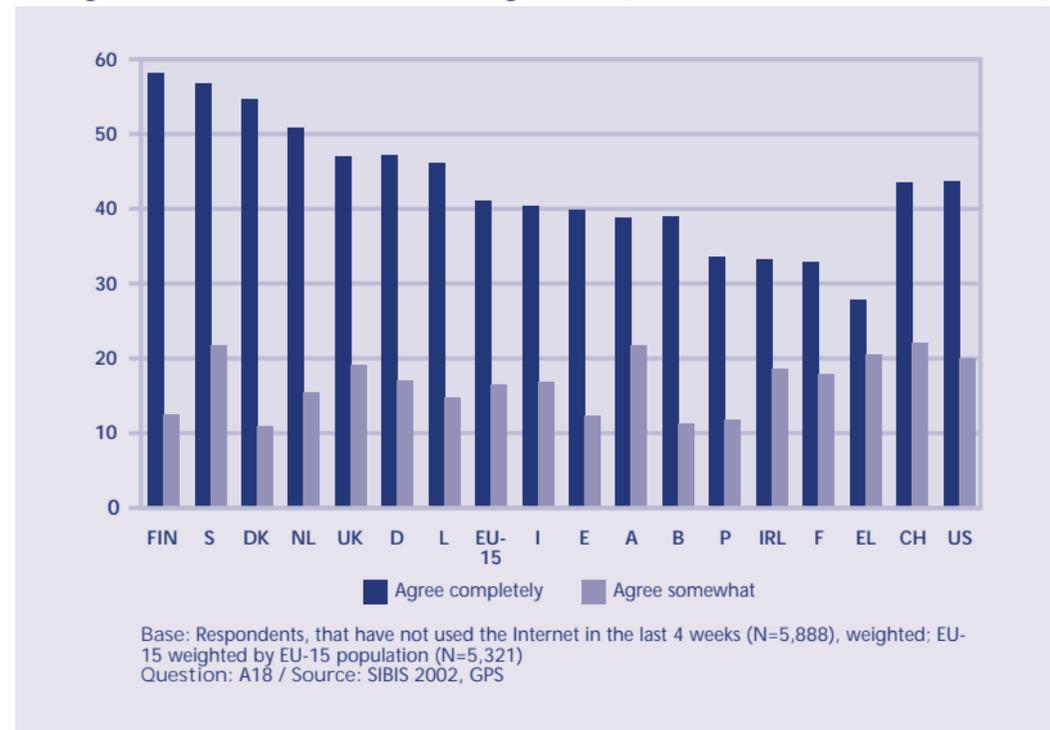
### 10.1 Lack of interest amongst non-users

2-in-5 non-users feel Internet "is not for them"...

In Europe overall, about two in five of those who do not use the Internet agree strongly that the Internet is "not something for me [them]". This is especially the case in countries where Internet penetration is already high, hinting that a 'saturation point' might exist.

...especially in countries with high penetration rates

Feelings that the Internet is "not something for me" (% of non-Internet users; last 4 weeks)



## 10.2 Security and Trust

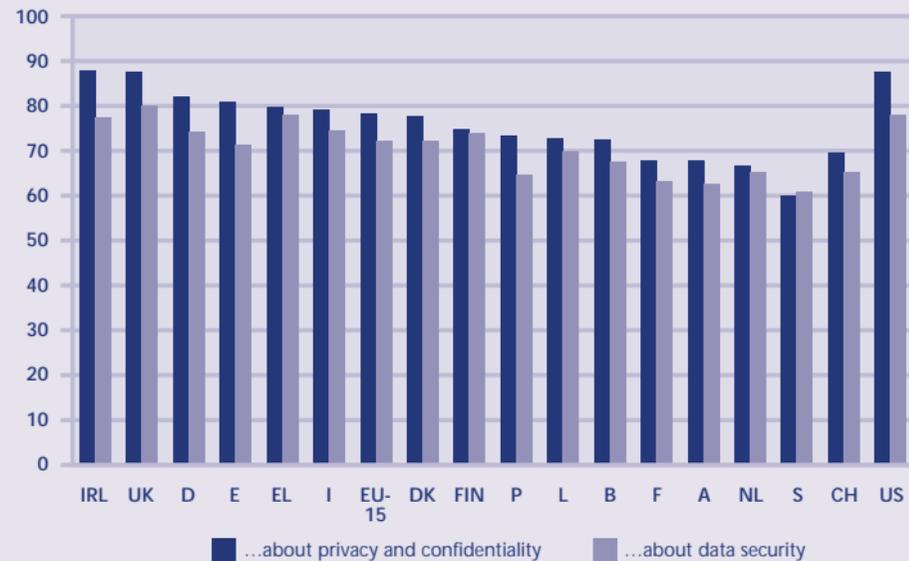
Internet users are concerned about security and privacy...

Security and Trust on the Internet is high on the agenda as an issue to resolve in the development of the Information Society. Lack of trust will keep people from using it and lack of security will undermine trust. SIBIS has developed new indicators to assess the extent to which online security and privacy are concerns of Internet users. The survey found that in all countries citizens are strongly concerned about both, with slightly higher concerns about privacy and more concern overall in the so-called "Anglo Saxon" countries - Ireland, the UK and US. Further research is needed to explore the underlying reasons, for example, more awareness of the issues, more actual negative experiences or greater general distrust in the functioning of society.

### Concerns about data security, privacy and confidentiality

(respondents feeling very or somewhat concerned...; % of regular Internet users)

...especially in Ireland, UK and US



Base: Regular Internet user (N=5,944), weighted; EU-15 weighted by EU-15 population (N=4,985)  
Question: J1 / Source: SIBIS 2002, GPS

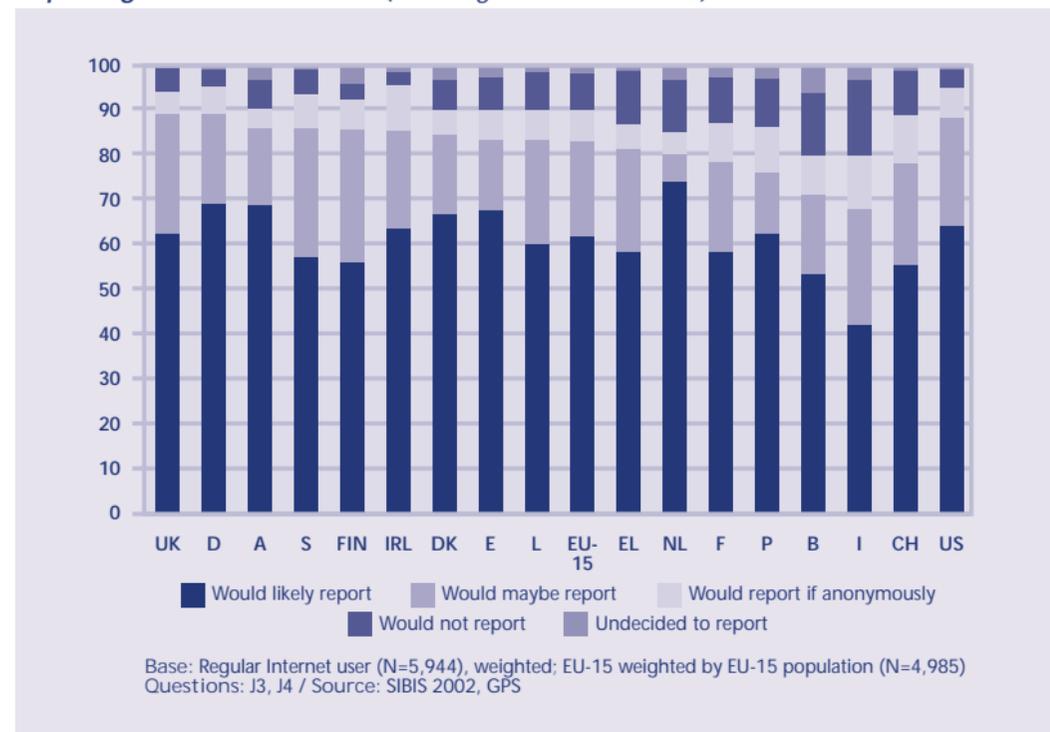
Willingness of users to report negative experiences is important...

In order to take protective measures users need to know what is going on and initiatives for sharing information on vulnerabilities, dependencies, threats and incidents are high on the agenda <sup>8</sup>. Particularly for viruses, but also with other kinds of problems an early warning from users can help other users worldwide to take measures to protect themselves.

SIBIS developed an indicator of willingness to report online violations of security or trust and the survey showed that there is a high preparedness to do this in all countries (never below 68%). The SIBIS data also show that in general the ability to report anonymously only marginally affects the willingness to report. Further research will be needed to examine whether willingness to report violations and the impact of anonymity varies for different kind of intrusions (viruses, unauthorised access etc).

...and SIBIS found that this is high in all countries

Reporting of online violations (% of regular Internet users)



## 11 Organisations and the Information Society

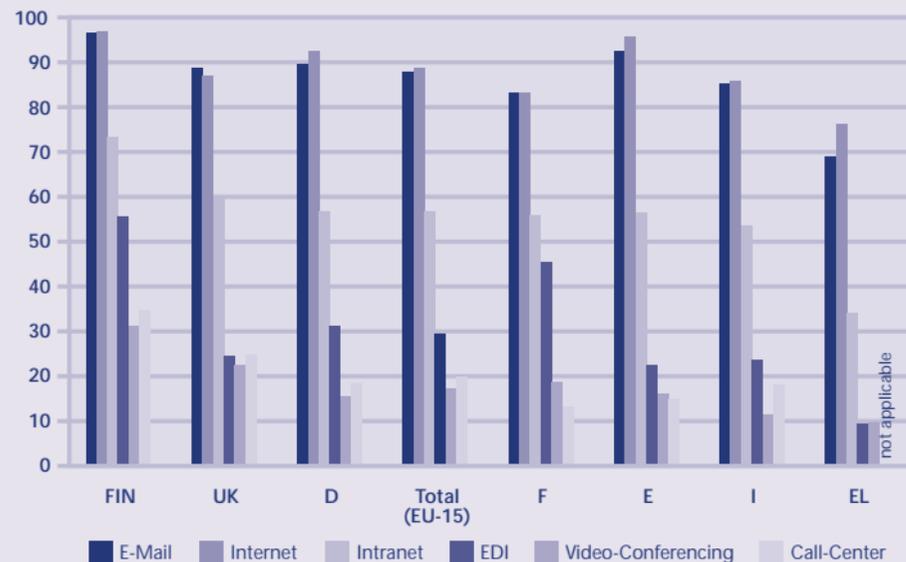
## 11.1 Online access and usage

*Communications facilities used by establishments (% of establishments)*

E-mail and Internet becoming ubiquitous...

...more than 50% have intranets...

...EDI still quite widely used...



Base: All respondents (N=3,139), weighted by employment  
 Questions: B1, B2, B3, B5, B7, B8 / Source: SIBIS 2002, DMS

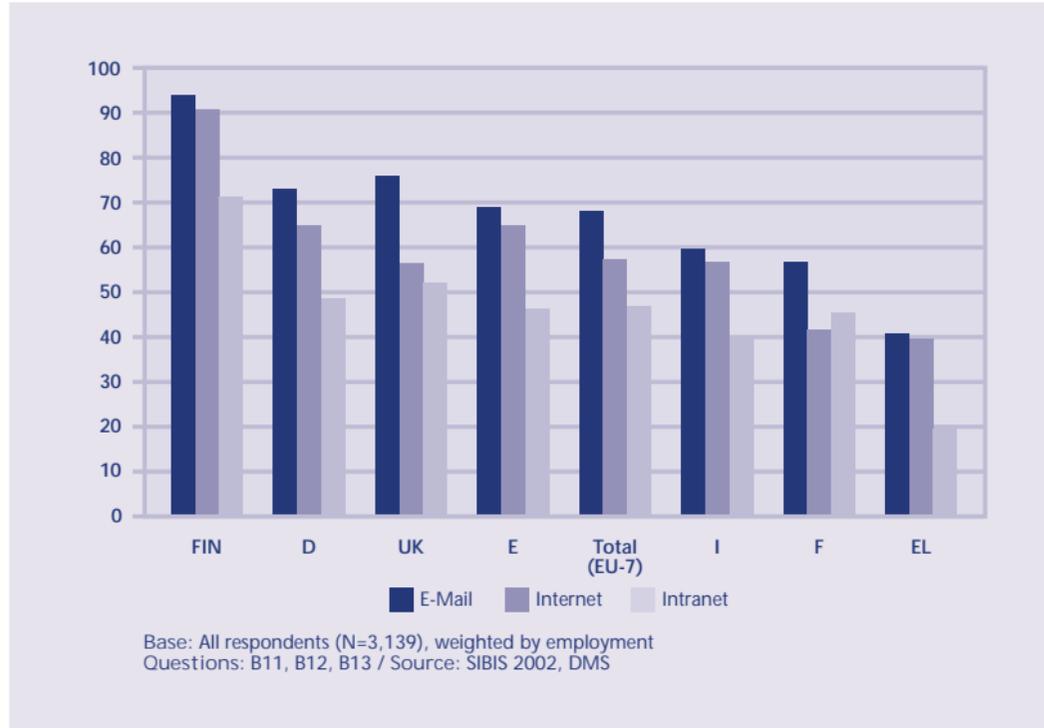
...1-in-5 establishments use call centres...

...video-conferencing is emerging

E-mail and the Internet are now being used by the vast majority of establishments in most countries, although level of usage in Greece are somewhat lower. Intranets are also becoming widespread, with more than half of establishments having an intranet in all countries surveyed with the exception of Greece. EDI is widely used in some countries, ranging from more than half of establishments in Finland to fewer than 10% in Greece. Call centres are used by about one in five (19.5%) establishments overall, ranging from more than one in three establishments in Finland (34.7%) to just over one in eight (12.8%) in France. Finally, videoconferencing is now clearly emerging, being used by almost one in three establishments in Finland and between one in five and one in six in other countries, although usage is lower in Italy (11.2%) and Greece (9.6%).

## 11.2 Staff access to ICTs

*Establishments giving their staff access to ICTs (% of establishments)*



Increasingly, EU establishments grant their staff access to the Internet ...

... in Finland, more than 90% do...

... in Germany, their number has nearly tripled in 3 years.

EU organisations are important providers and consumers of ICT skills, both through formal training and through hands-on experience. A useful indicator, therefore, is the share of establishments that give their staff access to ICTs at the workplace. SIBIS data shows that between 40% (Greece) and 91% (Finland) of EU employment is in organisations that grant their staff free access to the internet. The commitment with which Finnish establishments provide a conducive environment for their employees to use e-mail and the Internet can be assumed to be one reason for the success of the country in the European information economy. Other EU countries are catching up, though. In Germany, the number of establishments providing workplaces with Internet access has almost tripled in the last 3 years, from 24% in 1999 to 65% in 2002.

## 11.3 eCommerce

New SIBIS typology of eCommerce

SIBIS has developed a new typology of eCommerce that helps to indicate the levels of activity and integration into business processes. It clearly shows that European establishments vary widely in their levels of engagement with eCommerce.

Front-office activities increasingly online

In the seven countries covered in the SIBIS establishment survey, only a very small minority of establishments (6%) remains completely offline, although a further one in five organisations only uses basic e-mail. For one third of establishments (33.2%) in the countries surveyed, their eCommerce engagement involves back-office transactions through closed network business integration (based on the use of extranets or EDI). More than two in five establishments (40.7%) engage in some level of front-office eCommerce, with this being restricted to web marketing for one in five establishments (19.1%) and extending to web sales for one in twelve (8.0%). Just under one in seven establishments (13.6%) engage in both front-office and back-office eCommerce. This advanced level of eCommerce is much more common in Finland and Germany, and is relatively rare in Greece and Italy.

eCommerce still marginal for most...

eCommerce is still of marginal relevance for most organisations. Although volumes of e-sales and e-purchases are difficult to estimate, in the majority of cases (with some exceptions) they remain below 5% of total sales/purchases. Nevertheless, a majority of establishments do declare that eCommerce has had positive impacts for them, with e-sales judged to positively affect quality of customer services and the efficiency of business processes, and e-procurement resulting in cost and efficiency benefits. However, quite a large number of establishments judge the impact to have been neither positive nor negative or have difficulty in estimating it.

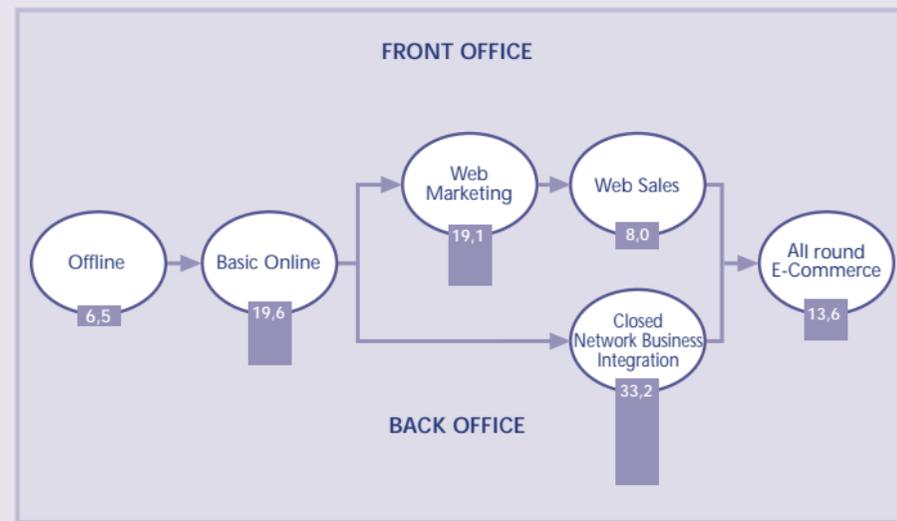
...but generally viewed as having positive impacts

Different levels of engagement...

...some still offline...

...some embracing all round eCommerce

### Degree of business engagement in eCommerce (% of businesses)



Base: All respondents (N=3,139), weighted by employment

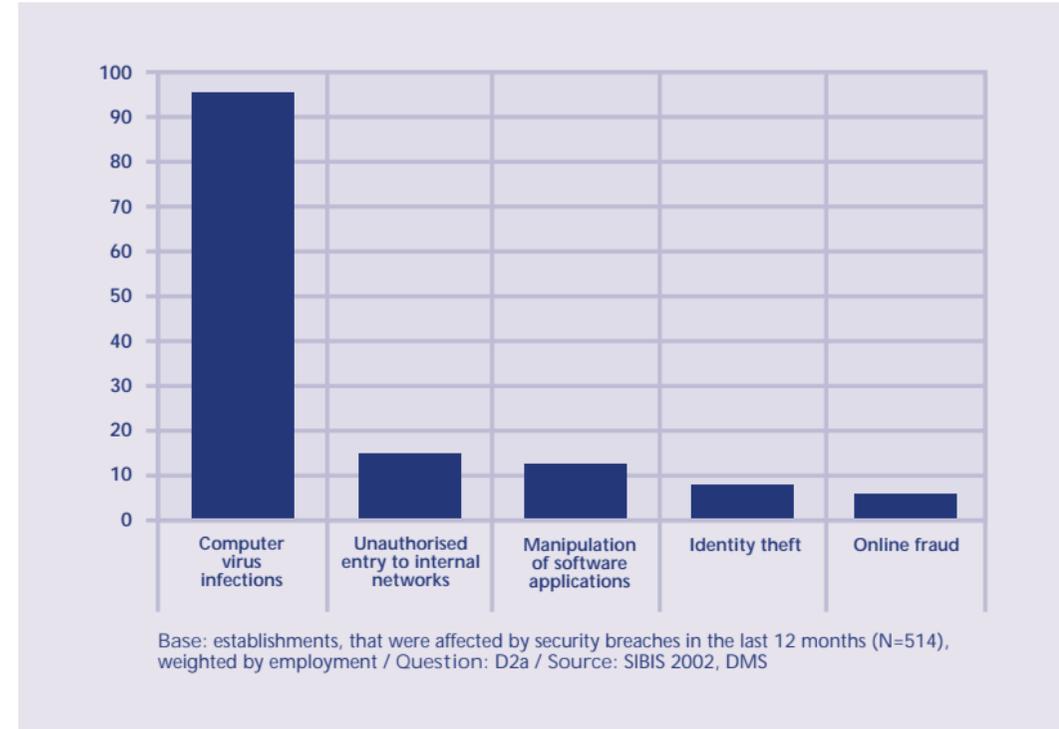
Questions: B1, B2, C1, C2, C3, C13, C15, C19, C20 / Source: SIBIS 2002, DMS

## 11.4 Security breaches

Before the SIBIS survey, there was little data available on different kinds of information security breaches being experienced by European organisations. The SIBIS data show that computer virus infections are the most frequent problem, with the overwhelming majority of organisations reporting that they have been affected by these. The number of other security breaches reported, such as unauthorised access to internal networks or identity theft was fairly low but, of course, some of these low likelihood breaches may have very significant consequences when they actually do occur.

**Types of security breaches occurring in European organisations**  
(% of establishments that were affected by security breaches in the last year)

Computer virus infections most frequent



## 11.5 Web site accessibility

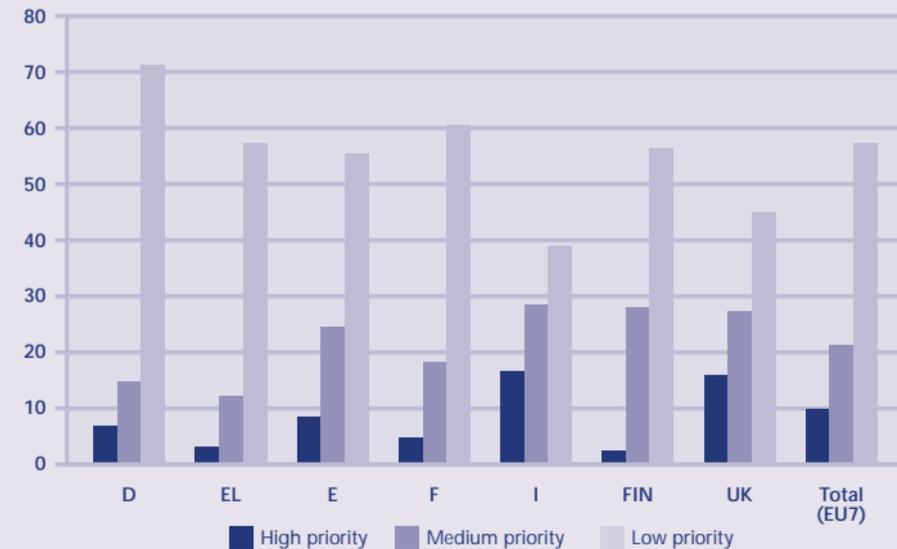
Only a minority of establishments give accessibility a priority...

Ensuring that vulnerable groups such as people with literacy problems or people with disabilities can participate fully in the Information Society is an important goal of the eEurope initiative. A key aspect of this concerns web site accessibility. There are now accepted standards and guidelines for web sites to ensure that people with literacy problems, visual impairments and other disabilities can use them. Despite its current prominence in public policy, however, SIBIS found that only a minority of establishments gives web site accessibility a high level of priority.

Finally, SIBIS developed a new scale combining degree of priority given to each group of [potential] users for whom accessibility is an issue, ratings of ease of adapting the organisation's website to make it accessible, whether formal accessibility guidelines were used and whether and how the website's accessibility was evaluated. The results show just how far European establishments have to go to improve the situation. Only a small minority are really giving web accessibility the attention that it deserves.

...for people with limited literacy...

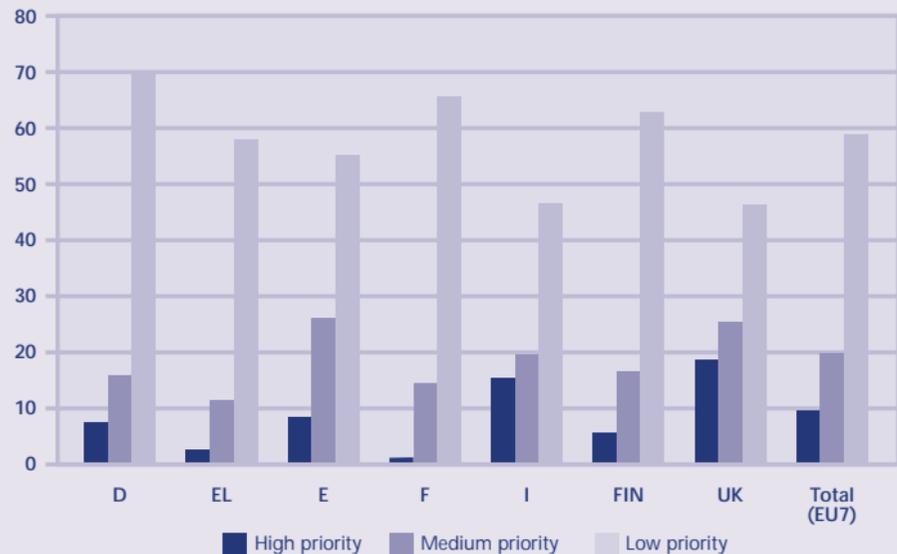
*Priority given to web site accessibility for people with limited literacy  
(% of establishments with online presence)*



Base: Establishments with online presence (N=1,857), weighted by employment  
Question: G1a(c) / Source: SIBIS 2002, DMS

...and people with visual impairments

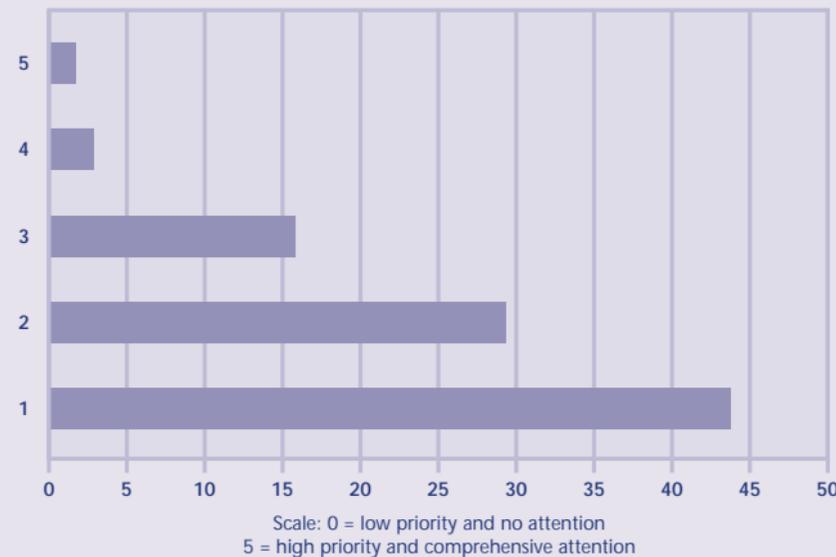
**Priority given to web site accessibility for people with visual impairments**  
(% of establishments with online presence)



Base: Establishments with online presence (N=1,857), weighted by employment  
Question: G1a(a) / Source: SIBIS 2002, DMS

New SIBIS scale shows just how far we have yet to go

**Ratings of organisations on the SIBIS web accessibility scale**  
(% of businesses)



Scale: 0 = low priority and no attention  
5 = high priority and comprehensive attention  
Base: Establishments with online presence (N=1,857), weighted by employment  
Question: G1a, G1b, G2, G3, G4 / Source: SIBIS 2002, DMS

## 12 Patterns across the Member States

New perspectives  
on evolution across  
countries

The SIBIS data also allows the generation of new perspectives on how the Information Society is evolving across the EU Member States. These analyses show a lot of commonality but also some important exceptions.

## 12.1 Online activities

Users more active  
online in countries  
with higher Internet  
penetration levels

One interesting finding is that the tendency of Internet users to do various practical things online generally increases as the level of Internet penetration increases across countries, and this is not explained by factors such as the higher prevalence of users with longer experience of usage in countries with higher penetration levels. This would not necessarily be intuitively predicted, as it might be expected that users in all countries whatever the level of Internet penetration in the country, would see the same utility value in certain core online activities. On the other hand, of course, a relevant factor may be that services are more available and/or marketed in countries with higher numbers of users.

## eShopping

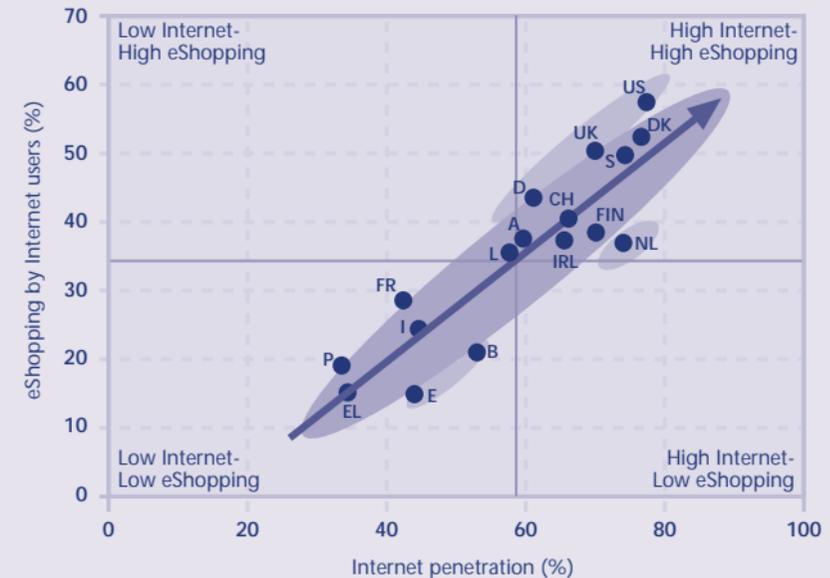
Strong association  
between eShopping  
and Internet  
penetration...

The strongest association was found for online shopping in the last 12 months, with a clear trend towards Internet users having an increased propensity to shop online as Internet penetration increases across countries. Somewhat lower than expected eShopping in the last 12 months was found in the Netherlands (a high Internet penetration country) and also in Spain and Belgium (both low Internet penetration countries). Slightly higher than expected levels were found in the US, UK and Germany (all high Internet penetration countries).

...but less  
eShopping than  
expected  
in Spain,  
Belgium and the  
Netherlands...

...and more than  
expected in the US,  
UK and Germany

## eShopping (last 12 months) by Internet penetration



Bases: "Internet penetration": all respondents (N=11,832), weighted  
"eShopping": all Internet users (N=6,905), weighted  
Questions: A7, A8, B1b / Source: SIBIS 2002, GPS

Strong association  
also for regular  
eShopping...

For regular eShopping (done in last 4 weeks), there was also a strong positive association with Internet penetration although not quite as strong as for eShopping in the last 12 months. In this case, higher than expected propensities were again found in the US, UK and Germany, and lower levels were again found in the Netherlands and also in Ireland and Finland.

These findings indicate that eShopping may grow rapidly amongst Internet users as Internet penetration increases in the different countries. However, country-specific market and/or cultural factors will also affect the speed of diffusion of eShopping, as evidenced by the higher than expected levels in some countries and lower than expected levels in others.

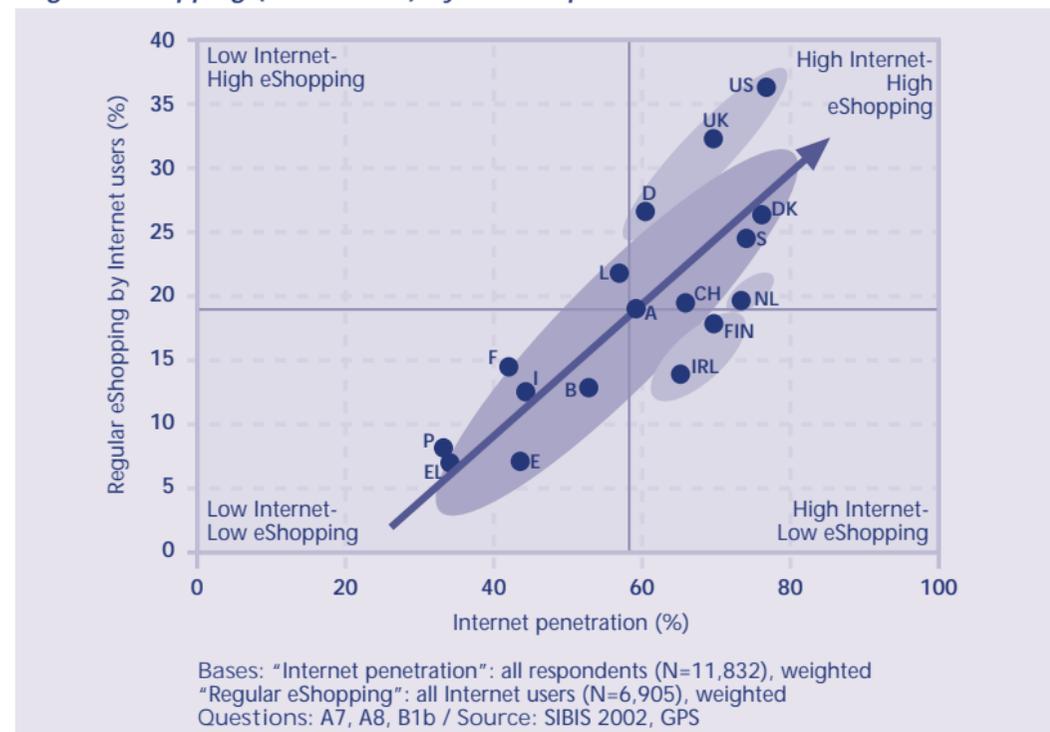
### eBanking

In the case of regular eBanking, again there is a trend towards increased eBanking amongst Internet users as Internet penetration increases across countries, although the association is not as strong as for eShopping. Finnish Internet users are exceptionally enthusiastic about eBanking whereas Internet users in Ireland, Switzerland and the US are somewhat less enthusiastic than might be expected.

...but more regular  
eShopping than  
expected in the US, UK  
and Germany...

...and less than  
expected in Ireland,  
Finland and the  
Netherlands

Regular eShopping (last 4 weeks) by Internet penetration

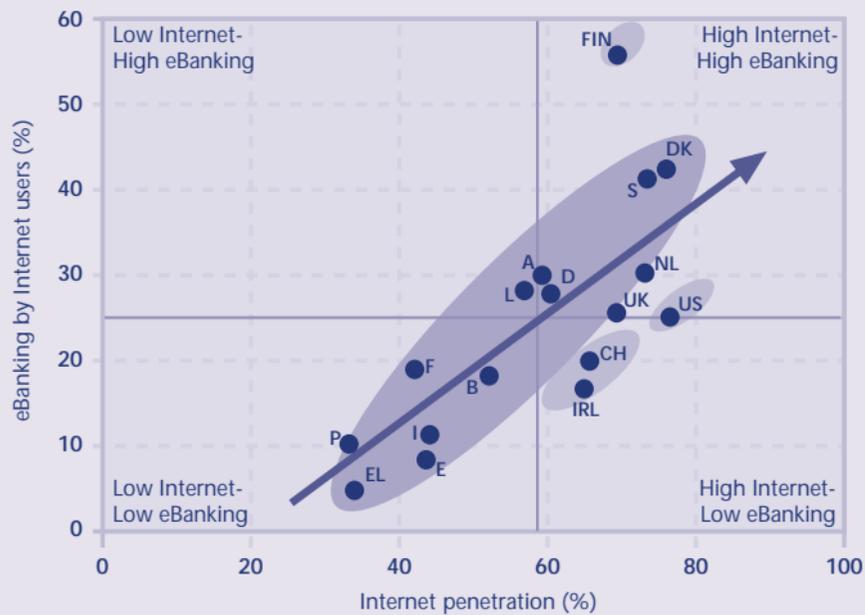


### Regular eBanking (last 4 weeks) by Internet penetration

Clear association also for eBanking...

...although Finns do a lot more eBanking than expected...

...and Irish, Swiss and Americans do less



Bases: "Internet penetration": all respondents (N=11,832), weighted  
 "Regular eBanking": all Internet users (N=6,905), weighted  
 Questions: A7, A8, B1c / Source: SIBIS 2002, GPS

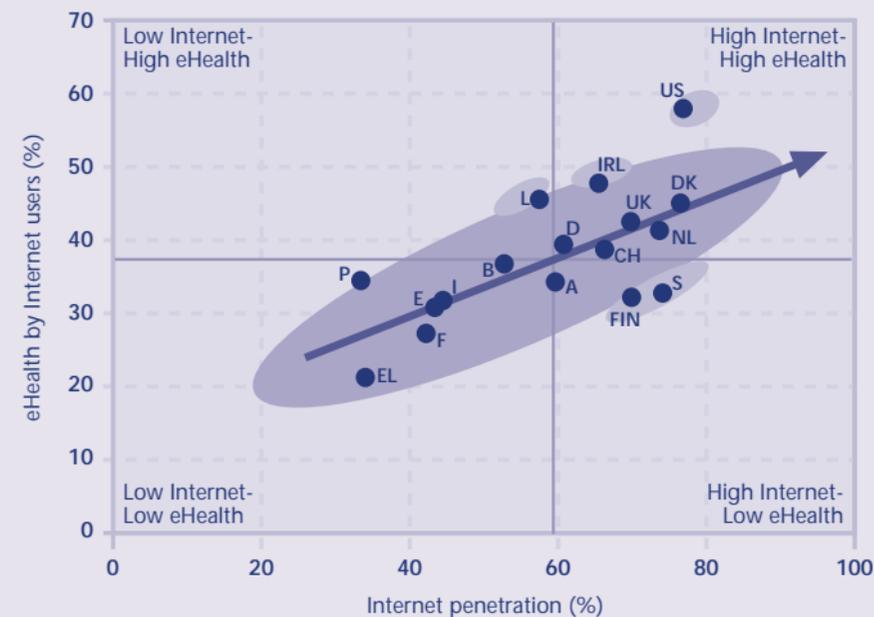
### eHealth

### eHealth (last 12 months) by Internet penetration

Clear association also for eHealth

...although more eHealth activity in the US than expected...

...and less in Finland and Sweden



Bases: "Internet penetration": all respondents (N=11,832), weighted  
 "eHealth": all Internet users (N=6,905), weighted  
 Questions: A7, A8, B1d / Source: SIBIS 2002, GPS

Bringing work home by eWorking increases as Internet penetration increases...

For eHealth, there is also a significant trend towards increased levels of eHealth activity by Internet users in countries with higher levels of Internet penetration, although the strength of the association is less than for eShopping or eBanking. US Internet users have an especially high propensity towards engaging in online health activity. Internet users in Ireland and Luxembourg are also somewhat more likely to do this than would be expected on the basis of Internet penetration levels alone, whereas Finnish and Swedish users have a lower than might be expected propensity. Relevant factors in these differences might include a higher orientation towards or necessity for self-management of one's health in the US in comparison to the Nordic countries with their generally well developed public health services, although confirmation of this would require further specific studies.

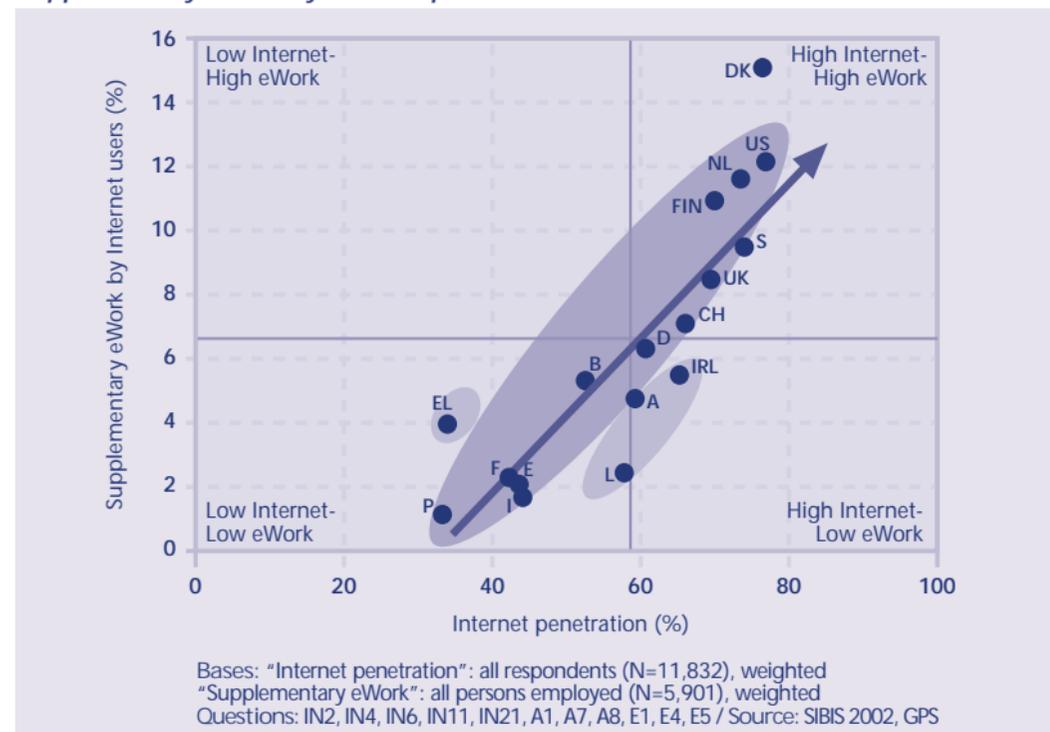
### 12.2 eWorking from home

For supplementary ("after hours") eWorking, there is a strong positive association with Internet penetration levels. In fact, with the exception of eShopping (in last 12 months), this was the strongest association found. However, Danes and Greeks were more likely to do this than would be expected on the basis of Internet penetration levels alone, whereas levels were lower than might be expected in Luxembourg, Ireland and Austria. Further research would be needed to examine the factors underlying these trends, such as reluctance to bring work home or lack of company-provided facilities for such eWorking from home.

...Danes do it a lot...

...but not so popular in Luxembourg, Austria and Ireland

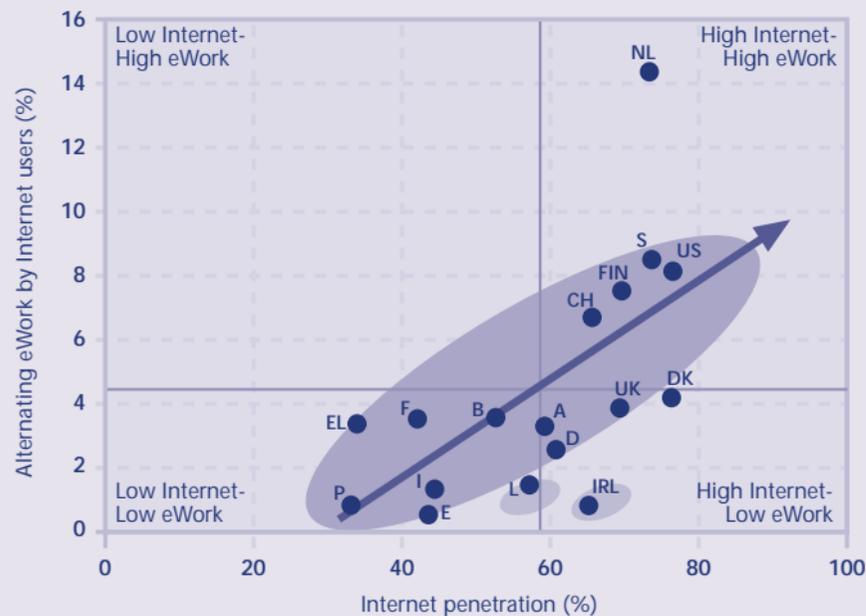
Supplementary eWork by Internet penetration



### Alternating eWork by Internet penetration

Dutch seem especially keen on the eWork alternative...

...but less keen in Ireland and Luxembourg



Bases: "Internet penetration": all respondents (N=11,832), weighted  
 "Alternating eWork": all persons employed (N=5,901), weighted  
 Questions: IN2, IN4, IN6, IN11, IN21, A1, A7, A8, E1, E4, E5 / Source: SIBIS 2002, GPS

Similar trend for eWorking as alternative to the office...

...but not as strong

For eWorking as an alternative to going to the office, there was also a significant positive association with Internet penetration rates, although this was a lot less strong than for supplementary eWorking and was also weaker than for eShopping, eBanking and eHealth. This is probably not surprising given the wide variations across countries in factors that can influence this form of eWorking, such as trends in work organisation, commuting times/distances and ways of managing work-life balance issues.

Apart from the general trend, workers in the Netherlands are a lot more likely and workers in Ireland and Luxembourg are somewhat less likely to do this form of eWorking than might be expected on the basis of Internet penetration levels alone.

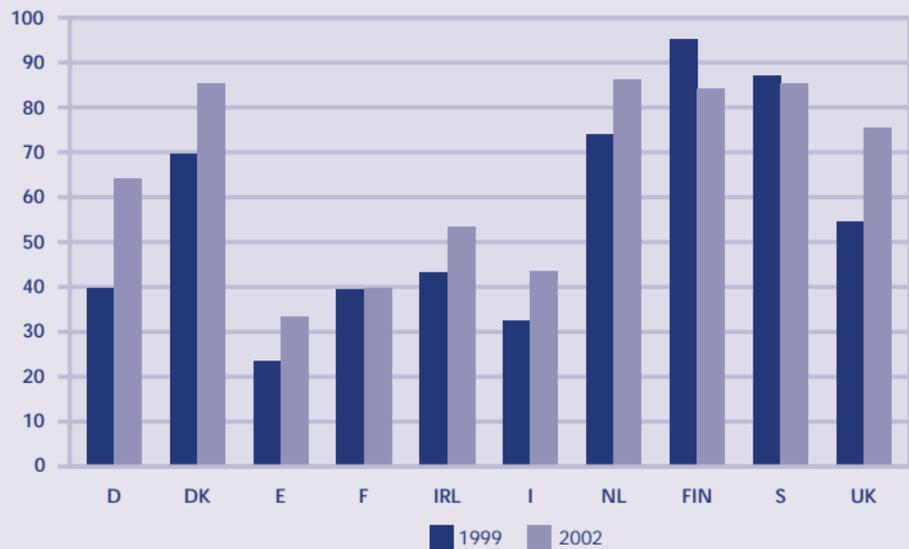
### 12.3 The e3 Index

The new e3 Index

In order to look at overall development patterns, SIBIS has developed the new e3 Index. This aggregates key indicators on the take-up and usage of ICTs by the population in relation to three spheres of activity - basic communication, consumption and work <sup>9</sup>. The eCommunication, eConsumption and eWork Indexes are each aggregates of three individual indicators <sup>10</sup> and the overall e3 Index combines the scores of the three individual indexes. Overall, the Nordic countries and the Netherlands had the highest scores on the e3 Index both in 1999 and 2002, with the Netherlands leading the EU in 2002, followed by Sweden, Denmark and Finland. This group of countries has moved closer together, with Finland losing the edge it had in 1999. The middle field is made up by the UK, Germany and Ireland, while at the bottom of the ranking order, Spain, France and Italy are lagging behind more clearly today than in 1999.

Nordic countries and Netherlands group together at the top

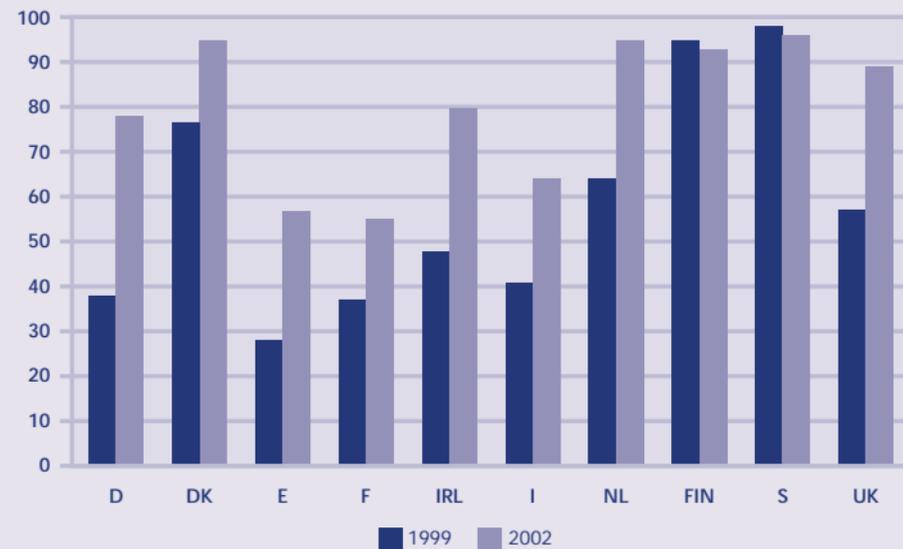
*e3* (average scores)



Base: see the following graphs / Questions: see the following graphs / Source: see the following graphs

UK catching up in eCommunication

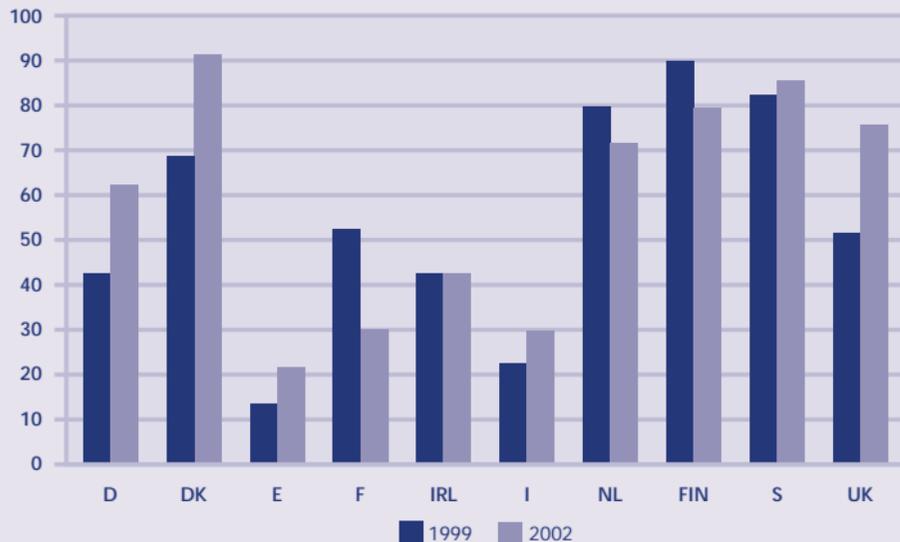
*eCommunication* (average scores)



Bases: 1999: all respondents (N=7,700), weighted / 2002: all respondents (N=10,306), weighted  
 Questions: only 2002: A3, A7, A8, A19  
 Sources: 1999 : ECATT 1999, GPS; Eurobarometer 50.1 1999 / 2002 : SIBIS 2002, GPS

Dutch drop back  
a little and UK  
surges forward  
in eConsumption

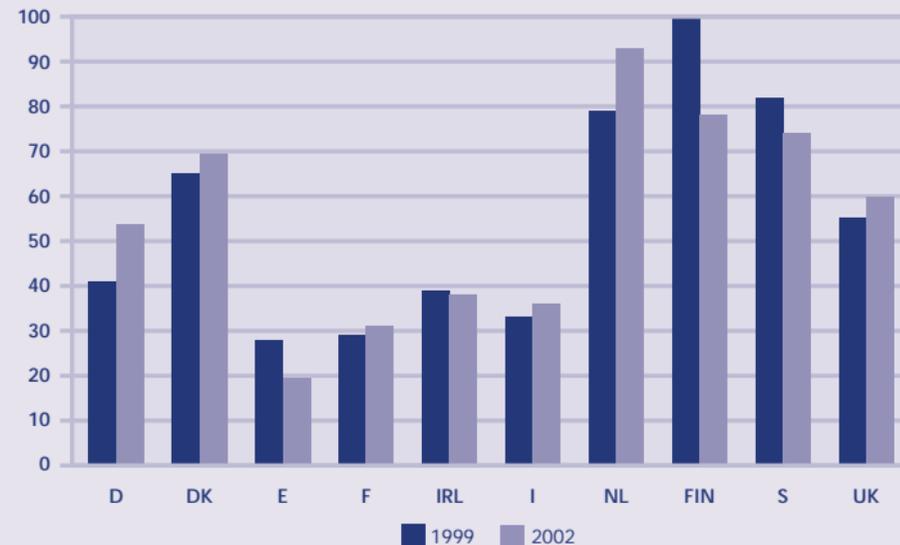
*eConsumption* (average scores)



Bases: 1999: all respondents (N=7,700), weighted / 2002: all respondents (N=10,306), weighted  
Question: only 2002: B1 / Sources: 1999: ECATT 1999, GPS / 2002: SIBIS 2002, GPS

Dutch move to  
top and Finns  
fall back in eWork

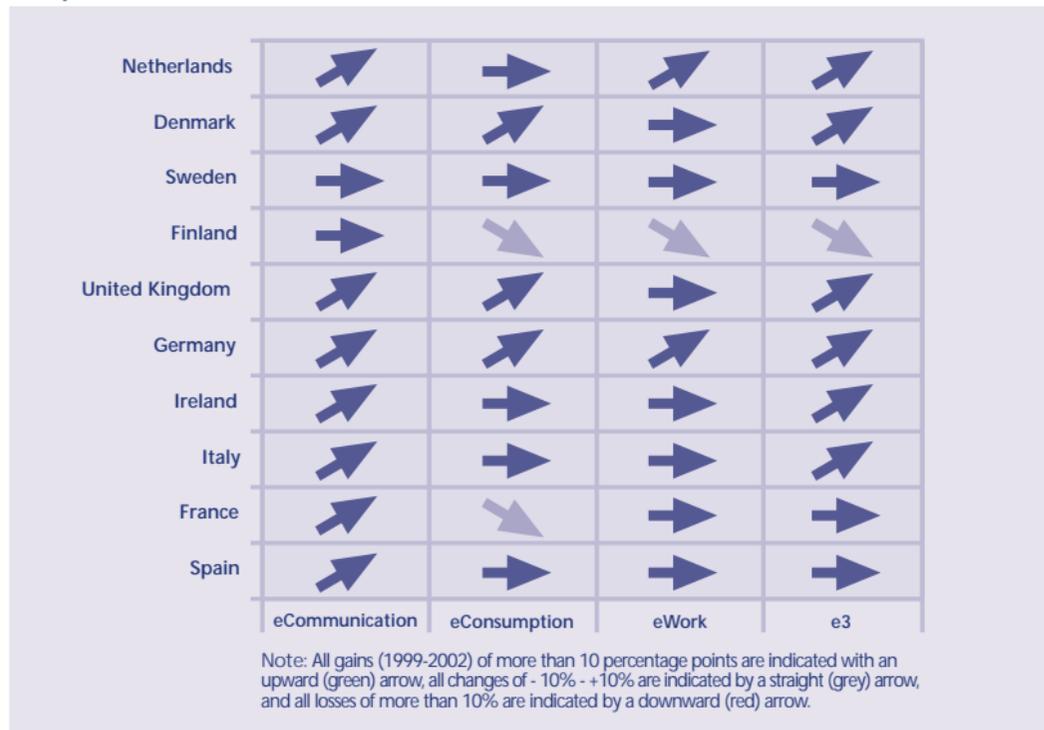
*eWork* (average scores)



Bases: 1999: all persons employed (N=3,765), weighted / 2002: all persons employed (N=5,901), weighted  
Questions: only 2002: IN2, IN4, IN6, IN11, IN21, A1, E1, E4, E5  
Sources: 1999: ECATT 1999, GPS / 2002: SIBIS 2002, GPS

Many have improved their performance relative to the e3 benchmark countries...

### Development of e3 1999 to 2003 – Member States' performance in comparison to EU benchmark



...but not all

Varied patterns across countries...

There are changes regarding the scores of most countries compared to the benchmark countries at the two points in time (Finland in 1999 and the Netherlands in 2002). Two groups of countries can be identified:

- 6 countries which have a much higher score in 2002 than in 1999, meaning that they moved closer to the benchmark (or, in the case of the Netherlands, gained the benchmark position themselves). This group also includes Denmark at the upper end of the ranking table, the UK and Germany in the middle field, and Ireland and Italy at the lower end.
  - 4 countries for which the index value for adoption of ICTs and ICT-based applications has hardly changed or has even decreased between 1999 and 2002: Finland and Sweden which were quite close to the maximum value of 100 in 1999 already; and Spain and France which have not managed to move closer to the benchmark.
- Taking a closer look at each of the three sub-indices, the following picture emerges:
- in eCommunication, all countries have gained ground considerably when compared to the benchmark, with the exception of Finland and Sweden which were already close to the saturation point in 1999;



...on the individual  
eIndicators

- in eConsumption, in contrast, only three countries (Denmark, the U.K. and Germany) have improved their standing relative to the benchmark, while Finland has lost its top position to Denmark, and France is stagnating at a low level of penetration;
- in eWork, only the Netherlands and Germany have improved their score considerably, while Finland, again, has lost its former position at the top, this time to the Netherlands which appears as the undisputed eWork leader in the EU.

Overall..

...disparities have  
reduced...

...but some have  
gained little

Bearing in mind that absolute values for nearly all of the indicators have increased, some of them quite considerably, in the last 3 years (the only obvious exception being home-based teleworking), these findings indicate that disparities between Member States have reduced with regard to basic participation in the Information Society. On the other hand, some countries clearly need to increase their efforts to take their population online – namely Spain and France, having hardly moved closer to the EU benchmark at all in the last three years.

New insights into  
Member State  
performances...

Online users do more  
things online in  
countries with more  
people online...

...a "chicken and egg"  
situation for policy

## 12.4 Conclusions

These new perspectives on benchmarking the Information Society in the EU provide new insights into Member State performances and into the dynamics of change across the Member States. Some countries, such as Spain and France, appear not to be closing the Information Society gap with the leading countries as quickly as might be expected. In others, such as Ireland in particular, recent surges in Internet usage have not so far been matched by commensurate increases in the propensity of Internet users to do practical things such as eShopping, eBanking and eWorking online.

As a general rule, however, there are clear signs that the propensity of Internet users to do various things online increases with increasing levels of Internet penetration across countries. This poses a classic "chicken and egg" conundrum. Is it that the availability of useful online services and content drive Internet penetration in a country or is it, vice versa, that increased Internet penetration drives the availability of useful services and content? Further research will be needed to examine the relative strength of these and other forces and thereby to provide pointers for effective Information Society policy.

### 13 Next steps

Extension to  
the new accession  
States...

...and packaging  
and presentation  
of methodological  
contribution

This report has focused primarily on presenting an integrated portrait of the Information Society in Europe and a benchmarking of EU and Member State performance, based on the results of the SIBIS population and establishment surveys. The next stages of the project will focus on two areas. First, the surveys will be extended to cover the 10 new accession states so that developments in these countries can be benchmarked. Second, the work on indicator development and on the performance of the SIBIS indicators will be fully documented and made available for other parties to use (an initial overview is provided in the Annex to this report). This should be of particular value in the context of the eEurope 2005 benchmarking exercise, as well as for other national and international programmes to monitor Information Society developments.



## Annex 1: Overview of indicator developments

The primary focus of SIBIS is on development of indicators to add to the current repertoire available for Information Society benchmarking. Quite a number of new indicators were developed in the process and work is ongoing on refining and improving these. This section presents an initial overview of some of the main aspects of this work. Further outputs from the project will present this in more detail.

### Work, employment and skills

A key area to benchmark...

At the core of the Information Society concept lies the belief that systems of production and labour deployment are changing as a result of the growing importance of information and knowledge vis-à-vis the traditional factors of production. As a consequence, the organisation of work, employment relationships and productive skills are issues which need to be analysed continuously and in great detail, using a set of indicators that are not only adequate but also efficient to use.

...but existing approaches need to be updated...

Employment and the labour market are undoubtedly one of the fields best covered by available statistics. There is a long tradition of producing data on a great number of employment-related indicators. This tradition, however, works as a disadvantage today as current changes in the way work is organised had not been foreseen at the time the statistical systems were created, and therefore are not well represented in current data sources. The Community Labour Force Survey (LFS) is the main provider of cross-country data on issues of work relationships and types of employment. These data are not

...and made more suitable for comparative benchmarking

SIBIS develops and pilots new indicators

always well suited for benchmarking, as actual question wordings and questionnaire structures differ considerably between countries. There is a case for alternative approaches that are tailored to the purpose of benchmarking between countries.

SIBIS contributes to the development of new indicators for work, employment and skills, by

- suggesting new indicators which better capture phenomena which are not sufficiently represented in available statistics, and which point towards greater flexibility of work organisation regarding time, space, content and contractual base;
- piloting these new indicators using a cost-efficient methodology which is well suited for the purpose of benchmarking, namely CATI telephone surveys.

Major policy implications...

### eHealth

Searching for health-related information by citizens is one of the most frequent activities on the Internet. This has profound implications for the organisation of healthcare and for public health. Indicators are needed that capture the more important developments and provide a basis for public policy in the area.

...but little benchmarking data available...

The only robust European-wide data on citizens' eHealth activity has come from Eurobarometer and has been limited to a single item on seeking health-related advice

or information on the Internet. Directly comparable data has not been available for the US. There is a need, therefore, for more detailed data on citizens' eHealth activity and for this to be in a form that allows reliable comparison with the US.

SIBIS deepens the available data...

SIBIS has begun the process of filling these gaps by gathering data on the same indicators in the same survey in both the EU and the US. It has also developed and piloted new indicators on the reasons why people are seeking health-related information online, the degree of success they are experiencing, the availability of suitable information in the different European languages, and the extent to which various types of information provider are judged to be trustworthy.

...and enables benchmarking

### eCommerce

Need to focus more on intensity and impacts...

eCommerce in Europe is growing from the pioneer phase to increasing integration within people's lives and organisations normal business practices. The indicators required to monitor this evolution must have greater depth and articulation than those previously used to measure the start-up and early take-off of the phenomenon. There is a need for indicators of the "intensity" and "impacts" of eCommerce, rather than just measurements of the diffusion of ICTs used for eCommerce (based on "readiness" indicators). The development of B2C eCommerce should be analysed taking into account consumer purchasing behaviour and customer satisfaction, through market research.

...and capture the complexities of B2B

The analysis of B2B eCommerce should focus more on sectoral and business size variables, which considerably affect development and impacts.

In terms of research, B2C is relatively easier to study; the available data is quite extensive and existing indicators are relatively adequate. B2B is a more complex domain, where the understanding of the interaction between eCommerce innovation and existing business processes is still far from adequate, and therefore discussion on appropriate indicators is open and lively. The implications for market structure and business value chains are much stronger than in the case of B2C, but less understood. Also, available data is scarce and poorly segmented. Therefore problems of measuring and monitoring are greater and SIBIS focused especially on filling gaps in the B2B domain.

SIBIS benchmarks business sectors and degree of eCommerce engagement

Available surveys on eCommerce have established that differences by sector and establishments size are even more relevant than for ICT diffusion patterns. But the analysis of eCommerce diffusion by sector has still been limited and there is a lack of comparable data. For these reasons many of the indicators examined by SIBIS are segmented by sector (manufacturing, finance, distribution, & public administration). Also, SIBIS has developed a new typology of organisations based on their degree of engagement in eCommerce for front-office and/or back-office activities.



## eGovernment

Need to study both supply and demand sides

eGovernment depends on two complementary aspects:

- **Supply-side: What do governments offer online?**  
The vision of eGovernment dictates the types of services that must be available online and the level of sophistication they must achieve.
- **Demand-side: What do users want online?**  
The adoption of eGovernment by its intended users, how do users perceive eGovernment, how well they can complete expected transactions, and what barriers stand in the way of successful adoption.

Existing data focuses on supply side...

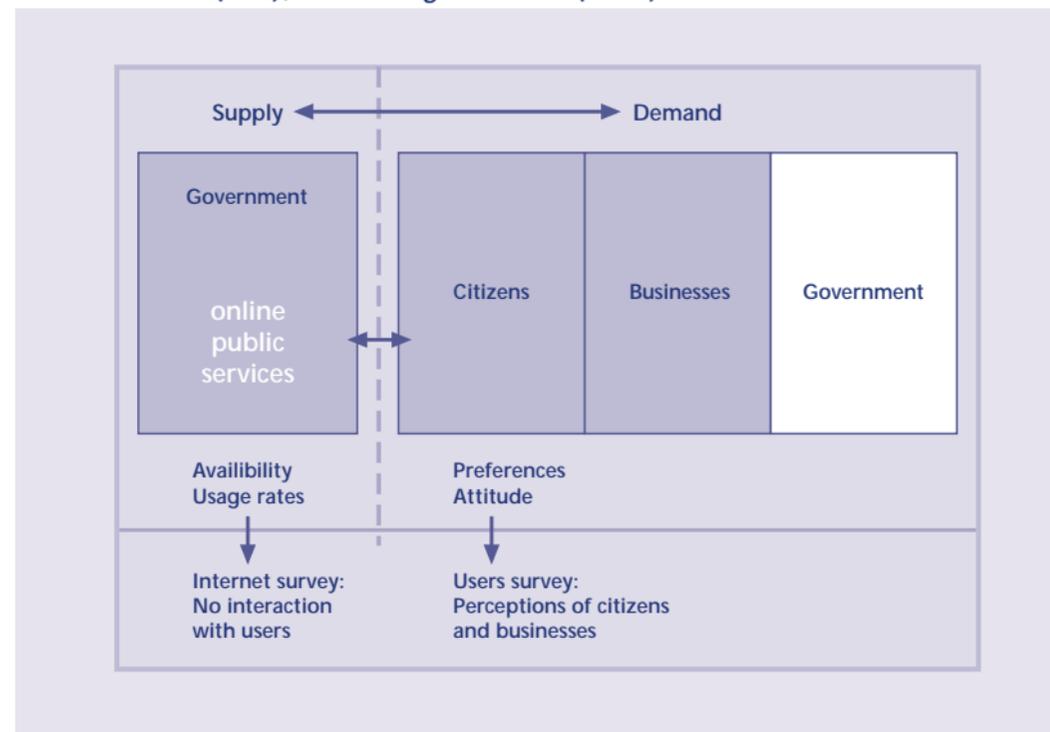
Existing studies concentrate on the supply-side of eGovernment, that is, on the availability and level of sophistication of online services <sup>11</sup> and usage <sup>12</sup>. SIBIS complements these studies by addressing the demand-side of eGovernment, not only usage but also perceptions and barriers to utilisation that have not been treated previously. The SIBIS indicators measure acceptance and adoption of eGovernment by its intended users and constitute a novel and necessary set of indicators. Some existing studies have looked at the preference of citizens for eGovernment in comparison to conventional means of transacting with government, but they have not sought to elucidate what drives citizens toward or away from eGovernment. Besides, studies of business preferences for eGovernment or existing means of transaction are non-existent.

...SIBIS also addresses demand side...

...and fills some of the gaps

For this reason, SIBIS focused on factors that either facilitate or impede the implementation of eGovernment based on user perception.

*Types of indicators on eGovernment: existing indicators (grey), SIBIS indicators (blue), still missing indicators (white).*



## Security and trust

High on  
the agenda

Security and Trust is high on the agenda as one of the next issues to resolve in rolling out the Internet as an enabler for the Information Society. Lack of trust will keep people from using it and lack of security will result in disappointments that will undermine trust. It is clear that individual concerns about privacy, security, and the use of information about their preferences and activities are a barrier to the formation of an effective and broad-based information society. At the same time information sharing and early warning are crucial to effectively limit both the probability of attacks and the damages caused.

Actions to ensure a secure information infrastructure are deemed necessary at a European level, as clearly stated in a number of policy papers, among which the eEurope 2005 Action Plan <sup>13</sup>. The Commission has recognised the importance of security in general and network and information security in particular and has defined it as one of its priorities for 2003. Action in the field of network and information security should focus on supporting awareness raising actions and data collection and analysis of security risks.

To foster such actions it is essential to know people's concerns and their willingness to report information on violations they have experienced. It is also necessary to gain information on what sort of breaches organisations suffer, in what way they try to avoid them, what priorities they have in terms of information security and what barriers they face in setting up an information security policy.

Lack of data

Before SIBIS, data on information security issues was extremely scarce. Although some attempts to assess information security issues had been made <sup>14</sup>, they were not specifically focused on the EU and some had a very imprecise statistical methodology. The issues addressed were limited and very much geographically oriented. Some of them were conducted over the Internet and, therefore, excluded all persons who had less access to the web (such as those who could not access the Internet from home).

SIBIS - first steps  
towards a  
comprehensive  
approach...

SIBIS represents the first step towards a comprehensive approach to gathering data on individuals' and organisations' visions and perceptions on information security and on-line trust. Apart from its own data, the project will also be proposing further indicators (for example, on the identification and benchmarking of good practice in organisations' security procedures) for use in other benchmarking endeavours. Another pivotal achievement is the cross-cultural approach since SIBIS has targeted users and organisations in the EU, US and Switzerland.

...and the data can  
support EU policy  
and action

SIBIS provides an independent statistical evaluation and supports the accomplishment of EU activities in the area of information security. Elements such as policy-making mechanisms, deterrence, protection, detection, and risk management are crucial for information security. The EU should also seek to provide "operational" support (for example by developing European-wide warning and information sharing networks) and raise citizens' awareness of information security issues. Statistical information is a requisite for the implementation of any such action <sup>15</sup>. In particular, SIBIS' work will be

extremely useful for the proposed *EU Cybersecurity Taskforce* and the European Network and Information Security Agency, to be established in 2004 as proposed by the European Commission of February 10, 2003.

#### Innovative indicators

In order to support these policy efforts, SIBIS has produced innovative indicators measuring citizens' privacy and security concerns and the impact of these concerns on on-line shopping and banking, citizens' propensity to report on-line violations, and citizens' awareness of security features of websites. SIBIS has also developed indicators on breaches and their financial impact on European organisations, as well as indicators assessing the information security priorities and the barriers to effective implementation of an information security policy in such organisations.

#### Digital literacy

#### Crucial skills for the Information Society...

In the knowledge-based society, being able to communicate and work digitally is as basic as being able to read and write. All groups in society, regardless of age, gender, educational background, etc., must have the opportunity to take part in the societal processes of living, working, and learning to avoid any kind of social exclusion or biases on the labour market. Digital literacy therefore is a precondition for participating in the Information Society and is a key policy goal, not least for the formal educational sector.

...both basic skills and higher order ones

In the context of the eLearning Action plan (COM 2001) digital literacy for all was established as a political goal. At the eLearning summit in 2001 (European Commission 2001) the concept of digital literacy was extended to include both basic skills and higher order skills not directly connected to use of ICT but rather actualised by ICT and the information society.

Lack of indicators and data...

Some of the aspects of digital literacy are already being surveyed continuously (e.g. use of e-mail), but more sophisticated indicators are not well developed and there is a lack of data to inform policy.

...COQS index fills some of the gaps

To begin to fill this gap, the SIBIS project defined a set of indicators, which has its base in the eLearning summit definition of basic skills of digital literacy. This definition of digital literacy consists of four indicators - skills to communicate with others via the internet, to obtain (download) and install software on a computer, to question the source of information on the internet and to search for required information using search engines. Based on the piloting of these indicators in the SIBIS General Population Survey unique data on digital literacy skills have been collected, and the "COQS" index of digital literacy has been developed. Based on the COQS index the 15 EU countries have been benchmarked against each other, as well as against USA.

...and indicate important policy needs

The data collected in the SIBIS survey shows important differences in digital literacy across the EU countries, which cause concern and a need for special attention in a number of countries. Benchmarked against the USA, all European countries lag behind (except for Austrian youth aged up to age 24). Further investigations of the underlying reasons for these differences should be a priority, as well as efforts to learn from the best scoring European countries (and USA) in order to design specific policies in the EU to raise the general level of digital literacy.

#### Telecommunications and access

Traditional focus on counting of instances...

Progress in the field of telecommunications and access was being measured long before the advent of the information society and eEurope. It is only in recent years that measurements are starting to change from systems of basic counting of instances (of technology take-up) to ones which look at the usage and impact that benefit society as a whole.

...lack of consistency and coherence

The work undertaken at the beginning of the SIBIS project confirmed that although many basic quantitative indicators were already available across Europe, these were not always utilised in a consistent and coherent manner. Also, there was no specific pan-European methodological approach to the understanding of Telecommunications and Access.

Need for new indicators...

...especially on usage and impacts

SIBIS develops new indicators...

...and applies these consistently...

...to contribute to eEurope 2005...

...and to wider benchmarking

The distinct concentration on indicators tracking the 'penetration of technologies' and on 'access levels' (so-called 'readiness' indicators), meant there was enormous scope for development of indicators measuring what this access really means and what are the patterns of use of new technologies. There was even less information available on the impact of the use of new technologies.

Within the context of the SIBIS project, some of these more 'extended' questions about citizens' use and impact of new technologies have been addressed. Also, all the indicators that have been developed as part of SIBIS in the area of Telecommunications and Access have been developed and tested in a consistent methodological way across all 15 EU member states and will be extended under the umbrella of SIBIS+ work.

Many of these indicators relate to the priorities set for eEurope2005 and can be used to inform policy decision making, to benchmark, and to monitor the effects on regulation. The SIBIS benchmarking results not only emphasise the value of the quantitative results obtained through the SIBIS project for purposes of making comparisons across the EU-15 Member States, Switzerland and the US, but also provide a qualitative insight into the usefulness, validity, and constraints of telecommunications and access indicators.



## Social Inclusion

Tendency to focus on "exclusion"

The theme of social inclusion in the Information Society effectively tends to be defined using the 'inverted retina' perspective, that is to say, the focus is on its 'flip' side - exclusion. The key issues to be measured from this perspective relate to lack of inclusion defined in terms of a "distance" or a "gap" regarding access to and use of ICTs / Information Society products and services. The underlying rationale is that the lack of participation is accompanied by adverse consequences arising out of these 'gaps' or differential positions in terms of the Information Society, leading to the emergence of 'digital divides'. An inadequate level of participation is often conditioned by a combination of factors that are traced to lack of resources (in a wide sense, including skill endowment), facilities, opportunities, but inevitably there are also some psycho-social issues at play, which in turn means that digital divides can reinforce existing 'social fault' lines, but sometimes cut across them.

Wide impacts of the Information Society

While it is not always strictly correct to talk about the impact of the Information Society, since its advent ultimately intertwines both social shaping and its impacts, the influence of the Information Society is undoubtedly felt in all walks of life – from work, learning, leisure, social interaction and, increasingly, wider societal participation and enfranchisement, to other subject matters such as managing personal affairs (e.g. health)

Lack of comparative quantitative indicators...

Whilst the theme of digital divide has gained in prominence in terms of attention from both the policy and the research circles, it has continued to suffer from a lack of comparative quantitative indicators, especially in terms of facilitating methodologically sound

...and lack of data

assessment with external benchmarks. It is only with the aid of these tools that an informed judgement can be made regarding whether and to what extent a society makes the best possible use of new information and communication technologies (ICT's).

Although a myriad of sources across the Member States offer a variety of indicators that seek to capture the differential level of individual participation in the Information Society, there is still a lack of comprehensive comparative data suitable for concurrent and external benchmarking. In addition, and probably more problematic, issues such as the individual rationale for and the sustainability of participation have been inadequately, if at all covered. In addition, there has yet to be any robust benchmarking of the extent to which online establishments are ensuring that their web sites and services are accessible to all.

SIBIS begins to fill the gap

SIBIS has begun the process of filling some of these gaps. The main contributions have been through:

- suggesting new indicators that better capture phenomena which are not sufficiently represented in available statistics, especially in terms of suitability for cross-country comparisons and in terms of capturing relevant phenomena,
- piloting these new indicators and
- combining, where appropriate, SIBIS indicators and existing indicators with the aim of obtaining a longitudinal picture regarding eInclusion.

## Research and Development (R&D)

Internet technologies...

...an important group of inputs to R&D

No comprehensive data...

The relationship between the R&D system and the Internet must be considered as particularly important: R&D is an important source of inventions, technical knowledge and skills and is therefore a major motor of economic growth. Taking an economic production function approach we can model the output of an R&D system as a function of its various inputs: researchers and supportive staff, instruments, library collections, computers and other capital goods, services from various service providers (such as computing services) and many other material and immaterial inputs which are impossible to assess in their entirety. However, there can be no doubt that Internet technologies constitute one important group of inputs to R&D which are used themselves or which provide access to other digitised research inputs such as databases and libraries. In order to evaluate the extent to which the different inputs contribute to a large and high-quality research output, statistical data for indicators on both sides of the production function are essential. As yet there is no comprehensive database covering the technological inputs for R&D activities. The OECD, together with the national statistical institutes and R&D institutions, has developed various manuals <sup>16</sup> and data collections. The Main Science and Technology Indicators Database (MSTI) covers the outputs (patents) as well as inputs (personnel, expenditure) of R&D activities. Other partly proprietary databases cover specific elements of R&D and include the bibliographical databases of the Institute for Scientific Information or the Cooperative Agreements and Technology Indicators (CATI) database developed at the Maastricht Economic Research Institute on Innovation and Technology (MERIT). The lack of proper indicators on the use of Internet technologies in R&D has been frequently lamented in the literature:

...pressing need for European-wide surveys

SIBIS develops an indicator system...

...and plans benchmarking survey

*“There is a pressing need to increase efforts and resources to undertake in-depth empirical studies on the innovative uses of Internet in science and to carry out European-wide surveys on this issue. Such studies are the only way to generate a sufficient amount of data and information necessary to evaluate the impact of new, high capacity electronic communication facilities upon the organization, distribution and conduct of collaboration on fundamental research problems.” <sup>17</sup>*

The SIBIS research on the Internet for R&D sets out to develop indicators which are appropriate for measuring the extent to which the Internet has been integrated into R&D and the effects of this. So far, the SIBIS work in the topic area has successfully constructed an indicator system which reflects the different aspects of the Internet in research and development, in particular availability of adequate research networks and of specialised computer support staff.

SIBIS has also developed a survey instrument which will produce, for the first time ever, internationally comparable data on the Internet use in selected research disciplines. This constitutes a considerable progress beyond the current practice of statistics, both from the perspective of R&D statistics and Internet statistics. Whereas the former has not yet devised indicators for measuring technology use in R&D, the latter can benefit from the fact that researchers often constitute the avantgarde of technology users producing and using technologies which spread to other areas of society later on.

## Annex 2: Methodology overview

### General Population Survey (GPS)

The survey was conducted in April-May 2002 (interviews were carried out between 4th April and 18th May) in all 15 EU Member States plus Switzerland and the USA, using computer-aided telephone interviews. The survey was co-ordinated and executed by INRA Deutschland GmbH, Mölln. The population for the study was all persons aged 15 and over living in private households in the respective countries and speaking the respective national language(s). 11,832 interviews were successfully completed. The average interview length per country varied between 10 (Greece) and 20 minutes (Sweden).

**Sampling:** Target households were selected at random in all countries, either by random dialling techniques such as permutation of final digits or by drawing a random sample from official sources. Mostly a geographical stratification was implemented beforehand. For the selection of the target person common random keys were applied in all countries except for the U.K. where quota was used. In two cases (Spain, USA), screening had to be directed towards male respondents towards the very end of the field work in order to gain gender representativeness.

There were three adjustments necessary in order to provide reliable data:

- Transformation from household sample to person sample. As only one person per household is interviewed, the described sample procedure provides a household sample, i.e. each household of the base population has the same likelihood of being in the sample but not each person. With the weighting stage of the transformation the equal likelihood of households is replaced mathematically by the equal likelihood of the individuals. To this end, each data set is multiplied by the number of people in the household aged 15 or over. This number is subsequently divided by the average household size in order to obtain the actual case number.
- Adjustment of unweighted sample structure to the official statistics. Because random samples are not evenly distributed across all population strata, the distribution of unweighted samples regularly and systematically deviate from the population distribution from official statistics. Through mathematical weighting the sample distribution was adjusted to the official statistics. The national weighting factor, which results from the iterative weighting, was included in the data material.
- Adjustment of weighted sample structure to the EU-15 member states population. This weighting factor was necessary to calculate total figures according to the whole population of the European Union member states. Furthermore it is useful to compare the EU with the US. Population sizes of each member state are weighted to reduce the distortion based on the sample sizes in each country.

### Sample characteristics GPS

	Total		EU-15	
	unweighted	weighted	unweighted	weighted
Total sample	11832	11832	10306	10306
Country				
Austria	500	500	-	-
Belgium	585	585	-	-
Denmark	501	501	-	-
Finland	669	669	-	-
France	1000	1000	-	-
Germany	1001	1001	-	-
Greece	505	505	-	-
Ireland	500	500	-	-
Italy	1000	1000	-	-
Luxembourg	500	500	-	-
Netherlands	530	530	-	-
Portugal	500	500	-	-
Spain	1015	1015	-	-
Sweden	500	500	-	-
Switzerland	522	522	-	-
UK	1000	1000	-	-
USA	1004	1004	-	-
<b>EU-15</b>	<b>-</b>	<b>-</b>	<b>10306</b>	<b>10306</b>
Age groups				
up to 24	1964	2019	1731	1651
25 to 49	5511	5309	4817	4593
50 to 64	2515	2495	2191	2209
65 and more	1833	2000	1558	1839
don't know	9	9	9	14

	Total		EU-15	
	unweighted	weighted	unweighted	weighted
Total sample	11832	11832	10306	10306
Terminal education age				
up to 13	695	717	693	728
14	715	742	701	881
15 to16	1794	1750	1641	1820
17 to 20	3587	3515	2997	2937
21 and more	3266	3275	2743	2495
still studying	1687	1751	1463	1372
don't know	88	81	77	73
Employment status				
paid employment	4966	4853	4291	4133
self-employed	935	941	809	799
unemployed/ temporarily not working	701	683	621	631
in education	1687	1751	1463	1372
retired or other not working	3441	3510	3034	3292
don't know	102	94	88	80
Internet usage				
total Internet use	6905	6908	5828	5610
regular use (last 4 weeks)	5944	5948	4985	4781
occasional use (last 12 months)	961	960	843	830
non-Internet use	5550	5643	4655	4548

### Decision Maker Survey (DMS)

The survey was conducted in March-May 2002 (interviews were carried out between 21st March and 15th May) in seven EU Member States using computer-aided telephone interviews. The survey was co-ordinated and executed by INRA Deutschland GmbH, Mölln. The population for this study was defined as all establishments belonging to four aggregated industry sectors in the seven Member States Germany, Finland, France, Greece, the U.K., Italy and Spain. The interview was conducted with IT responsible persons in establishments across all sectors of the economy. 3,139 interviews were successfully completed. The average interview length per country varied between 14 (France) and 18 minutes (Italy).

**Sampling:** The sample was set up according to given industry and size class quota. Accordingly a stratified random sample was drawn from the universe, allowing for the relevant industries within four aggregated sectors (manufacturing, construction, primary sector; distribution, catering, transport & communication; financial & business services; public administration, education, health, other personal and social services). Drawing the sample was organised locally by the national executing institutes.

**Weighting:** For the SIBIS DMS a sample stratified by sector/ size cells was used which ensured that in each sector, establishments from all size classes (1 to 9, 10 to 49, 50 to 199, 200 to 499 and 500+) were sampled. In order to be able to raise figures to national level, some form of weighting is required which adequately reflects the structure and distribution of establishments (or related variables) in the universe of the respective country (and, by implication, EU-15).

- **Original weight:** Within each country, the interviews were split according to a quota plan which guaranteed that the sample is not dominated by micro and small establishments. The quotas roughly reflect the distribution of employment over sector and establishment size bands in the EU, and derive from research into establishment sampling frames undertaken for previous studies by Infratest and GfK in the course of ECaTT. They represent best estimates, but do not take account of country differences. Weighting was used in cases where the quotas could not be reached exactly in line with this quota plan (mostly due to the limited absolute number of establishments in the two biggest size classes). Note that because of the use of a single quota plan for all countries, country differences in the distribution of employment over establishment size bands which occur in reality are not reflected in the data. This is due the lack of available data on the distribution of employment across establishments size bands in almost all EU Member States, and constitutes a considerable problem. This weight is therefore not used for presenting SIBIS results.
- **Weighting by employment:** The data available on the distribution of employment over establishment size bands is very limited for most EU Member States. SIBIS used data from a variety of sources, including BT database (United Kingdom), ISTAT Industry and Services Intermediate Census (Italy), National Statistical Service of Greece (Greece), SIREN (France), Tilstokeskus Official Statistics (Finland), Heins + Partner B-Pool (Germany) and Schober Business Pool (Spain) and adjusted using data from the DG Enterprise/ Eurostat SME Database (latest available, 1997), to estimate the establishment/ employment structure for each country in the sample.

Using this weight, the weighted sample for each country therefore reflects employee distribution between the five establishment size bands within that country. This means that a data reference of, for example, "20% of all establishments in country A" should be understood to mean "establishments accounting for 20% of all employees in country A".

- Weighting by employment for EU-7 averages: Additionally another weighting factor was created to calculate average figures for all countries in the sample (which together represent roughly 82% percentage of total EU employment). Each country is represented in this weight according to its share in the total employment of the 7 EU countries in which the survey was conducted.

*Sample characteristics DMS*

	Total	
	unweighted	weighted by employment
Total sample	3139	3139
Country		
Finland	306	306
France	501	501
Germany	512	512
Greece	301	301
Italy	512	512
Spain	507	507
UK	500	500
Number of staff at site		
up to 9	803	713
10 to 49	769	746
50 to 199	668	648
200 to 499	626	364
500 and more	273	668

	Total	
	unweighted	weighted by employment
Total sample	3139	3139
Industry Sector		
primary: manufacturing, energy, mining, construction	990	989
secondary: distribution, catering, communication and transport	873	878
third: financial and business services	502	501
fourth: public administration, health, education, other social/ personal	774	772
Establishments with Internet access		
having access to the Internet	2785	2785
no access to the Internet	354	354
Establishments with online presence (e.g. website)		
online presence	1857	1925
no online presence	1264	1190
don't know	18	24

## Notes

- 1 Statistical Indicators Benchmarking the Information Society
- 2 The reports are available at <http://www.sibis-eu.org>
- 3 Although the mobile phone market is very dynamic and France has seen strong growth in mobile ownership since the SIBIS survey levels are still low in comparison to other countries.
- 4 The indicator combines 8 items, 4 positive (online public services are faster than traditional methods, reduce the number of mistakes by public authorities, make it possible to deal with public authorities at more convenient times and at more convenient locations) and 4 negative (online public services are not useful enough, require you to install special equipment or software, do not seem as safe as traditional ways, are difficult to use)
- 5 A full understanding of the dynamics of change in digital divides in Europe requires consideration of the relative stages of evolution of the Information Society in the different Member States. Further discussion of these issues can be found in Selhofer, H. and Hüsing, T. (2002), "The Digital Divide Index - a measure of social inequalities in the adoption of ICT", Paper to IST 2002 Conference, Copenhagen, 4-6 November, 2002.
- 6 See e.g. Sicherl P. (2003), "Comparing in Two Dimensions: A Broader Concept and a Novel Statistical Measure of the Time Dimension of Disparities", European Societies (forthcoming).
- 7 Sicherl, P. (2003), "Different Statistical Measures Provide Different Perspectives on Digital Divide", eWISDOM 2/2003 (forthcoming).
- 8 On information sharing and early warning see DDSI, Information Sharing Roadmap and Final Report of a Workshop held in Brussels 17-18 January 2002 on "Warning and Information Sharing", also available at <http://ewis.jrc.it>
- 9 Comparable data from two surveys (ECATT 1999 and SIBIS 2002) were available for 10 EU Member States: Germany, Italy, Finland, Sweden, Spain, France, United Kingdom, the Netherlands, Ireland and Denmark. Mobile phone usage was not included in the ECATT 1999 questionnaire, so data from Eurobarometer 50.1 was used for this indicator.
- 10 eCommunication - penetration rates for e-mail and the Internet (use in the 4 weeks prior to the surveys), mobile phones (access for own personal use); eConsumption - using the Internet to find information about products and services (e-informed consumption), ordering through the Internet (eShopping) and carrying out financial transactions online (eBanking); eWork - home-based telework (at least 1 day per week), multi-locational telework, and telecooperation
- 11 See for example the studies done by Accenture (2001, 2002; see references), the web-based survey on electronic public services by Cap Gemini Ernst & Young, the Global (2001), eGovernment survey by World Markets Research Centre (Sept. 2001) and several national surveys (2000/2001)
- 12 Eurobarometer survey
- 13 For example, the eEurope 2005 Action Plan, states that "the more networks and computers become an essential part of business and daily life, the more security becomes a necessity. Because of the value of current and expected transactions carried out on-line, networks and information systems need to be secure. Security has therefore become a key enabler for e-business and a pre-requisite for privacy." For further reference, see also other official documents, such as Network and Information Security: Proposal for A European Approach, COM(2001) 298 of 6.6.2001, Creating a Safer Information Society by Improving the Security of Information Infrastructures and Combating Computer--related Crime, COM (2000) 890 of 22.1.2001, Directive 97/66/EC of the European Parliament and the Council on 15 December 1997 concerning the processing of personal data and the protection of privacy in the telecommunications sector, OJ L 24 of 30.1.1998, etc.
- 14 See for example GVU's Tenth WWW User Survey, October 1998, available at [http://www.cc.gatech.edu/gvu/user\\_surveys/](http://www.cc.gatech.edu/gvu/user_surveys/)
- 15 See for example DDSI – Dependability Policy for Europe: Summary of Findings, October 2002.
- 16 OECD (1994): The Measurement of Scientific and Technological Activities: Proposed Standard Practice for Surveys of Research and Experimental Development - Frascati Manual 1993. 5th Edition. Paris. - OECD (1997): Proposed Guidelines for Collecting and Interpreting Technological Innovation Data: Oslo Manual. 2nd Edition. Paris.
- 17 From the summary of a European Science Foundation conference, Foray, D. (1999): Building the Virtual 'House of Salomon': Digital collaboration technologies, the organisation of scientific work and the economics of knowledge access. Report of the ESF-IIASA-NSF Workshop - 3 to 5 December 1999 - at the International Institute for Applied System Analysis, Laxenburg, Austria, p. 9. (<http://www.esf.org/policy/pdf/iiasa.pdf>)

