

The European e-Business Report

2002/2003 edition

A portrait of
e-business in 15 sectors
of the EU economy

First Synthesis Report of the

**e-business
w@tch**



The European e-Business Market Watch



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**A portrait of e-business
in 15 sectors of the EU economy**

1st Synthesis Report of the *e-Business W@tch*

March 2003



**European Commission
Enterprise Directorate General**

THE EUROPEAN E-BUSINESS MARKET WATCH

The European Commission, Enterprise Directorate General, launched the e-Business Market Watch (the *e-Business W@tch*) to monitor the growing maturity of electronic business across different sectors of the economy in the European Union. Since January 2002 the *e-Business W@tch* has been covering seven manufacturing and eight financial and service sectors. Results are published in quarterly sector impact studies and newsletters, along with a set of statistics and other material on e-business. This report is a synopsis of the various publications that have been published during the first year of operation of the *e-Business W@tch*.

All publications of the *e-Business W@tch* – including this report – are available in electronic format on the Internet either via the Europa server (www.europa.eu.int/comm/enterprise/ict/policy/watch/index.htm) or directly at the *e-Business W@tch* website (www.ebusiness-watch.org). E-mail: info@ebusiness-watch.org.

The e-Business W@tch is being implemented on behalf of the European Commission, under a service contract running from December 2001 until June 2003, by empirica GmbH (Bonn) in co-operation with DIW Berlin – German Institute for Economic Research and Databank Consulting (Milan) with the support of Berlecon Research (Berlin).



empirica GmbH
Oxfordstr. 2, D-53111 Bonn
info@empirica.com



DIW Berlin
Königin-Luise-Str. 5, D-14195 Berlin
pkoefflinger@diw.de



Databank Consulting spa
Corso Italia 8, I-20122 Milan
dbcons@dbcons.it

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For further information, contact:

European Commission
Enterprise Directorate-General
e-Business, ICT Industries and Services
B-1049 Brussels

Fax: (32-2) 2967019
E-mail: entr-ict-e-commerce@cec.eu.int

Copies can be requested, free of charge, from the above address. The report is also available in electronic format and can be downloaded from the 'Publications' section of the *e-Business W@tch* website (www.ebusiness-watch.org).

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



The competitiveness of European enterprises strongly depends on the productive usage of information and communication technologies (ICT). There is now sufficient evidence that companies across the EU have significantly improved their basic ICT infrastructure and connectivity to the Internet. This improvement, however, is yet to materialise in substantial productivity gains.

In order to reap the real benefits of investing in ICT, companies need to take further steps beyond simply 'going digital'. They need to improve both employers' and employees' skills, as well as to integrate ICT into their business processes. The focus has now to be shifted from basic connectivity and electronic commerce transactions to conducting business electronically. This emphasis on the productive use ICT all along the value chain is reflected by the term 'e-business'.

Since its launch in January 2002, the *e-Business W@tch* has provided policy-makers and stakeholders in industry with statistical data and analysis to better identify the challenges to be addressed in support of e-business. By studying developments in fifteen sectors of the EU economy, the *e-Business W@tch* has contributed to better understanding the impact of e-business on enterprise competitiveness and productivity. As a result, we now have a better picture of the take-up of ICT and e-business in Europe.

So far, most benchmarking indicators are still referring to national comparisons. However, the remarkable differences observed sometimes at the national level, may have to be attributed to a large extent to the specificities of the particular economy and its structure. This is an important lesson to be learned from the experience of the *e-Business W@tch*. Another lesson is that the full implementation of e-business solutions is still in its infancy, in particular for most SMEs. Further efforts have to be undertaken, therefore, by both the ICT industry and policy makers, to get SMEs on board in order to improve the overall performance of Europe in the global competitiveness arena.

Erkki Liikanen

European Commissioner for Enterprise and Information Society

<http://europa.eu.int/liikanen>

Introduction

The e-Business W@tch – monitoring the impact of electronic business on the economy

European policy is in many areas increasingly focussed on promoting the business techniques and new ways of working which will provide the economic and social foundation of the information society in Europe. The eEurope 2005 Action Plan as endorsed by the Seville European Council in June 2002¹ includes Action 3.1.2. "A dynamic e-business environment" with the goal "to promote take-up of e-business with the aim of increasing the competitiveness of European enterprises and raising productivity and growth through investment in information and communication technologies, human resources (notably e-skills) and new business models".

To help policymakers define their programmes, and to monitor the effectiveness of these policies, some indication of progress and of areas requiring active support is essential. Despite the considerable amount of studies and market research on electronic business (and especially on electronic commerce), there used to be a lack of reliable empirical information about the extent, scope, nature of and factors affecting the speed of e-business development at the sector level in an internationally comparative framework.

For this reason, in January 2002 the European Commission, DG Enterprise, launched the e-Business Market W@tch Function with the objective of providing this information. In the meantime, the *e-Business W@tch* has presented a first set of e-Business Impact Studies for 15 sectors of the economy and carried out a representative survey of more than 9,200 enterprises from these sectors. The conceptual framework adopted follows a concept developed by the OECD in 1999 which has been widely used in e-business statistics since. It suggests a three-part-analyse of the uptake of ICT and their application for e-business: (a) infrastructure ("readiness"), (b) activities and (c) impacts.

This report presents a synopsis of the 15 Sector Impact Studies, summarising their main findings. It starts with a summary of main results in each of the three stages described by the OECD. The section with coloured pages in this part presents scoreboards of e-business indicators by business activity and size class. The charts make visible which areas of electronic business are particularly relevant (or less relevant) in specific sectors. Part B features short contributions from experts on specific aspects of e-business, such as the importance of standardization. Part C contains summaries of the 15 Sector Impact Studies (of about 10 pages each). Each summary begins with a sector profile, followed by a portrait of the general uptake of ICT and e-business by enterprises in the sector. There is an analysis of how these are used for e-commerce and e-business purposes and how sophisticated the integration of these processes has already become. It ends with a tentative assessment (based on the perception of companies interviewed) of the impact of e-business and conclusions to be drawn. An annex outlines the methodology that was used to collect the data on which most of this research is based.

The research presented in this report is intended to help to benchmark progress and to assess how electronic business development can be further enhanced at the European level or at Member State level with the objective of strengthening the competitiveness of European businesses. Special attention is paid to the SME dimension of e-business. More information about the *e-Business W@tch* is available at www.ebusiness-watch.org.

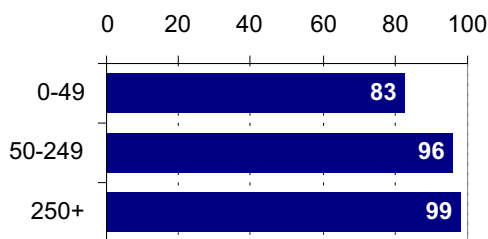
¹ COM(2002)263 final

Executive Summary

Basic access to ICT is no longer a barrier

Basic ICT infrastructure and access are no longer barriers to e-business uptake. Even among small enterprises (0-49 employees), 94% used computers and 84% had access to the Internet in mid 2002. The use of e-mail and of the WWW has become nearly ubiquitous in the world of business. However, there are still significant differences with respect to the quality of businesses' Internet access, especially with regard to bandwidth. In most of the sectors, many of the small enterprises still use an analogue dial-up modem to connect to the net. This indicates low levels of usage (e.g. e-mail) rather than active usage of networks for e-business.

Have Internet access
(% of enterprises, 7/2002)



Source: e-Business W@tch (Survey 2002)

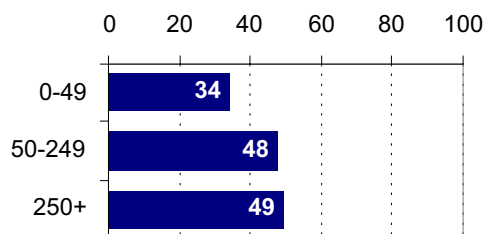
W@tchlist – this will be important:

- ▶ Diffusion of broadband connectivity, especially among SMEs
- ▶ Access of employees to ICT
- ▶ Remote access to companies' IT networks to facilitate flexible and mobile work in the EU
- ▶ Monitoring of the development of the IT skills gap

E-commerce activities: fast adoption of online purchasing

While sell-side e-commerce, and particularly B2C, has not yet reached the volumes anticipated during the boom-and-hype time of the Internet economy, online purchasing seems to spread fast. 34% of enterprises (accounting for 42% of employment) and nearly half of all large enterprises say they make online purchases of MRO goods or direct production goods. In ICT services, in the media & printing sectors and in business services the share of companies purchasing online is already above 45% (in ICT services even at 80%).

Make online purchases
(% of enterprises, 7/2002)



Source: e-Business W@tch (Survey 2002)

W@tchlist – this will be important:

- ▶ Channel strategies used for online selling and purchasing (e.g. website, extranets)
- ▶ Monitoring of further development of B2B marketplaces and SME participation
- ▶ Impact of e-procurement initiatives of large players on competition and supply chain
- ▶ Increasing importance of net-influenced sales on B2C e-commerce (instead of focus only on transactions)

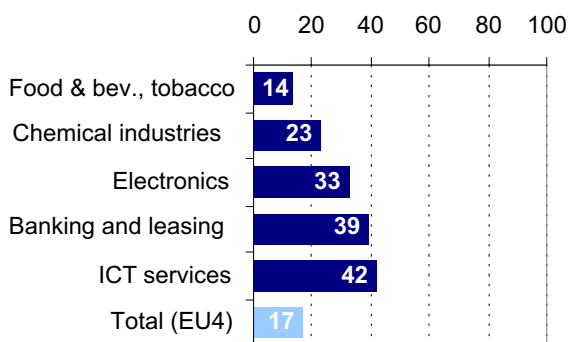
In this context, electronic B2B marketplaces on the Internet have been paid much attention. About 5-6% of European enterprises used e-marketplaces in 2002 and 3% planned to do so until mid 2003. At first sight this may seem a low level of usage. However, marketplaces are important as the intensity of trade (volume of transactions) is often higher than is the case with other online trading channels. Usage also depends on the sector. In the chemical industries, transport equipment manufacturing and in ICT services B2B marketplaces have clearly gained momentum.

In spite of the as yet rather low level of online sales (if measured as percentage of total sales), it is likely that we have only seen the beginnings, even in B2C. The Internet has become a powerful tool for consumers to compare offers in an efficient way. With the introduction of the Euro in most of the EU countries, and the increase and further improvement of public online marketplaces (including peer-to-peer marketplaces and auction platforms) and meta-services (e.g. price-finders), the transparency of prices across regions will further increase. And considering that today's youth – the first generation growing up with the Internet – is likely to develop a different shopping behaviour than their parents and grandparents, the potential for B2C electronic commerce is probably still huge.

E-business integration – the big issue for the years to come

Experts unanimously agree that the new challenge in the e-business (r)evolution many companies are facing today is to integrate the "e"-activities into their general business processes instead of conducting e-commerce as a separate business. This may require more advanced e-business solutions, but implementing them in the company is cost intensive and requires a high level of managerial skills. Today, sophisticated solutions for Customer Relationship Management (CRM) and Supply Chain Management (SCM) are used mainly by large enterprises and by specific sectors.

*Diffusion of CRM technology by sector
(enterprises comprising ...% of employment, 7/2002)*



Source: e-Business W@tch (Survey 2002)

W@tchlist – this will be important:

- ▶ Integration of e-commerce activities with back-end systems
- ▶ Development of new metrics for e-business sophistication and related policy targets
- ▶ "Digital gap" between SMEs and large enterprises with respect to higher level applications, impact on competition
- ▶ Further analysis of sector specific e-business application profiles, taking into account different requirements

On the other hand, online technologies are increasingly used for a number of processes which characterise working routines in companies and facilitate exchanging information with customers and suppliers. 45% of employees work in companies that use online technologies for collaborative work purposes, for instance to share documents. Enterprises accounting for 26% of employees use online technologies to track working hours and production time. And online e-learning applications are used by about 12% of enterprises, accounting for 19% of employment.

Most of these functions are more important for large enterprises than for medium-sized and particularly for small ones, and there are also considerable differences by sector. For instance, about 40% of employees in the ICT services, electronics and transport equipment manufacturing sectors work in enterprises that use online technologies to collaborate with business partners in designing products. However, the figure is only between 15-18% in other manufacturing sectors such as metal products and machinery and equipment.

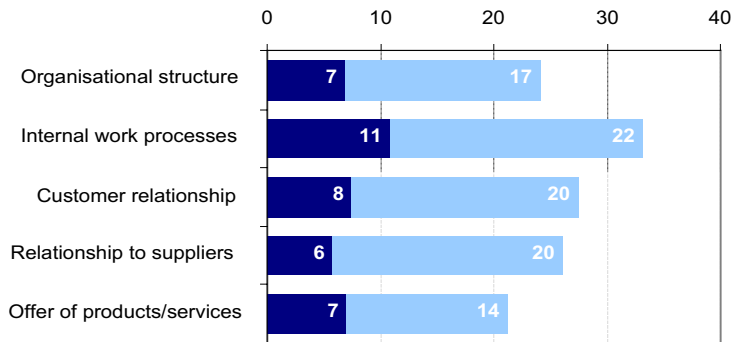
Sectors also differ in the degree to which they have integrated their online sales with the backend systems. In the financial services and some of the manufacturing sectors, a significant percentage of those companies selling online already report that integration is accomplished. Other sectors are less advanced in that respect, including retail and tourism where online selling is supposed to play a relatively important role.

Perceived impacts of electronic business activities

In 2002, more than 10% of European enterprises said that e-business constituted a "significant part" of the way they operated and nearly 50% felt that it constituted at least some part of their activities. The impact is most significant in those sectors which manufacture or operate IT and electronics themselves (ICT services, electronics industry) and in sectors with a high potential for digitisation of service delivery (publishing, business services). In tourism, the awareness of e-business impacts is also very high. On the other hand, there are late adopters where only about a third of firms reports that e-business is already important. The most "conservative" sectors in this respect are the food and beverages industry, retail and the manufacture of metal products.

The most significant impacts of e-business concern the internal work processes. More than a quarter of all enterprises say that these have significantly or somewhat changed through e-business practices. About 20% of enterprises report that the organisation structure and the relation to customers and suppliers has significantly or somewhat changed.

*Perceived impact of e-business activities on ...
(EU-4 enterprises comprising ...% of employment, 7/2002)*



... has changed significantly (dark bar) / somewhat (light bar)

Source: e-Business W@tch (Survey 2002)

W@tchlist – this will be important:

- ▶ Learning from others: Collection of e-business good practice examples for (i) specific sectors and (ii) considering specific requirements of SMEs
- ▶ Statistical effort to improve metrics for measuring impact, e.g. impact of e-business adoption vs. non-adoption on competitiveness
- ▶ Analysis of aggregate impacts (on value chain within sectors, on regional competitiveness)

Looking at the impact of e-commerce activities, close to 60% of those firms that use e-procurement report a "positive" or even "very positive" impact on procurement costs and on their internal business processes. Most of the others say there was "no impact", while only few observe a negative impact. Firms that sell online tend to observe positive effects on sales volumes, number of customers, efficiency of internal business processes and an expansion of the sales area. The quality of customer service is the area where most companies (28%) have achieved "very positive" effects through selling online. Reducing costs for logistics and inventory, on the other hand, is the impact area with the lowest degree of satisfaction.

Thus, the overall "business climate" for electronic business is fairly positive – though not enthusiastic. A majority of firms are fairly satisfied and some are very satisfied with the effect of their e-business solutions. However, there are the disappointed ones as well – and to a higher degree among the large enterprises (19%) than among the small and medium-sized ones (12% / 15% of enterprises).

Part A: Synopsis of Main Findings

1 The adoption of e-business by European enterprises

This chapter provides an overview of the state of adoption of electronic business by enterprises from 15 sectors of the EU economy. A more detailed background analysis for each sector is given in Part C of this report. The focus in this chapter is on the comparison of key figures. It becomes evident that the nature and role of electronic business differs by business activity in many ways. The application of ICT for business purposes depends, for instance, on whether companies are dealing with a large number of consumers or mainly with smaller number of other businesses, on the kinds of goods or services produced, and on the sector specific value chain. The presentation of statistics is structured into four sections. This approach has been developed from a widely used conceptual framework for the analysis of electronic business initially proposed by the OECD.² Issues dealt with can be mapped into this framework:

e-Readiness	e-Activity	e-Integration	e-Impacts
ICT infrastructure and skills development	E-commerce (frequency and intensity)	Business processes within and between enterprises	Effects of e-business activities on enterprises
<ul style="list-style-type: none"> Connectivity Bandwidth Remote / wireless access Demand for IT staff Skills development 	<ul style="list-style-type: none"> Online marketing and sales Online procurement B2B marketplaces 	<ul style="list-style-type: none"> Processes within the enterprise Processes of the extended enterprise Technologies for e-business integration 	<ul style="list-style-type: none"> Impacts of online procurement and selling Overall impacts Satisfaction Planned expenditures
<ul style="list-style-type: none"> 94% use computers 83% have access to the Internet, but 28% of those still use a dial-up modem to connect 71% use the WWW 29% have a company intranet about 12% of staff is mainly occupied with IT maintenance 13% searched for IT staff in past 12 months 83% of employees work in enterprises supporting IT training schemes 	<ul style="list-style-type: none"> 52% have a web presence 13% make online sales, 42% of those for more than 2 years already Company website is the main channel for online sales (85%) 70% report that online sales account for <10% of total sales 34% make online purchases 62% report that online purchases account for <10% of total procurement 5% trade on B2B e-marketplaces 	<ul style="list-style-type: none"> 10% use online technologies to track working hours and production time 12% use e-learning technologies 9% of businesses selling online say online sales are fully integrated with backend system 42% exchange documents electronically with suppliers 13% collaborate with business partners online in designing products 7% use a customer relationship management (CRM) software 	<ul style="list-style-type: none"> 12% say e-business constitutes "a significant part" of how they operate 27% of all businesses say that e-business has changed their internal work processes, 24% customer relationship 14% are "very satisfied" with their e-business activities, 74% "fairly satisfied" 32% planned to increase their e-business expenditures in 2002/03, 60% wanted to maintain level 45% think that large enterprises will mainly benefit from e-business, 35% say SMEs and large businesses will benefit equally

Source: e-Business W@tch

² cf. Colecchia, Alessandra / Pattinson, Bill / B. K. Atrostic (2000): Defining and Measuring Electronic Commerce. A discussion paper, OECD, Paris. February.

1.1 ICT infrastructure and skills development in EU enterprises

Connectivity

Basic ICT infrastructure and access are no longer barriers to e-business uptake. 97% of all employees worked in companies that used computers and 91% in companies with Internet access in 2002. Even among small enterprises (0-49 employees), 94% reported to use computers and 84% to be connected to the net. There are only a few sectors left where a significant percentage of enterprises still considers Internet access as irrelevant for their activities. These are in particular the food and beverages industry, where 17% of enterprises said that they are not online and do not plan to get online, retail (16%) and the health and social services sector (16%).

The high figures for basic PC and Internet diffusion, however, do not say anything about the quality of the equipment and the intensity of usage, for instance about the PC density within businesses which could not be investigated in the survey presented here.

As enterprises have connected to the Internet, the usage of e-mail and of the WWW have become nearly ubiquitous in the world of business, and a vast majority of enterprises – except the smallest ones – have implemented a local area network (LAN) to connect their computers. About 30% of all enterprises (accounting for 50% of employment) use an intranet.

Table 1-1: Usage of network applications and infrastructure

EU-4* by sector	e-mail	WWW	Intranet	Extranet	LAN	WAN
Food & beverages, tobacco	82	79	39	10	60	28
Media & printing	96	94	58	25	74	37
Chemical industries	95	94	63	23	83	48
Metal products	89	84	42	10	62	17
Machinery and equipment	93	89	60	15	75	29
Electronics	98	92	80	25	92	52
Transport equipment	98	98	74	16	90	49
Retail	76	73	42	13	54	29
Tourism	90	81	41	13	47	19
Banking and leasing	94	93	74	29	95	70
Insurance and pension funding	93	94	79	40	87	63
Real estate activities	91	85	34	11	53	17
Business services	93	92	51	24	68	32
ICT services	99	98	85	54	96	73
Health and social services	74	72	34	15	52	22
EU-4* total	87	84	51	20	67	34
EU-15	87	84	51	20	66	34
0-49 employees ^{a)}	79	71	29	9	43	9
50-249 employees ^{a)}	95	91	56	20	80	30
250+ employees ^{a)}	96	96	75	31	89	60

Figures weighted by employment (enterprises comprising ...% of employees), except ^{a)} (% of enterprises)
Base: all enterprises (N=9264 for EU-15; N=5917 for EU-4). *EU-4 includes D, F, I, UK. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Bandwidth

While basic connectivity indicators do not reveal much of a gap between sectors or regions anymore, there are still significant differences with respect to the quality of businesses' Internet access. 28% of

the small enterprises still connect to the Internet with an analogue dial-up modem. Large enterprises, on the other hand, are well equipped with fixed network connections. 26% of all enterprises connected to the Internet say they use xDSL connectivity. The method of connection is shifting toward options providing higher bandwidth, but the speed at which this transformation will evolve is unclear and is likely to remain an issue for e-business and infrastructure policies on European and regional level.

Table 1-2: Type of Internet access

EU-4* by sector	Analogue dial up modem	ISDN	DSL	Other fixed connection	Connectivity >2Mbit/s
Food & beverages, tobacco	27	51	22	14	14
Media & printing	19	35	26	31	28
Chemical industries	13	28	17	40	33
Metal products	23	43	20	14	10
Machinery and equipment	15	36	29	30	29
Electronics	6	24	24	50	41
Transport equipment	3	54	18	21	19
Retail	27	46	24	21	20
Tourism	26	37	28	13	17
Banking and leasing	11	21	20	57	34
Insurance and pension funding	10	33	24	47	34
Real estate activities	20	44	28	11	16
Business services	17	39	32	28	26
ICT services	9	23	25	60	55
Health and social services	26	47	23	13	13
EU-4* total	19	39	25	27	24
EU-15	19	39	26	26	25
0-49 employees ^{a)}	28	42	26	6	12
50-249 employees ^{a)}	15	42	28	24	24
250+ employees ^{a)}	12	31	27	47	38

Figures weighted by employment (enterprises comprising ...% of employees), except ^{a)} (% of enterprises). Base: enterprises with Internet access (N=8479 for EU-15; N=5417 for EU-4). *EU-4 includes D, F, I, UK. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

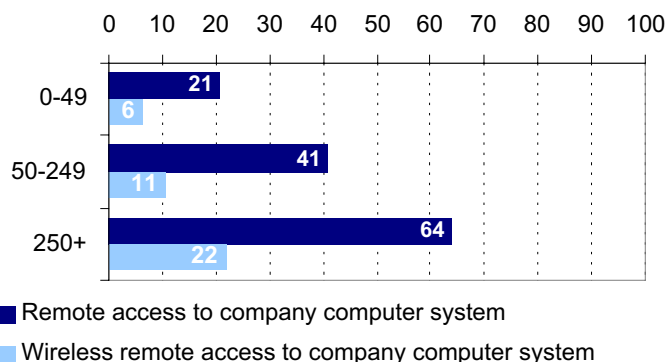
Remote and wireless access

Large enterprises are three times more likely to enable their employees to remotely access the computer systems than small enterprises. Nearly two thirds of the larger enterprises, but less than one third of SMEs enabled remote access in 2002. About 22% of large enterprises reported that they have implemented wireless access technology such as a W-LAN (Wireless Local Area Network).

Figure 1-1: Enterprises enabling remote access to their computer system (by size class)

Base: EU-15, enterprises using computers (N=8967). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)



The demand for IT specialists

The *e-Business W@tch* asked companies how many people (in equivalents of full time jobs) they employed for maintaining their IT systems and networks and computed the figure as "staff per 100 employees". Results show that large companies clearly benefit from economies of scale and that the relative demand for IT staff differs considerably between sectors. As this ratio does not include information about the qualifications of the staff counted it should be used as an indication rather than as an exact measurement, though.

Table 1-3: Average relative size of IT and web departments of European enterprises

EU-15 by size class	Average size of IT department (Headcount per 100 employees)	Average size of web department (Headcount per 100 employees)
0-49 employees	12.3	6.8
50-249 employees	4.3	1.1
250+ employees	2.8	0.3

Base: EU-15, enterprises using computers (N=9077) / enterprises having a website (N=5974). Interview question: "How many employees in your company are mainly occupied with the implementation and maintenance of IT and networks / with the maintenance of the company website? Please estimate the equivalence in terms of full-time jobs."

Source: *e-Business W@tch* (2003)

The *e-Business W@tch* also asked companies whether they were recruiting IT specialists within the past 12 months. Close to 50% of large companies said they did so (in 2001/02), while only 13% of SMEs had demand. Companies which had recruited (or tried to) were asked whether they experienced any difficulties in finding qualified staff. Comparing sectors, it seems that the ICT services and business services sectors are those which experienced the greatest difficulties. 21% and 11% respectively out of all enterprises reported difficulties in finding IT staff in 2001/02. The sector average is 6%.

Table 1-4: IT recruitment activities by sector

EU-4* by sector	Have recruited / tried to recruit IT specialists (past 12 months)	... of those have experienced great difficulties	... of those have experienced some difficulties	% of total with difficulties in finding IT specialists
Food & beverages, tobacco	4	16	43	2
Media & printing	14	21	27	6
Chemical industries	13	15	28	5
Metal products	9	27	15	4
Machinery and equipment	13	22	22	6
Electronics	16	19	31	8
Transport equipment	10	18	21	4
Retail	10	12	26	4
Tourism	16	17	30	8
Banking and leasing	17	14	22	6
Insurance and pension funding	15	10	13	3
Real estate activities	11	8	20	3
Business services	17	33	28	11
ICT services	40	27	24	21
Health and social services	9	20	20	4
EU-4* total	13	22	26	6
EU-15	13	22	26	6
0-49 employees	13	22	26	6
50-249 employees	28	14	33	13
250+ employees	47	13	36	23

Figures: % of enterprises. Base: all enterprises (N=9264 for EU-15; N=5917 for EU-4). EU-4 includes D, F, I, UK. Reporting period: June/July 2002.

Source: *e-Business W@tch* (2003)

During the boom phase of the new economy, the "skills gap" – defined as the shortage in the supply of IT professionals (in the widest sense) – became one of the key challenges for information society policy. EITO estimated back in 2000 that there was a gap of about 13% of potential jobs (i.e. about 1.8 million positions) unfilled and that ICT employment would grow by 7.4 million jobs in Western Europe between 2000 and 2003, leading to a total demand of about 22 million. The biggest contribution to this demand was expected to come from the emergence of e-business. After the burst of the Internet bubble and the resulting crisis of the whole ICT sector, the situation has changed in an unforeseen way. As enterprises from this sector are forced to downsize, IT skilled staff becomes available again. However, that does not mean that the demand for e-business skills has come to an end. Demand for people with a sound qualification in areas relevant for e-business is still considerable, as survey results and the vacancies posted in newspapers and magazines clearly demonstrate.

Developing and improving IT skills in the company

Hiring professionals, however, is only one aspect of developing IT skills in the company. Continuously improving the general IT skills of the existing staff is also important. In any of the 15 sectors surveyed, a great majority of enterprises say they support IT training schemes (83% of employees work in such enterprises). As a rule of thumb, sectors which are among the most active recruiters of IT staff are at the same time the most active supporters of IT training for their employees, e.g. the financial sectors, ICT services and transport equipment manufacturing. The financial and the ICT services sectors are also more likely than others to organise their own IT training schemes. About 80% of employees from these sectors work in companies which offer in-house IT training.

Table 1-5: Company support for IT training schemes

	Support any training scheme	Offer in-house IT training	Support participation in IT training offered by third parties	Let their employees use some working time for IT learning
EU-4* by sector				
Food & beverages, tobacco	79	42	58	59
Media & printing	85	48	59	71
Chemical industries	88	56	67	78
Metal products	77	46	54	59
Machinery and equipment	88	58	59	60
Electronics	86	63	65	74
Transport equipment	93	54	82	63
Retail	74	46	49	56
Tourism	74	37	47	62
Banking and leasing	97	80	78	82
Insurance and pension funding	99	86	87	89
Real estate activities	81	45	50	68
Business services	84	49	58	69
ICT services	97	82	73	86
Health and social services	82	40	54	65
EU-4* total	83	52	58	66
EU-15	83	51	58	66
0-49 employees	70	34	42	57
50-249 employees	88	53	64	70
250+ employees	95	70	75	74

Base: all enterprises (N=9264 for EU-15; N=5917 for EU-4). EU-4 includes D, F, I, UK. Figures weighted by employment ("...% of employees work in enterprises that support / offer ..."). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

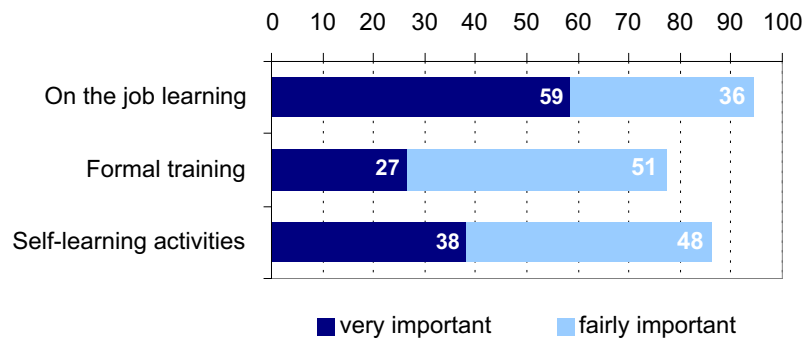
A majority of companies in all sectors (about 57%, accounting for 66% of employment) say they let their employees use some working time for IT learning activities. This figure, however, also includes informal "learning-by-doing" and not necessarily formalised and organised e-learning activities, as the much lower response rate for e-learning indicates (when asked explicitly whether the company used online technologies for e-learning). About 19% of employees work in companies that offer e-learning opportunities. Again, the financial and the ICT services sectors are the most active users. As can be expected, the usage of e-learning increases with the size of the company, reaching already 29% of employees in large companies.

Although being supportive in developing the IT skills of their employees, enterprises regard "learning on the job" clearly as the most important way to improve the IT skills base in the company. About 60% of enterprises say that learning on the job is very important. In comparison, only about half as many companies regard formal training schemes as very important for their IT skills development. The transport equipment manufacturing sector is outstanding in this respect. 43% of its employees work in companies which regard formal training as very important. In other sectors, e.g. in the real estate and business services sectors, the importance of formal training is considered much lower. Self-learning activities of employees are rated as very important by about 40% of enterprises (on average), with the ICT services sector standing out (51%).

Figure 1-2: How important are various methods for the acquisition of IT skills? Assessment by companies.

Base: EU-15, enterprises using computers, (N=8967). Percent of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)



1.2 E-commerce activities

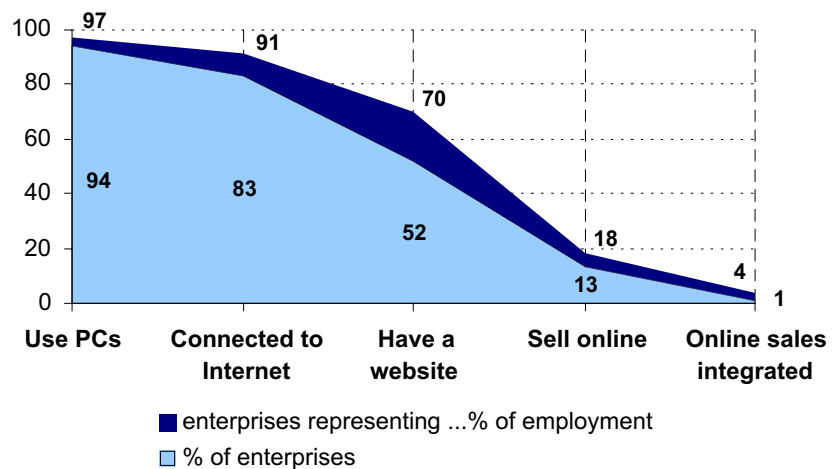
Marketing and sales

A number of policy reports about e-commerce in the EU and in the United States concluded that the take-up of sell-side e-commerce has disappointed initial expectations and faces particular difficulties.³ This assessment is mainly based on the perceived discrepancy between the fast uptake of information and communication technologies by enterprises in general and the comparatively moderate success in using these technologies for selling online. The *e-Business W@tch* found that 94% of enterprises used computers in mid 2002, 83% had access to the Internet, 52% their own website, 34% of enterprises had implemented e-purchasing processes but only 13% used e-commerce to make sales.⁴

Figure 1-3: From using PCs to back-end integration of e-commerce

Base: all enterprises, EU-15 (N=9264). Reporting period: June/July 2002.

Source: *e-Business W@tch* (Survey 2002)



The result of this gap is what appears to be a relatively low level of online transactions compared to the level of traditional forms of ordering and purchasing goods and services. In the United States, e-commerce as a share of total U.S. retail sales remained at approximately 1 percent in 2001⁵, and most figures for Europe point at a similar share. Even out of those enterprises selling online, 45% say the share of goods and services sold online is less than 5% of their total sales, and further 25% say it is between 5-10%. All in all, this is not even close to many of the figures that were published in the various auguries of the mid 1990s, when electronic commerce was expected to be boosted automatically by the advent and fast adoption of the Internet (both by consumers and businesses), and actually – at the same time – to be a major driver for consumers to get connected to the Internet. While the commercialisation of the Internet, if liked or disliked, has certainly come true in the way commonly anticipated, the mere volume of purchases made by the consumers on the net has not yet reached the level which businesses would like to see.

³ for instance: Communication by the European Commission on eEurope Benchmarking: "eCommerce faces particular difficulties. It is growing, but much slower than expected and seems to be mainly taken up by well-established companies. An urgent review is required to identify obstacles to eCommerce take-up." [COM (2002) 62 final]

⁴ includes micro-enterprises. Weighted by employment figures ("enterprises comprising ...% of employees") are higher, especially with respect to online selling (17%) and procurement (43%)

⁵ cf. "Digital Economy 2002", report by the US Department of Commerce, Economics and Statistics Administration: "To date, the Internet as a commercial medium has disappointed initial expectations. E-commerce as a share of total U.S. retail sales remains at approximately 1 percent. At the industry level, reliance on e-commerce has been widespread but uneven. In 1999, the Internet or more traditional EDI transactions accounted for 12 percent of manufacturing shipments and 5.4 percent of sales by wholesale merchants. By contrast, e-commerce accounts for less than 1 percent of shipments among retailers and selected service providers." (p. vi-vii). <http://www.esa.doc.gov/508/esa/pdf/DE2002r1.pdf>

Figure 1-4: Companies selling online (2002) and planning to sell online (by mid 2003)

Base: EU-4 (D, F, I, UK), N=5917. Figures weighted by employment ("enterprises comprising ...% of employment say that they sell online")

Source: e-Business W@tch (2003)

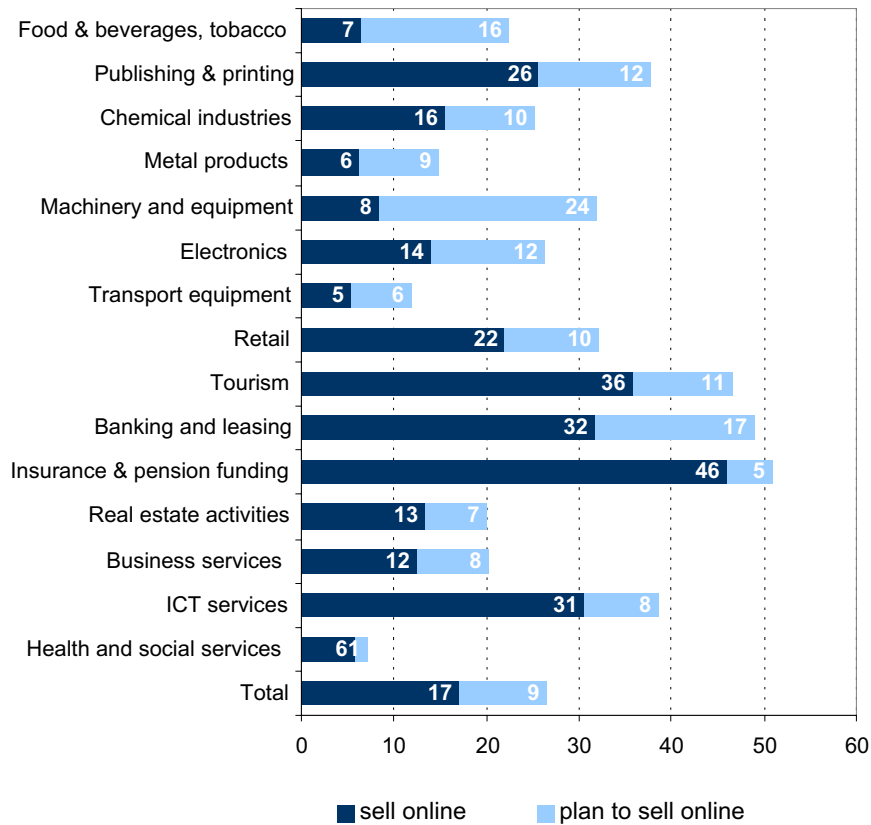


Table 1-6: E-commerce channels used for selling online

EU-4* by sector	Company website	Electronic market-place(s)	Extranet	EDI	Mobile e-commerce (e.g. WAP)
Food & beverages, tobacco	61	41	24	40	18
Media & printing	93	29	16	3	7
Chemical industries	67	60	0	0	1
Metal products	73	32	5	0	5
Machinery and equipment	88	52	23	17	1
Electronics	74	45	59	59	2
Transport equipment	23	72	30	63	32
Retail	87	37	2	18	2
Tourism	85	27	5	10	11
Banking and leasing	88	24	15	1	15
Insurance and pension funding	98	42	23	0	6
Real estate activities	78	27	10	6	3
Business services	96	22	11	17	1
ICT services	84	41	30	17	6
Health and social services	64	43	0	21	1
EU-4* total	83	35	12	15	6
EU-15	84	34	12	16	7
0-49 employees ^{a)}	85	36	5	6	8
50-249 employees ^{a)}	89	31	14	7	6
250+ employees ^{a)}	83	33	20	25	8

Figures weighted by employment (enterprises comprising ...% of employees), except ^{a)} (% of enterprises). Base: enterprises selling online (N=1346 for EU-15; N=805 for EU-4). *EU-4 includes D, F, I, UK. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

However, while particularly business-to-consumer (B2C) electronic commerce may not have developed as fast as expected, it is likely that we have only seen the beginnings. The Internet has become a powerful tool for consumers to compare offers in an efficient way. With the introduction of the Euro in most of the EU countries, and the increase and further improvement of public online marketplaces (including peer-to-peer market places and auction platforms) and meta-services such as price-finders, the transparency of prices across regions will further increase. Considering that today's youth – the first generation growing up with the Internet – is likely to develop a different shopping behaviour than their parents and grand-parents, the potential for B2C electronic commerce is still huge. Consumers will ultimately make use of their power to select the best and cheapest offer from different vendors.

While this can be an opportunity for businesses which sell to consumers, it is at the same time a huge challenge, since location is becoming a less important factor in retail (except for food and cheap everyday life commodities). Recent market research suggests that online shopping is in fact increasing fast, albeit at a still rather low level if measured as a share of the total sales volume. Forrester Research estimated in November 2002 that European online Christmas shopping 2002 would total 7.6 billion Euro, an increase of 86% over the year before.⁶ Net-influenced sales were estimated to rise to 20 billion Euro across all of Europe, and the percentage of European adults who buy online was believed to have risen from 14% in 2001 to 19% in 2002. A key to understanding the real impact of the net on consumer sales may in fact be to shift the focus from measuring mere transactions to the broader concept of "net-influenced" sales. This approach considers the important role of the Internet during the pre-purchase stages, for instance for browsing the offer and comparing prices.

Another indicator suggesting that sell-side e-commerce may gain momentum is the high percentage of enterprises that reported plans to take up e-commerce in the 2002 survey. Close to 10% of all enterprises said they were planning to start selling online by mid 2003.

Fast adoption of e-procurement

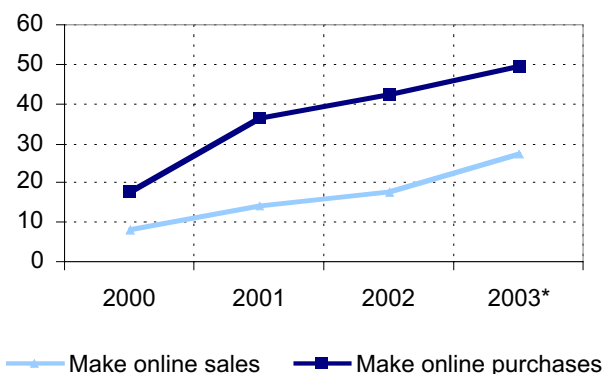
The real e-business (r)evolution, however, is probably taking place in the business-to-business (B2B) arena. In contrast to B2C e-commerce, e-procurement activities have already been widely adopted by enterprises in nearly all sectors of the economy. In total, 34% of enterprises (accounting for 42% of employment) and nearly half of all large enterprises said they made online purchases of MRO (maintenance, repair and operating) supplies and/or direct production goods in 2002. Medium-sized enterprises do not differ from large ones with respect to the diffusion of e-procurement, and even small enterprises are not trailing far behind.

Figure 1-5: Adoption process of online selling and purchasing in EU enterprises (%)

Data based on information from companies when they started to sell/purchase online, asked in 2002; *2003: estimate, based on plans reported.

Figures weighted by employment (enterprises comprising ...% of employees sell / purchase online). Base: all enterprises (N=9264). Reporting period: June/July 2002. Questions: "Does your company sell/purchase online?", If so: "Since when ...?" Mid of year.

Source: e-Business W@tch (2003)



The percentage of goods and services procured online (as % of total procurement), however, is still below 10% in most cases. 37% of those enterprises that make online purchases reported in 2002 that e-procurement accounted for about 1-5% of goods and services purchased, 25% said the share was between 6-10%. 9% reported a share of more than 50%.

⁶ Forrester Research, Press release from 13th November 2002 (<http://www.forrester.com/ER/Press/Release/0.1769.764.00.html>)

Figure 1-6: Companies purchasing online / planning to purchase online (by mid 2003)

Base: EU-4 (D, F, I, UK), N=5917.

Figures weighted by employment ("enterprises comprising ...% of employment say that they purchase online").

Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

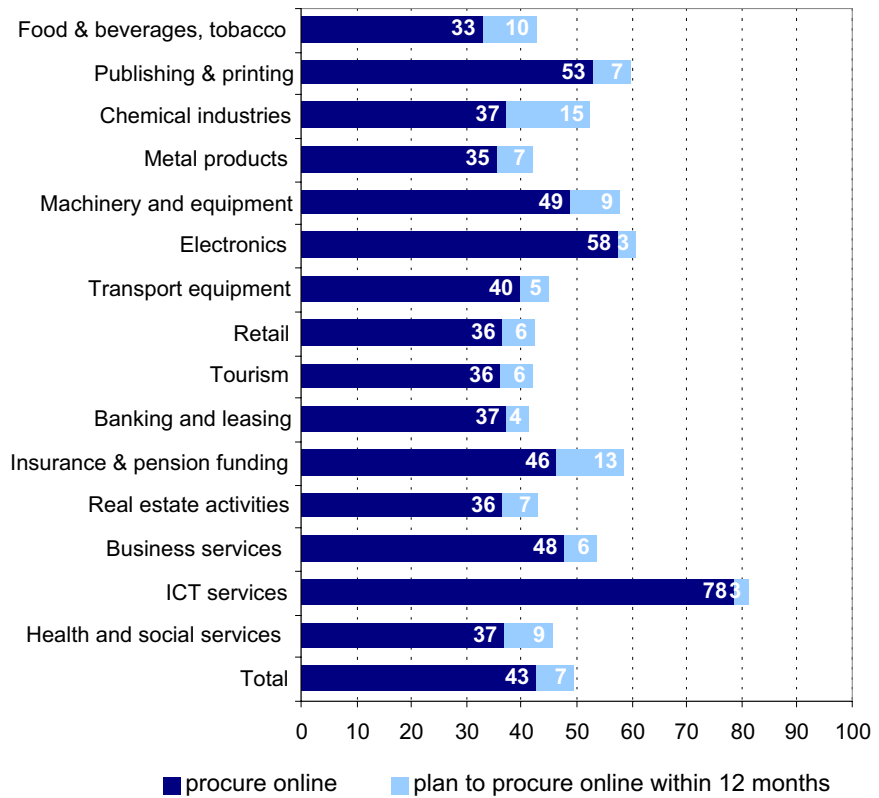


Figure 1-7: Share of e-procurement as % of total purchases

Base: EU-4 (D, F, I, UK), companies procuring online, excl. "no answer" / "don't know" (N=2251).

Figures weighted by employment ("enterprises comprising ...% of employment say that they procure ...")

Source: e-Business W@tch (2003)

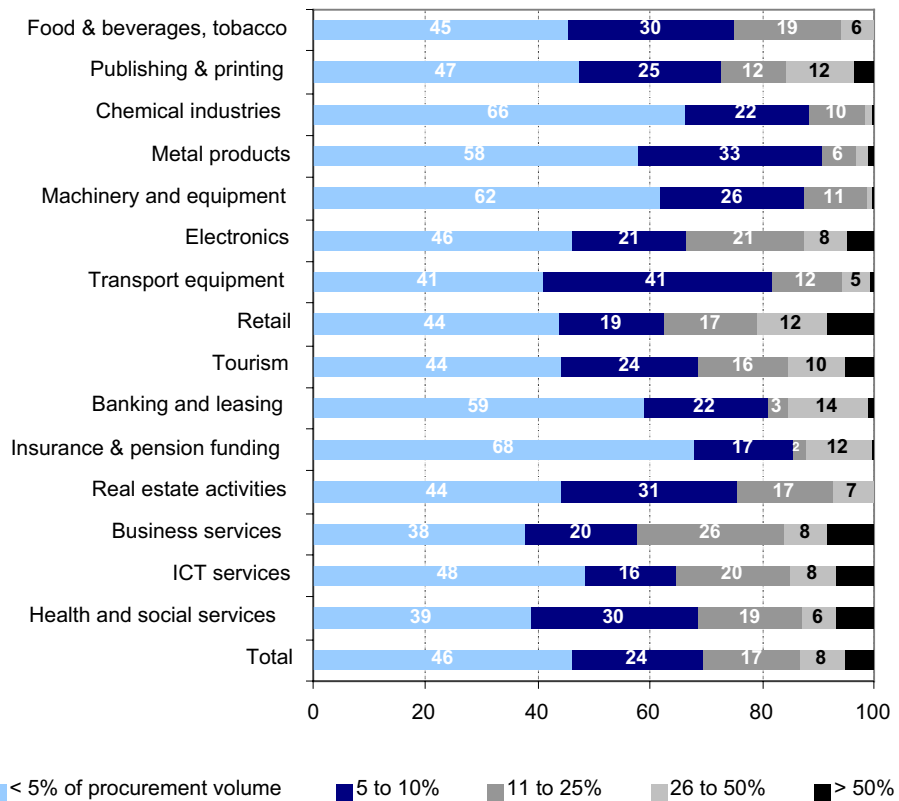


Table 1-7: Barriers to selling online (companies completely agreeing to statement)

EU-4* by sector	Customers hesitant to buy online	Products do not lend themselves to selling online	Technology is too expensive	Delivery process causes problems	Adapting corporate culture is difficult
Food & beverages, tobacco	25	58	18	18	26
Media & printing	29	52	23	11	22
Chemical industries	20	45	15	13	23
Metal products	29	57	25	13	30
Machinery and equipment	25	58	29	13	26
Electronics	22	45	18	8	26
Transport equipment	28	75	11	17	23
Retail	27	35	26	18	25
Tourism	28	39	26	10	21
Banking and leasing	26	36	24	19	30
Insurance and pension funding	33	37	16	11	18
Real estate activities	30	58	21	12	21
Business services	28	59	18	12	23
ICT services	27	47	13	14	14
Health and social services	29	60	22	11	25
EU-4* total	27	50	21	14	24
EU-15	28	49	21	14	24

Figures weighted by employment (enterprises comprising ...% of employees fully agreeing to statement).
Base: all enterprises (N=9264 for EU-15 N=5917 for EU-4). *EU-4 includes D, F, I, UK. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Table 1-8: Barriers to procuring online (companies completely agreeing to statement)

EU-4* by sector	Requires face-to-face interaction	Suppliers do not sell online	Concerns about data protection and security	Technology is expensive	Cost advantage is insignificant
Food & beverages, tobacco	46	42	25	22	22
Media & printing	36	30	30	20	21
Chemical industries	45	36	22	22	11
Metal products	45	44	25	29	22
Machinery and equipment	41	38	23	28	17
Electronics	34	33	31	21	19
Transport equipment	35	39	29	10	23
Retail	36	34	34	28	27
Tourism	30	32	29	27	20
Banking and leasing	41	29	30	23	14
Insurance and pension funding	33	26	28	8	19
Real estate activities	35	35	36	28	21
Business services	32	28	29	17	21
ICT services	29	19	25	20	13
Health and social services	35	26	37	26	23
EU-4* total	36	32	30	23	21
EU-15	36	32	30	23	20

Figures weighted by employment (enterprises comprising ...% of employees fully agreeing to statement).
Base: all enterprises (N=9264 for EU-15; N=5917 for EU-4). *EU-4 includes D, F, I, UK. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

The development of B2B e-marketplaces

Within the discussion of B2B e-commerce, a lot of attention has been paid to the emergence of electronic marketplaces. Unlike the classical e-commerce sites of individual companies (sell-side solutions), virtual marketplaces feature several suppliers and bring together several buyers. Furthermore, B2B marketplaces differ from Internet portals, simple information directories and industry networks in their transaction focus. Cost savings have been the major selling argument brought forward by marketplace operators and the main motivation for buyers to use marketplaces. In theory, cost savings should be the result of the following mechanisms:

- (1) Growing market transparency lowers the product costs for participants who have been paying more than the market price up to now.
- (2) In catalogue-based marketplaces the aggregated buyers have more market power than each individual buyer and can exert pressure on prices.
- (3) The electronic processing of purchases and sales saves transaction costs.

During the dot.com boom of 1999-2001 the number of B2B marketplaces increased considerably all over the world. A survey by Berlecon Research counted 332 marketplaces worldwide in late 1999; this number tripled to 1090 in mid-2000 and – despite the bursting dot.com bubble – increased further in 2001. Since then, however, the number has been decreasing again.

Table 1-9: Estimated numbers of active B2B marketplaces by region of activity

Active in ...	Estimate by Berlecon Research	... by eMarketServices
World	1,028	1,189
North America	636	469
Europe	380	528

Sources: B2B marketplace databases from Berlecon Research (www.berlecon.de) and eMarketServices (www.emarketsservices.com), Jan. 2003. The regional information denotes activity within the respective region, not necessarily the headquarters.

The *e-Business W@tch* asked enterprises whether they trade on e-marketplaces and – if so – what type of transactions they accomplish there. About 5-6% of the EU enterprises (comprising 6.5% of all employees) in the 15 sectors covered used e-marketplaces in 2002 and 3.3% said they planned to do so by mid 2003. The figure appears to be rather low at first glance, considering the intensity of the related policy debates. However, there is a considerable difference between industry sectors, and in some of them diffusion has reached an important economic level, as notably the large enterprises (accounting for a vast majority of employees) trade on marketplaces. In the ICT services sector nearly 12% of all companies trade on marketplaces. In the chemical industries (NACE 24, 25) and transport equipment manufacturing sector (NACE 34, 35) the percentage of companies is lower, but accounts for about 15% of employment. In the machinery and equipment manufacturing sector (NACE 29), marketplaces seem to gain importance (3% of enterprises accounting for 11% of employment). Plans to use marketplaces reported by enterprises indicate a higher interest in sectors which are not yet as intensive users as the leading sectors.

Large enterprises are more likely to use marketplaces than SMEs. While about 10% of the large enterprises say they use e-marketplaces for selling or purchasing products and services in 2002, only about 5% of the SMEs do so. The percentage of enterprises which plan to start using marketplaces is higher among large enterprises as well.

There is hardly a difference between SMEs and large enterprises, however, in terms of which activities are carried out on e-marketplaces. "Simple" catalogue-based offering and purchasing are clearly the most important types of transaction. Participation in auctions is less important, and also launching or answering calls for tender trail behind. The fact that none of these activities has a participation rate of more than 50% indicates that enterprises tend to assume a very specific behaviour and role in their approach toward e-marketplaces. In particular, answers suggest that most enterprises use a marketplace either as a vendor or buyer, but not in both roles.

Table 1-10: Participation in B2B e-marketplaces by sector (2002)

EU-4 by sector	Trading on e-marketplaces (mid 2002)		Planning to trade on e-marketplaces (by mid 2003)	
	% of enterprises	comprising ...% of employment	% of enterprises	comprising ...% of employment
Food & beverages, tobacco	0.7	3.8	2.7	3.8
Media & printing	4.7	6.9	3.9	6.6
Chemical industries	4.3	17.2	2.7	2.1
Metal products	0.8	4.9	2.4	3.1
Machinery and equipment	3.0	11.4	2.7	1.4
Electronics	4.6	7.6	3.8	8.7
Transport equipment	4.1	14.1	3.2	4.9
Retail	6.6	5.7	2.0	7.2
Tourism	8.6	8.5	5.0	3.9
Banking and leasing	3.7	2.0	1.6	5.0
Insurance and pension funding	4.2	6.1	5.0	3.7
Real estate activities	2.5	3.1	1.3	1.7
Business services	5.0	4.5	5.1	4.1
ICT services	11.9	8.6	9.0	5.1
Health and social services	3.8	3.4	2.3	3.5
EU-4* total	5.3	6.5	3.4	4.6
EU-15	5.4	6.6	3.3	4.8
0-49 employees	5.4	5.3	3.3	3.4
50-249 employees	5.4	5.2	4.2	3.8
250+ employees	10.0	8.6	5.2	6.6

Base: all enterprises (N=9264 for EU-15; N=5917 for EU-4). *EU-4 include D, F, I and UK. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Table 1-11: Activities on B2B e-marketplaces (2002)

Activity on e-marketplaces (EU-15)	Participation rate (% of enterprises)
Catalogue-based offering	45
Catalogue-based purchasing	36
Auctions: selling	16
Auctions: bidding	18
Launching calls for tender	14
Answering calls for tender	21

Base: EU-15, enterprises trading on e-marketplaces (N = 497)

Source: e-Business W@tch (2003)

1.3 Integration and sophistication of e-business processes

ICT and e-business experts point out that the next stage and challenge in the e-business (r)evolution which many companies will have to manage is about integrating the "e" into their general business processes, instead of conducting e-commerce as a separate business, as it is still the reality in many companies. External relations between the company, its customers (be it other businesses or consumers), suppliers and co-operating partners as well as internal processes (within the enterprise) will be closely tied to each other with the support of information technology and communication networks. Supply chain management, marketing and sales, logistics and delivery, after sales services, as well as other more horizontal business functions (e.g. knowledge management, finance) will all be integrated as parts of an overall (electronic) business strategy.

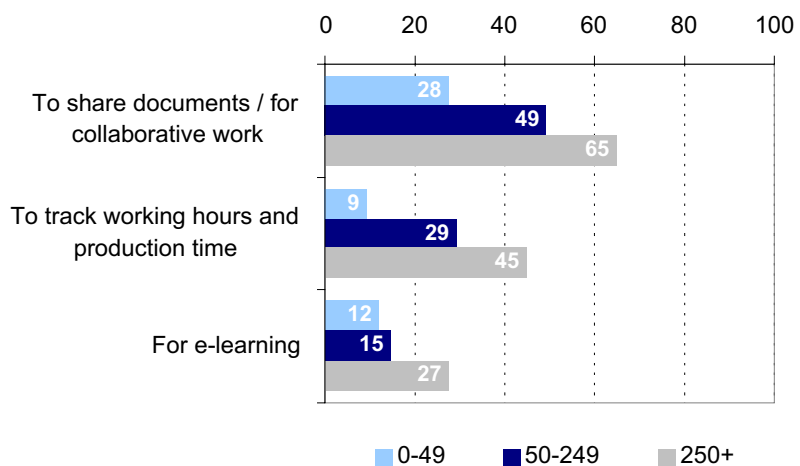
Processes within the enterprise

A first step in this direction is to enable rather simple functions internally. Sharing documents to perform collaborative work, for instance, has become quite common among enterprises except for the smallest ones. 46% of employees work in companies where document sharing is possible. The diffusion of IT solutions for other, more specific applications is less advanced, as the following examples show: Companies accounting for 23% of employment use online technologies to support the human resources management, 12% to automate the travel reimbursement of employees and 19% for e-learning. As the efficiency gains from IT supported internal business processes tend to increase with the company size, large enterprises are more likely to make use of them.

Figure 1-8: Enterprises (by size-class) using online technologies for internal business processes

Base: EU-15, all enterprises (N=9264). In % of enterprises.

Source: e-Business W@tch (2003)



Processes of the extended enterprise

The main idea behind the concept of an "extended enterprise" is that a company is constituted not only by its management, employees and means of production, but also by a functioning network of business partners, including suppliers and customers. The coordination and management of this network often include third-party relationships maintained on behalf of the client. For companies from the advertising industry, for example, the management of third party relationships is a core business. They do not only design advertising campaigns for their customers, but also manage the various relationships with suppliers, freelancers and contractors within the advertising value chain.

ICTs and e-business applications play a major role in the management of complex third party relationships. In the 1990s, e-mail caused a revolution in the speed of communication (multiplying the "communication turnover"). Building on this, new applications have been developed to facilitate the co-

operation among businesses and the co-ordination of projects involving different partners. Close to 50% of employees work in companies that exchange documents electronically with suppliers and customers. In 2002, 13% of enterprises (accounting for 20% of employment) used online tools for collaboration in designing products, and 10% to forecast product demand, which is most important for industries keeping a stock of produced goods.

Table 1-12: Usage of online technologies for various business processes

EU-4* by sector	Online collaboration with business partners		Online management of capacity / inventory	Electronic exchange of documents	
	for designing products	to forecast product demands		with suppliers	with customers
Food & beverages, tobacco	10	11	10	41	38
Media & printing	32	15	20	61	60
Chemical industries	24	18	21	46	52
Metal products	16	10	11	47	47
Machinery and equipment	18	9	11	48	55
Electronics	39	24	22	53	59
Transport equipment	42	11	26	60	59
Retail	15	24	21	53	34
Tourism	16	10	12	40	33
Banking and leasing	21	19	17	42	48
Insurance and pension funding	19	25	15	54	39
Real estate activities	9	11	7	37	38
Business services	19	12	13	46	56
ICT services	46	21	26	58	60
Health and social services	10	8	14	33	27
EU-4* total	20	15	16	47	45
EU-15	20	15	17	47	46

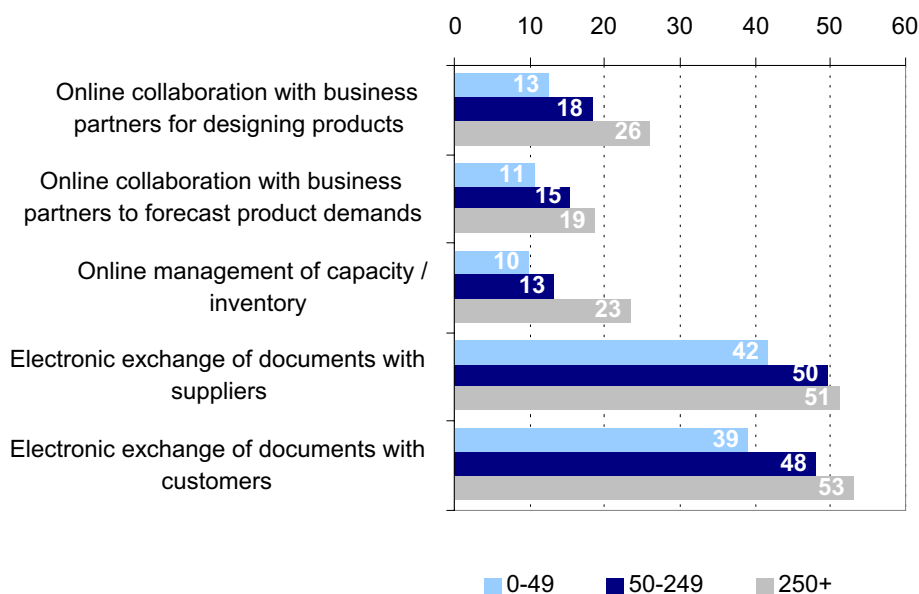
Figures weighted by employment (enterprises comprising ...% of employees).
Base: all enterprises (N=9264 for EU-15; N=5917 for EU-4). *EU-4 includes D, F, I, UK. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Figure 1-9:
Processes of the extended enterprise (by size-class)

Base: EU-15, all enterprises (N=9264).
In % of enterprises.

Source: e-Business W@tch (2003)



Integrating e-commerce

Quite a number of enterprises have started to sell online on their website, but consider this as a parallel activity to their "normal" business. The costs for implementing a rather isolated solution such as a website with some ordering forms are inexpensive, but it is questionable if this is a successful strategy in the long run. A more advanced solution that integrates e-commerce activities with processes of the value chain is much more complex and cost intensive. It may not yet dawn on many businesses that this will be a requirement at some point in their not too distant future. And it may be a hard lesson to learn that after having been told to "go digital" for years, and after finally having taken the first steps, there are many more steps to go. In 2002, the majority of enterprises selling online said that they were informed about incoming orders by an automatically generated e-mail (> 50%).

Table 1-13: Method of processing online orders

EU-4* by sector	Online orders are fully integrated with the back-end system	Incoming online orders generate an automatic e-mail	Company receives a fax informing about online orders	Information about online orders in other form(s)	Online orders trigger business processes
Food & beverages, tobacco	16	63	20	2	38
Media & printing	31	56	7	3	48
Chemical industries	--	57	2	2	43
Metal products	--	57	16	--	25
Machinery and equipment	25	56	3	10	34
Electronics	54	36	6	2	58
Transport equipment	33	17	34	1	78
Retail	16	72	3	8	30
Tourism	18	67	7	3	32
Banking and leasing	56	19	1	8	79
Insurance and pension funding	43	37	6	6	43
Real estate activities	6	66	7	11	22
Business services	6	55	8	10	40
ICT services	66	14	1	8	55
Health and social services	22	40	15	22	36
EU-4* total	26	52	6	7	42
EU-15	26	51	7	7	43

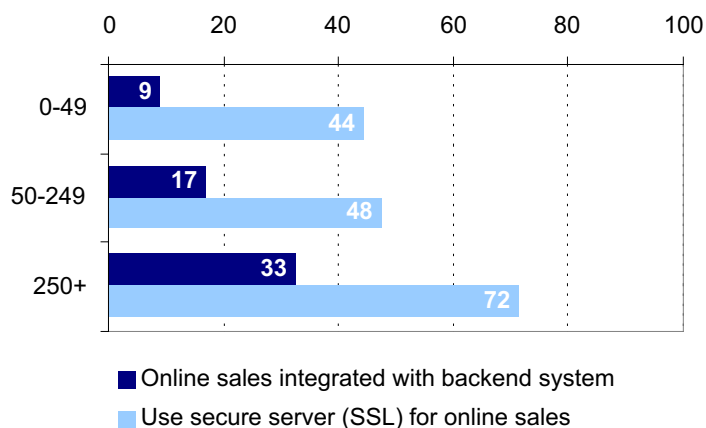
Figures weighted by employment (enterprises comprising ...% of employees). Base: enterprises selling online (N=1346 for EU-15; N=805 for EU-4). *EU-4 includes D, F, I, UK. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Figure 1-10: Sophistication of online selling by size-class: integration with backend system, usage of secure servers

Base: EU-15, enterprises selling online (N=1346). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)



In a way, tackling this task can be regarded as a revival of the old issue of business process re-engineering and will be a key challenge especially for SMEs for the years to come, as otherwise the digital divide between large enterprises and SMEs may increase to the disadvantage of the latter. A critical success factor in this context is to what extent it will be possible to agree on technical standards and to whether adequate e-business technologies which are affordable to SMEs will be available. The IT and software industries have developed special software solutions to help enterprises integrating business processes.

CRM and SCM – hyped acronyms or the next big thing?

Electronic business is ascribed the potential to significantly improve customer relationship. But, as with other functions, exploiting this potential is still in a very early stage, and there is a lot of uncertainty how electronic **Customer Relationship Management** (CRM) will really work at the end of the day, what it will achieve and how it should be implemented in business processes. CRM solutions have become a hot topic and senior management issue because they consume considerable amounts of money and – not to neglect the success stories – have in many cases proved a disappointment. Expenses do not only include the purchase of the software. Costs for the consequent implementation process, training and integration outlays can be three to five times higher.⁷ Accenture has identified two principal reasons why CRM may fall short of expectations: (i) the disconnect between customer relationship management vision and execution, and (ii) the rising standard for customer relationship management excellence.⁸

In theory, online interaction with customers can collect and furnish a wealth of data on customers' behaviour and needs. CRM solutions promise the ability to synthesize these data and to provide a universal view of the customer. But how exactly to use these data in order to provide a value added service to customers (and without getting into conflict with data protection) is to a large extent still unknown terrain or part of experiments. Forerunners in B2C e-commerce, particularly in retail sectors trading books, CDs and IT products (amazon.com may serve as an example) demonstrate already today the potential of CRM in the digital economy. But CRM solutions needs to contribute to profitability and must not become an end in itself. Quite a lot of Internet companies which burst during the dot.com crash had implemented cutting-edge CRM solutions – maybe too advanced compared to the amount of business they generated. Still, ICT service providers regard electronic CRM solutions as a most promising business area in the future.

CRM can also be used to collect information how to customise products already during the production process. However, it should not be overlooked that customising an offer creates additional costs in the first place, and the benefits (better service to customers, eventually increased sales) must justify this additional cost.

Supply Chain Management (SCM) solutions shall help businesses to reduce costs, increase revenue, and improve service to their customers by matching supply and demand through integrated and collaborative planning tools. Cost reductions are to be achieved for instance by integration with public and private e-marketplaces and thus to facilitate retrieval and comparison of suppliers. SCM also promises to reduce inventories and to increase productivity by maximizing the efficiency of order processes and other administration functions. Solutions may also support collaboration with business partners. However, in order to reap these benefits, companies must make considerable investments first. McKinsey estimates that vendors (including supply chain specialists such as Ariba and i2 Technologies, and software developers such as SAP and Oracle) sold more than 15 billion EUR in SCM software licences from 1999 to 2002 and that this was only the first step in a process.⁹

⁷ Ebner, Manuel et al. (2002): "How to rescue CRM", in: The McKinsey Quarterly, 2002 special edition: "Technology after the bubble", 49-57

⁸ Freeland, John (2003): "Customer Relationship Management: Is It Worth It?". accenture, Outlook Point of View, January 2003. http://www.accenture.com/xdoc/en/ideas/outlook/pov/pov_worth_it_a4.pdf (accessed in March 2003)

⁹ Kanakamedala, Kishore et al. (2003): "Getting supply chain software right", in: The McKinsey Quarterly, 2003, No.1, 78-85

As with CRM, results of implementing an SCM software have been mixed. While many companies were able to exploit the potential of this technology to improve their supply chain processes, others are reported to be disappointed about the outcome, considering the huge investments and organisational implications. Again, technology must have a measurable impact and not become an end in itself.

Enterprise Resource Planning (ERP) systems allow to cover all major business activities within a company, including product planning, parts purchasing, inventory management, order tracking, human resources, projects management, and finance. ERP evolved from material requirement planning (MRP) around 1990. Ideally, ERP allows businesses to co-ordinate global demand, supply and production. Selecting the right ERP software and implementing the system is a highly complex process, inevitably involving important decisions about business processes and strategies. ERP systems are predominantly used by manufacturing companies. The way these systems operate and interoperate has been changed by the rise of the Internet. Current ERP systems have to support Internet connectivity.¹⁰

Sophisticated CRM, SCM and ERP solutions are not widely diffused yet. However, the implementation has gained momentum among large enterprises. The critical divide is currently between medium-sized and large enterprises. 31% of all large enterprises used a CRM solution and 13% had implemented a software solution for supply chain management in mid 2002. There are considerable differences between sectors, as the sophistication of customer relationship management, for instance, is more relevant for sectors where companies typically deal with a large number of customers (e.g. in telecommunications or in the financial services).

Table 1-14: E-business sophistication: diffusion of special e-business solutions

	CRM solution		SCM solution		ERP system	
	Use	Plan to use (12 months)	Use	Plan to use (12 months)	Use	Plan to use (12 months)
EU-4* by sector						
Food & beverages, tobacco	14	3	4	6	19	5
Media & printing	15	6	6	4	18	3
Chemical industries	23	15	13	6	50	4
Metal products	6	6	5	3	25	5
Machinery and equipment	18	6	8	2	37	4
Electronics	33	9	19	11	61	3
Transport equipment	18	1	17	6	53	1
Retail	16	9	9	2	14	2
Tourism	13	2	4	0.8	7	2
Banking and leasing	39	12	2	<1	12	<1
Insurance and pension funding	30	12	6	6	12	8
Real estate activities	6	3	3	1	5	2
Business services	17	5	4	2	13	3
ICT services	42	6	9	3	41	5
Health and social services	4	1	2	2	5	1
EU-4* total	17	6	7	3	20	3
EU-15	17	6	7	3	20	3

Figures weighted by employment (enterprises comprising ...% of employees).
Base: all enterprises (N=9264 for EU-15; N=5917 for EU-4). *EU-4 includes D, F, I, UK. Reporting period: June/July 2002.

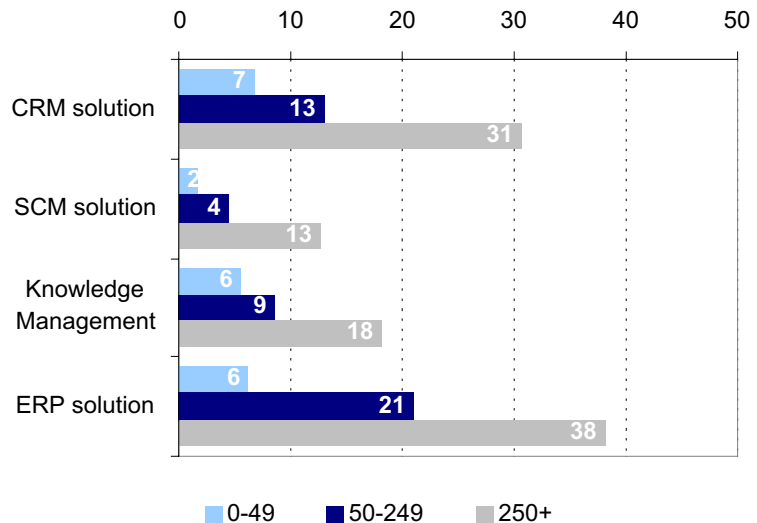
Source: e-Business W@tch (2003)

¹⁰ cf. Amor, Daniel (2002): The e-business (r)evolution. living and working in an interconnected world. 2nd edition. New Jersey: Prentice Hall. 123 ff.

Figure 1-11: Diffusion of sophisticated e-business solutions by company size-class (% of enterprises)

CRM = Customer Relationship Management
 SCM = Supply Chain Management
 ERP = Enterprise Resource Planning
 Base: EU-15, all enterprises (N=9264).

Source: e-Business W@tch (2003)



e-Readiness > e-Activity > e-Integration > e-Impacts

1.4 Perceived impacts of e-business

Impact of e-procurement

Survey results show that currently e-purchasing is the most widely adopted e-business activity, having gained acceptance from both large and small enterprises. Potential impacts include saving on procurement costs, better relations with suppliers, improving of internal business processes and variations in the number of active suppliers. The main impact of e-procurement – according to the perception of enterprises that make online purchases – is on the efficiency of internal business processes. About 60% of enterprises, and in some sectors even 75%, report (fairly or very) positive effects, less than 5% observe negative effects. Large enterprises are slightly more satisfied (70% "fairly/very positive"), but medium-sized (60%) and even small enterprises (55%) are not too different in their perception of impacts.

A main driver to implement e-procurement mechanisms is to reduce costs. This can be achieved in two ways: by reducing costs of the goods / services purchased and by reducing (internal) processing costs for procurement processes. 58% of those companies which use e-procurement have experienced a positive impact on their procurement costs, albeit only 13% a "very positive" one. While there are only marginal differences between sectors in that respect, large enterprises currently seem to benefit slightly more from e-procurement than SMEs.

There is some controversy as to whether e-procurement will lead to concentration, as several international players have announced strategies to drastically decrease the number of their suppliers by using marketplaces for e-procurement. Survey results do not immediately support this evidence. 25% of companies that procure online say that e-procurement activities have rather caused the number of their suppliers to increase, while only 5% say the number has decreased. However, among large enterprises, the share of the latter rises to 16%. The picture differs also between sectors. In ICT services, for instance, more people work in companies reporting that the number of their suppliers has decreased because of e-procurement than in enterprises which have broadened their supplier base.

Figure 1-12: Perceived impact of e-procurement on various business areas

Base: EU-15, enterprises making online purchases, excl. "Don't know" / "No answer" (N~3500 per item asked).

In % of enterprises saying that the impact has been ...

Source: e-Business W@tch (2003)

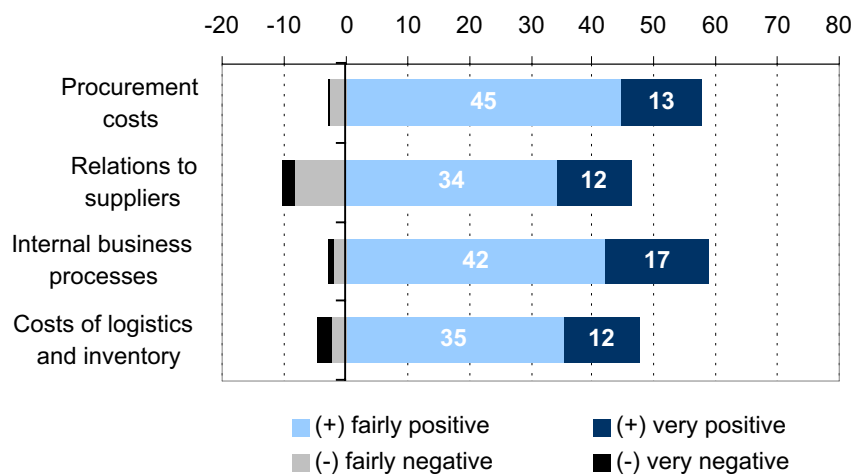
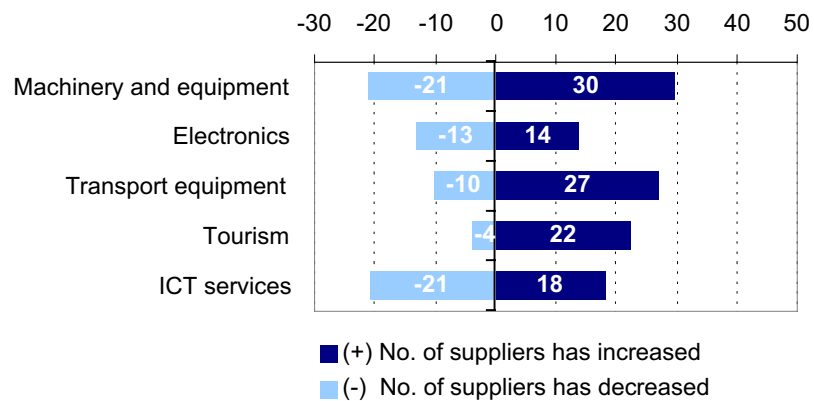


Figure 1-13: Impact of e-procurement on the number of suppliers in various sectors

Base: EU-4, enterprises making online purchases.

Weighted by employment (enterprises comprising ...% of employment say that the number of suppliers has increased/decreased as a consequence of e-procurement).

Source: e-Business W@tch (2003)



Impact of selling online

Many firms report that their goods and services simply do not lend themselves to selling online. In addition, low expectations about online sales volumes are named as a major barrier to implementation of online sales. Companies are also reluctant to implement online sales solutions because they fear increased price pressure and implementation costs. The market transparency that helps them to save costs as a buyer puts pressure on their own margins as a seller. On the other hand, those firms that already sell online reported positive effects on sales volumes, number of customers, efficiency of internal business processes and an expansion of the sales area. The quality of customer service is the area where most companies (28%) assume to have achieved "very positive" effects through selling online. Reducing costs for logistics and inventory, on the other hand, is the impact area with the lowest degree of satisfaction. This indicates that selling online is – at this point of time – more important with respect to customer service than as a means of reducing costs.

With respect to the perceived impacts of selling online, differences between sectors are less pronounced than in other areas of e-business. However, there are some remarkable results when looking at negative impacts. The share of disappointed companies is highest in the transport equipment manufacturing sector.

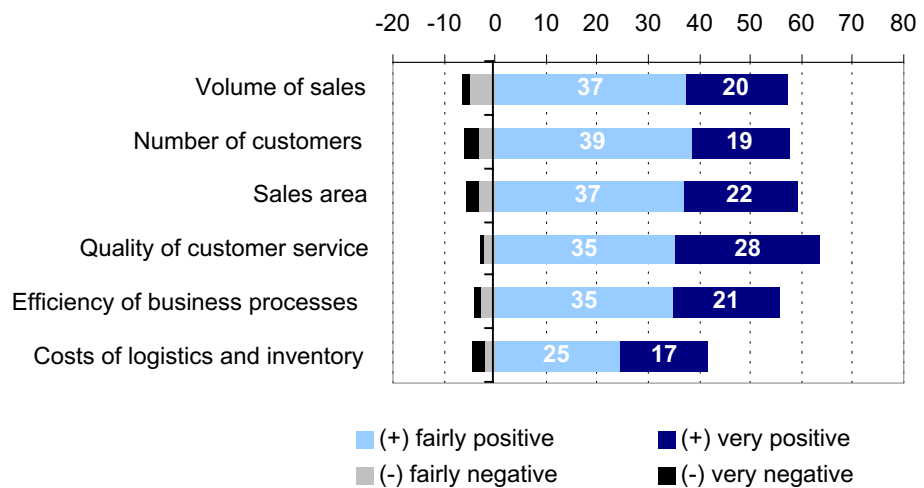
- More than 20% of online sellers in transport equipment manufacturing, machinery and equipment and in the chemical industries report a negative impact on the number of customers. This assessment is probably to be understood as a critical perspective on the impact of e-commerce on these sectors as a whole.

- 25% of online sellers in transport equipment manufacturing and 24% of banking / leasing enterprises selling online observe negative impacts on the costs of logistics and inventory. In the case of banks, this finding reflects that online banking seems to be well accepted by customers, but not necessarily a profitable operation for banks so far (cf. contribution by Prof. Umberto Filotto in this report).
- 20% of transport equipment manufacturers selling online and 17% in the chemical industries see a negative impact on the quality of customer service.

Figure 1-14:
Perceived impacts of selling online on various business areas

Base: EU-15, enterprises selling online, (N~1200 per item asked). In % of enterprises.

Source: e-Business W@tch (2003)



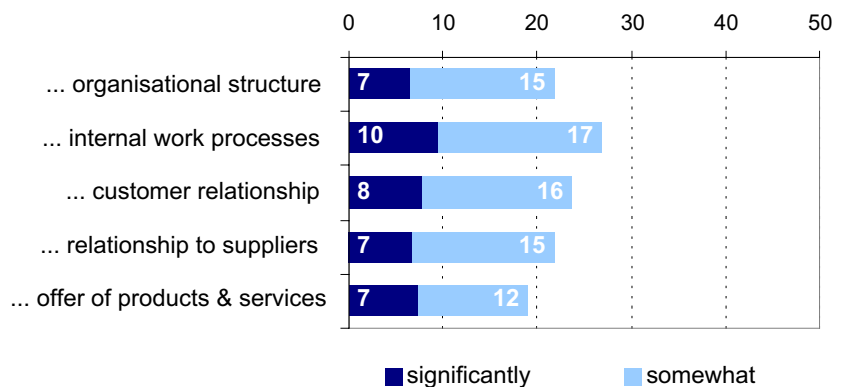
The overall significance of e-business today

All in all, more than half of all enterprises said in 2002 that e-business had already at least some significance for the way they operate. About 12% said it constituted a significant part. Remarkably, small enterprises do not differ from medium-sized and not even much from large enterprises in their perception of the relative importance. While this is only a "soft" indicator which does not reveal hard facts about real e-business activities, it is a useful barometer for the general attitude toward and perception of electronic business development and one's own position in this development.

Figure 1-15: Perceived impacts: Have e-business activities changed the ...

Base: EU-15, all enterprises (N=9264). In % of enterprises.

Source: e-Business W@tch (2003)



The most significant impacts of e-business concern the internal work processes. More than a quarter of all enterprises said that these had significantly or somewhat changed through e-business practices. About 20% of enterprises reported that the organisation structure and the relation to customers and suppliers have significantly or somewhat changed. Impacts on the organisational structure and internal work processes were considered more important in large enterprises, though. Perceived impacts were least pronounced with respect to the offer of products and services.

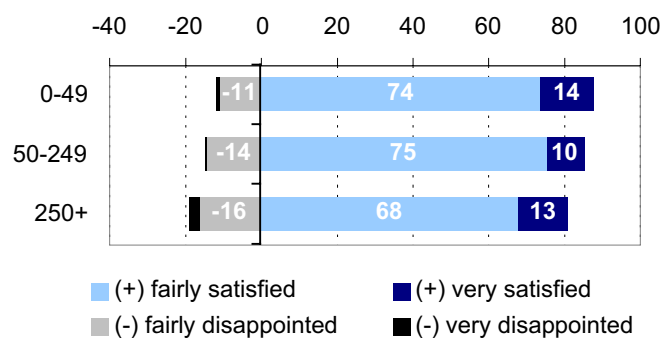
Electronic business is about to significantly impact on companies' relationships to customers. Although e-commerce transactions, especially in the business-to-consumer area, have not deployed as fast as expected (12% of companies sell online), about a quarter of all enterprises felt that e-business had already somewhat or significantly changed the way they interact with their customers. The financial and ICT services sectors are outstanding in that respect, observing the highest impact.

The *e-Business W@tch* asked companies how satisfied they were with the results of their e-business activities. On the whole, businesses seemed to be satisfied, if unenthusiastic. In total, 14% of enterprises said they were "very satisfied" and 74% reported to be "fairly satisfied", which leaves about 12% of enterprises that were "(very) disappointed" with the effects of their e-business activities. The share of companies openly admitting disappointment with the effects of e-business so far is notably higher among large enterprises (16%). Sectors do not differ very much with respect to e-business satisfaction (cf. respective Index in the sector scoreboards).

Figure 1-16: Satisfaction with e-business activities

Base: EU-15, enterprises practising e-business (N=4365). In % of enterprises.

Source: *e-Business W@tch* (2003)



Intended expenditures on e-business technologies

In mid 2002, the intentions of companies concerning their expenditures on e-business-related technologies were more promising than the general climate for IT spending in 2002/03 would suggest. A third of all enterprises said in 2002 that they planned to increase expenditures and only a very few said they would decrease investments. However, this is just a statement of intention and must be confronted with statistics on real IT spending, many of which report reduced expenditures on new hardware and software by 15-25% in 2002.¹¹

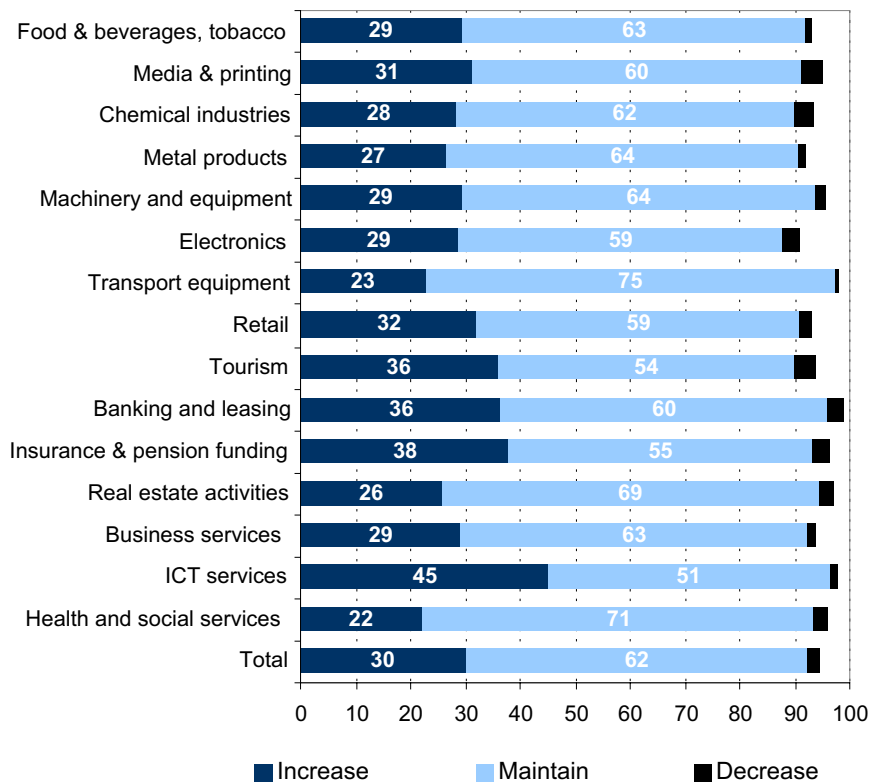
Sectors do not differ very much in their attitudes towards future investments, with a few exceptions only: The ICT services sector has a higher percentage of companies reporting plans for increased expenditures, while particularly the automotive and the health sectors are more cautious in their projections than the industry average.

¹¹ cf. for instance Matter, Frank et al. (2003): "Fighting complexity in IT", in: The McKinsey Quarterly, 2003, No. 1, 57-65

Figure 1-17: Planned expenditures on e-business technologies for 12 months period ahead: level of expenditure compared to current level

Base: EU-15, all enterprises (N=9264). In % of enterprises. Figures don't add up to 100 because of "don't know" / "no answer". Reporting period: June/July 2002.

Source: e-Business W@tch (2003)



2 Conclusions: economic and policy implications

2.1 Economic implications of e-business developments

The dynamic adoption of e-business has considerable economic and organisational implications. As companies are striving to exploit opportunities to save costs, to streamline procedures in existing transactions and business routines and to expand markets, they are at the same time challenged to introduce new business models and to re-define value chains. The current situation within the sectors analysed is quite diverse. E-business activities and impacts, in fact, reflect differences in

- the core activities
- the nature of products and services provided (manufacturing versus services, standardised products and services versus customised ones)
- the customer base, i.e. between sectors mainly selling to companies (B2B focus) and consumer oriented sectors (B2C)
- degrees of ICT adoption and usage within the industry.

The results achieved are also influenced by the different business models adopted: pure online players, multi-channel distribution, e-business activities through portals (generic or thematic), and marketplaces. Furthermore, e-business covers a wide and diverse field of internal and external business processes. Some of these have not (yet) developed as was anticipated, others have already achieved enormous progress. Evidence suggests a shift of attention toward usage of e-business technologies for internal business processes and co-operation with business partners.

2.1.1 Impact on individual enterprises

Efficiency of internal processes

Network applications are increasingly used to support internal business processes such as tracking of working time, collaborative work and human resources management. Larger enterprises are on average four times as likely as small ones to adopt these applications. However, changes in workflow are also taking place within SMEs. E-business tools used internally can help to streamline those components of business that can be standardised. Highly repetitive tasks such as data storage, e-mail acknowledgements or checking inventory levels and the associated cost of staff to deal with it can in many industries represent a significant part of the costs for customer services and their optimisation has very clear economic implications. A standardisation of recurring business processes make costs and quality of the resulting products and services more predictable and help finding inefficiencies in the production process. This holds true for standardised parts as well as for the knowledge-intensive part of the businesses.

Relations with suppliers and customers

A most important and frequently reported effect of e-business concerns the relations with business partners, suppliers and customers. Interactive relationships are economically difficult to quantify, but they comprise a variety of features that are generally considered as being positive in reducing costs through reviewing and improving organisational inefficiencies and activities through open and trusted communication. According to the results of the *e-Business W@tch* survey 2002, the electronic exchange of documents with suppliers and customers is quite common while more sophisticated forms of cooperation such as co-design of products are not very diffused.

Online collaboration, the exchanging of important design or production related information and the ability to access data about production times and schedules through extranets, mail groups or other electronic communication mediums have all been demonstrated to potentially reduce costs in manufacturing sectors. Integration allows closer synchronisation of the supply chain with the aim of reducing inventory and shortening cycle times. Reducing time to market reduces development and set up costs and potentially increases revenues due to the benefits of being first to market.

Employing e-business tools to improve customer-faced processes such as customer service, sales and marketing is very important for those industries that deal with large numbers of customers. Through more efficient systems and techniques for dealing with information on customers (CRM), clusters of customers with particular characteristics can be constructed, allowing marketing measures to focus on the most profitable and promising ones.

Increasing complexity of organisations

In some sectors, the development of e-business is associated to an increased complexity of the organisations. Such complexity is obviously driven also by external factors (concentration, vertical integration, diversification), but in a few cases it is determined by the e-business strategies adopted by companies. This happens mainly in those sectors where e-business has been leading towards the adoption of multi-channel strategies, as for instance in the finance and the retail sector.

For financial Institutions operating in retail banking the most commonly adopted strategy is the multi-channel strategy, which better suits the preference of the customer according to his/her various needs. Physical branches are still the most important contact point with customers and the most used channel for purchasing banking products. This explains why European banks are scaling down their physical network more slowly than expected, and in a few cases further expansion is actually taking place.

Similarly, in the retail sector, the online channel is only rarely developing as an independent channel, with its own characteristics and features. More frequently it is developing as a complementary one, able to exploit experience with customers' relationship, brand reliability and logistical support of the physical channel.

Implementing a multi-channel strategy involves high costs, however, as it implies a broad range of investments with respect to technological and organisational requirements (e.g. integration of channels with back office processes and CRM solutions). Integration is critical because much of the value from online activities is related to offline ones (cross-selling, process cost-cuts).

Impact on the offer of products and services

Companies do not observe a significant impact of doing business electronically on their offer of products and services. The highest intensity of impacts are reported from those sectors where digitalisation and IT developments directly affect the offer as in telecommunications and computer related services, business services, finance and media.

In business services, for instance, the nature of the services provided change by being provided digitally or by having digital components added to them. Security services can enhance their personal observation with additional permanent video surveillance and thus provide a higher service value. Architects and designers no longer only supply the design of something but also the CAD object that can be directly used for production or other purposes. Such changes imply cost savings for the service companies' customers or lead to a higher value of the service. The most important impact of e-business on the offer as perceived by companies is not the change of the product or service itself, however, but the improved quality of customer service.

2.1.2 Impact on industry structure

Vertical integration and "shortening" of the value chain

In some sectors companies (particularly the largest ones) try to exploit e-business for exerting more control on upstream and downstream activities with the twofold objective of incorporating margins and taking strategic control of the most critical activities of the value chain. Large multinational food producers, for instance, search for greater integration with raw material suppliers with the aim not only of reducing costs but also of ensuring the quality standards which are essential to build customers' trust and to create brand loyalty. Conversely, food producers are also increasingly collaborating with distribution channels. Automatic stock replenishment and deliveries are increasingly becoming their responsibility.

The role of third parties and the changes in intermediation

A very important aspect of e-business is the emergence of third-party initiatives such as marketplaces. Although the overall participation on B2B e-marketplaces is still below 10% of all enterprises, in sectors such as chemicals and transport equipment manufacturing trading on marketplaces is clearly gaining momentum.

In the chemical industry, using e-markets is often one element within the e-commerce strategy of companies. The strategy also involves direct access for customers through enterprise portals as well as direct integration of ERP systems with important suppliers or customers. In the ICT services sector, marketplaces respond to sector specific inefficiencies in input management. They are still in an initial phase, and their development is currently suffering from the low dynamics in the ICT sector. Marketplaces have tried to capitalise on the industry-specific input inefficiencies such as volatile demand for telecommunication capacity, for software components or for experts.

Although the impacts of marketplaces are yet below initial expectations, their development might eventually be a challenge for competition. A further increased bargaining power of large customers along with mechanisms that put price at the centre of purchasing decisions could lead to further concentration among suppliers and to a discrimination against weaker partners. In the retail sector, for instance, there are indications that in a number of marketplace initiatives the threshold of exchanges required is not affordable for smaller companies.

An issue of great concern in the past has been to what extent e-business is leading towards “disintermediation” thanks to the possibility of selling directly to the final customer by using the Internet. However, even in those sectors where the value chain has been “squeezed” by the implementation of e-business, there is no evidence of substantial disintermediation phenomena.

The pioneer sector with respect to disintermediation and re-intermediation effects is tourism. Here, the traditional tourist service providers (hotels, other types of accommodations, airlines) have implemented a business strategy which tends to enhance the link with the end-users. These players have quickly moved from mere information to interactive sites and are increasingly using the network in a Customer Relationship Management (CRM) perspective. As far as airlines are concerned, the Internet is creating a market for “no-frills” airways. Tour operators and travel agencies increasingly use the web as an additional channel to sell products to end-users. Another relevant effect of the advent of the Internet is the birth of new players “e-intermediaries” in the sector: online-only agencies, travel portals and regional and local tourist portals.

Transparency and customers’ bargaining power

The spread of e-business means an increase in a customer's bargaining power: more active, better informed, in a position to compare prices and quality of services. This impact is particularly evident in those sectors where customers have easier access to information such as Tourism, Finance and Insurance services. While transaction transparency can bring positive impacts in terms of trust and fairness, it also poses significant challenges related to the pressure on prices that it brings about.

2.2 Policy Implications

Defining the target audience of policy actions

Producing ICT policy recommendations which apply across the EU’s extremely diverse economic landscape is a particularly difficult challenge. The EU policy objective is to achieve the goals set out first in Lisbon in March 2000, and then reinforced in Gothenburg (June 2001) for Europe to become the world's most sustainably competitive and dynamic knowledge-based economy. eEurope 2002 has been concluded and a number of other initiatives are in place (e.g. eEurope2005 Action Plan, Go Digital), which set out comprehensive actions amongst other activities to increase SME involvement and awareness, resolve legal uncertainty, and increase confidence.

The difficulty is the challenge of crafting policies that are applicable across enterprises and industrial divides, requiring at one level broad policy actions, and at another, a number of activities tailored to specific industrial sectors. For example, manufacturing, with a high number of small and medium sized enterprises and significant capital intensity, is characterised by the existence of “islands of activity”. These are still proving to be difficult and costly to integrate. Many manufacturing processes are also labour intensive and this imposes a significant barrier to a greater ICT diffusion. At the other end of the industrial spectrum, large enterprises within the service industry, such as banking, insurance and retail have benefited from ICT infrastructure investments. They have exploited economies of scale, through concentration in an industry where average costs decrease with increase in the number of customers and thereby give large firms a distinct cost advantage. The ability to conduct business via the Internet makes this effect even more pronounced, as it can facilitate lower costs per sale through easier world-wide distribution to a much larger number of customers.

Six policy actions, which together can leverage greater preparedness for enterprises across industrial activity and size class are outlined in this section.

- The first is creating the regulatory framework, which focuses on European directives, harmonisation, and the resolution of legal uncertainties.

- The second and third action areas directly concern the approach to e-commerce/business growth characterised by improving security and increasing trust and by the active development, promotion and implementation of technical standards and best practice guidelines.
- Raising e-business awareness is the fourth major policy action addressed. While the publication of good practice is occurring in several areas, it needs to become more focussed and directed towards SMEs.
- Education and training of individuals in enterprise skills for e-business is the fifth major policy action. IT skill development needs are discussed, and a summary of specific educational activities directed at SMEs is outlined e.g. SME support activities, and the use of SME support networks.
- The sixth action area presented comprises the other policy actions required for engaging and encouraging SMEs in particular to be more active in e-business.

2.2.1 Creating the European legal framework

Trans-boundary trading

E-business facilitates international trade. As more and more companies make use of this opportunity, the requirement for harmonised legislation across Europe also increases. In the financial sector, for instance, the Financial Action Plan aims to create an integrated European capital market by 2005. Insurance providers, to give another example, need to develop local products for every EU market because insurance law in the Member States is not symmetrical – as the EU Directive on distance marketing of financial services is implemented in different ways under different regulatory systems. This is most pronounced for savings and pension instruments (and other more complicated financial products) which are generally tailored to the tax situation of the targeted client group. A second example is that in most countries the development of “electronic government” lags behind e-finance.

Market dominance

In certain sectors, such as in machinery and equipment which supply the automotives sector, enterprises (notably SMEs) have expressed concern about the lock-in effects of market dominance. The emergence of powerful online marketplaces (run by automotive giants) pose the threat of practices that might eventually be a challenge to fair competition. A lock-in of users might increase costs of changing suppliers or customers and, thus, reduce the intensity of competition. Further increased bargaining power of large customers along with mechanisms that put price at the centre of purchasing decisions could lead to insolvencies and further concentration among suppliers, especially among smaller enterprises. This calls for a close monitoring of the behaviour of powerful online marketplaces and their impact on competitive conditions.

Policy makers therefore face decisions whether to apply non-interventionism or regulatory control, and the right balance appears to be a precarious one. On the one hand it is necessary to remove the obstacles to the expansion of cross border activities. On the other hand, technology developments could threaten the dominant incumbents by further introducing outside competitors, alternative business strategies, increased price transparency and disintermediation.

2.2.2 Improving security and increasing trust

With appropriate care the spread of e-business could potentially bring an increase in a customer's bargaining power: more active, better informed, in a position to compare prices and quality of services. It is well known, however, that concerns about inadequate security provide a significant deterrent and barriers. This poses opportunities and challenges for businesses. The *e-Business W@tch* survey revealed that unresolved security issues cause widespread public and business concern and are therefore posing a considerable continuing e-business barrier. While a range of effective security tools are already available – they are not being uniformly implemented. To remedy this, policy measures

might be needed to raise awareness about the dimensions of the problem and the various alternative solutions. Consequently, promoting the usage of security systems might be a legitimate policy target.

In banking and finance, in the health and social services and in the real estate sectors there is a particular need for secure transaction processes due to the high value of the transactions and transfers, and/or the sensitivity of information. However, in the survey of the *e-Business W@tch* companies from these sectors express the opinion that security measures and their related technologies were prohibitively expensive, more so than in the view of enterprises from other sectors. This could have implications for the software industry. Regulatory institutions (e.g. in the financial and health sectors), trade associations and public entities could form or promote public-private partnerships to conduct pilot projects for testing, improving and spreading e-business technologies in these sectors.

2.2.3 Developing technical standards: the diffusion of Internet based communication standards¹²

Technology standards and best practice guidelines improve compatibility and reliability of ICT systems and when properly defined and implemented can have an important impact on trust. For this reason, there are specific requirements for actions, at national and EU level, which will help ensure widespread technological progress, improve transaction security, and establish platforms and architectures for open and flexible systems which can be used to improve the management of internal and external exchanges.

Of particular interest in the context of e-business over the Internet is the impact and diffusion of Internet based communication and transaction standards. The infrastructure architectures that need to be considered and are being addressed span the entire stack from re-engineering of low level protocols to ensure systemic security and privacy/data protection up to the data standards, ontologies and choreography required to enable the semantic web, ensure scalable interoperability, and guaranteed quality of services and delivery. These are complex cross industry and cross-national areas and can often provide the theatre of bitter strategic disputes amongst rival interests. At the same time therefore there is an growing appreciation of the importance of using open software. Although not new this is an area in which Policy can be set by for example EU encouraging member state administrations to make use of and extend shared software with one another.

A fine example of this is the offer from Estonia, which has successfully rolled out over 150k high end PKI based e-identity smart cards to their citizens within the past year, and who are now making their open software for secure electronic signature of documents via the web available to EU Member States. The European Standardization organisations are eminently suited to oversee the management of this open software development / sharing process and to provide and maintain access to the latest revisions and status on certification of trusted components. This could be a good way to better integrate the formal/informal standards processes in these areas while ensuring the necessary level of support for implementations and adoption of enhancements.

Standardization of data formats

One of these current areas for significant ongoing policy action is the standardization of data formats, in order to promote interoperability and the exchange of data across platforms. This is a particularly important area for SMEs. Where there is immense diversity and diffusion of formats, significant resources are required when exchanging data (e.g. invoices, orders) among and between enterprises. Using standard data definitions and existing technologies a broadening of the players involved in e-business' initiatives can be supported by Web-based EDI for example. Use of the web which is within the reach of all SMEs expands capabilities associated with electronic data interchange to companies not involved in the traditional EDI value added networks. In addition it enables companies who already

¹² This chapter was edited by Henry J. F. Ryan from Lios Geal Consultants (Ireland), expert of the *e-Business W@tch* for standardization issues.

use traditional EDI the opportunity to be connected to other companies without having to disinvest in their proven technologies. As the Internet can support complex transaction and enquiry functions previously only possible through the EDI value added networks, a greater integration is emerging amongst players previously excluded because of the large investments and recurring expenses required to implement and maintain the dedicated network infrastructure and expert staff. On the other hand, for the immediate future it may be more economic for some existing trading communities to extend use of their VANs (Value Added Networks) rather than establishing and maintaining requisite security levels in an open Internet network.

No one standard is sufficient for the transition to and operation of web based e-business infrastructures. At the same time without agreed standards there can be no communication and cooperative ventures are doomed to factional contests, internal disputes and inevitable decline. The failure of the dot.coms is a stark warning if needed that technology is not sufficient to successfully run a commercial business. The other two elements are a sound business model and consistently meeting the needs of the consumer. These three elements and similar considerations apply to e-government services especially those which span national and pan-European territories. Standardization (of technology, data, processes, including e-identification, e-authentication, e-signature, certification and accreditation criteria and conformance testing etc) is a means to help ensure the business case through shared common trusted infrastructure and essential supporting services.

Standardization – a policy challenge

The EU policy objectives regarding standardization can be stated in very strategic high level language in terms of the expectations regarding facilitated open structured industry collaborations which will use formal documented technology agreements to increase speed and innovation in products and services that will help to lower business and administrative costs and provide better services to consumers and citizens. The international collaboration on standards is governed by a high level objective of fostering local technologies and advantage while at same time eliminating technical barriers to trade. The industry motto in this regard is for “One product tested once and available everywhere”.

Setting and agreeing quantitative targets with respect to these objectives is a difficult task. Some of the premises can be disputed and several of the objectives at first glance seem to be orthogonal to one another. In the interests of the policy makers and the companies and people involved at the coal-face of standardization it is essential to identify ways in which to set and assess impact measures. Good progress has been made in defining impact measures for the eEurope 2005 programme. A concerted effort should be made not to assess past or current standards activities but to develop and put in place some key measures and indicators for assessing the degree to which short and long term policy goals have been reached or assisted through standards work and what additional requirements exist and how they can be met. Europe’s goal is to establish a knowledge based society. It is being increasingly recognised that it is no longer sufficient to pump resources into areas without due regard to evaluation of the results and tailoring future efforts to achieve better returns. This is not an area in which major progress can be expected overnight. An ad hoc approach while possibly effective in some instances is not the answer. A structured methodology is required which knits with the macro policy evaluations that need to be conducted. This effort can and must build on existing reports and analyses. The economic analysis conducted within NIST on specific standards initiatives, the reports by Swann et al provide useful inputs to starting this work on a good footing.

Standards are vital for the future development of electronic business and therefore for the e-readiness and competitiveness of enterprises. Admittedly, standards are not solely an SME specific issue, and it is difficult to determine in advance whether in the end large enterprises or SMEs would be the main beneficiaries from initiatives. One thing is certain. Uncertainty on which technology to bet your business is a major barrier to implementing sophisticated IT solutions at this point of time. SME support networks and advisers realise this dilemma and frequently urge reliable agreements on technical standards as being a highly desirable goal from the viewpoint of SMEs.

The difficulty is knowing which approach and which technology/standard to back. There is no one single easy answer to this question. The variety of specifications available from national and inter-

national standards organizations and as many as 1000 different industry consortia and alliances indicates the level of the difficulties facing SMEs (and all others including application and service providers) who wish to adopt technical solutions which will enable them to succeed today and continue to grow and prosper as technology and implementations evolve. It would help if there were some hallmark to distinguish the good successful standards from others destined to fade and crash. The European voluntary standards organizations have an important potential role here. In addition to the full standard agreed after formal balloting of the participating states (e/g in CEN this includes EU member states and others) or the primary constituency (e.g. in ETSI) there are also now established industry agreements produced by CEN/ISSS Workshops. Examples include FINREAD (Financial Card Reader), FASTEST (specifications for inter-modal interoperable e-ticketing), eURI (common interface to online services). Other work in progress includes Workshop on eAuthentication and related common work on this topic at international level between representatives from Europe, Japan and US interests. Integration and recognition of specifications from industry consortia can add a cachet and hall-mark which distinguishes these specifications as having undergone public open scrutiny and been accepted according to established proven standardization approval principles. This information and trust enhancing measure can be taken into account when companies are exploring and deciding their technical architecture strategies and configurations. The expectation is that the longevity and productivity resulting will be significantly enhanced.¹³

ebXML – will it dominate the e-commerce landscape?

It must be conceded that there are dangers. Grand schemes of standardization have not often been very successful. Technologies and markets evolve and change. Sometimes it can take too long for a suite of standards to be developed and the window of opportunity passes for good. Take for example ebXML, one of the largest efforts involving industry (OASIS) and formal international organizations (UN/CEFACT) in growing web based e-business and migration from older more expensive EDI solutions. ebXML using the power of Extensible Markup Language envisages and offers the facility for any business to make available data on its product set via the web and through a system of registries and equivalence directories.

Although most of the basic work was completed on schedule in 2001 there are still gaps and in the meantime industry developments have moved on. There is no doubt that aspects of ebXML will survive and become an essential part of e-commerce between SMEs, e.g. the emphasis and tools provided for business process modelling and registry searches. The work underway in CEN/ISSS Workshop on eBES (e-Business Board for European Standardization) and on interoperability certifications and one stop shops for various industry applications across Europe are also very positive policy driven initiatives. This must continue, be assessed and be enhanced.

The likelihood of ebXML dominating the e-commerce landscape, however, seems to be receding at this time. According to an eBES survey conducted in latter half of 2002 more than two-thirds (70%) of the responding 77 European SME companies replied that they would not envision adopting ebXML before the next 3-5 years. This leaves room for a lot of change as two years i.e. half that average estimate is a realistic outer measure of new product lifetime in the ICT business. In the meantime new web service technologies and semantic ontologies are emerging and will be advanced further through the support provided by the European Union's 6th Framework Programme for research and development (FP6). In addition there are indications that major desktop and enterprise vendors such as Microsoft and IBM are now seen as either non-supportive or at best ambivalent. Given that policy initiatives must address both medium and longer term objectives it will be important to concentrate standards efforts at the policy level in two areas. First is to be aware of and extend the business case studies available from the ebXML marketing and awareness group work.

¹³ More information on the CEN/ISSS e-Commerce sector workshops (past and present) is available from <http://www.cenorm.be/iss/Workshop/Workshops.htm>. These workshops provide inter alia frameworks and detailed best practice solutions for e-catalogues, classification, and also detailed specifications for XML business transactions for various application sectors (so far footwear, textiles, construction).

Secondly it is imperative that the work undertaken in FP6 has strong links to the voluntary European standards organizations and vice versa. At minimum this must include information on use of existing and emerging standards, catalogues and summaries of new work and support for inclusion and integration of the outputs of all projects into a framework of European standardization. Consideration should also be given to establishing vendor independent standardization help desks for SMEs and administrations under the auspices and control of the European standards organizations.

2.2.4 Promoting e-business awareness

Until now few – and mainly the leading – companies have been transforming the usage of ICTs from a mere tool for reducing production costs to a support tool for strategic decisions and e-business interaction models. The dominant culture, especially among SMEs, is still quite conservative. They lack confidence in the potential and benefits of new technologies for their business, and instead underline the common concerns about security and the cultural reluctance towards any change in established procedures.

To overcome this reluctance, good practices such as successful initiatives having developed forms of collaborative product design, joint marketing and integrated logistics through e-business should be shared and promoted in their respective sectors. Examples should be very specific, though, as different sectors and sub-sectors will follow different “optimal” e-business strategies. Companies particularly need reliable information of the actual costs and benefits of potential e-business solutions and activities.

A good deal of the information offered on e-business issues used to be biased in two ways. The first bias is towards high profile sectors, such as pharmaceutical, aerospace and finance. There is not much information available on the more diverse manufacturing sectors, especially on the variety of conducting e-business. The second bias is towards large companies. Many of the available e-business examples and case studies are based on larger companies, if not global giants. Pragmatic, small scale, low risk projects need to be more in the focus of case studies in the future.

2.2.5 Enterprise skills for e-business

E-business activities underscore the need for a more multi-skilled workforce. The flexibility of organisations is, in electronic environments, dependent to a significant part on the adaptability of their workers. The main difficulty for businesses in this respect is the requirement to train users every time their work routines are changed and new software packages are introduced. Re-training of staff and re-organisation of business processes are part of the implementation costs for e-business initiatives. The task of continuous re-qualification (“life long learning”) constitutes an essential characteristic of a knowledge-based economy, but should not be left to the responsibility of enterprises only. The challenge includes other stakeholders as well, such as trade unions, colleges and universities, learning institutions and the government. There is still scope for greater collaboration across industrial communities. At the industry level, unions and research and training organisations (RTOs) can act as conduits for raising the profile of training programmes.

2.2.6 Engaging SMEs in e-business

Several information packs and case studies on e-business activities are now publicly available and paint a picture of industries that hesitated at first but then quickly started to adopt e-business. However, one has to bear in mind that most published studies by private research companies focus very much on e-business activities of large, globally active companies. Some surveys by industry associations indicate that many smaller companies are still in a very early stage of e-business usage. Many have not yet integrated their internal Enterprise Resource Planning (ERP) systems and are unable to conduct e-business in the same way as larger companies.

Processing and information costs

An important objective for SMEs is to decrease processing costs for commercial transactions, especially for the procurement of MRO goods and direct production inputs, as many SMEs have to deal with a high number of low value transactions. Software solutions supporting the sourcing and procurement processes and facilitating interoperability are required. Policy activities should encourage and support SMEs in utilising such solutions.

A second objective in today's customer-focused markets is to speed up information flows. For SMEs, speed and flexibility is often one of their major competitive advantages. However, for many SMEs the existence of older capital equipment, which may have significant manual labour input, limited computer control or limited production runs is an impediment for investment in ICTs. To tackle this barrier, software adapted to the needs of SMEs.

Improved transparency about markets is another relevant issue for SMEs, as they usually cannot conduct their own market research activities. Industry-wide Internet services (such as portals or B2B marketplaces) have the potential to offer such information. Industry service sites, for instance, often include information about training and skills, new industrial processes, legislation and other relevant market issues.

Extending SME markets

Small and medium sized enterprises have difficulties in accessing overseas markets, not only because of the costs of establishing the traditional sales distribution route, but also in developing an e-business presence that can be effectively used to support such activity. Presently, SMEs see a significant gulf in their actual experience of e-business activities and the type of transformation needed to support international activities.

The tourism sector offers good examples of how to use e-business applications to extend the market scope, for instance destination management systems (a resort integrated information system enabling the collection of all tourist information and services, made available for promotion and sale through a website). Such systems enable SMEs to play a proactive role in promoting their business in other areas. Co-ordination of efforts plays a fundamental role for ensuring success of such initiatives. This role can be played by local government (via regional tourist services) or with a co-operative structure managed by operators themselves.

Does non-adoption mean SME exclusion?

Advanced e-solutions require substantial investments in software, customisation, and user training before they are "up and running" and before they can reach a positive return on investment (ROI). In general, and mainly for this reason, findings presented in the sector reports indicate that the implementation of e-business solutions appear to benefit large firms to a greater extent than SMEs. Large firms are currently more advanced in integrating the "e" into their general business processes and are thus in an advantageous position to realise the full potential for efficiency gains, reduced costs, and better competitive positions in the market.

On the other hand, this does not mean a particular market failure or any irrationality being displayed by economic agents in not adopting e-business. SMEs may be well advised not to heedlessly adopt any standard industry solutions that are primarily shaped to benefit OEMs or large firms. Negotiations and retention could well be their best strategy to influence the industry's e-transformation to their interest, as in the long run an industry-wide e-transformation can only be successful if all partners in the value chain and the final customer profit from it. If the e-economy in Europe is to thrive and become a driver for the recovery of the economy as a whole, it will depend to a large extent on the equal participation and "e-inclusion" of SMEs. Thus there is a clear call for a continuation of SME specific e-policies. These have to reflect recent developments, and particularly the hardly contested observation that success in electronic business is not a simple matter of practising e-commerce or not. The real challenge is now to manage a re-engineering of business processes.

3 Collection of Charts

Series I:

E-Business Indicators by Business Activity

A collection of 20 bar graphs comparing sectors with respect to the diffusion of ICT infrastructure, e-commerce activities, e-businesses processes within enterprises and between business partners in the value chain, and to what extent electronic business has changed the way how companies operate. In order to ensure comparability across sectors, the comparison is based on a sample of enterprises from Germany, France, Italy and UK (N = 5917, i.e. about 400 per sector). This sample was available for all 15 sectors covered by the *e-Business W@tch* and included in this comparison, while the sets of other countries for which data are available for a specific sector differ by sector. The figures presented in these bar charts have been weighted by employment, which means that they should be read as "enterprises comprising ...% of employment in a sector".

Series II:

E-Business Indicators by Company Size-Class

This collection of 18 bar graphs illustrates to what extent company size matters as a critical factor for the diffusion of ICT infrastructure and of e-business applications. The charts shows in what areas small and medium sized enterprises have (almost of fully) closed the gap to the large enterprises, and which kind of applications are still dominated by larger companies. Data are based on a sample of 9264 interviews with companies from 15 sectors, including interviews in all Member States of the EU-15. The figures presented in these bar charts should be read as "...% of enterprises (as legal units)" in the respective size class.

Series III:

Benchmarking Scoreboard of Indexed Indicators: The e-Business Profile of 15 Sectors

The Benchmarking Scoreboard shows the e-business profiles of 15 sectors of the economy¹⁴ based on 23 indexed indicators, which means that "100" stands for the industry average from these 15 sectors. A definition of the indicators selected for the benchmarking charts is given in the table below. The benchmarking is based on employment-weighted figures in order to emphasize the overall economic importance of applications and not to risk that a large number of micro and small enterprises distorts the picture. The values should therefore be read in the following way: "Compared to the industry average, employees in the [respective] sector are ...% as likely to work in a company which uses/has/says ...". For example, the "food, beverages and tobacco" sector shows a benchmarking value of 76 for intranet diffusion. This means that employees in this sector are 76% as likely to work in a company that has implemented an intranet as on industry average. Values higher than 200 are indicated by the figure in the respective bar.

Although benchmarking activities normally imply that a higher score is better, in this context the main objective of the charts presented is definitely not to make a statement which sectors perform "better" or "worse". Rather, the objective is to make visible at a glance the differences between sectors with respect to the role and the relative importance of various e-business application areas. For instance, the chart for the tourism sector shows that e-commerce is very important in that sector (most scores are clearly above average), while applications for internal processes and e-business integration are not as widely diffused as in other sectors. This does not necessarily mean that tourism lags behind, but can to a large extent be explained by – and, vice versa, confirms – analysis how hotels, restaurants and other companies from the sector are practising e-business.

¹⁴ For a definition of the sectors, see Annex "Methodology of the e-Business Survey 2002"

Table 3-1: Definition of indicators used in the Benchmarking Scoreboards (Series III)

Area	No.	Indicator	Definition
ICT infrastructure	1	Access to Internet	Percentage of employees working in enterprises with Internet access
	2	Broadband Internet access	Enterprises connected to the Internet by DSL or other fixed connection (as a share of enterprises connected, weighted by employment)
	3	Intranet	Percentage of employees working in enterprises with an intranet
	4	Extranet	Percentage of employees working in enterprises which have an extranet
	5	Employees' access to e-mail	Percentage of employees working in enterprises where the majority of office workers has access to e-mail for external communication
E-commerce	6	Website	Percentage of employees working in enterprises which have a website
	7	Online selling	Percentage of employees working in enterprises which sell online
	8	Online procurement	Percentage of employees working in enterprises which sell online
	9	Participation in B2B e-marketplaces	Percentage of employees working in enterprises which trade on Business-to-Business electronic marketplaces
E-business processes	10	Online collaboration: designing products	Percentage of employees working in enterprises using online technologies for collaboration in designing products / services
	11	e-CRM	Percentage of employees working in enterprises which use an (electronic) customer-relationship-management solution
	12	IT supported ERP	Percentage of employees working in enterprises which use an IT supported enterprise-resource-planning solution
	13	Online technologies to track working hours	Percentage of employees working in enterprises which use online technologies to track working hours and/or production time
	14	E-learning	Percentage of employees working in enterprises which use online e-learning applications
Barriers	15	Barriers to selling online: "Goods / services do not lend themselves"	Percentage of employees working in enterprises which agree completely to the statement: "Many of the goods / services we produce do not lend themselves to be sold online."
	16	Barriers to online procurement: "Suppliers do not sell online"	Percentage of employees working in enterprises which agree completely to the statement: "Most of our suppliers do not sell online."
	17	Barriers to online procurement: "Concerns about data protection / security"	Percentage of employees working in enterprises which agree completely to the statement: "We are concerned about data protection and security issues."
Impact	18	Significance of e-business today	Index based on the percentages of employees working in enterprises which say that e-business constitutes a "significant part" or "some part" of the way they operate. Weighted computation of both values.
	19	Impact on customer relationship	Percentage of employees working in enterprises which say that e-business has significantly or somewhat changed their customer relationship.
	20	Impact on relationship to suppliers	Percentage of employees working in enterprises which say that e-business has significantly or somewhat changed the relationship to their suppliers.
	21	Impact on work processes	Percentage of employees working in enterprises which say that e-business has significantly or somewhat changed internal work processes
	22	Satisfaction with e-business	Index based on the percentages of employees working in enterprises which are "very" or "fairly" satisfied with their e-business activities. Weighted computation of both values.
	23	Increase expenditure on e-business	Percentage of employees working in enterprises which plan to increase their expenditure on e-business technologies within the next 12 months.

Charts – Series I:

e-Business Indicators by Business Activity

I.1: ICT infrastructure

- PC
- Internet access
- Intranet
- LAN (Local Area Network)

I.2: E-commerce activity

- Website
- Sell online
- Use secure server (SSL)
- Purchase online

I.3: E-commerce intensity and integration

- Share of online sales
- Share of online purchases
- Online sales integrated with backend system
- Use a CRM system

I.4: E-processes within and between companies

- Collaborative work
- Track working hours online
- Collaboration with business partners
- e-Learning

I.5: E-business impacts

- Impact on organisational structure
- Impact on internal work processes
- Impact on customer relationship
- Impact on relationship to suppliers

Charts – Series II:

e-Business Indicators by Company Size-Class

II.1: ICT infrastructure

- PC
- Internet access
- Type of connectivity
- Intranet
- LAN (Local Area Network)
- WAN (Wide Area Network)

II.2: E-commerce activity and intensity

- Website
- Sell online
- Share of online sales
- Use secure server (SSL)
- Purchase online
- Share of online purchases

II.3: E-processes within and between companies

- Online sales integrated with backend system
- Use a CRM system
- Collaborative work
- Track working hours online
- Collaboration with business partners
- e-Learning

Charts – Series III:

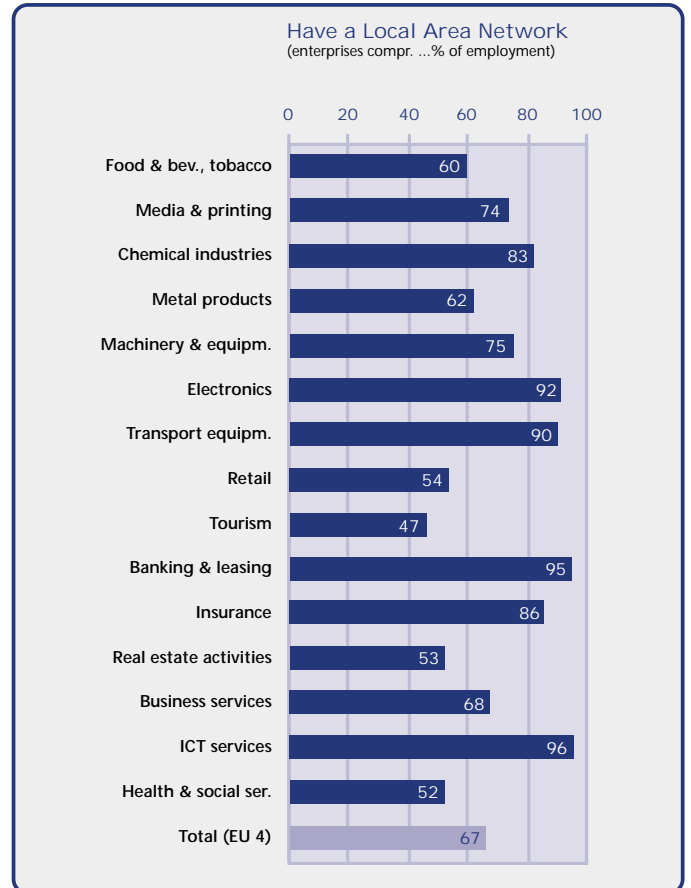
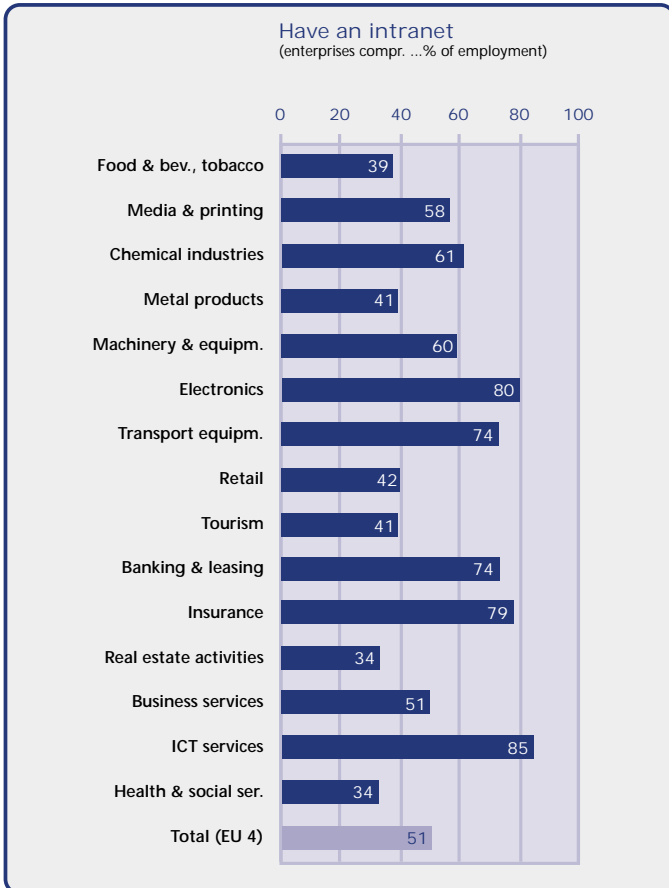
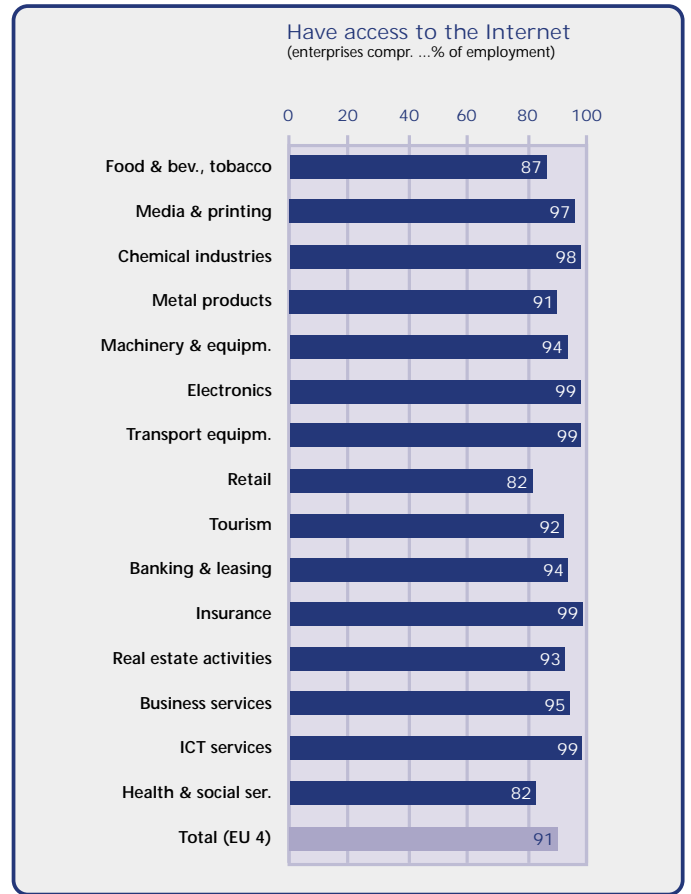
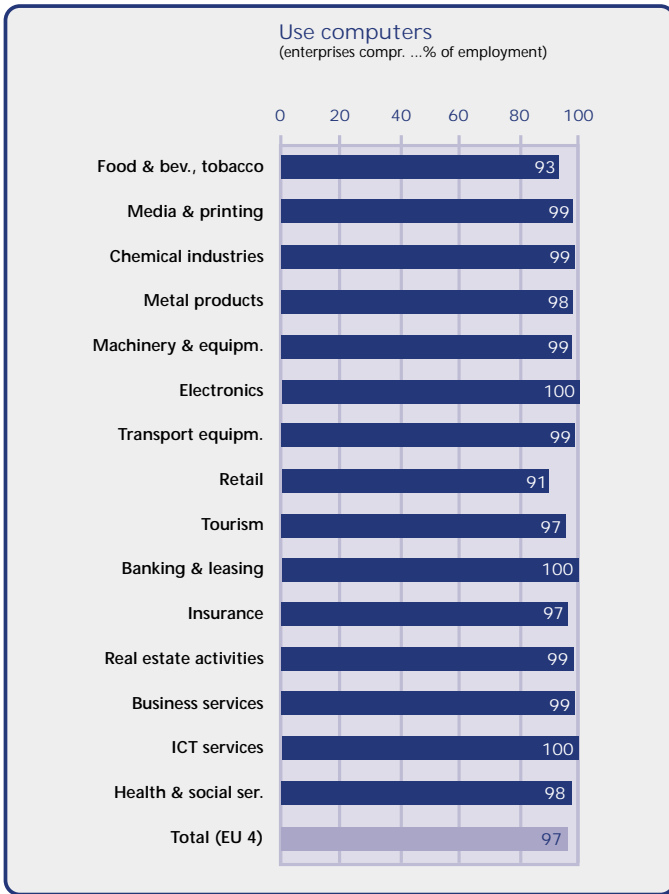
Benchmarking Scoreboards of Indexed indicators:
The e-Business Profile of 15 Sectors at a Glance

- III.1 Food, beverages and tobacco
- III.2 Media and printing
- III.3 Chemical industries
- III.4 Metal products
- III.5 Machinery and equipment
- III.6 Electrical machinery & electronics
- III.7 Transport equipment
- III.8 Retail
- III.9 Tourism
- III.10 Banking and leasing
- III.11 Insurance and pension funding
- III.12 Real estate
- III.13 Business Services
- III.14 ICT services
- III.15 Health and social services

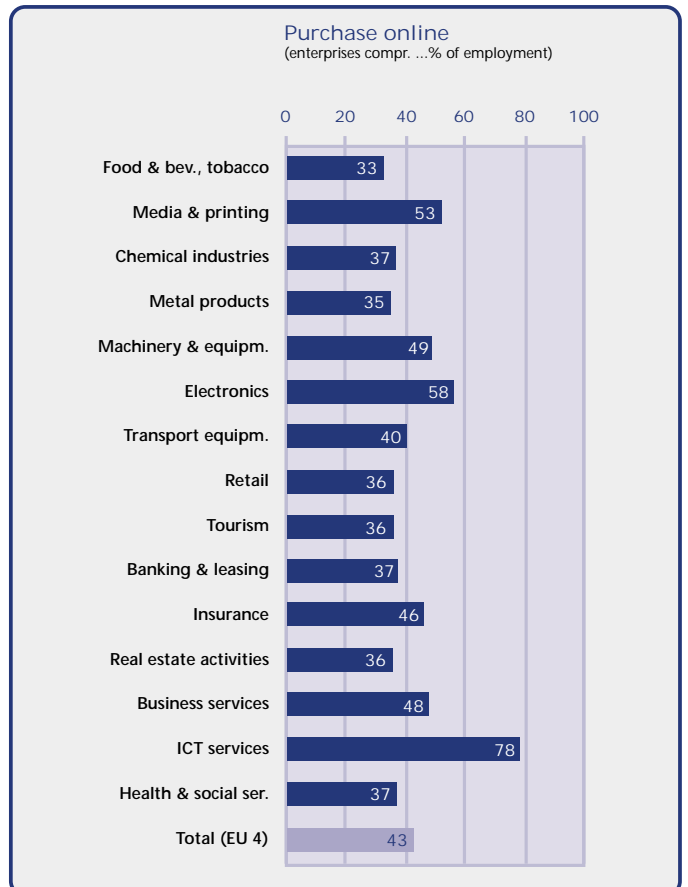
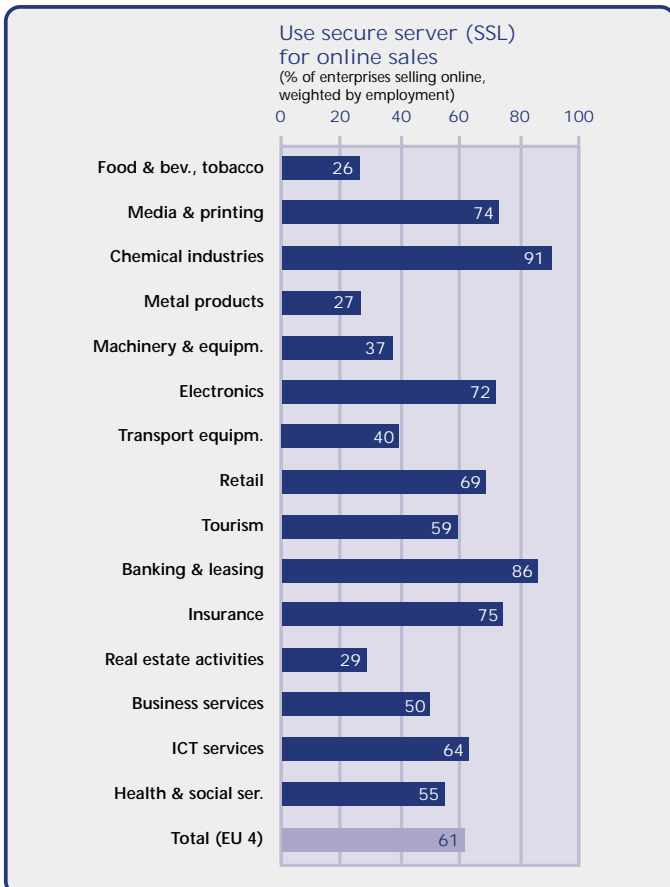
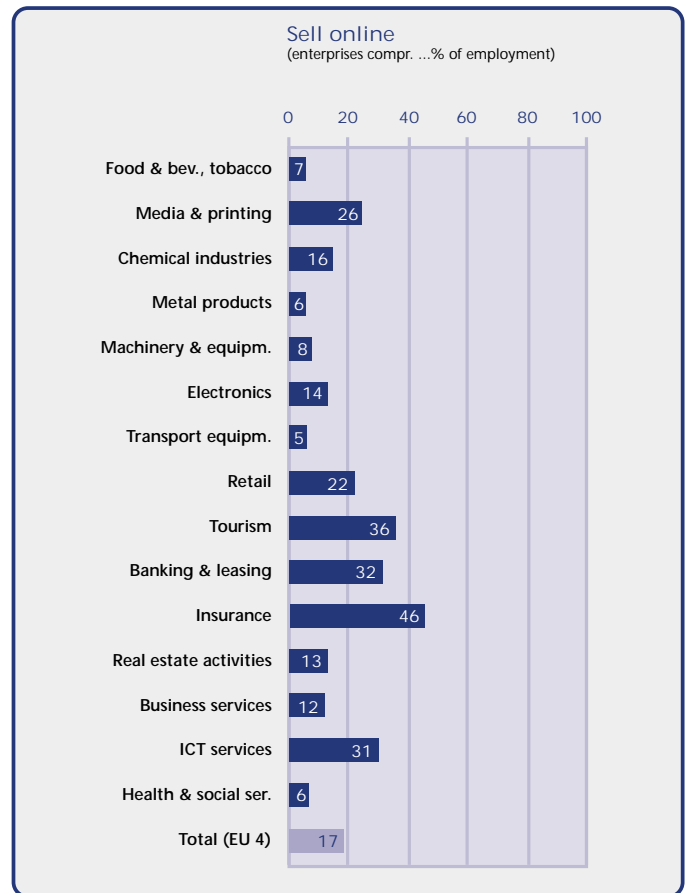
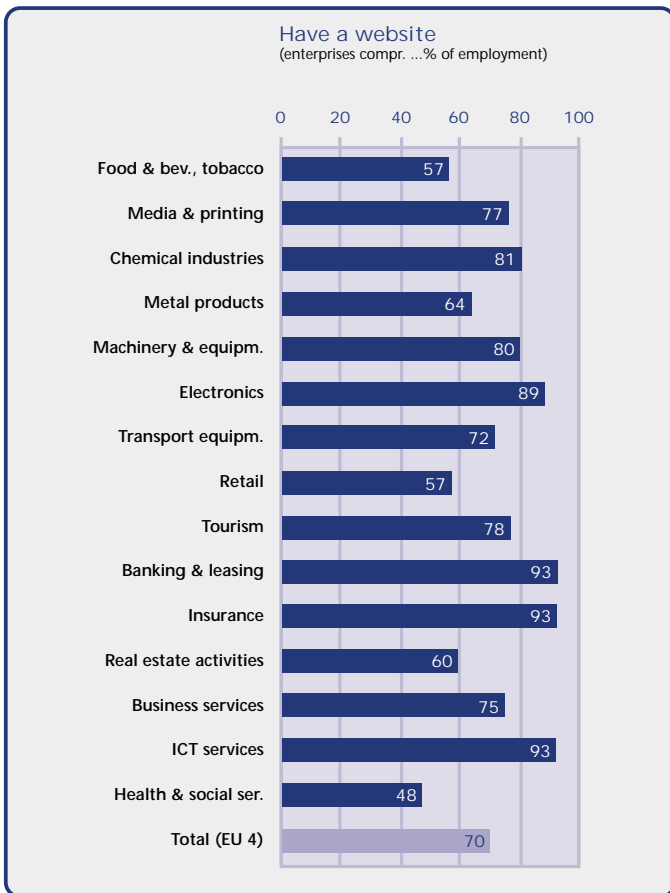
Each of the Benchmarking Scoreboards III.1 – III.15 is based on 23 indicators from the following areas:

- ICT infrastructure
- E-commerce
- E-business processes
- Barriers
- Impacts of e-business

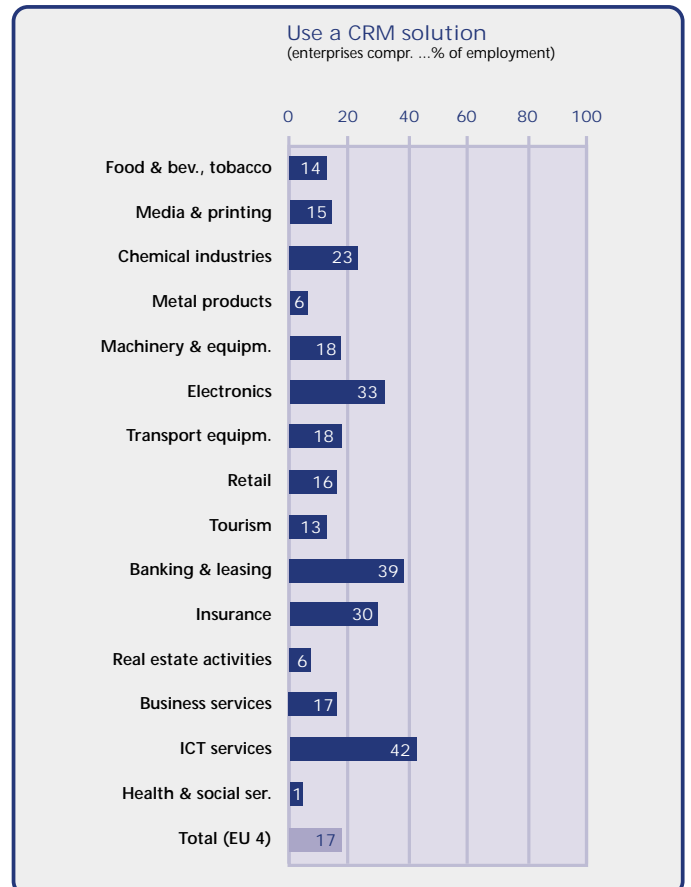
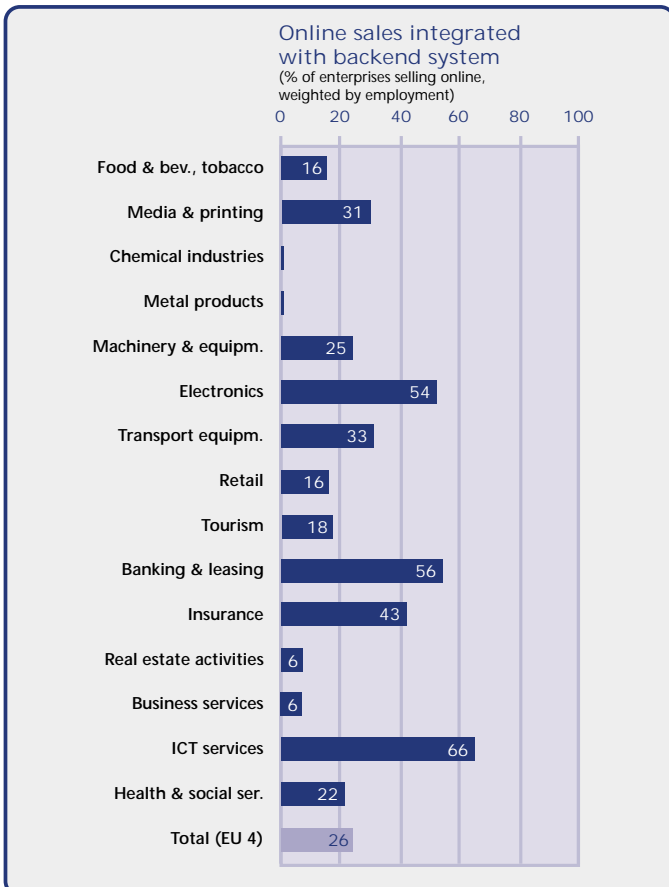
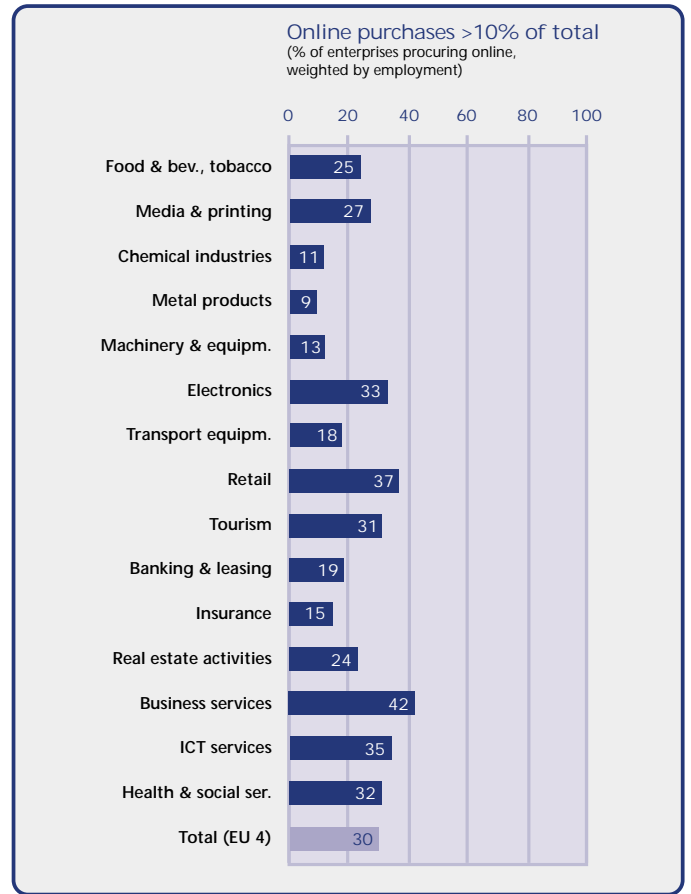
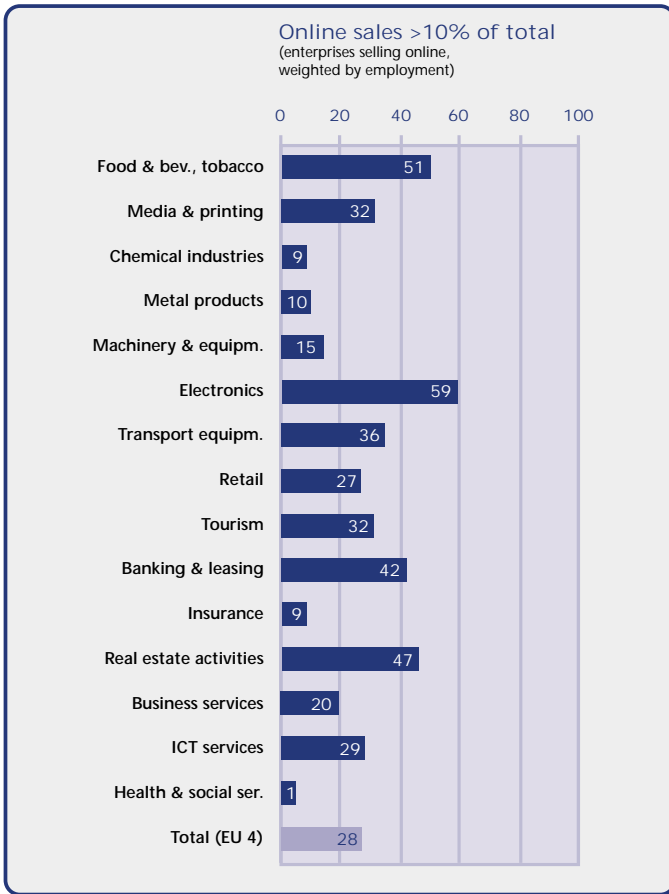
Series I.1: ICT infrastructure by business activity



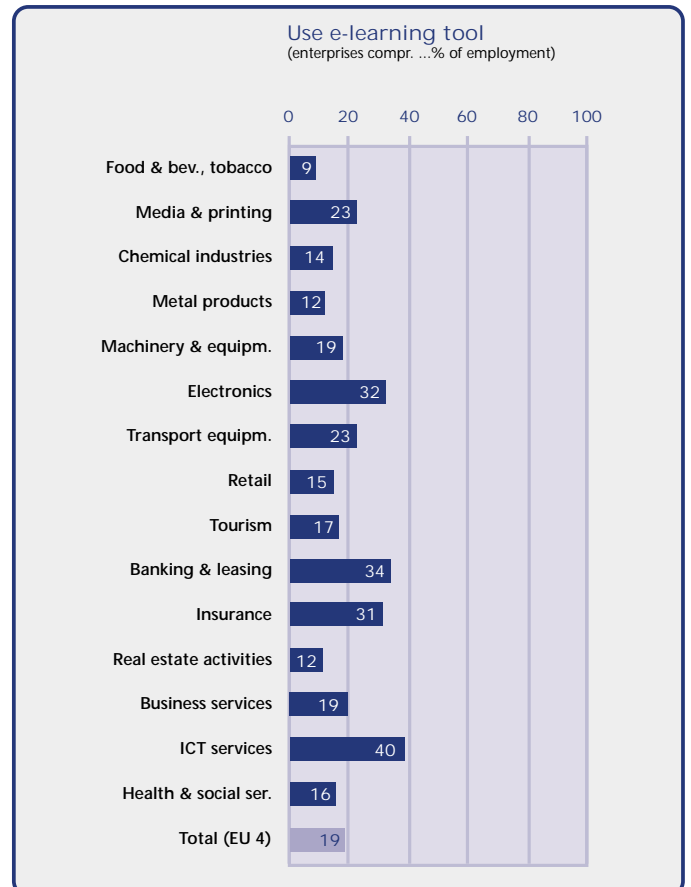
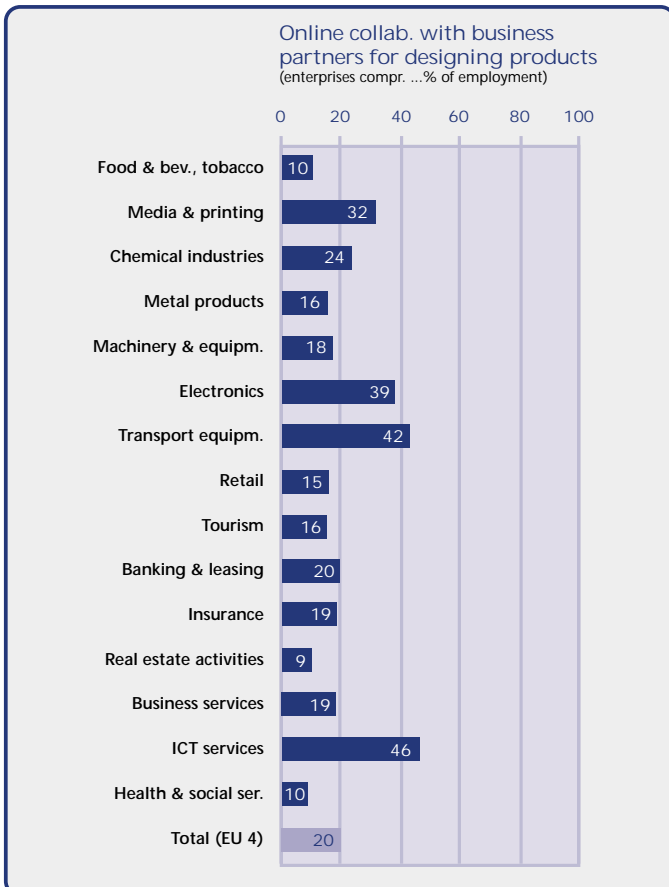
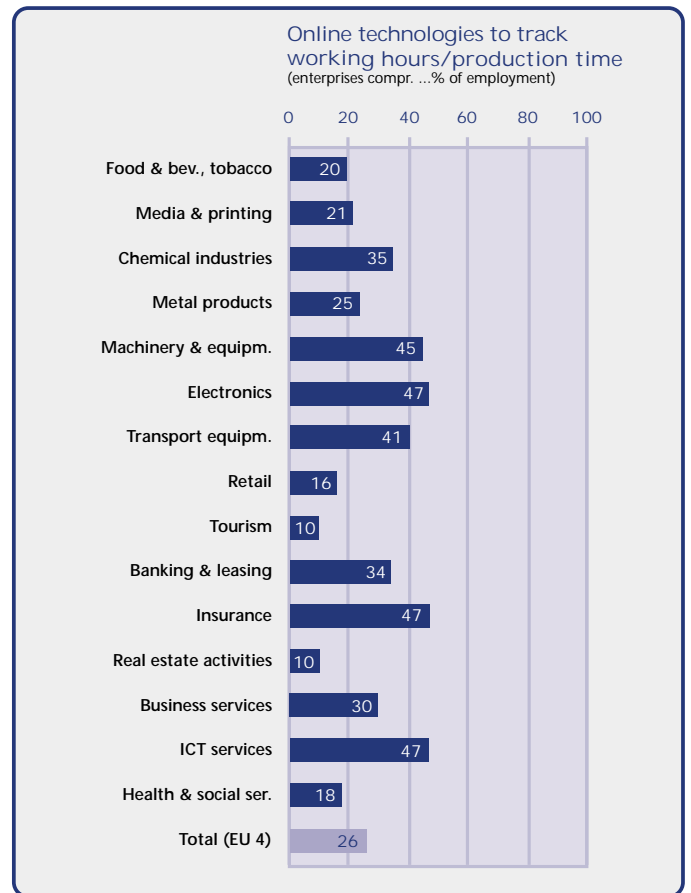
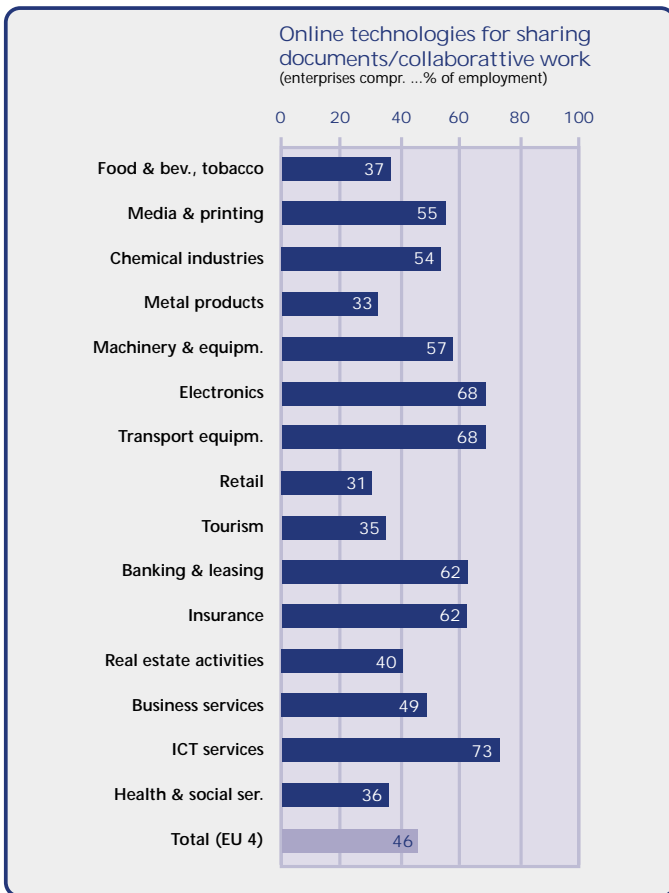
Series I.2: E-commerce activities by business activity



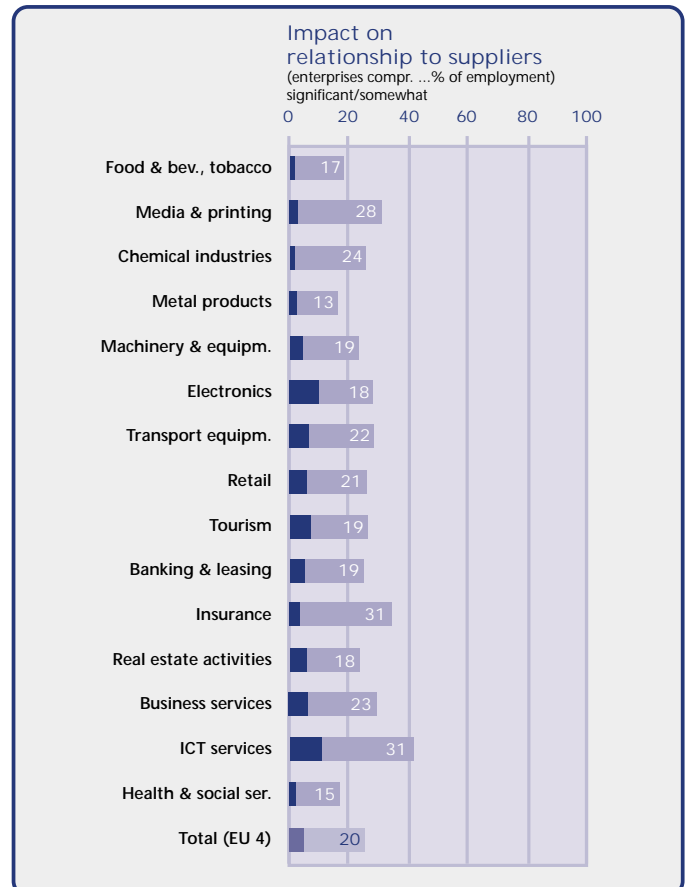
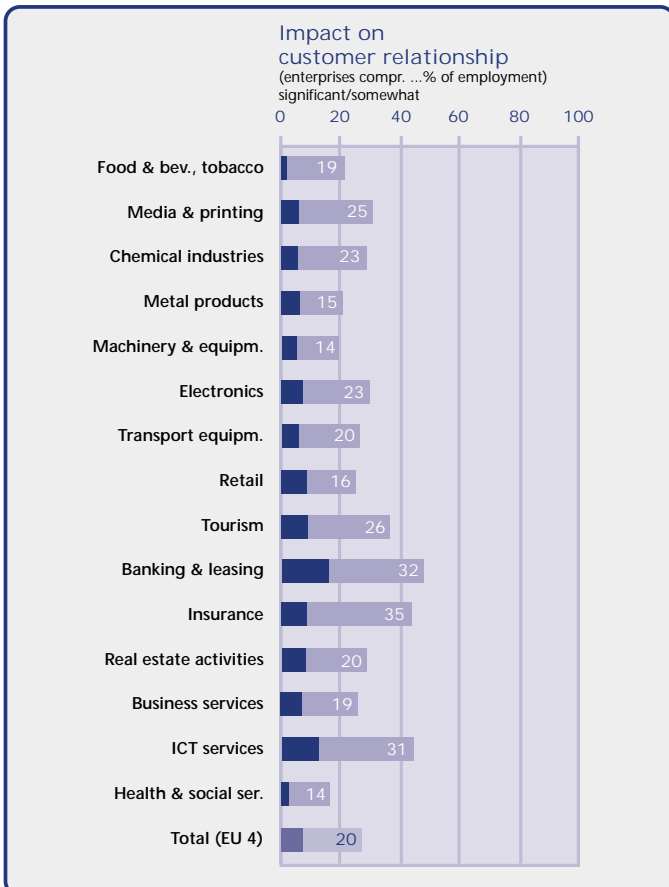
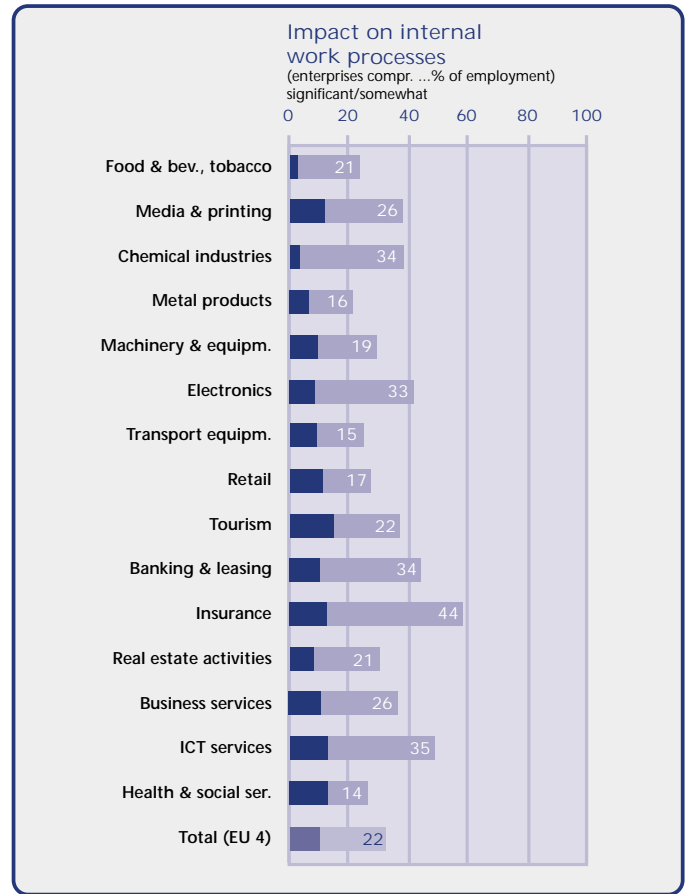
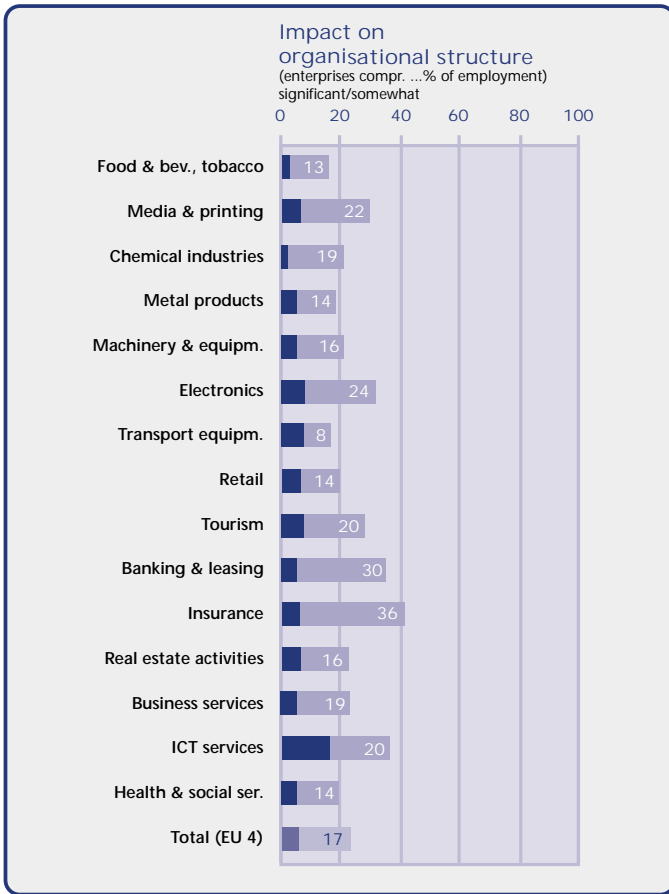
Series I.3: E-commerce intensity and integration by business activity



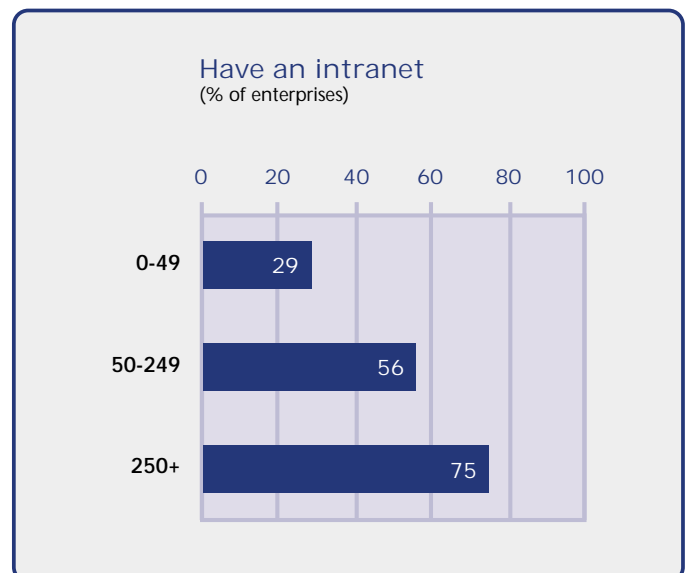
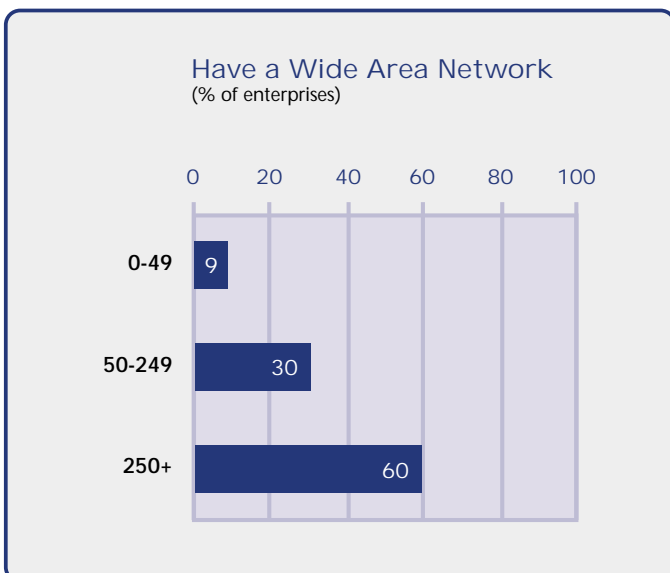
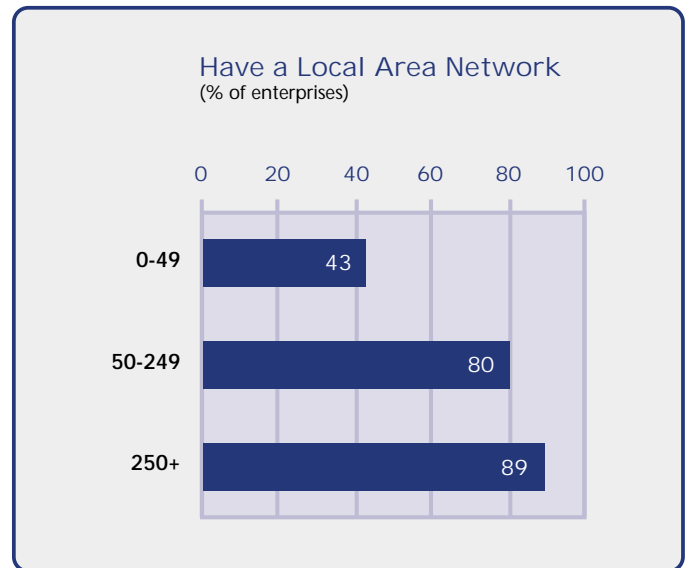
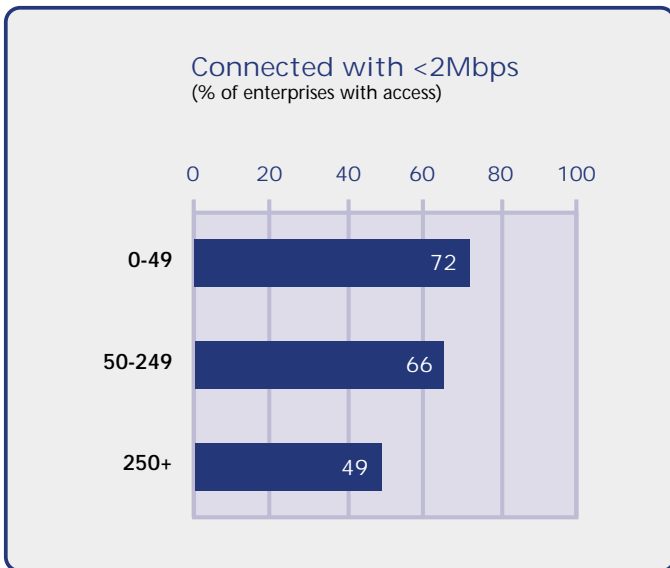
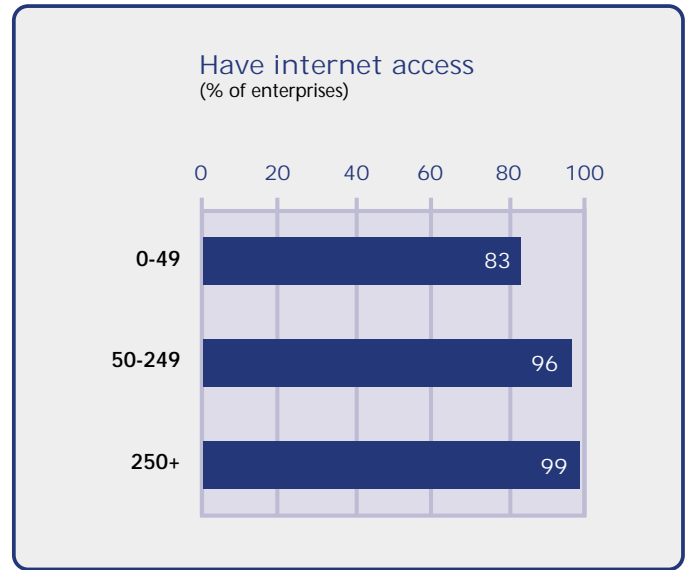
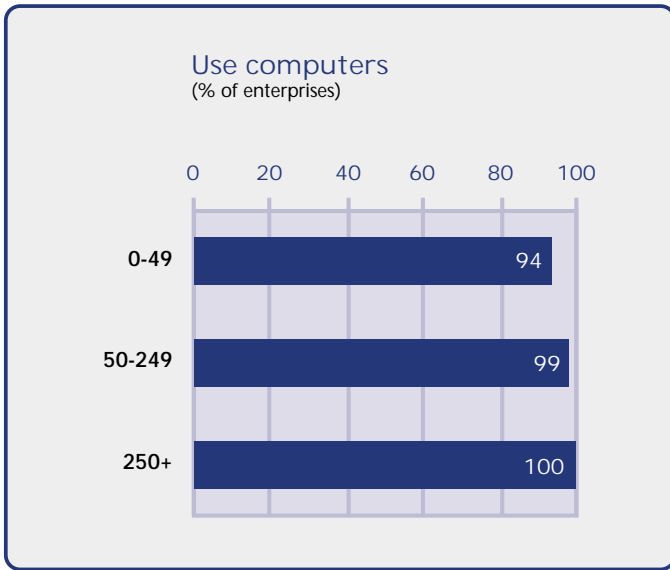
Series I.4: E-processes by business activity



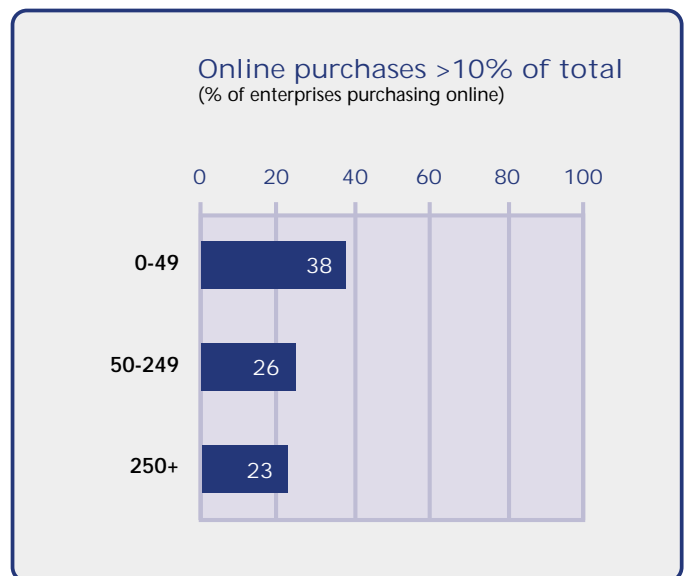
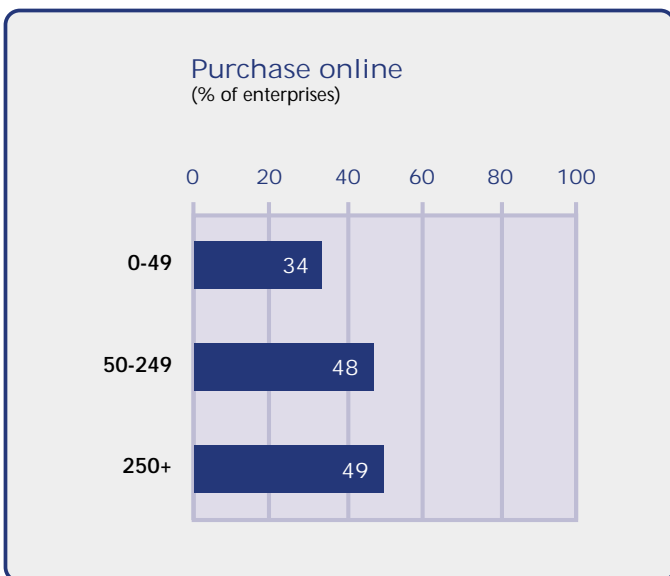
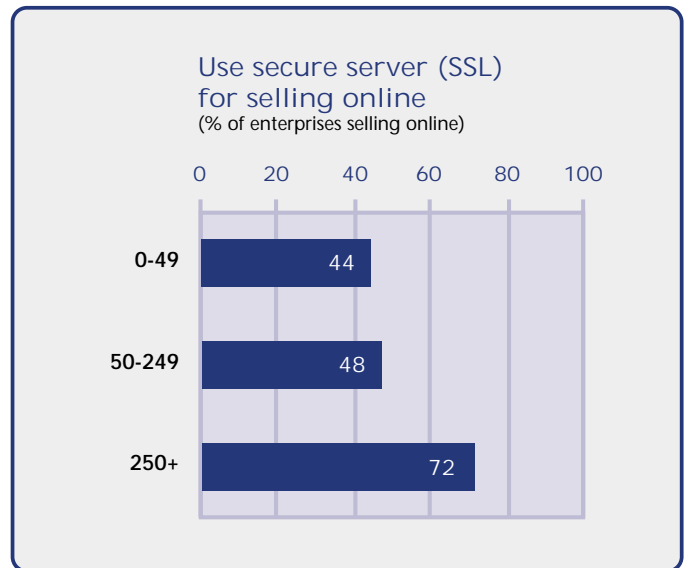
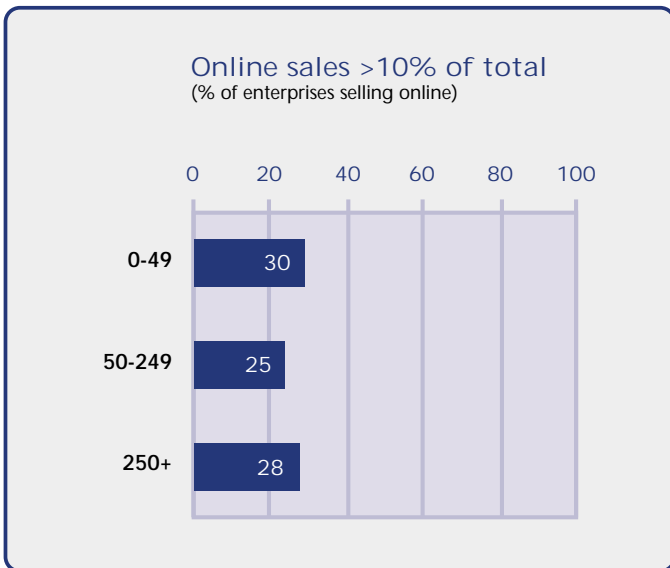
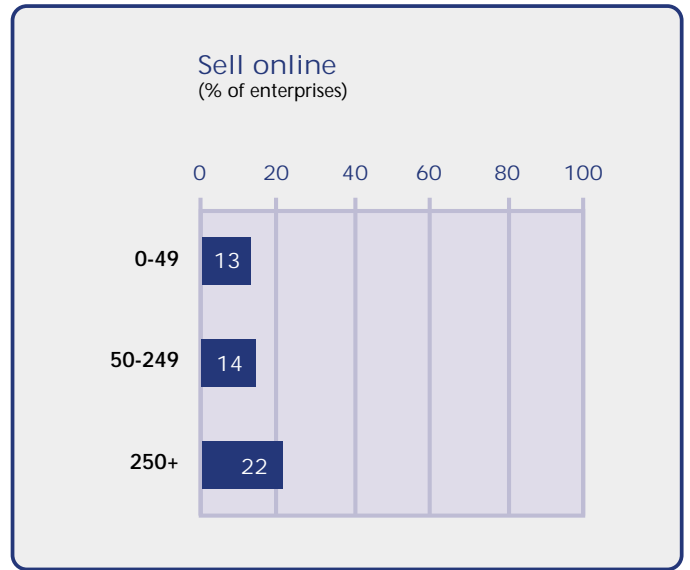
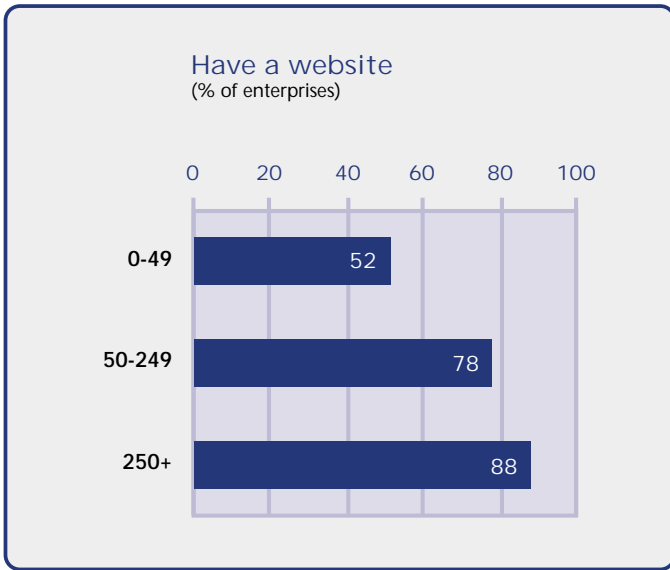
Series I.5: E-business impacts by business activity



Series II.1: ICT infrastructure by company size class

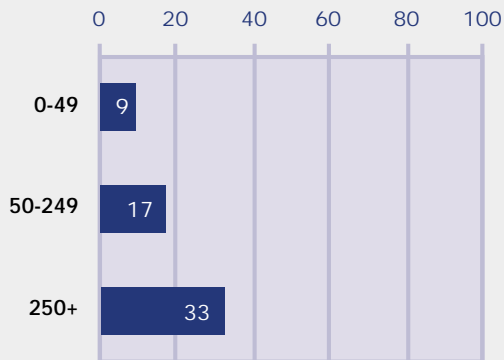


Series II.2: E-commerce activity and intensity by company size class

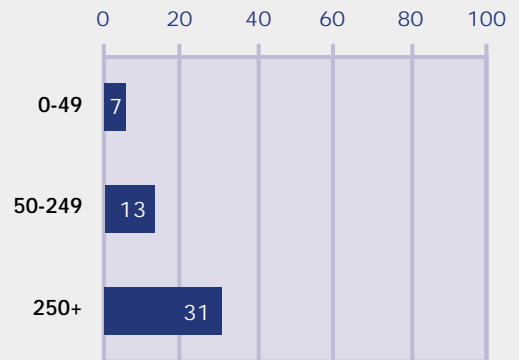


Series II.3: E-processes by company size class

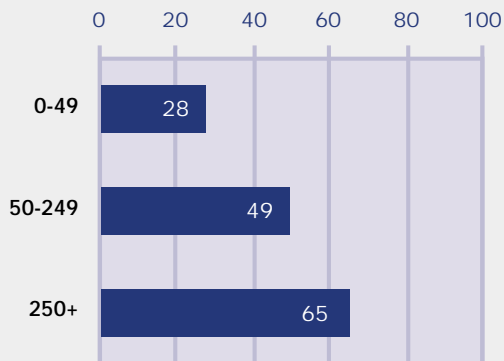
Online sales integrated with backend systems
(% of enterprises purchasing online)



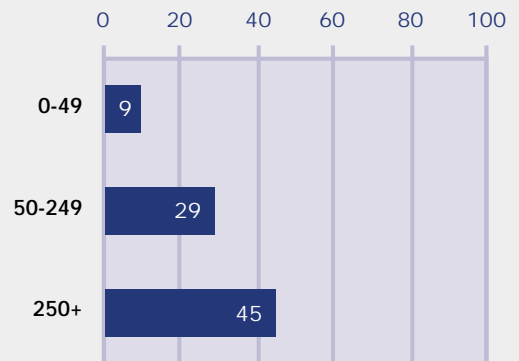
Use a CRM solution
(% of enterprises)



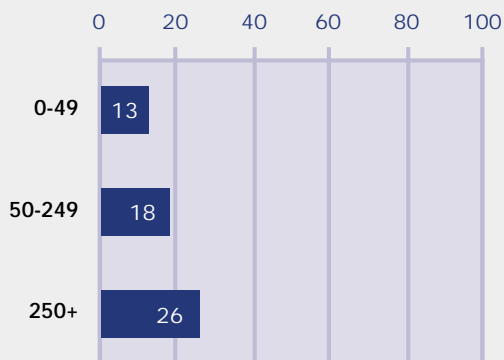
Online technologies for sharing documents/collaborative work
(% of enterprises)



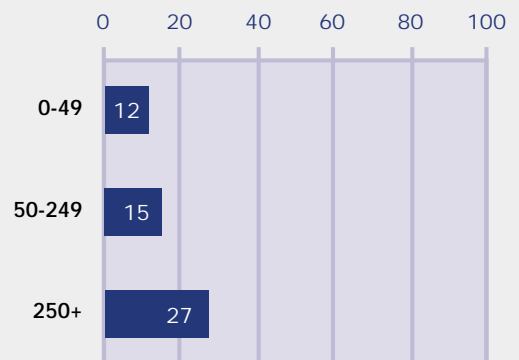
Online technologies to track working hours/prod. time
(% of enterprises)



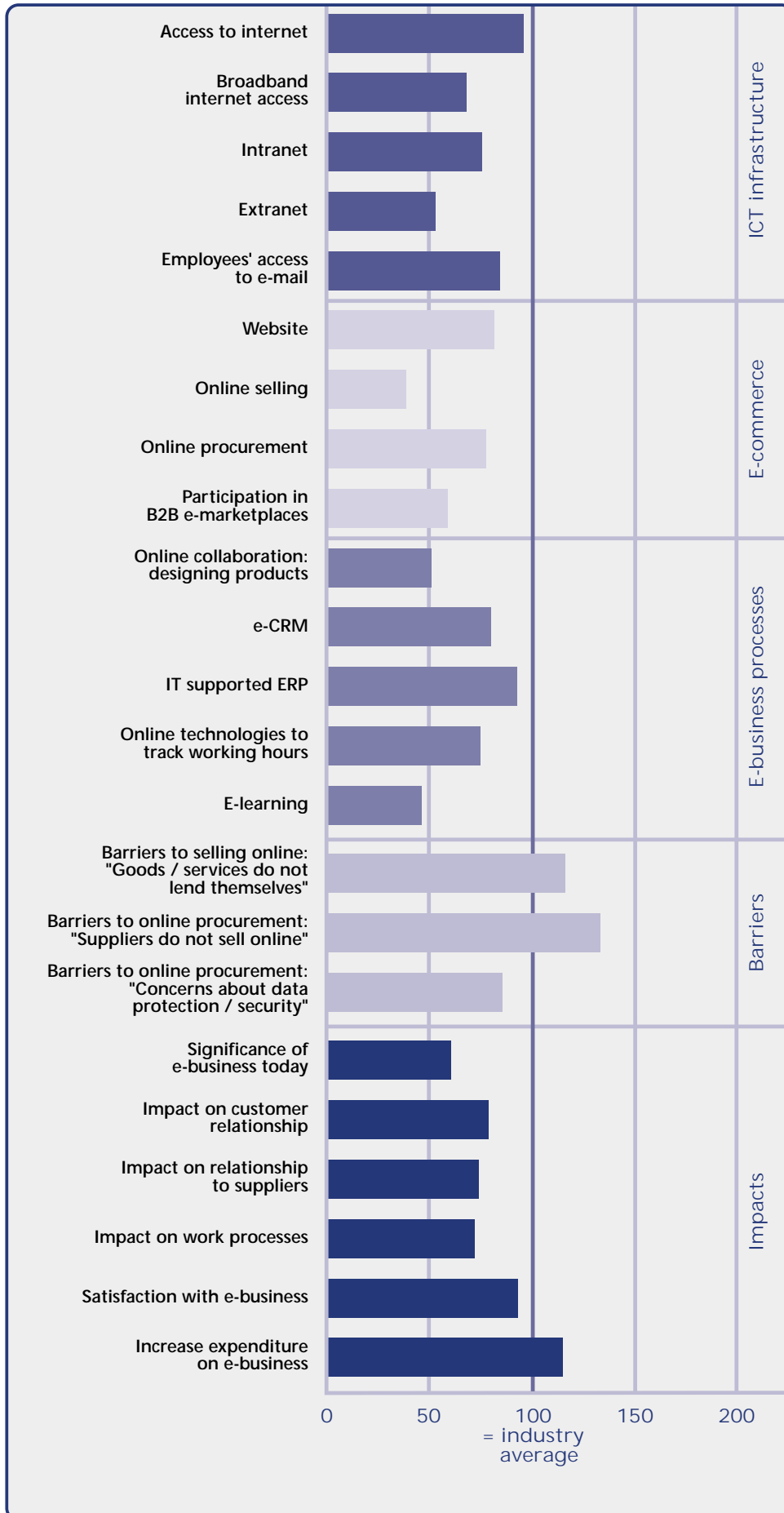
Online collab. with business partners for designing products
(% of enterprises)



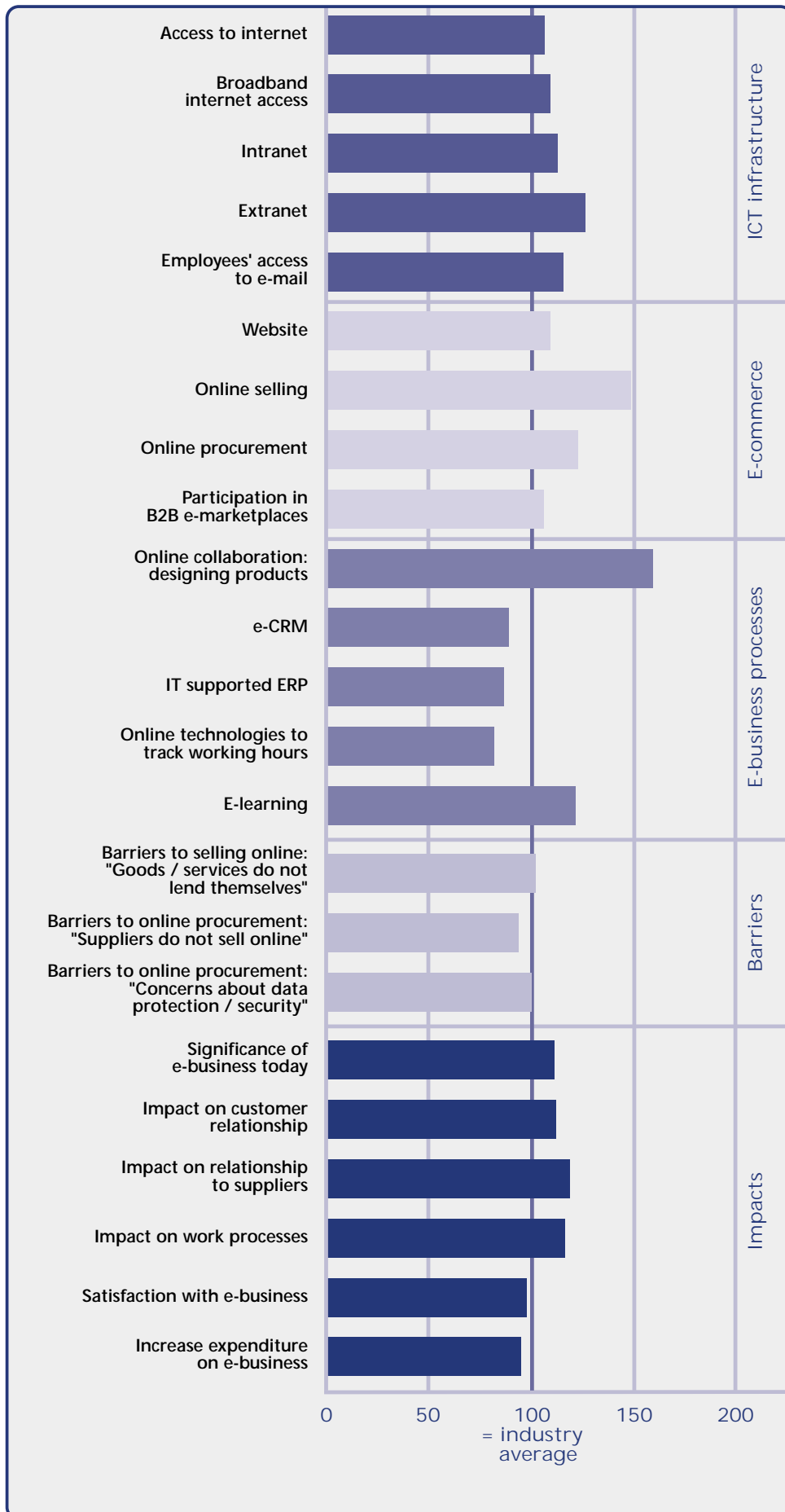
Use e-learning tools
(% of enterprises)



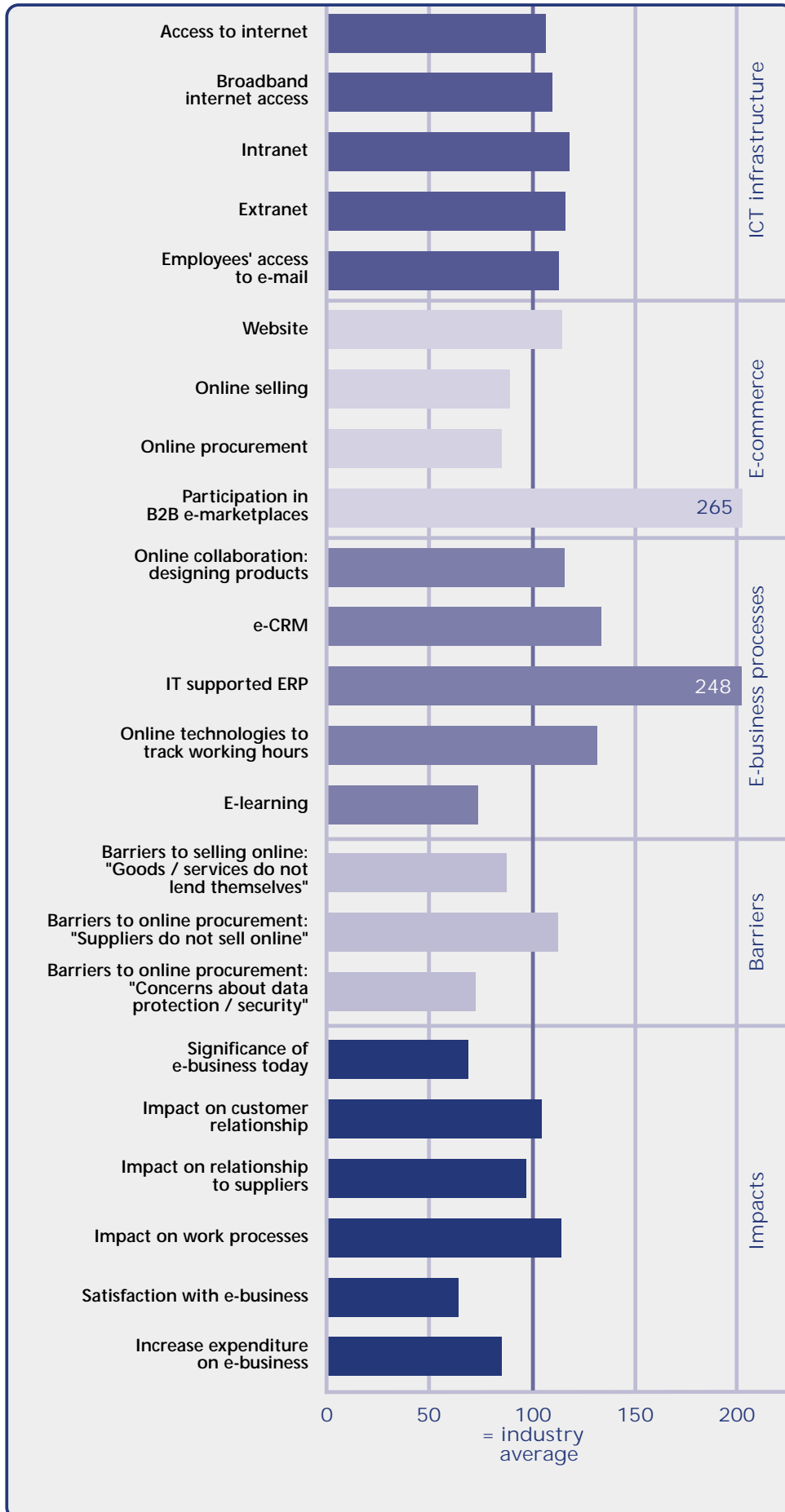
Scoreboard 1: Food, beverages and tobacco



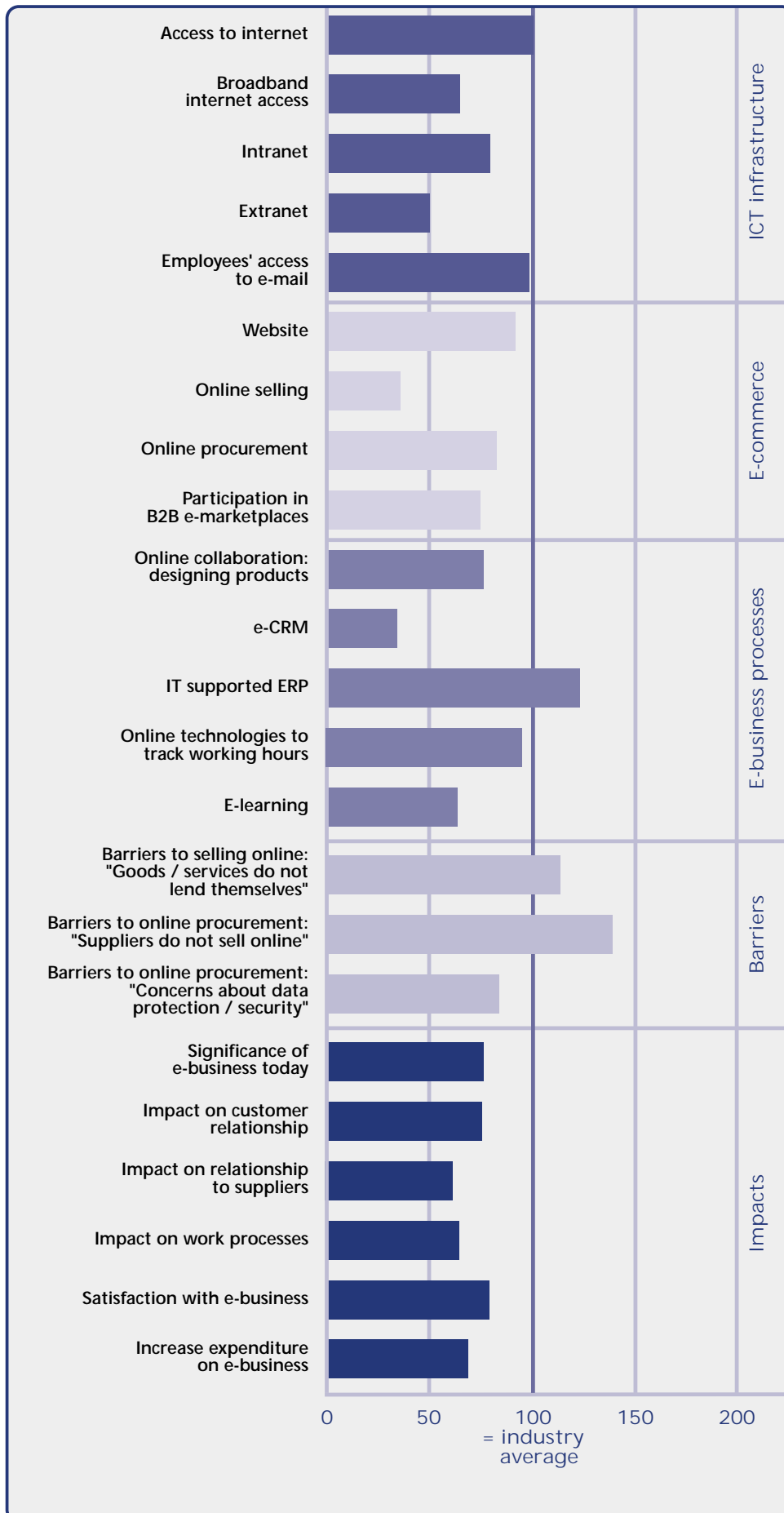
Scoreboard 2: Media and printing



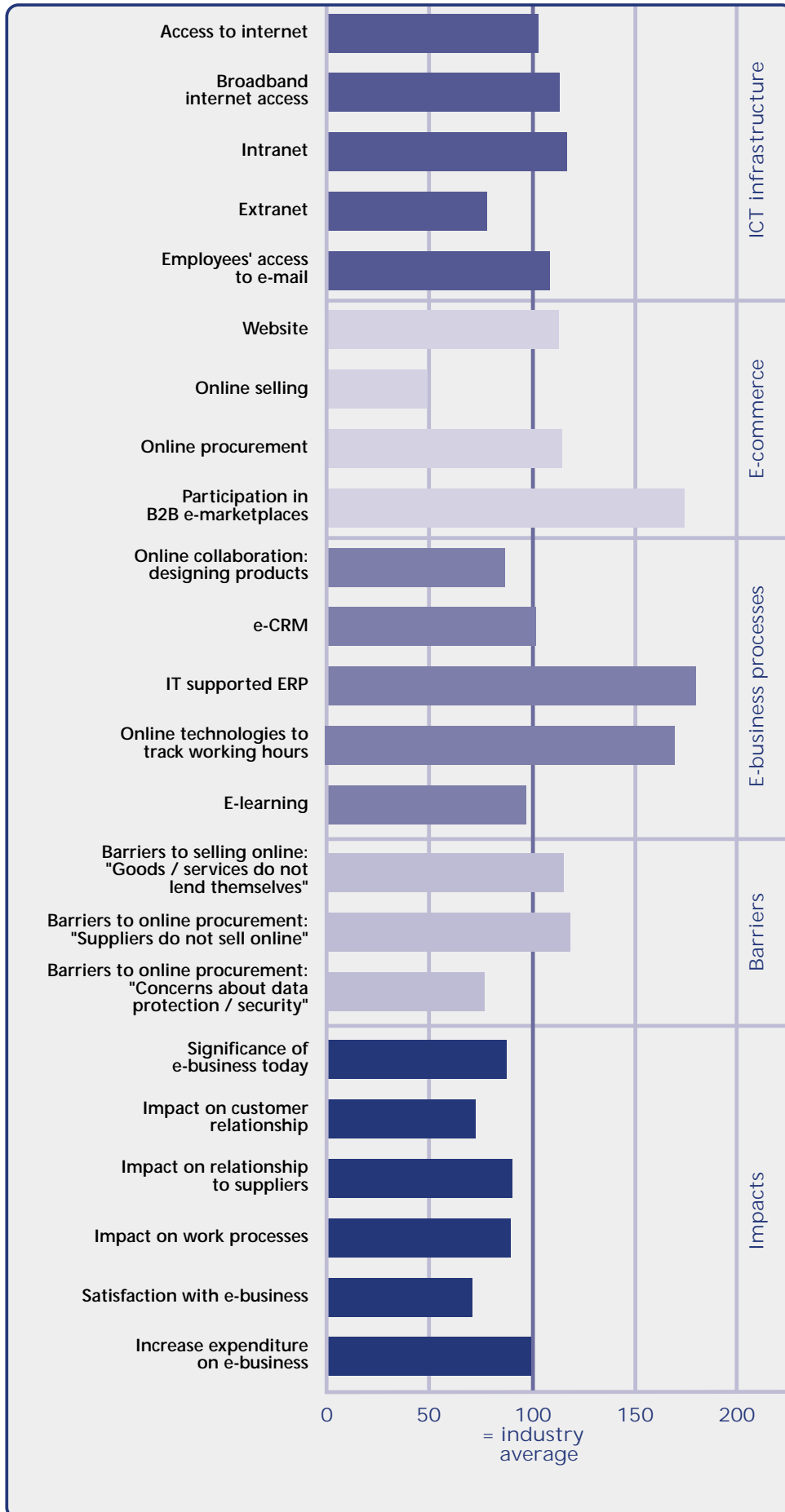
Scoreboard 3: Chemical industries



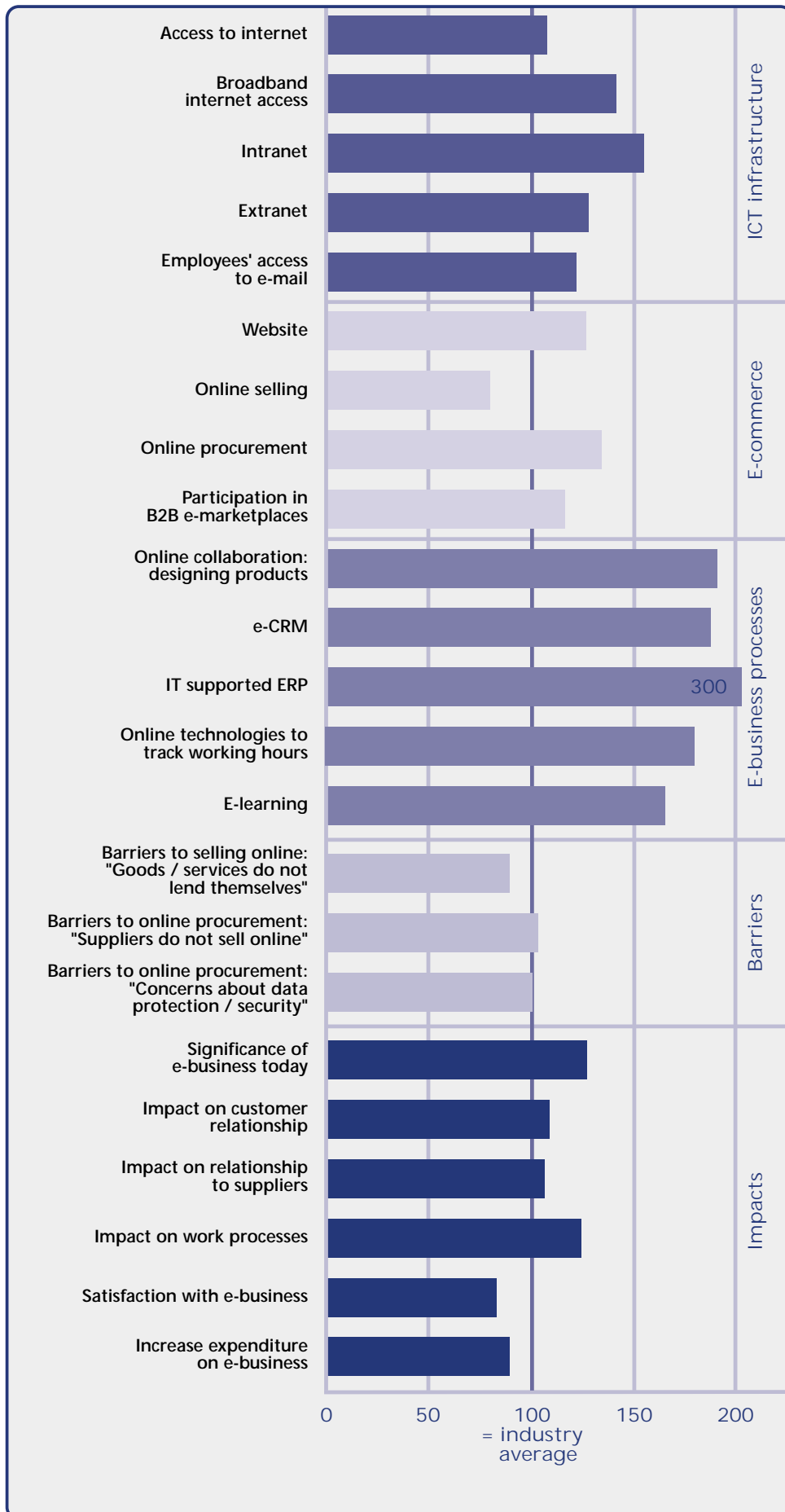
Scoreboard 4: Metal products



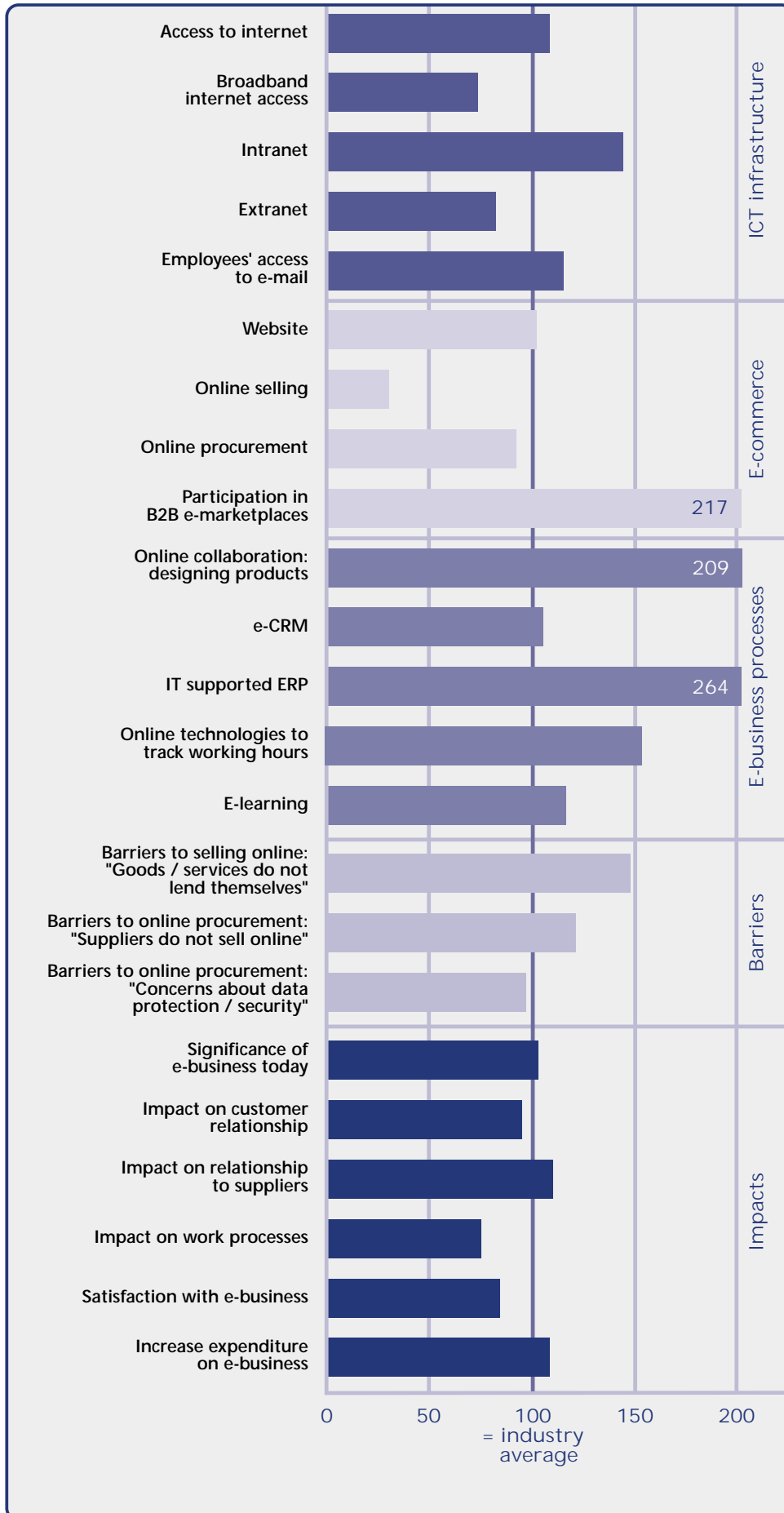
Scoreboard 5: Machinery and equipment



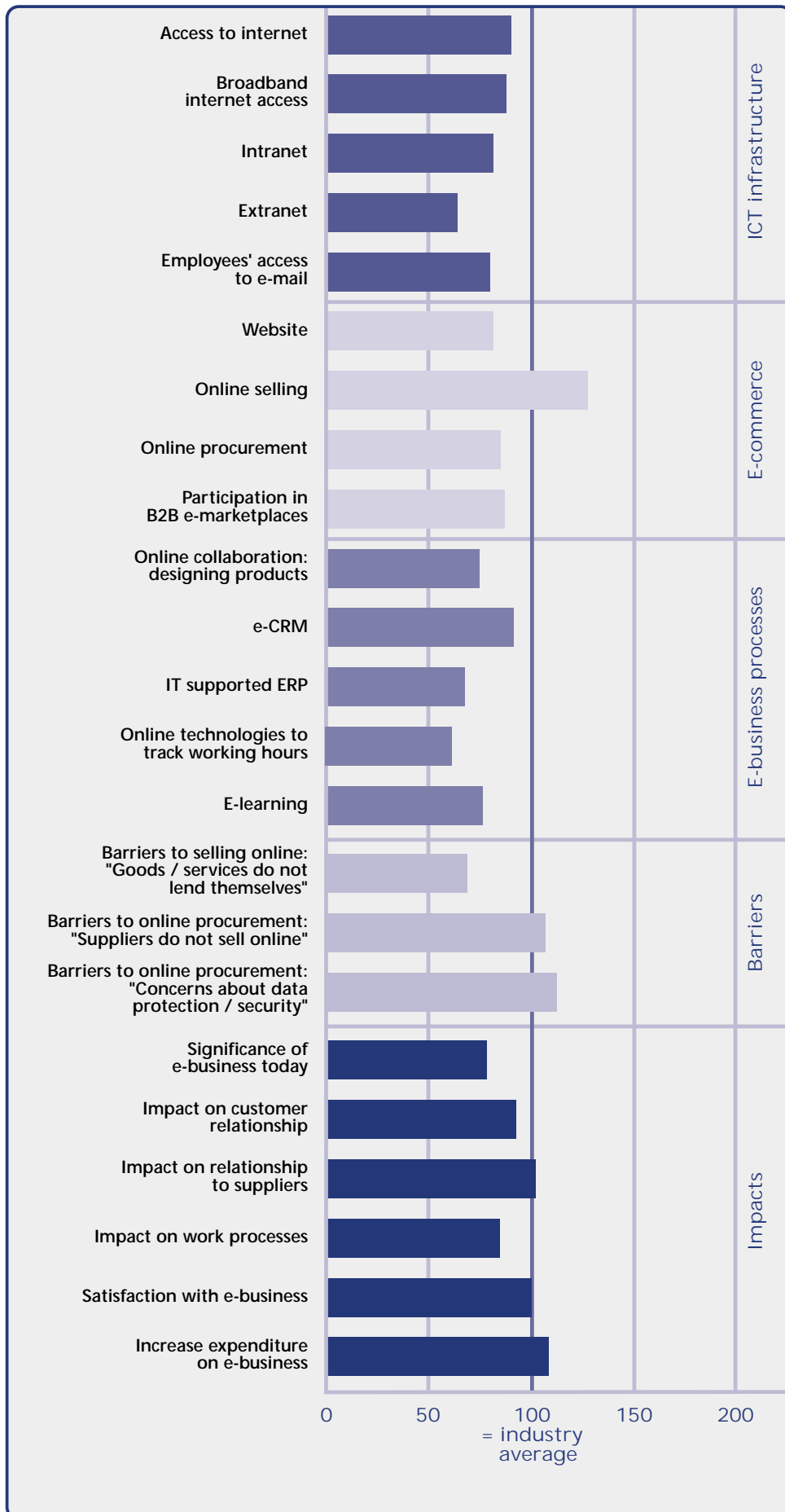
Scoreboard 6: Electrical machinery & electronics



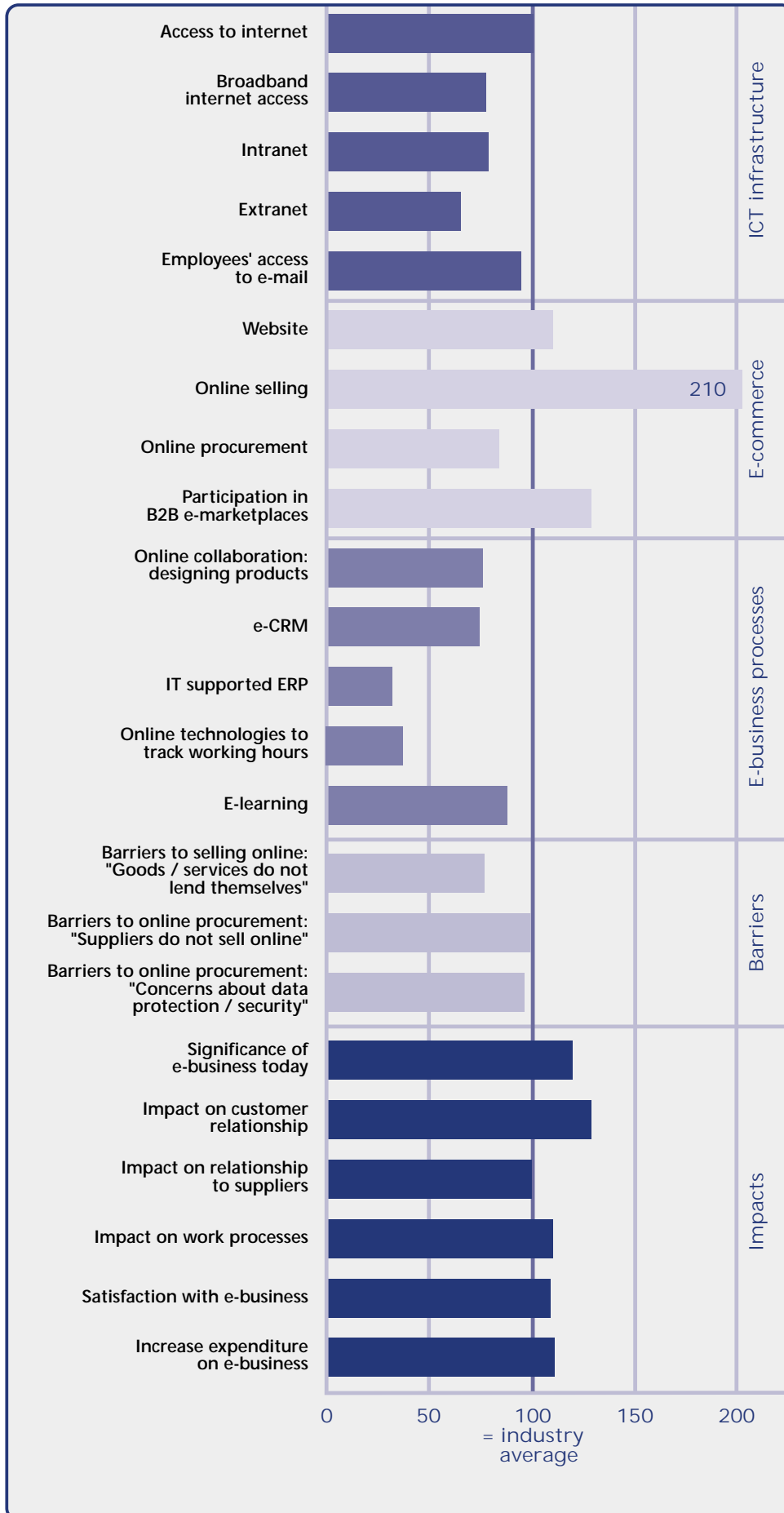
Scoreboard 7: Transport equipment



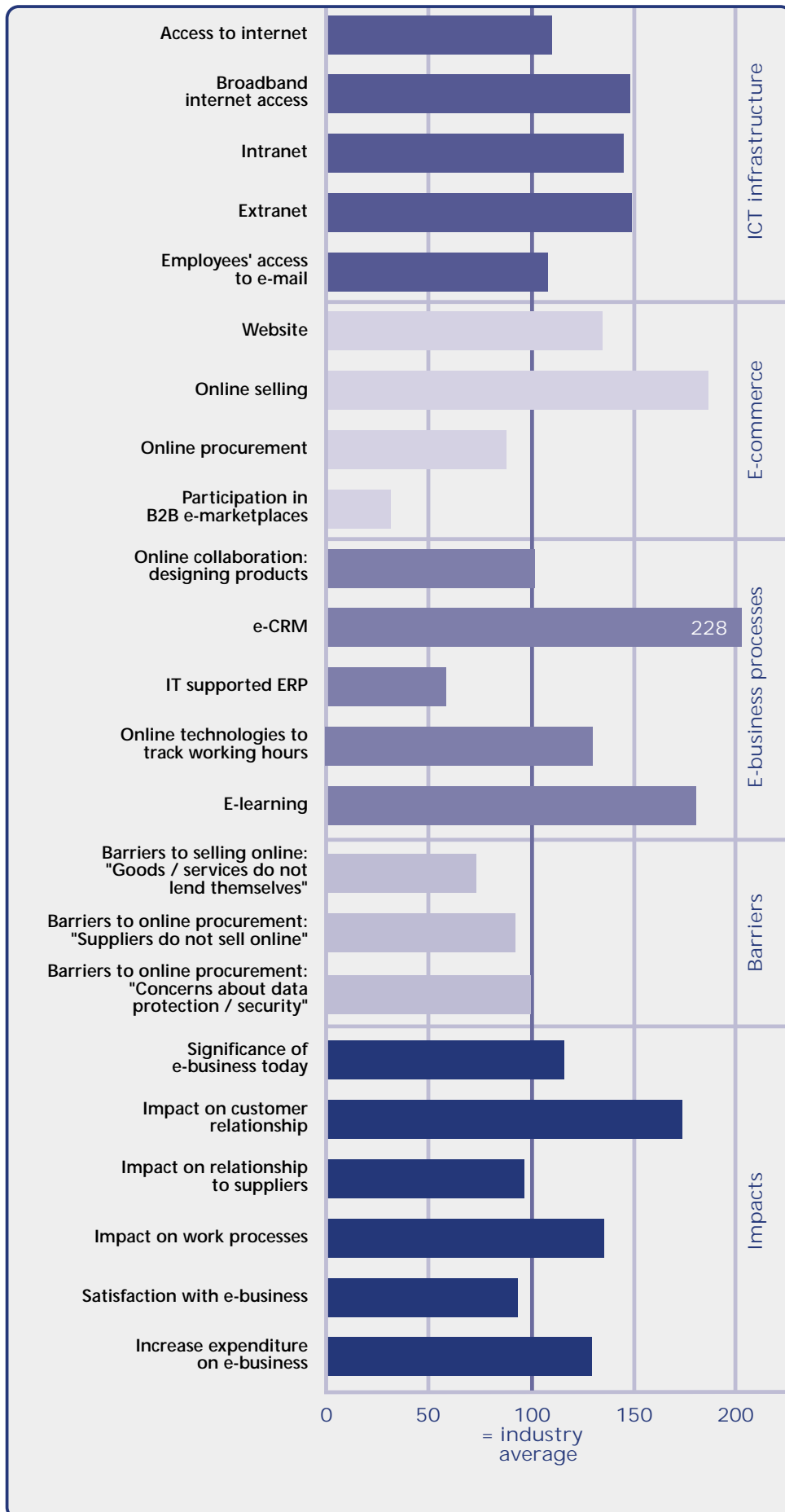
Scoreboard 8: Retail



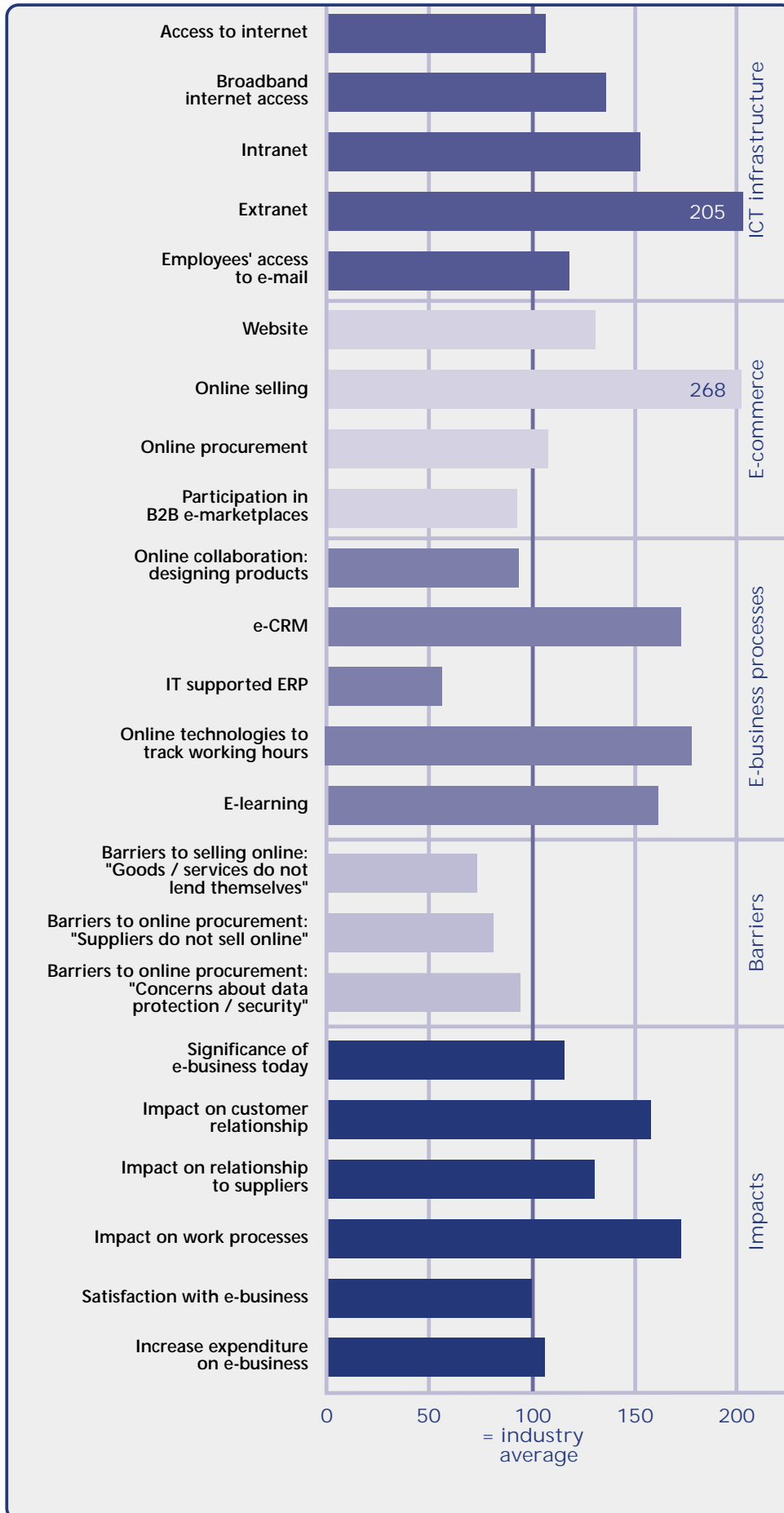
Scoreboard 9: Tourism



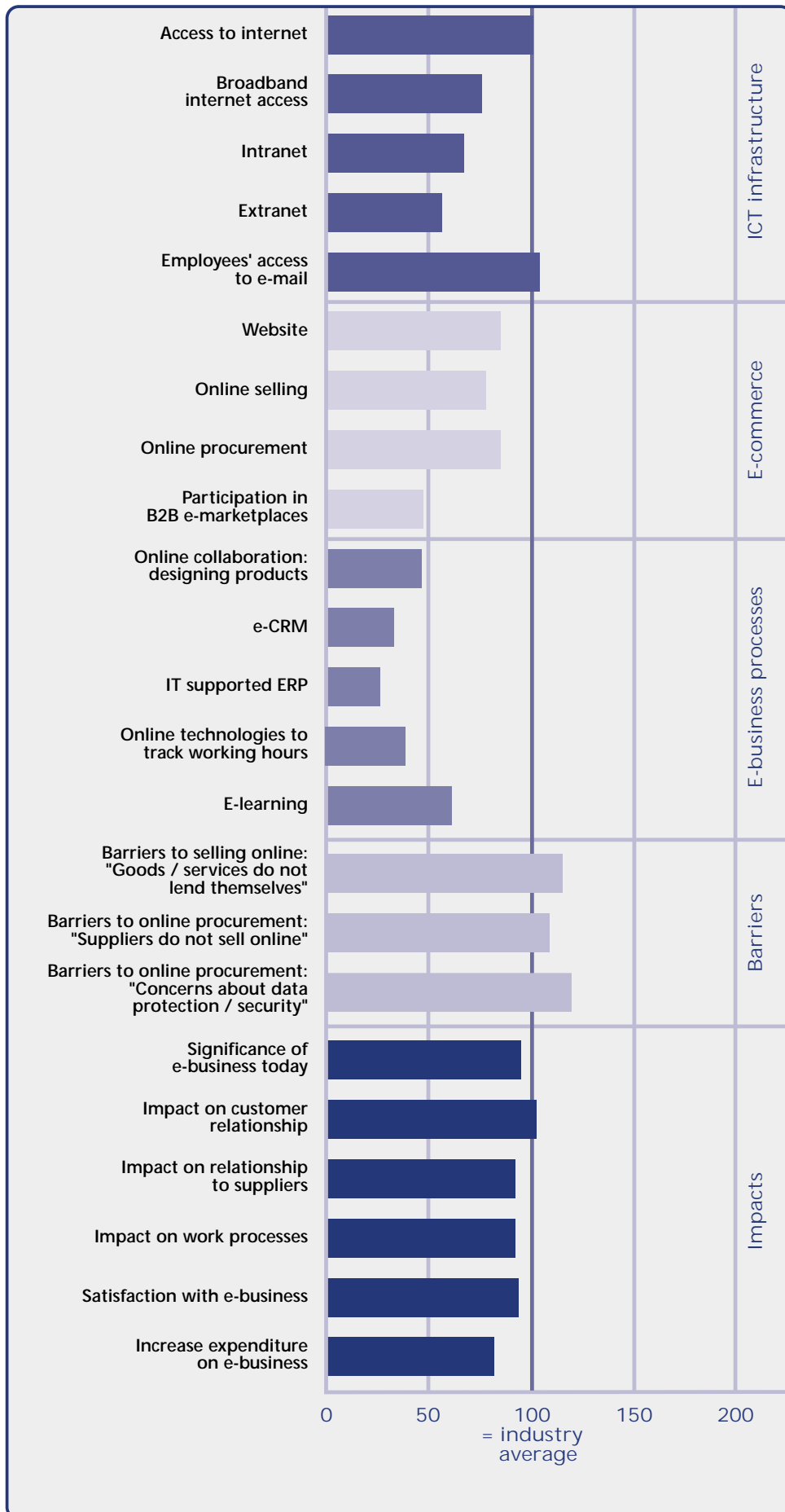
Scoreboard 10: Banking and leasing



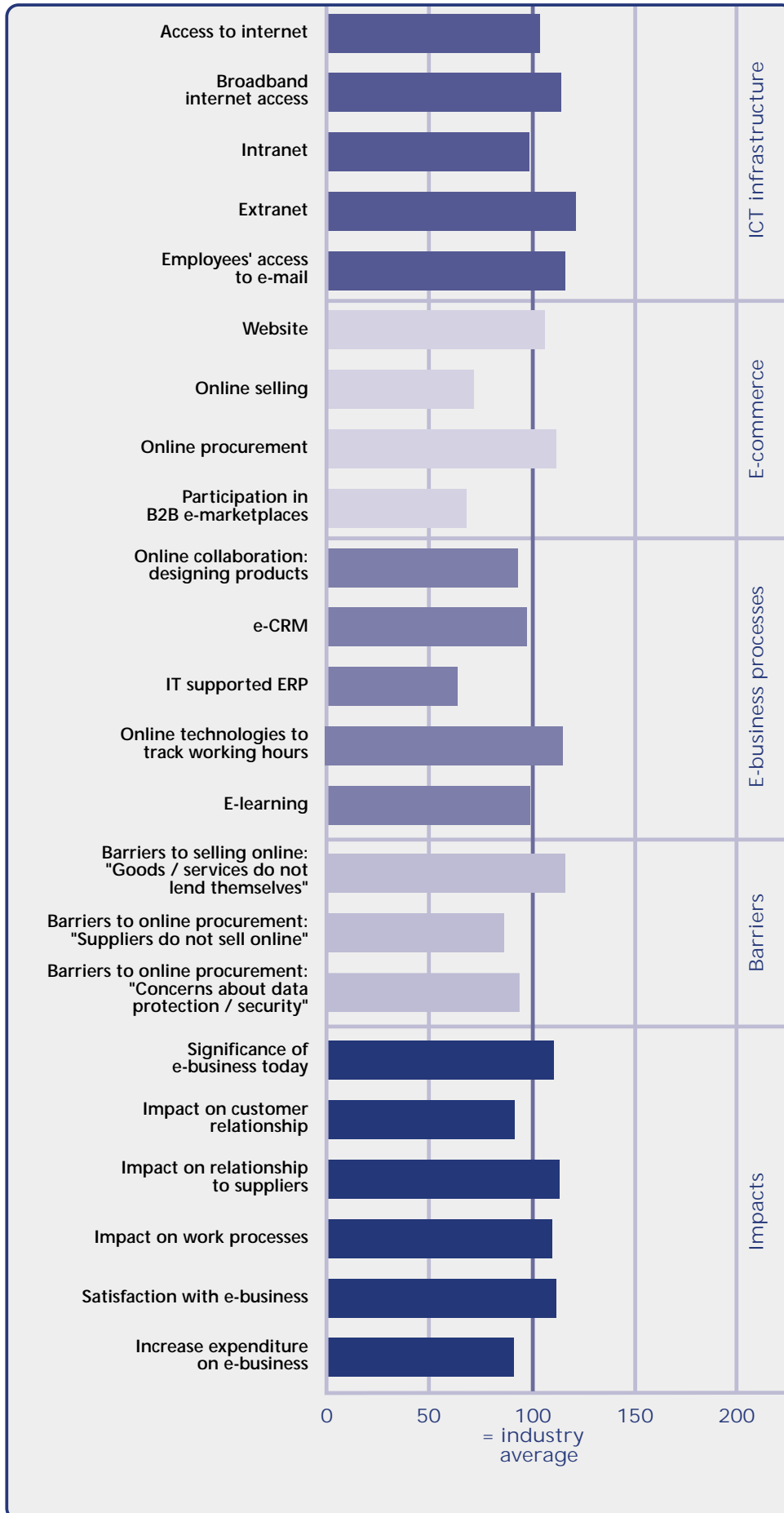
Scoreboard 11: Insurance and pension funding



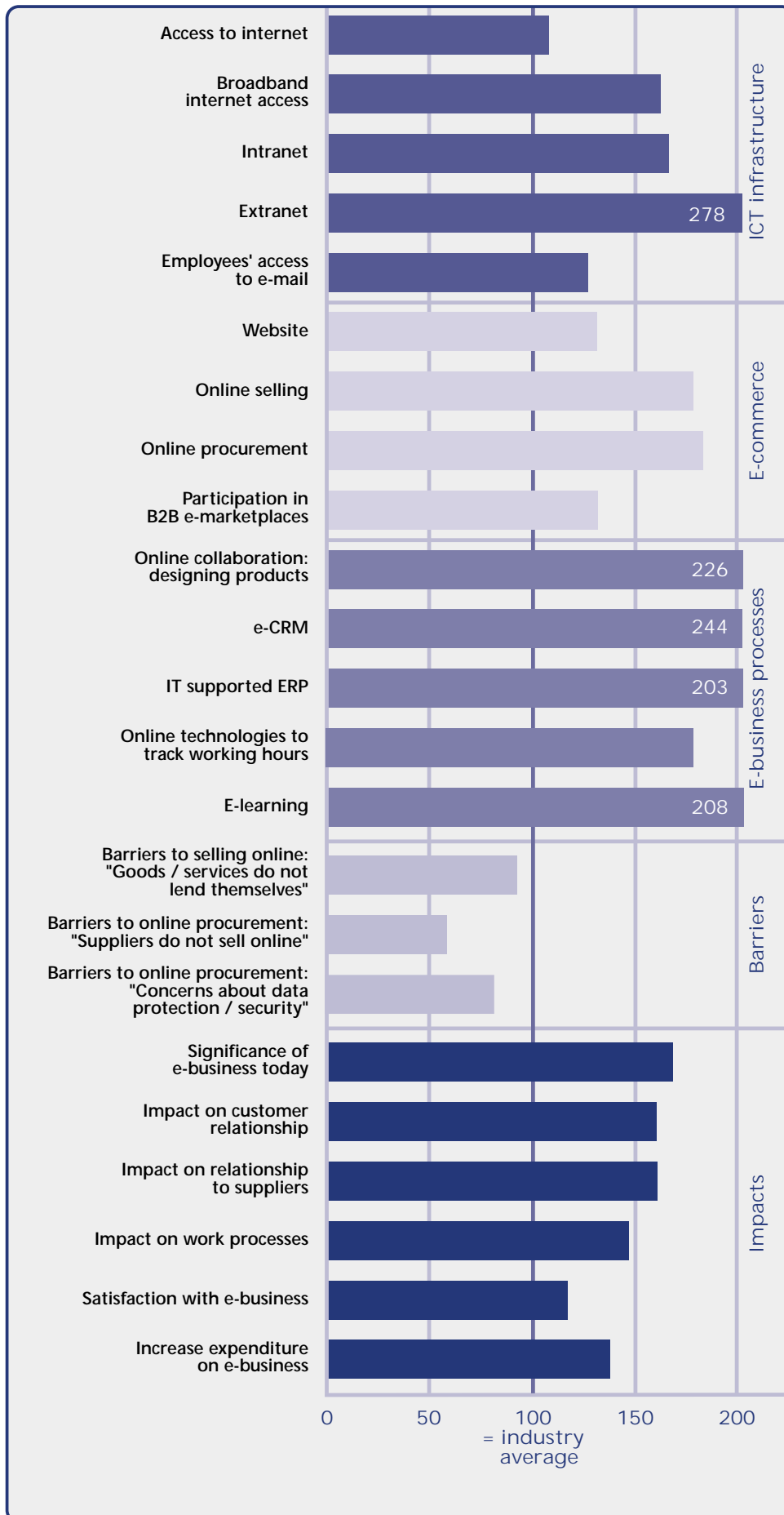
Scoreboard 12: Real estate



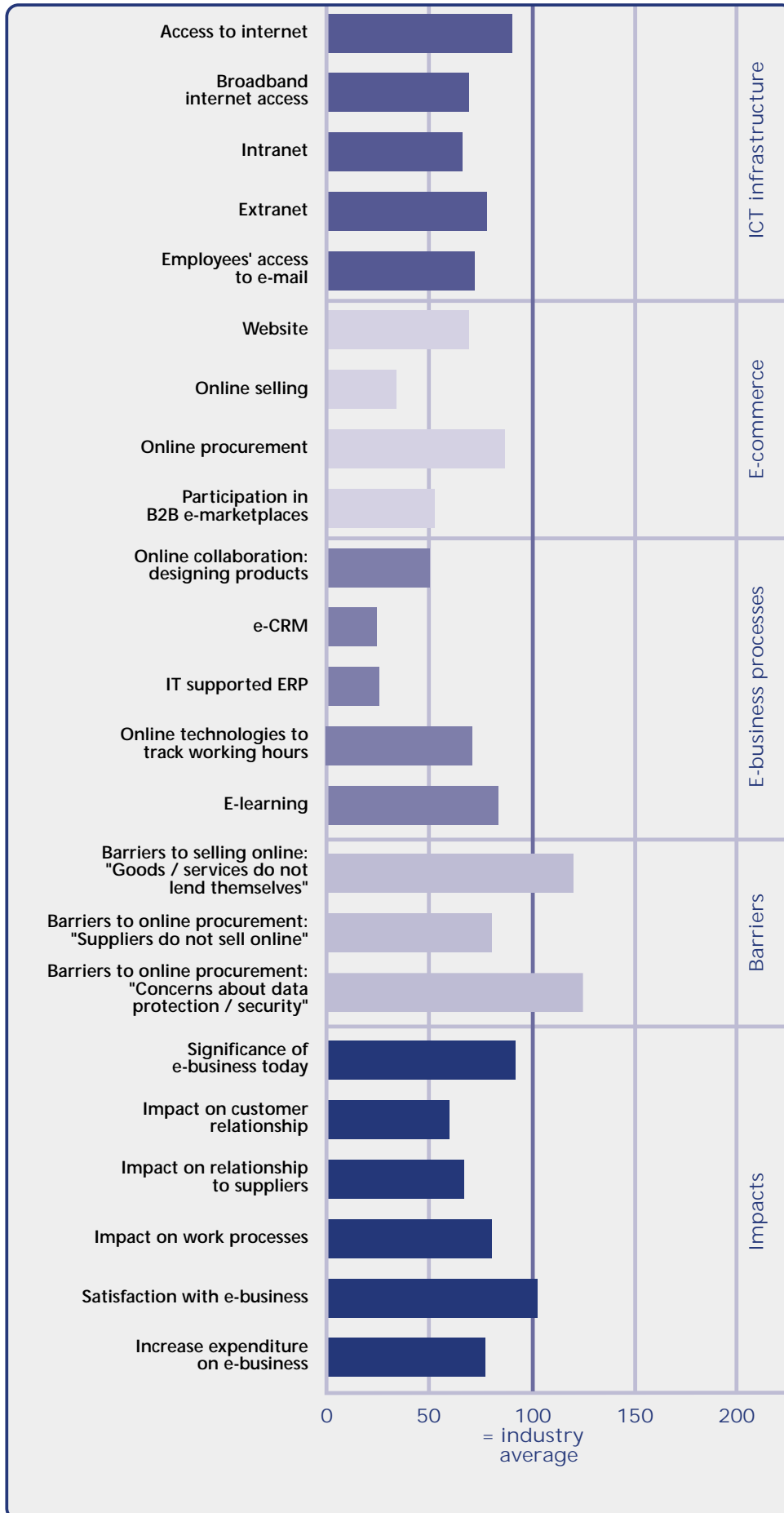
Scoreboard 13: Business Services



Scoreboard 14: ICT services



Scoreboard 15: Health and social services



Part B: Contributions

Products and Services Online: The Moving Mix

by Enrico Colla, CERIDICE¹⁵

Some categories of products and services are sold worldwide much more than others, due to some form of “appropriateness” with the web. But some differences still appear among different regions of the world, which can be explained by various demand and offer characteristics. Differences are also evident by consumers segments and for the same consumers over time.

Appropriateness can be explained by same product or service characteristics, but also by confidence, thrust and consumer attributes. These factors help to explain the nature and the extent of the future “disintermediation” of different categories from conventional retail channel to electronic ones in the future. New actors appears like “metamediaries”.

Statistics by regions, countries and segments

Appropriateness to online selling is reflected in statistics: travels, financial intermediaries and leisure are the best selling service categories online. They will stay on top in the next years. But also if we consider products, a lot of similarities worldwide still exist in what consumers buy online. According to Ernst & Young, books, CD's, computer hardware and software are in the top three categories of the majority of the countries surveyed, and toys, flowers and some textiles are following. Clothing, for example, ranks in the top five in USA and Australia, with over 37% of US online consumers likely to purchase the category.

Even if not too great, there are some transatlantic differences in online selling. In Europe we may observe a slightly higher percentage than in USA for video, music, travels, tickets and grocery. Different consumption and buying behaviour may explain those variations, as the existence of

innovative firms. For example, because of the greater development of the category, food and drinks account for 23% of online purchases in the UK. But this is partly due to Tesco and its innovative online selling, based on deliveries from stores. Dell is another example of a very successful business model of online selling of electronic products worldwide, and particularly in USA. The high consumption of toys in USA has also favoured the bigger development there of online selling of this products than in Europe.

Differences in online selling are evident by consumer segments defined by age, gender, lifestyle, etc. and the mix of product bought online evolves over time, as consumers become more adventurous (Reynolds 2002) in their purchasing.

Men are more interested than women in the adult sector, for example, and women like astrology or horoscopes more than men. An “affinity” ratio (NetValue 2001) can be used to compare different segments, where affinity is determined by the reach of the overall Internet population against the reach for the chosen segment. Segmentation can combine the product/service segment with the country: French men have the highest affinity with the use of streaming video sites and men in Germany had the highest affinity with the weather sector.

Factors explaining online sales

Appropriateness can generally be explained by same product/service characteristics. The most important factors for buying online (convenience, variety, savings, information availability, entertainment) have not the same level of relevance for all goods and services. That's why there are such important differences among them.

Although a wide variety of goods and services are capable of being offered via electronic channels, there is a general agreement that revenue and profitability from some categories will grow faster than others. The information content and the possibility of delivering it online is the main reason which explains the past, and future, performances of services such as travel (airline tickets), financial intermediaries, mortgages, car insurance and hotels.

As far as products are concerned, the perspective of online selling depends on a certain number of their characteristics, but also on familiarity and confidence, the degree of consumers recognition and trust already present. Some consumer

¹⁵ Centre for Research In Distribution and Electronic Commerce at the ESCP-EAP European School of Management, Paris

attributes are also important, indicating the extent to which the consumer might want to make the purchase electronically, independently from products characteristics, confidence and trust.

The perspective of online selling is higher when consumers don't consider it important to touch and try the product, when in-store experience is generally unpleasant, when customisation is important and when the product service has a personal nature, margins are high, delivery is cheap, instant gratification is less important, standardisation is high, price sensitiveness is high, products are gift oriented and information is important in the consumers' buying process (Rosen and Howard 2000).

These factors favour online selling of books, sporting goods, computers, toys, electronics, but also jewellery, basic grocery, clothing, basic household goods, drinks.

Risk of future disintermediation

The future online sales of different categories of merchandise will depend also on the nature and the extent of the future "disintermediation" or migration from conventional retail channel to electronic ones in the future. According to the research conducted by the British Council of Shopping Centres (BCSC 2001), the highest risk of disintermediation will have to be faced by banks/financial services and travel agents. Low-medium risk will characterize other traditional retailers in the following orders: secondary shops, outer shopping centres, department or variety stores, retail warehouses, supermarkets, neighbourhood and district centres. Large city-centre shopping centres, out-of-town shopping centres and prime shop will be the least threatened categories of retailers.

Category specialists' dominance and assortment enlargement

Due to the low market share of online selling in each category, the low geographical barriers to the development of firms and the high level of competition, concentration is very high and in each sector one or two leaders are emerging. Category specialists are dominant (like Dell, Tesco, Schwab, Lastminute) with a high degree of authority in product and service selection, which is positively correlated with consumer confidence and satisfaction (Szymanski and Hise, 2000) but some diversification is also developing. Some

firms try to expand products assortment (like Amazon who, after books and CD's, has introduced toys and electronics), and/or add a variety of services to their offering (like second-hand goods, auctions, more extensive information on available products, etc.).

A way of distinguishing four product grouping categories with implications for the sector structure and type of competition is based upon scale of gross profit and availability of supply. The four categories are as follows (Woodham Smith 2001):

- high gross profit, high supply categories, "such as travel, where airlines, cross-border firms, and local outfits compete in every country, will see fierce battles that will leave only the biggest firms standing";
- high gross profit, low supply categories, "such as health and beauty, contain Europe unexploited opportunities and the retrenchment of health and beauty pure plays has created a supply gap for multichannel retailers";
- low gross profit, high supply categories, "like music and books, too many retailers contend for too little gross profit, and continued consolidation and shifting business models will reign";
- low gross profit, low supply categories, like jewellery, which "does not justify dedicated online stores. However, a dearth of competitors makes these categories prime range extension for retailers";

New actors: metamediaries

New entrants in e-commerce which are not specialized in just one category of products or services are the "portals" or "metamediaries" (Sawhney 1999). These new actors seek to aggregate markets using benefit segmentation rather than geographical one and taking advantage of the Internet more effective capabilities for linking and aggregating information and knowledge related to certain kind of activities in a way that is not possible, or is more difficult, conventionally.

According to this contribution, metamediaries should offer a rich set of activities that :

- could be clustered together
- were important in terms of their demands on customers' time and their economic impact

- required customers to deal with many product and service providers across several industries
- were in markets containing integrated intermediaries who currently provide channel flow inefficiently and where the buying experience might be objectionable or uncomfortable.

We can think of plenty of unpleasant or difficult buying experiences: car buying or moving home spring to mind. Other potentially new markets that can be created which satisfy Sawhney criteria might include child-birth, weddings or holidays (Reynolds 2002).

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@ ecolla@negocia.fr

Offline Skills for Online Success

by Menno Smidts and Pim den Hertog,
Dialogic, Utrecht ¹⁶

In the first years of e-tailing companies invested heavily in their front offices. Expensive websites were constructed and large sums of money were spent on marketing and powerful brand-building campaigns. The e-tail community discovered that customer expectations could not be met by powerful brands and beautiful websites alone. In the year 2000 some companies in the US were fined by the FTC (Federal Trade Commission) for

not delivering Christmas presents in time for Christmas.

Online success therefore also depends on offline skills. Customers' web-shopping expectations are met when the right product is delivered at the right place at the right time and without any errors. This offline fulfilment turns out to be very difficult and expensive to achieve for e-tailers. It squeezes margins into losses and puts customer satisfaction under pressure.

In the traditional retail value chain the consumers themselves organise the most difficult part of the logistics chain. They are advised by shop employees, pick their products from the shelves, pay for them at the counter and subsequently take their new goods home, usually in their own car.

This active customer participation is absent in web-shopping. The e-tailer himself has to pick, bundle, pack the online orders and then take the goods into suburbia in small (expensive) vans in order to complete the delivery process. If customers fail to answer the doorbell (which often happens) distribution costs rise further because a second attempt to deliver the goods has to be made the next day. E-tailers make a loss when dissatisfied customers return their goods and claim their money back. This is a common phenomenon in distance selling.

E-tailers unable to organise this offline part of their business will probably lose customers, become confronted with rising costs and are much more likely to go bankrupt. Basically, e-tailers have three options for the delivery of goods ordered online:

- making use of existing shops;
- developing new delivery points;
- making use of existing distribution channels.

Using existing shops

While it may sound paradoxical to use a physical store for delivering online purchased goods, there are some good arguments for doing so. Some well-known retailers use their shops for customer services, offering a return service for goods ordered online. By doing this they are able to limit transport movements, reduce costs, increase shop traffic and enhance customer service; all of which is virtually impossible through the online channel. Additionally, thanks to the use of existing channels, the delivery of online purchased goods

¹⁶ Based on: Dialogic (2001). Return to the bottomline, ECP.NL, Utrecht / Leidschendam; and Dialogic (2001) De laatste loodjes wegen het zwaarst, ECP. NL, Utrecht / Leidschendam

through physical stores is cheap, and thus a cost advantage is created.

One Dutch company (www.freerecordshop.nl) increased its online sales after deciding to deliver online-purchased goods through their main street shops. However, it turned out that many of their customers were under the age of 18 and did not possess a credit card which facilitated online payment. The opportunity to pay in the shop attracted a new customer group and online sales increased.

E-tailers starting out do not have a network of shops at their disposal and so in order to reap the benefits of a shop they can approach existing shops and distribution channels. This is also a commercial opportunity for existing companies with a network of shops.

Developing new delivery points

Consumers today, more than ever before, are very mobile. Instead of delivering at the consumers' homes, e-tailers can create opportunities for their goods to be picked up at roadside locations. Possible pick-up places are railway stations, motorway slip roads, petrol stations or airports. By establishing pick-up points at heavy traffic locations e-tailers are able to reduce delivery costs and increase customer service. These pick-up points can also function as a drop-off point for returned goods.

UPS and Texaco have developed a service for e-tailers (www.relaystar.com) enabling them to make use of the UPS distribution network and Texaco petrol stations as pick-up and drop-off points. E-tailers can plug this service into their website at a minimum cost. For some consumer segments this can be a useful system. However, one must be careful not to reinvent the traditional neighbourhood shop because that could yet again lead to a significant rise in costs.

Using existing distribution channels

The ultimate delivery is made at the front door. In recent years several companies tried to make fast and efficient distribution channels their strategic imperative. 'To save time and avoid traffic and long lines' was the slogan of New York based KOZMO until its bankruptcy in the spring of 2001. KOZMO sold DVDs, snacks, meals, flowers, toys, and other goods that fitted into the bicycle messengers' bags. It transpired that building up a dedicated distribution network was too capital intensive, even in a wealthy and densely

populated city like New York. Consequently, other models have to be applied.

Logistic service companies can be a significant help in this respect. Corporations such as Deutsche Post, TPG, UPS and Royal Mail exploit wide distribution networks. By making use of these networks e-tailers are able to take advantage of the economies of scale created by the distributors, which allows them to act quickly at relatively low cost. Secondly, e-tailers can increase their distribution volumes fast without the need for additional investment. Thirdly, logistics companies offer extra services such as order management, warehousing, post-transaction management and returns. And finally, delivery costs become variable, and thus the e-tailer is not faced with costs if no sales are made. These advantages make distribution companies an attractive option for e-tailers to outsource their last-mile logistics. Naturally, there are certain disadvantages associated with this model as well. First of all, customer satisfaction depends on the quality of service provided by an outsider, e.g. the logistics company. Secondly, the competition can also use the same networks and thus a strategic advantage is lost.

This brings us to a final comment. Small and light packages are cheaper to transport than large and heavy ones. The loss of profit due to distribution costs is relatively less on high margin products compared to low margin products. Entrepreneurs will need to find an optimum between product margin and product dimensions in order to minimize the economic impact of distribution failure. The ideal product for a starting e-tailer is a small and light, high-margin niche product with well-known specifications. Examples being MP3 players, memory sticks, cartridges, toners, digital cameras, exclusive books, CDs, etc.

Other (difficult and necessary) offline measures for online success are increasing the number of successful first door calls and reducing the number of returned goods. Neighbours, or a nearby post office, can be an alternative drop off solution if a recipient is not at home. The number of returned goods can be reduced in several ways. First, it is essential to properly monitor returned goods. An e-tailer should refrain from selling goods with a high return-rate. Secondly, it is advantageous if the product specifications are consistent. This is the case with books, CDs and software. E-tailers must either invest in

information on their websites or sell standardised products. Finally it is important to note that people tend to be more willing to pay for distribution if the product is difficult to get hold of in their own geographical region. In other words: a niche strategy is more powerful than a general strategy.

E-tailing success is based on unequivocal choices regarding the products to be offered, and on smart organisational solutions for

@ smidts@dialogic.nl; denhertog@dialogic.nl

Adding Value Through Standardization in Europe

by John Ketchell, Director, CEN/ISSS¹⁷

Data exchange between entities located around the world, using different platforms, with different practices, different languages and character sets, requires a neutral tool for both parties to communicate – standards. Standards are agreed and published specifications which provide a framework for interoperability.

The key word is interoperability: without shared used specifications and open technology, the “network” will not work.

Now that the original “e-commerce hype” has passed, there has been an increasing understanding in the IT community of the importance of standardization to the full development of the potential of e-business. Standardization can help to remove some of the technological barriers to successful e-business, in particular in the following areas:

- Trust and confidence
- Technology (not incompatible, less expensive, flexible)
- Lack of B2B expertise
- Cost savings

A large number of different issues need work on in the standards context; and on some issues, Europe has something relevant to say, but it also needs to find regional solutions which fit local

needs. A key issue to improve the competitiveness of European industry is the realization of the Single European Electronic Marketplace. Standards play a significant role in enhancing and facilitating cross-border e-transactions.

Initiatives are already under way, carried out by CEN/ISSS and its partner European Standards Organizations, CENELEC and ETSI, in the framework of the eEurope 2005 Action Plan. The following important issues have been identified as priorities:

1. ebXML

The CEN/ISSS Workshop eBES (eBusiness Board for European Standardization) provides a European focal point for the UN/CEFACT process. Historically grouping the EDI community (EDI is still being used by many multi-national enterprises in the absence of the full development of more modern solutions), in 2002 we developed eBES activities in relation to the implementation of the UN's ebXML framework. We established a Vendor Forum in collaboration with the OASIS Consortium, which is producing practical pilot implementations of ebXML. In 2003/2004 we shall be developing eBES further in terms of producing consensus specifications, translating ebXML specifications into local languages, developing registry and repository services, and generally enhancing awareness.

2. E-business

To deal with e-business from a more general viewpoint, CEN/ISSS has two other complementary initiatives, the Electronic Commerce Workshop and a short-term eBusiness Standards Focus Group.

The Electronic Commerce Workshop – which is the longest established activity within ISSS (started in 1998) - focuses on core elements and strategic issues of ecommerce. Currently, projects are running in the areas of web services, information on e-signatures for SMEs, e-wallets, architectures and the use of open source software for supply-chain management. The Electronic Commerce Workshop closely liaises with the sectoral initiatives.

The eBusiness Standards Focus Group was created at the request of DG Enterprise of the European Commission, to prepare an overview report on the key e-business standards issues to be considered over the period 2003-2005. The

¹⁷ Within CEN (European Committee for Standardization), CEN/ISSS (the Information Society Standardization System) was created in 1997 to focus on ICT related standardisation activities. <http://www.cenorm.be/iss/>

report will be finalised in spring 2003 and used as a contribution to Commission policy-making.

3. Sector initiatives

The aim of many of these is to enhance the use of the ebXML framework by individual trading community. In some sectors which are mainly populated by SMEs such as textiles, footwear, furniture and construction, European companies need European consensus. With the support of the European Commission and the relevant trade associations, Workshops have already started in these sectors to migrate from EDI to XML. It is important to do some testing and to freely distribute software to help SMEs get familiar with technology.

Another area of recent activity is retailing, where the Workshop E-NOM has recently developed a CWA (CEN Workshop Agreement) containing a proposal for a demand-side classification for non-food products. This CWA is being input to the GCI (Global Commerce Initiative), thus bringing a European input to a worldwide initiative.

Other recent initiatives include best practice guidance for web portal sites (run in collaboration with the European furniture industry), a multilingual classification for sanitary ware and a classification for medical products.

4. Cataloguing and classification

These are sensitive issues for any company doing business on the Internet – the aim is the development of generic principles of e-business cataloguing.

Launched in collaboration with ISO TC37, the CEN/ISSS Workshop eCat aims at producing a consensus document defining multilingual catalogue strategies for ecommerce and ebusiness by the end of 2003.

We are also likely to examine the issue of e-business classification schemes, with a view to working towards some generic principles that can be applied.

5. E-procurement

There is need to support work on e-procurement, in terms of both public and private applications. An initiative is already under way in the field of eInvoicing, to draw up a report in connection with European Directive 2001/115/EC.

6. Trust and security

A number of distinct activities are under way in this broad area. A report on the state of standardization issues concerning Digital Rights Management will be presented in February 2003 and finalized after an open meeting.

A Focus Group on Network and Information Security was launched jointly with ETSI in 2002: this is examining standardization requirements in this area, in the light of a recent Commission Communication to the Council, and will provide a report in the spring of 2003, to be presented to an open meeting.

Following the publication last year of a report on standards requirements, a new CEN/ISSS Workshop on data protection and privacy issues is expected to start soon; this will concentrate initially on the provision of best-practice guidance material to help businesses implement the relevant EU data protection legislation.

Finally, an extensive programme of standardization on electronic signatures, in connection with the implementation of the relevant EU Directive, is nearing completion. These activities are carried out in collaboration with ETSI.

7. Knowledge Management

Launched June 2002, the Workshop will produce a European Guide on best practice in knowledge management.

8. Other activities

CEN/ISSS is carrying out a number of other activities in the Public Interest domain (Learning technologies, Design for all, Cultural diversity) and some Technical Workshops (for instance smart cards, meta-data).

9. International co-operation

CEN/ISSS has recently signed the ISO/IEC/ITU/UN-ECE Memorandum of Understanding (MoU), concerning standards collaboration in the area of e-business. We also link increasingly closely with relevant industry standards consortia, such as OASIS, W3C, or RosettaNet.

@ john.ketchell@cenorm.be

Increasing Maturity in Real Estate e-Business

by Bob Thompson, RETRI Group

The real estate industry can be segmented many different ways. However, a common taxonomy would see a group of property investors who see real estate as an investment asset allied to equities or Government bonds; a group of property owner/ developers who see property as bricks and mortar; and a group of intermediaries who see the other two groups as clients.

Clearly there is an extent to which these groups overlap – investing institutions sometimes develop and sell their own property for example. Also, it can be argued that any owner or occupier of property is a stakeholder in the real estate industry.

The level of e-business commitment and maturity within these groups is markedly different. Intermediaries have tended to lead the way followed, with varying degrees of reluctance, by the other two groups.

Typical of the property investment group would be the website for the specialist logistics property fund Celogix (www.celogix.nl). This is effectively an online brochure for the fund with very little in the way of e-business tools.

Further along the maturity curve are some property owners. London-based Broadgate Estates are partners in the Vicinitee (www.vicinitee.com) portal that delivers information and services to tenants of the company. The system is fully integrated into each building, with a substantial administrative layer producing, for example, access documentation.

The best intermediaries are even more mature in their use of e-business. Bouygues Immobilier (www.bouygues-immobilier.com) not only include a full property finding search engine, but also deliver financing and other financial services through the same route. Purchasers also have access to their own extranet for communication.

E-business has spawned new intermediaries in the sector. A good example here is Lediga Lokaler, the commercial real estate magazine and listing service (www.ledigalokaler.com). Established in 1995 the site holds details of commercial property throughout Sweden accessible via a

simple search engine with links back to the selling agent.

The acid test for all stakeholders in real estate however, is the extent to which e-business changes the fundamental business processes that are common to them all. Procurement, recruitment, sales, marketing have all seen the ubiquitous “e” prefix acting as an agent of change across a wide range of industries. To what extent has this happened in the real estate sector? Preliminary results from a survey of UK office occupiers show the real estate sector to be slow to adopt the Internet for many generic processes. The survey (www.retrigroup.com/cbed.htm), undertaken for new industry grouping cBED in the last quarter of 2002, examines in detail process changes that are delivering e-business in the UK.

Overall the survey analyses over five hundred responses from across the industrial structure, looking at the interface between technology and property. Amongst these are business processes generic to all businesses.

The real estate sector scores highly against the rest of the sample in two areas: the marketing of products or services and the use of the Internet for general access to information. In all other, more mature uses the sector compares much less favourably with the rest of industry.

Many parts of the real estate sector were seen as natural targets for disintermediation as the web penetrated transactional processes and the delivery of services online became more common. In fact this failed adequately to take into account the resilience of players within the sector who have begun to use the channel as a way of promoting their wares and delivering information to their clients.

A high proportion of respondents to this survey (around 86%) have their own websites that are used for marketing, yet only just over 8% sell online. In part this is due to the influence of the listing services. These databases of properties fulfil essentially the same function as classified advertisements in magazines. Their objective is not to compete with real estate agents but to complement the visibility of their products.

Clearly, some real estate products are large, illiquid and inflexible – office blocks for example – and are manifestly unsuited to the usual e-commerce models. However, there are also a whole range of products and services provided

within the sector that do not suffer from these disadvantages.

In the purchasing process the real estate sector is some 7% below the rest of industry in the adoption of online purchasing. Nevertheless 21% of real estate respondents do some e-procurement, usually via a specialist aggregator. A similar pattern can be seen with customer relationship management where although the real estate sector is behind, nearly 25% of respondents use e-CRM to some extent in the relationship with their clients.

Online research in the real estate context is largely research into market pricing. Identifying broad market parameters for subsequent use. Very little attention to the quality of the information found was recorded!

The area in which real estate seems to be furthest off the pace is in e-recruitment. Only about 7% of real estate companies recruit online compared with around 21% for other industries.

Breaking the sector down into size bands, the expectation would be that large firms would be more mature in their usage of the net. In fact this is only demonstrable in one of the generic processes – recruitment. With all the other functions small and medium sized real estate companies are at least holding their own, and in some cases getting ahead of their bigger competitors.

In some respects the real estate sector is a laggard in e-business. However, it is clear from ongoing research that processes are changing offering competitive advantage to those who understand that e-business involves long-term structural change in business processes. There is a danger here for those companies in the sector resistant to change. Even a cursory analysis of the websites of many real estate intermediaries reveals the shallowness of their understanding and ambition in this area. Yet it is clear that their clients are moving ahead. They expect the real estate sector to participate fully in their e-business in the future.

@ bob.thompson@dial.pipex.com

Looking For a Business Model of E-Banking

by Umberto Filotto, Full Professor University of Rome "Tor Vergata"

At the very beginning, it looked like the bank's promised land: the burden of costly and often inefficient branches was gone or at least could be progressively eased. The Internet could combine richness of content, availability of service, low cost, effectiveness, new products, new profitable customers and markets. Of course, some (huge) investments had to be made but, after all nobody expected a free lunch.

What is left now? The trading-online frenzy of the second half of the nineties is gone and with it the only real source of revenues for all the e-finance activities. So, not only there was no free lunch in the beginning, it looks that banks have invited everybody out for dinner.

Going through the *e-Business W@tch* statistics one thing really stands out: the financial industry has an overall digitalisation and e-business intensity that compares with and often outperforms that of many other industries; but then, when it comes down to the real thing, to selling online, things turn gloomy. The impact on sales and thus on revenues of the Internet is still extremely weak and the financial industry is underperforming despite its products being apparently the best of breed in Internet terms: everything is information-based, perfectly digitisable, and no logistics problems (the nightmare of all e-merchants) are involved. And so, what goes wrong?

Looking in the past for some lessons

This is a sad discovery, but not at all surprising as, in many aspects, it is simply the replay of something that happened in the past. Remember the ATM? When it was introduced banks were thinking of using it as a tool to market new products to new customers and were convinced that ATMs could pay for themselves via the fees chargeable to the customers using them. How did things really go? The good news is that ATMs catered not to new and special customers but to all customers. The bad news (apparently) is that no new services could be delivered and, moreover, that there was no way to get people who withdraw their cash from the machine to leave enough money to pay for the wear and tear

of that poor piece of steel. But what a piece of steel! Without it, what would be the impact on the banks' overheads or on the perception of service quality? These are questions that can be answered by everyone.

It seems that the situation is pretty much the same when it comes to Internet banking. The problem is not that customers are not using their Internet banking facilities; actually they are, and both the number of users and the intensity of use are increasing. The real problem is that they are not prepared to pay for them and, by comparison to the ATM story, customers are even more spoiled by the fact that, particularly in some countries, the Internet is free.

So is the Internet destiny to be a no profit proposition for banks? Before drawing any conclusions it is necessary to analyse the meaning of "selling online" from a bank's perspective. A few points have to be clarified:

- the first one is that speaking of selling and matching this concept with revenues is not appropriate. Banks actually rarely sell and, moreover, they don't earn a penny at this stage as the sale is just the starting point of a relationship through which revenues will flow; customers do not pay when they sign a contract, they pay when they use it;
- the second is that customers are ready to pay to use the service but refuse to pay to access it. This means that, no matter how costly it is to deliver a service they are not ready to pay an explicit price for the delivery while at the same time do not value in an appropriate way the implicit cost of accessing that service.

Now, moving on to Internet banking we have to recognize that :

- people are particularly reluctant to start a complex, delicate, and trust based relationship in an inevitably cold and impersonal way
- the Internet has sharpened the price sensitivity of people who have started to consider that by using the Internet they are levying the overhead of banks and, very simply ask for a price reduction in the usage of services irrespective of the increase of quality they are enjoying

So, what are the consequences? If we combine the first two considerations with the second two

the result is inevitable: unless the Internet is the exclusive mean through which a new product can be accessed (such as was the case with trading online in terms of the possibility for non professionals to do day trading) there is apparently no possibility of making some money offering Internet banking. Remember: Internet is just a way to get to the service and we are not used to pay an explicit price when we step into a branch or when we get in touch with a personal financial planner. So, no value to the bank from Internet banking?

If we put the question of value in terms of additional revenues the answer, at this stage of the technology, could easily be that there is probably only a marginal possibility that the Internet has a positive impact on the P&L statement. So, a rational option could be the one of not getting involved in the Internet game. But the question now becomes: perhaps having the Internet does not increase revenues, but how much money would be lost by not offering Internet banking?

It might be worth considering that despite that sales of banking products over the net are limited, the usage of some banking products is relevant: just think about checking the balance of one's account or about simple payment services such as direct money transfers. In these (and some other) cases Internet banking has excellent performances and, unsurprisingly, is heavily used; the only problem is that there are no direct end explicit revenues flowing from the net to the banks profit and loss account while, the cost of providing that service is tangible and relevant. But, if the service was not there, if the bank didn't provide to its customers the possibility of checking their account from their home on Sunday afternoon would they stay with that bank? I tend to think that a great, and increasing, number of them (and particularly those belonging to the most active and interesting segments) would simply switch to some other financial services provider.

Again, it is the ATM story: nobody wants to pay for them, nobody would chose a bank for the ATM but nobody would stay in a bank with no ATMs: and so we have to solve the problem of finding a sound and meaningful P&L for Internet banking operations. In my view there are different solutions that correspond to the different stages of the evolution of Internet technology.

The economic profile of Internet operations and the evolution of technology

In stage one, the one we are living in, technology is still in some ways poor, in the sense that the level of interaction it allows and the richness of content it can deliver are still extremely limited. In this stage Internet banking will be mainly operational. People will use it to do simple and clear operations which are linked to a product they already know and mostly have already bought. Given the fact that, as we mentioned many times, it is very difficult to get additional and explicit money from the customer if you don't sell a new service (but simply a new way to access it) the economic equilibrium of Internet operations has to derive from a redefinition of the internal pricing and economic metrics of the bank; no doubt the Internet contributes to the customer satisfaction and to the overall restructuring of the overhead. This has to be properly accounted for in Internet operations. This is not internal accounting restyling but an absolute necessity if we want to measure and monitor the Internet banking operations, to decide the level of investments and so on.

When I speak of redefining the metrics I am perfectly aware of the fact that I am touching on an issue that is very complicated and extremely delicate. The bank pricing rationale is biased by definition, as it is intended to drive the customer to some things and to prevent him or her doing other things; this rationale does not immediately

correspond to the cost structure because it could be necessary to do some dumping on some services and charging more on others. Unfortunately through the ages people have metabolised a structure of pricing which does not correspond to today's necessities and it is very difficult to change it now; as we said people refuse to pay to access services while they accept fees which do not correspond to real banking costs. So, no doubt it will be extremely complicated, but properly accounting the contribution of Internet operations has to become a priority in order manage this part of the business.

And after that there is the future which I defined as "stage two". This stage is expansive – as technology will evolve and will be able to fulfil many of our expectations. The Internet will become really interactive, and natural language will become the way to interact; broadband applications will be deliverable, and devices will be more and more user friendly. What will happen then? Probably new and exclusive services will be provided through the net and which will make Internet banking profitable as such. Of course we don't know now what services will be available so we cannot make any forecast regarding the overall economic performance of Internet banking operations; but it is highly likely that a powerful (and not simply replicative) technology will generate services that will take a great part of business and attract many customers.

@ u.filotto@assofin.it / umberto.filotto@sdabocconi.it

Part C: The Status-Quo of e-Business in 15 Sectors of the Economy

1 The food, beverages and tobacco industry

1.1 Economic profile and trends

The sector consists of two major activities within the NACE Rev. 1 classification: the manufacture of food products and beverages and the manufacture of tobacco products. Food accounts for more than 75% of the total production value of the sector, whilst beverages represent about 15%. Tobacco represents about 8% of total production.

NACE Rev.1 division	group	Activity
15		Manufacture of food products and beverages
	15.1	Production, processing and preserving of meat and meat products
	15.2	Processing and preserving of fish and fish products
	15.3	Processing and preserving of fruit and vegetables
	15.4	Manufacture of vegetable and animal oils and fats
	15.5	Manufacture of dairy products
	15.6	Manufacture of grain mill products, starches and starch products
	15.7	Manufacture of prepared animal feeds
	15.8	Manufacture of other food products
	15.9	Manufacture of beverages
16		Manufacture of tobacco products

The EU is the world's largest producer of food and beverages, with combined production estimated (for 2000) at 593 billion Euro, 100 billion Euro higher than in the USA (457.6 billion Euro in 1997) and more than 300 billion Euro higher than in Japan (258.6 billion Euro in 1997). The USA however, generates more value than the EU (195 billion Euro in 1997 versus 122.7 billion Euro in the EU in 1996), whilst Japan follows with 89.2 billion Euro (1996). France and Germany achieve a higher production value with 121 and 119 billion Euro in 2000. The United Kingdom ranks third in this classification with 91 billion Euro.

Table 1-1: Size, production value and turnover differences in EU food, beverage and tobacco industries

Feature vs. Country	Lowest	Highest
Size	Italy & Portugal (6.9 & 5.8)	Denmark (30.2)
Production per employee	Portugal - € 98,000	Belgium - € 371,000
Turnover	Luxembourg	France

Source: Eurostat

A considerable portion of products from this sector is sold to a significant number of international markets. Outside the EU the US (with 20.7% of total exports) represents the most important market, but over 50% is sold to the "rest of the world" – producing an appreciably diversified market. Raw material and product imports are also sourced from a significant number of countries, and as a result any technologies and applications that bring these markets closer, reducing transaction costs and improving customer satisfaction, could have a significant impact on sustaining the lead of the European Union. Whilst international markets are key, the EU's domestic market is crucial, and is undergoing significant institutional change. Such institutional change creates threats and opportunities for existing players with sunk investments.

Institutional changes are complemented with major market dynamics, creating a significant state of flux in this sector. The transformation of this sector tends to be shaped by the strategies of large companies, but change is afoot as customers are increasingly demanding differing modes of production (ecological, local, etc.), and suitability (reduction in production methods which increase food intolerance and quality assurance after European food scares such as BSE or Salmonella).

Undoubtedly though, the major inducer of change is the quest for price reduction, and here lies the strength of the multinational food manufacturers with their substantial purchasing power. They themselves are, however, also seeing powerful national/multinational retailers increase pressure on reducing prices. As a result of the escalating costs of brand development, increased distribution channels, and price competition, the sector will continue to see margins squeezed for agricultural and smaller food producers. Even so, some sub-sectors such as beverages still enjoy significant margins, but the upper hand of the distribution and retail network, focused on price control, will be the driving force behind change in this sector as well. Emerging market trends in food, beverage and tobacco can be summarised as:

<ul style="list-style-type: none"> • Increased segmentation of products 	<p>Development of <i>mega</i>-brands (products available throughout Europe) that stand as clear market choices. The large multinationals will continue to invest in substantial brand development.</p>
<ul style="list-style-type: none"> • Widening of the range of products/offers 	<p>Under the global brand products will become increasingly diversified (low fat, low salt, gluten free, etc.).</p>
<ul style="list-style-type: none"> • Intensive use of communication levers 	<p>E-business will complement significant media investment in strengthening and supporting brands.</p>
<ul style="list-style-type: none"> • Reduction of "me too" products 	<p>allowing companies to focus more on the core business. The expense of product and brand development in an increasingly competitive market is prohibitive. Products produced by several manufacturers competing on price will inevitably lead to consolidation.</p>
<ul style="list-style-type: none"> • Joint venture development through agreements at the European level. 	<p>Products are increasingly being produced under licence or in collaboration with regional producers. Competitive advantages are time to market and local focus.</p>
<ul style="list-style-type: none"> • Greater integration with raw material suppliers 	<p>Integration is less about e-business & ICT and more about long-term relationships, focused at reducing cost (for the manufacturer) and increasing security of demand (for the producer).</p>
<ul style="list-style-type: none"> • Increasing collaboration in distribution 	<p>This activity focuses upstream on distribution and retail chains. Automatic stock replenishment and deliveries are increasingly becoming the responsibility of producers (for example in WalMart (US & UK) & Tesco's (UK) supply chains).</p>

1.2 Usage of ICT & e-business

1.2.1 The role of e-business in retail

Core sector business areas are: supply, production, logistics, services, and marketing & sales. Other critical areas now being targeted for improvement are: packaging processes, the control of quality in Hazard Analysis and Control Critical Points (HACCP), the quality of the product, and the reverse supply chain management of returned products.

In the production sector, verifying the quality of the raw material is becoming increasingly more important. Vertical integration and control between production processes and their suppliers have been the focal point of many agribusiness ICT initiatives.

However, whilst there is a demand for increased ICT integration, the current diffusion of applications is believed to be low outside of large multinationals and their larger suppliers. For the most part, suppliers have more traditional relationships and communication techniques, and the operational focus is on quantity, quality, and delivery schedules. An e-business solution that would guarantee food safety to end consumers and integrate (vertical) business operations across the supply chain would be likely to become the 'killer application' in the food industry.

E-business solutions (ICTs & software) focus predominately on the business interface and on integrating activities such as accounting, administration, and stock control. Large software houses have developed flexible ERP systems for many food manufacturers. It is mostly the larger agribusinesses that deploy this software, though there are examples of bespoke applications created by small in-house IT teams.

Recently there has been a growing trend for larger companies (in nearly all the sectors) to concentrate on improving logistics, by upgrading the management of warehouses and the capacity for storage, and trying to improve the flows of input and output in order to avoid stock breaches and to guarantee more punctual deliveries.

In the large multinationals, the role of ICTs is evolving from mere instrumentation for reducing production costs to become a growing support for strategic decisions and greater e-business interaction/models. However, the degree of diffusion of ICT within the EU food industry depends heavily upon the adoption behaviour of SMEs, which are the predominant institutional type .

The strategic use of new ICTs is depicted by various Efficient Customer Response (ECR) initiatives that have gradually spread since the 1990s throughout North American and EU countries. The objectives of the ECR initiatives include reducing operating costs and optimising the principal processes of the food chain, i.e. efficient replenishment of products and efficient store assortment, and developing more efficient promotion and efficient new product introduction. These projects involve the larger distribution companies and a variety of manufacturing companies, most of which operate in the food service sector. For instance, the Efficient Foodservice Response (EFR) initiative aims at billions of Euro savings that may be achieved in food supply chain across five defined strategies: (a) equitable alliances, (b) supply chain demand forecasting, (c) electronic commerce, (d) logistics optimisation, and (e) foodservice category management. The starting point for every ECR project is typically the development of an efficient replenishment process, aimed at optimising the number and cost of replenishments at the individual retail store.

1.2.2 ICT infrastructure

The spread and use of ICT technologies mirrors the structure of the food and beverages industry. While the big multinationals (most of which lead in their markets) are also the companies with the most highly evolved infrastructures, smaller businesses normally "lag behind" when it comes to ICT.

EDI was one of the early network applications and is still the primary communication tool between customers and suppliers. It was introduced to manage the connections between enterprises (with electronic mail), thus reducing the invoicing and operating costs of ordering. The EDI system connects the computers at the producer's facilities directly with the distribution chain, creating efficiencies by eliminating printed documents and decreasing time dedicated to the "order-delivery-invoicing" procedure.

While more advanced solutions have languished, simple electronic mail (**e-mail**) has emerged as a kind of (ICT) "killer application", particularly for SMEs, as a simple, cheap and rapid means of communication. E-mail differs from EDI in its unstructured format (documents exchanged via EDI have a predefined structured form), which can be an advantage and disadvantage. A clear advantage of e-mail is that it is so easy that virtually everybody can use it; SMEs do not need to employ specially trained personnel to send and receive e-mails, which is not the case for some of the more sophisticated applications.

Table 1-2: Food, beverages & tobacco: Usage of IT infrastructure according to size classes

Use / have implemented ...	All sectors	Food and beverages			
		All enterprises	0 - 49 employees	50 - 249 employees	250+ employees
Computer	94	87	86	99	100
Internet	84	74	73	97	100
E-mail usage	81	67	67	90	98
WWW	73	62	61	91	95
Intranet	30	20	19	47	55
Extranet	9	5	5	13	13
LAN	43	30	29	66	88
WAN	9	9	8	18	52
EDI	9	11	11	30	59

Base: EU-4 (D, F, I, UK), all enterprises. N=402 (for food & beverages sector), N=5917 (for all sectors). In % of enterprises.

Source: e-Business W@tch (2003)

Table 1-3: Food, beverages & tobacco: Usage of IT infrastructure

	DK	D	E	F	I	NL	P	UK	EU 8
Computer	88	82	100	80	97	96	90	83	89
Internet	83	63	86	64	92	78	76	75	76
E-mail usage	75	50	84	59	88	73	66	72	70
WWW	74	49	58	57	74	71	56	67	61
Intranet	28	11	9	19	28	16	20	21	19
Extranet	6	2	4	7	7	7	5	4	5
LAN	36	19	41	31	39	32	36	33	32
WAN	7	2	7	14	9	6	19	7	9
EDI	18	3	15	24	5	11	16	13	12

Base: all enterprises. N=798 (for EU-8). In % of enterprises.

Source: e-Business W@tch (2003)

1.2.3 E-commerce activities

45% of the enterprises in the sector reported having a website in 2002, the percentage increasing by company size. Smaller businesses are still in an earlier adoption phase, as indicated by the significant share of small businesses stating that they intend to have a website by mid 2003 (17%).

Table 1-4: Food, beverages & tobacco: Percentage of companies having a website on the Internet (2002) and planning to have a website by mid 2003

	All sectors	Food and beverages			
		All enterprises	0 - 49 employees	50 - 249 employees	250+ employees
Website	54	45	44	57	73
Plan to have a website	16	17	18	20	12

Base: EU-4 (D, F, I, UK), all enterprises. N=402 (for food & beverages sector), N=5917 (for all sectors). In % of enterprises.

Source: e-Business W@tch (2003)

Only 7% of enterprises in the industry currently have an online selling system in place. At the national level, Denmark, Spain and Italy use this sales method the most, while France is the country least oriented toward selling online (2% only). The majority (94%) of enterprises which sell online use their own website as a distribution platform. Many also use marketplaces (mentioned by 41% of the enterprises with selling online). There is only marginal use of mobile commerce (e.g. by using WAP services) and sales conducted on extranets.

B2C is the most commonly used channel in the food, beverage and tobacco industry (79% of enterprises direct their online sales toward the final consumer), but B2B is also significant: 69% of the enterprises which sell online state that they sell to other businesses.

Table 1-5: Food, beverages & tobacco: Enterprises selling online

	DK	D	E	F	I	NL	P	UK	EU 8
Selling online	12	5	11	2	10	9	4	4	7
Planning to sell online	8	22	20	7	14	9	16	10	14

Base: all enterprises. N=798 (for EU-8). In % of enterprises.

Source: e-Business W@tch (2003)

Making online purchases is more common in the food and beverages sector than selling online. About 19% of the enterprises in the sector say they purchase goods or services online, but the figure is higher in countries such as Denmark (38%), Germany (36%) and the UK (35%).

Table 1-6: Food, beverages & tobacco: Enterprises procuring online

	DK	D	E	F	I	NL	P	UK	EU 8
Online procurement	38	36	12	15	7	23	24	35	19
Planning to procure online	7	7	9	7	10	7	25	3	9

Base: all enterprises. N=798 (for EU-8). In % of enterprises.

Source: e-Business W@tch (2003)

1.2.4 Diffusion of advanced e-business solutions – striving towards back-end integration

Very few companies in the sector have implemented **Enterprise Resource Planning (ERP)** to integrate their information systems with their customers. Only rarely is information managed via internal ERP systems exchanged with trading partners; generally, information is still received in printed form and then manually inserted into the system. The relatively low penetration of integrated management applications is not surprising, given the application cost to company size ratio, and the lack of specific solutions for small and medium sized enterprises.

However, integrated management systems adoption will emerge as a trend in the coming years as the major ERP suppliers create solutions for small and medium sized businesses, opening up new perspectives for those companies with the available capital to invest. Up to now, this sector has not shown a particular interest in ERP, opting rather for traditional business models more adapted to their size and characteristics. The functionalities of ERP systems are integrated by means of specific sector utilities, for example management of returns, handling recyclable packaging, HACCP quality control, handling with double independent measure units or recipe management.

Leading companies in this sector are developing applications for Sales Force Automation (with the objective of upgrading the management of the sales force), Supply Chain Management, (with the aim of improving physical distribution and reducing logistics costs), and Business Intelligence (in particular, the management of the information supplied to the sales force), and systems to support CRM philosophies (with the objective of improving customer service and building up loyalty).

Supply Chain Management (SCM) is in an embryonic phase, but presents significant opportunities. After reengineering internal processes to increase efficiency, large companies (especially in the food and beverage sector) have attempted to increase their competitive advantage by achieving inter-organisational goals, such as decreasing time-to-market and distribution costs. In the process, companies are reshaping relationships with their suppliers, producers, distributors, retail stores and customers. SCM projects move toward integration of these processes, throughout the complete supply chain from receiving the order to procurement and from production to delivery.

Only a small proportion of sector companies use **Sales Force Automation (SFA)** software, despite a period of rapid growth off a small base, which has recently stabilised. Developmental difficulties are essentially associated with difficulties in calculating the ROI and reluctance by sales personnel to implement this business solution. Applications usually include personalised date books (appointment calendars and address and telephone books) and focus on improving the administrative productivity of the sales agents through automation of specific functions (such as handling contracts and sales expectations).

An emerging customer-centred approach and the spread of concepts such as "segment by one" and "mass customisation" have encouraged the implementation of **Customer Relationship Management** by some of the larger companies. Primarily, CRM is a strategy and an operating method whose goal lies in improving and expanding the connection with the customer, with the aim of generating new business opportunities. CRM system implementations mostly involve customer contact points with the company in: sales, marketing, trade assistance services, order management, distribution and delivery. Typically, the first areas tackled in implementing CRM are automation of the sales force and call centre management. CRM systems offer new specialised applications, but also use or reuse investments already made in structures such as Help desks and Websites, redirecting them to meet CRM needs (for instance at Coca Cola). Thus the service component is still more important than the software application component.

Table 1-7: Food, beverages & tobacco: Usage of special e-business solutions

Use ...	DK	D	E	F	I	NL	P	UK	EU 8
SCM system	1.5	1.7	4.9	0.1	6.9	3.9	5.3	2.0	3.3
Plan to use	1.9	3.3	3.4	0.1	0.1	2.2	15.0	0.8	2.0
CRM system	1.5	0.4	3.4	0.0	10.4	12.2	5.2	2.7	4.0
Plan to use	2.4	0.2	1.8	0.2	1.8	1.7	13.6	2.1	1.6
Knowledge Management	0.2	0.0	6.7	0.0	5.3	4.6	3.9	3.7	2.8
Plan to use	0.2	0.1	0.2	0.1	0.0	1.4	9.9	0.2	0.5
ERP system	7.5	2.4	5.8	4.2	15.8	4.5	9.0	2.3	7.2
Plan to use	0.0	0.1	0.1	1.7	1.7	3.3	11.8	4.0	1.7
Online banking	69.5	47.6	70.9	35.4	58.8	56.4	27.9	33.2	49.5

Base: all enterprises. N=798 (for EU-8). In % of enterprises.

Source: e-Business W@tch (2003)

The web is fostering e-business in the sector, where formerly the need for expensive Value Added Networks slowed the adoption of EDI. The trend in the larger companies is towards innovation, despite the fact that most systems focus primarily on internal processes and procedures. Initially, companies have used the web for showcase web pages and portals, but a few food marketplaces have been established. Their business proposition is to attempt to gain market share by reducing costs, mostly by standardising procurement, and developing online auctions, purchasing groups, and virtual consortia. The following table shows the main marketplace initiatives on a European level.

Integration of tiers of suppliers to manufacturers and to the retail and distribution network could drive down costs, improve logistics and ultimately improve customer satisfaction. The actual extent of collaboration and integration by means of B2B e-commerce is dependent on many factors. Whilst it is necessary to achieve a greater collaboration and integration between producers and suppliers of raw materials, it is evident that the diffusion of network technologies can only build on an average penetration rate of EDI solutions. The integration of upstream suppliers is inhibited by the dominance of traditional transaction and communication channels, where the "social factor" (personal contact with business partners, "handshake agreements", long-term partnerships) plays a very important role. Even so, there are efforts to achieve better integration by implementing Supply Chain Management (SCM) applications. The "push" for integration between production, packaging and modern distribution is bilateral, in the sense that the initiatives for e-business are promoted from both parties, and are now supported by greater interaction from the so-called "parallel" sectors, e.g. packaging manufacturers and food production process companies.

1.2.5 Impacts of e-business

The majority of enterprises in the food & beverages sector (64%) do not feel that e-business is important for their company yet. However, this reflects the large number of small enterprises.

Table 1-8: Food, beverages & tobacco: Importance of e-business
(% of enterprises reporting significant or some importance)

E-business ...	DK	D	E	F	I	NL	P	UK	EU 8
• plays a significant part of how company operates	6	3	5	2	7	3	<1	2	4
• plays some part of how company operates	18	44	25	19	28	33	24	45	29
• does not play a role yet	74	53	71	78	59	58	62	51	64
E-business will play an important role in the future	14	17	41	23	36	17	24	26	28
E-business sceptics	76	76	45	72	45	75	47	68	61

Base: all enterprises. N=798 (for EU-8). In % of enterprises.

Source: e-Business W@tch (2003)

The major impact of e-business is currently observed on work processes within the company. About 22% of employees in the sector work in enterprises that report that work processes have significantly or somewhat changed as a consequence of e-business activities. The figure is 20% for customer relationship. The least significant impact is on the offers of products themselves (12%). These findings are common across many sectors and are not specific to the food & beverages industry. However, the impacts of e-business activities on the sector is significantly below average as perceived by companies in all areas of business.

Table 1-9: Food, beverages & tobacco: Impact of e-business on the company

e-business has changed significantly or somewhat the ..."	All sectors	Food and beverages			
		All enterprises	0 - 49 employees	50 - 249 employees	250+ employees
... organisational structure	25	16	15	13	18
... internal work processes	33	22	17	17	31
... customer relationship	27	20	15	17	27
... relationship to suppliers	26	18	14	18	22
... offers of products / services	21	12	11	7	15

Base: EU-4 (D, F, I, UK), all enterprises. N=402 (for food & beverages sector), N=5917 (for all sectors). Weighted by employment ("enterprises comprising ...% of employment say that ...").

Source: e-Business W@tch (2003)

On the whole, e-business in the food and beverages sector has mainly been internally orientated, for instance focussing on reducing the costs of communication and internal procedures. It should be noted, however, that there is growing interest in external network initiatives, especially in showcase portals and marketplaces. Portals of this type attempt to gain market share by reducing costs, mostly by standardising procurement, and developing online auctions, purchasing groups, and virtual consortia. Notable initiatives have involved beverage products, some of which are comprised of sites and portals that carry out exclusive institutional functions and "showcases". Among these, noteworthy sites are www.enotrya.com (an Italian wine site), www.scotch-whisky.com (a site that is a virtual club for Scotch whisky connoisseurs), www.vinsdebourgogne.com (a virtual community site for Burgundy wine, with news on wines, wineries, wine makers, and more), and www.chianticlassico.com (an e-commerce site of the historic Chianti Classico consortia).

In spite of the general economic downturn and some irritation or hesitation with respect to electronic business across all sectors, the climate for making investments into e-business is not bad in the food

sector. 62% of the enterprises surveyed in 2002 stated that they would not be changing their current level of investment, while 30% of the enterprises planned to increase their investment in e-business technologies for the 12 months period ahead. Denmark and Italy seem to be the countries most strongly oriented toward increasing investment. Large enterprises are more oriented toward increasing ICT expenditure over the 12 months period ahead (58%), though a significant percentage of SMEs (29%) responded in the same way.

Table 1-10: Food, beverages & tobacco companies: Planned expenditures on e-business technologies

Expected expenditure on e-business technologies in the 12 months period ahead	All sectors	Food and beverages			
		All enterprises	0 - 49 employees	50 - 249 employees	250+ employees
will increase	30	29	29	23	58
will decrease	2	1	1	2	1
will remain unchanged	63	63	63	74	39

Base: EU-4 (D, F, I, UK), all enterprises. N=402 (for food & beverages sector), N=5917 (for all sectors). In % of enterprises.

Source: e-Business W@tch (2003)

1.3 Conclusions

The food, beverages and tobacco sector comprises 15% of the total manufacturing production of the European Union. This intensely competitive sector is characterised on the one hand by a relatively small group of large companies that tend to operate globally and, on the other, by a large number of small and medium-sized business that operate locally, with the balance varying between countries. The spread of ICTs and e-business reflects the structure of the food industry. Large multinational companies (usually leaders in their sectors) are the most technologically advanced companies, while smaller companies lag behind in adopting ICT, especially upstream of the various product lines.

Table 1-11: Strengths and weaknesses of e-business in the food, beverages and tobacco sector

Points of strength	Points of weakness
<ul style="list-style-type: none"> • Presence of multinationals leading in the introduction of ICT and development of e-business • Presence of many companies capable of offering local speciality products which are also popular abroad • Good level of availability of "basic" ICT infrastructures (PC, website, e-mail) • ICT training and education is quite widespread in larger enterprises • Good prospects for growth for selling online, in terms of both B2B and B2C • In a number of countries (including France, Italy, Spain) enterprises have large shares of online sales for export thanks to their offer of local speciality products • Birth of a number of marketplaces and portals / vortals specialising in specific food sectors • Significantly widespread use of banking online. Growing offer of specialised ERP services for food enterprises • About 30% of enterprises plan to increase ICT expenditures in the 12 months period ahead 	<ul style="list-style-type: none"> • Presence of a large number of SMEs which lag behind when it comes to ICT "awareness" • SMEs often cannot budget for ICT expenses • Lack of availability of certain "advanced" ICT structures (such as LAN, Intranet, WAN, Extranet), especially in SMEs • Little education and training in SMEs • Little use of e-commerce throughout the sector • Online sales/purchases represent a small percentage of the total • Enterprises rarely participate in B2B initiatives and marketplaces in the sector • Certain specific e-business solutions (SCM, CRM, ASP, KM, etc.) are rare, practically non-existent in SMEs • Presence of high barriers (mostly "psychological") to growth in e-commerce

Source: Databank Consulting

The main factors that push companies in the food sector to consider ICT solutions include greater efficiency in internal processes (productive, administrative, delivery of orders) and integration of internal processes with external organisations to improve logistics and reduce costs. A more integrated view is emerging, with leading companies looking for ways to apply technology strategically to improve business management activities. The gradual acceptance of several ECR (Efficient Customer Response) initiatives, involving co-operation between modern distribution and industry, has been particularly significant. E-Business ICT have served well the growth/expansion strategies of large multinationals as well as SMEs that export to foreign markets using the Internet as a marketing channel.

The statistical data and the analysis of current e-business practices in the sector suggest the following most important economic implications for the next few years:

- Optimisation of certain company processes/areas/activities could promote recovery of operating spread and free up financial resources for use in other areas (such as trade marketing, customer service, etc.). The structure of the value chain will most likely not be significantly altered, however.
- Increasing collaboration among enterprises as shared network initiatives increase: This could result in the birth of new agreements or strategic alliances, or in mergers and acquisitions, thereby increasing concentration in the sector;
- Growing cost competition accelerated by introduction of a number of labour-saving technologies could drive a number of companies (especially smaller enterprises) out of the sector as they fail to stay competitive on the market.
- Widespread adoption of new ICT applications and infrastructures could lead to increased integration within various sectors, especially between industry and distribution.
- Growth in logistics, together with dissemination of specific application systems (including CRM, SCM, and SFA) could promote an overall improvement in customer service.
- Growth of selling online could encourage the birth of new enterprises specialising in this channel (and growth of existing enterprises), development of new online players (online supermarkets, e-tailing, virtual consortia, etc.) and creation of strategic new groups of enterprises.
- Dissemination of ICT, if supported by appropriate education and training, could lead to a change in attitudes toward ICT, even in SMEs.

There are some policy related issues linked to these observations:

Encouraging the further up-take of e-business by the food & beverages sector, and especially among SMEs, will be a key issue for policy actions.

In the food & beverage industry, the adoption of e-business has been slower than in leading sectors such as other manufacturing sectors and electronics in particular. E-mail and EDI have been introduced later, and more sophisticated technologies and applications are still poorly diffused, except in large multinationals and their larger suppliers. EDI is therefore still the dominant B2B System. ERP, CRM, SCM and ASP are still in a pilot stage. The overall degree of diffusion of ICT within the EU food industry depends heavily on the adoption behaviour of SMEs, which are the predominant institutional type. It is necessary to foster SMEs' access to e-business solutions. SMEs have clearly increased their efforts, but important issues still need to be addressed in order to exploit the potential of e-business. These include the affordability of the solutions proposed, the development of standards, security issues and the optimisation of financial measures supporting these goals.

The integration of business processes along the supply chain and logistics will be become a key to success in the sector and therefore the most important area for e-business applications.

There is a continuous pressure in the food & beverage sector to optimise internal processes and to integrate them with those of customers and suppliers. Products are increasingly being made under licence or in collaboration with regional producers. Long-term relationships and trusted partnerships

with raw material suppliers are becoming even more important in order to safeguard the quality of products. Collaboration with distribution networks is increasing. The sector, however, is still characterised by the existence of "islands of activity" which have proved to be difficult and costly to integrate. Many food manufacturing processes are still labour intensive and this imposes a significant barrier to a greater ICT diffusion. There have been massive investments in logistics, but these are largely limited to the bigger companies. Thus, there is a strong case for developing affordable integrated management solutions for small and medium-sized enterprises.

This pressure for integration also raises policy challenges, especially in the area of harmonisation of product legislation and regarding the monitoring of transports and logistics impacts on economy and environment.

Awareness raising continues to be important – recognising the future impact of ICTs

Until now, only leading companies have progressed their usage of ICTs from a mere tool for reducing production costs to a support tool for strategic decisions and e-business interaction models. The dominant culture, especially among SMEs, is still conservative. They lack confidence in the potential and benefits of new technologies for their business, and instead underline the common concerns about security and the cultural reluctance about any change of established procedures. Companies of all size, however, should be fully aware of and recognise the future impact which e-business applications will have on their business, e.g. for achieving competitive advantages and enhancing profitability. Successful initiatives, which have developed forms of collaborative product design, joint marketing and integrated logistics among the various players in the value chain, should be promoted and become common knowledge in the sector.

To this end, among SMEs in particular, there is a need for promoting information about ICT potential through the dissemination of best practices, enhancing trust and confidence, developing awareness raising actions and for ensuring that appropriate skills are available. Industry associations will play an important role in taking up these actions and getting their members involved.

Quality assurance, including food safety, is a key issue that most companies in the food industry are facing today.

Verifying the quality of raw materials and finished products is becoming increasingly important. ICT are important in this respect as they play a key role in facilitating vertical integration and control between production processes and their suppliers. An e-business solution that would guarantee food safety to consumers and vertically integrate business operations across the supply chain would have a good chance of becoming the "killer application" for e-business in the food industry. In this context, transparency of information and actions aimed at building customers' trust and loyalty will be key issues of the near future.

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2 Media & printing

2.1 Economic profile and trends

Digitisation has a profound impact on the media industries, as the services they deliver – the "content" – can potentially be fully digitised, making it independent of the medium by which they are delivered. This has resulted in the convergence of formerly independent industries (print, music, audiovisual). Previously clearly-defined industry structures are dissolving, and integrated media companies are emerging that cannot be defined within traditional sector boundaries. Traditional printing companies turn into cross-media service companies and traditional publishers into new media ventures, which publish across various distribution channels, such as Internet, wireless devices or CD-ROM.

The *e-Business W@tch* focuses on those industries whose main business is the creation and distribution of content, including the publishing and printing sector, but also the music and audiovisual industries incorporated in NACE 92.1 and 92.2. Not included in this analysis are all downstream distribution channels for materialised content such as wholesale or resale of such products (part of NACE 51 and 52, respectively) or video rental (NACE 71.40).

NACE Rev.1		Activity
division	group	
22		Publishing, printing and reproduction of recorded media
	22.1	Publishing
	22.2	Printing and service activities related to printing
	22.3	Reproduction of recorded media
92		Recreational, cultural and sporting activities
	92.1	Motion picture and video activities
	92.2	Radio and television activities

In the year 2000, the publishing and printing sector in the EU (excluding Greece and Luxemburg) generated over 233 billion Euro of production value. Slightly more than 100 billion Euro of value added at factor cost was created. In the last few years the industry has been characterised by rapid growth. Between 1997 and 2000, the production value in the sector grew by 53%. Value added increased even faster, by 65%. Over 50% of the sector's total production value can be attributed to the publishing sub-unit (NACE 22.1). This category, however, contains not only the publishing of books and papers, but also the entire music records industry. Its development is therefore closely linked with the very dynamic music market.

Table 2-1: Structure of the media and printing industry in the EU-13 (2000) by kind of activity

NACE Rev. 1		Production value		Value added at factor cost (est.)	
		EUR (m)*	%	EUR (m)*	%
22.1	Publishing	120,858.30	51.7	49,339.10	48.9
22.2	Printing and services related to printing	99,586.60	42.6	46,807.10	46.4
22.3	Reproduction of recorded media	13,463.90	5.8	4,709.80	4.7
22	Publishing, printing and reproduction of recorded media total	233,909.00	100.0	100,856.00	100.0

* EU-13, no data is available for Luxemburg and Greece.

Source: Eurostat New Cronos PRELI and SBS ENTER 2002. Estimates and calculations by DIW 2002.

In general, the publishing and printing sector has a relatively small role in the national economies of the EU. On average the production value of the industry accounted for 4,6% of total manufacturing production (EU-13) in 2000 and for 5.1% of total employment in manufacturing EU-12). However, the special importance of the media industries is not only constituted by their economic activities but also by their important function for democracy and culture.

Publishing, printing and reproduction of recorded media tends to be dominated by small-sized enterprises. In 1999 over 97% of all companies employed less than 49 persons. However, firms included in this size class generated only 36.7% of total turnover of the sector and employed less than half of those working in these industries.

Table 2-2: Size class distribution in NACE 22 (Publishing, printing and reproduction of recorded media) in the EU-11 (1999)

NACE 22: Publishing, printing and reproduction of recorded media	Number of Enterprises		
	1 to 49	50 to 249	>250
Number of enterprises (%)	97.2	2.4	0.5
Turnover (%)	36.7	26.6	36.7
Persons employed (%)	47.4	24.2	28.4

EU-11 1999 (latest available figures). No data were available for Greece, Luxembourg, Netherlands and UK.

Source: Eurostat New Cronos 2002. DIW 2002.

Economic slowdown and industry consolidation

The media and printing sector is not unscathed by the economic slowdown of the past two years. In particular, the sector has been hit by a decline in advertising revenues, with online advertising in particular developing well below expectations, despite the increase of Internet usage. The advertising slump resulted initially from a general cutback of advertising expenditure in the enterprise sector in the wake of the economic slowdown. Secondly, it resulted from the bankruptcy of many start-up-companies with overly high advertising budgets in the wake of the bursting dot-com bubble. Private consumption has been weak as well, resulting in slow demand for content products. Subscriptions for magazines and newspapers have been declining and several magazines – especially so called “new economy magazines” – had to be closed only a few months after their first publication. In addition the printing industry had to cope with high raw material prices.

Structural changes and the need for new business strategies

The ICT revolution has resulted in an erosion of traditional revenue streams, a substitution of traditional products and a replacement of whole steps in the value chain. Printers, for example, face the challenge that parts of the production process of printed goods are becoming obsolete through the increasing digitisation of the workflow. As a response, even small print companies are diversifying from traditional print products into crossmedia services, such as multimedia design and layout.

Digital products have specific economic properties that require the adoption of new business strategies. Digital information goods have high first-copy and low replication cost. A pop-song, for example, might involve high production costs (composing, recording, licensing etc.) but the marginal cost to duplicate the song on CD or DVD tends to be very low (duplication cost over the Internet can even be zero). At the same time, digitisation allows for the production of different media from one single data source. If stored in certain file formats (e.g. XML), a news story, for example, can be sent to the printer’s computer-to-press system (CTP) to be immediately printed, published on a website, sent to a wireless device or archived on a CD. Therefore, the most profitable way of exploiting digital content products is often described by the industry as “create once and distribute many”.

In response to these changes, large, vertically integrated media groups were created that produce and own the content as well as the channels to distribute it. In some cases content producers have tried to become channel owners, as happened with Bertelsman, which invested (and later divested) in Internet service provider AOL Europe. In other cases channel owners have attempted to take over content producers. The acquisition of television production house Endemol by telecom operator Telefonica is an example of the latter. The troubles that those merged companies have been facing lately has, however, led to a broad scale discussion about the sense of merging the creation and distribution of content. Recent changes in the strategy of media giants such as Bertelsmann and Vivendi suggest a return to a more focused approach.

Internationalisation

With the exception of parts of the music and movie industries and scientific publishing, the sector analysed in this report has traditionally been largely focused on local markets. The international trade of content goods and services has been limited by language and cultural barriers. However, over the past years, the publishing and printing, as well as the radio and television markets, have increasingly become international. One major factor contributing to this trend is that new distribution channels of digital goods such as the Internet or satellite do not have physical borders. The growing use of English as an international language and a certain degree of cultural convergence have further accelerated the internationalisation of the media and printing sector. As a result, large international media conglomerates that follow strategies of transnational vertical and diagonal concentration have emerged on the one hand. On the other hand, a number of smaller companies specialises in the development of content formats that can easily be exported both to other European countries as well as beyond. In the printing industry, the complete digitisation of production processes allows for outsourcing of parts of the process, sometimes across borders. In addition, the catch-up process of Eastern European countries has resulted in a rise of the overall print capacity.

Copyright issues

The digitisation of content in combination with ever-more powerful computers, the emergence of the World Wide Web as well as the creation of powerful search engines and exchange services for audio and video content on the Internet have created a major challenge for the media and printing sector. The industry used to have a great deal of control over the distribution media (for instance CDs, broadcast) and distribution channels of its content. While in the past uncontrolled exchange of content (e.g. of tapes) took place only occasionally and between people who knew each other, this situation has changed considerably. Two different regimes are possible for compensating copyright owners for the loss of sales (however large this may be). The first is a lump-sum charge on the sale of technical equipment necessary to reproduce digital goods (i.e., computers, CD or DVD drives) and on media (e.g., raw CDs or DVDs) as is the case currently with photocopiers or audio recorders and tapes in many countries.¹ This sum can then be distributed to the copyright owners. The second regime consists of technical solutions for digital rights management (DRM). DRM systems identify and describe content and set rules for how the content is to be used while encryption makes it unusable to non-authorised users. DRM systems are, however, currently neither widely deployed nor widely accepted. Consumers in particular are not accepting them easily, since they often also limit the *legal* use of digital content.

2.2 Usage of ICT & e-business

2.2.1 The printing industry

Procurement

In contrast to publishing, online trading of direct inputs such as paper, paint, plates and film plays an increasing role in the printing industry. Standardised paper products in particular are bought over the Internet. Several electronic marketplaces in Europe have emerged, which support the paper procurement for the printing industry. While electronic transactions are primarily intended to reduce cost and improve efficiency, enhanced information is still seen as the major advantage of such marketplaces. According to a survey among German print and publishing companies, information on prices, availability, delivery times, discounts and new products are the major advantages of e-Commerce offerings of suppliers (cf. bvdM 2001).

¹ In Germany, for example, currently 7.50 Euro are levied on each CD burner sold and 30 Euro on each personal computer. Cf. www.vgwort.de.

Print transaction and production

In addition to buying inputs online, the printing industry is increasingly getting involved in e-commerce transactions on the sell-side. First, this simply involves the process of matching buyers and suppliers. On directory sites, print buyers can search for printers that match their individual needs and contact them in conventional manners. On marketplaces, print buyers can place jobs and printers submit quotations. However, the low degree of standardisation of most print products limits the advantages of electronic marketplaces in the printing sector.

Much more advantageous is the electronic support of the entire print transaction and production process via print procurement and processing platforms. Such platforms enable the automation of the various stages of the print process. Product specification, quoting, ordering, proofing, production management as well as reporting and billing can be conducted via the Internet, thereby reducing transaction costs and increasing speed for both, supplier and buyer of print. The implementation of such complex software solutions, however, requires not only investments in hard- and software, but also a reorganisation of business processes at the printer as well as the customer side. Some solutions are specifically developed for smaller print houses though, enabling them to implement e-business features such as online ordering, quoting, file transfer and billing at low cost. The systems can be hosted by the solution provider (ASP), thereby further reducing investment requirements.

One important prerequisite for an increasing use of integrated e-commerce and/or procurement systems in the printing industry is a certain degree of standardisation of the complex business processes involved in specifying and procuring print. Therefore, CIP4, an international standards body, is working on a standardised job definition format (JDF) that has gained widespread support in the printing industry (cf. www.CIP4.org).

In addition, efficiency and speed of the print process have been significantly increased by the use of the Internet as the main communication channel between producer and customer as well as between different service providers. As a result, different service providers can easily collaborate (graphic designer, photographer, repro company etc.), which is especially important for complex projects, where the processing by a single company is no longer sufficient. Single companies have to become part of larger digital networks – a chance and a challenge especially for smaller print companies. At the same time, the customer is increasingly directly involved in the production process with access to workflow systems, design, proofing, etc. Particularly fast changes have occurred in the pre-press sector, where new technologies such as computer to plate or computer to press (CTP) have made whole steps in the production process such as film production obsolete.

Digitisation has not only improved the efficiency of printing but has also led to new services and printing techniques. Digital printing makes the production of small volumes (possibly single-copy) and personalised printing technically and economically feasible. In response, new concepts such as “books on demand” or “printing on demand” have emerged. “Printing on demand”, although still in its infancy, allows the client to directly influence the printing process. Services of this kind have so far been mainly used by large professional clients. Large scale producers of manuals, for instance, now use printing on demand processes.

2.2.2 Content production and publishing

Procurement

The electronic procurement of direct inputs in the publishing industry is limited to a small fraction of all inputs. The most important direct inputs in this sector are creativity (for content creation) and content itself (for content bundling and distribution). Since both can hardly be standardised, the procurement process usually requires direct contact between buyer and seller. Even though certain transactions could theoretically be automated, e.g. the trading of film or music rights, traditional methods of conducting business still dominate the market. In the movie industry, for example, film rights are traded at “offline” industry events such as the Cannes film festival rather than over the Internet.

Nevertheless, there do exist electronic marketplaces for content. Within the so-called content syndication model content is traded electronically over the Internet. Specialised online content brokers have emerged that collect and repackage online information from different sources and distribute it to various business clients. However, while some industry players use content syndicators to supplement their own content offerings, customers usually do not come from the content industry but from other industries such as telecommunication or financial services. To the companies within the content industry, content syndication is an additional source of income rather than a way to acquire content. Self-syndicating by content producers without the use of intermediaries has become increasingly common. Since several content syndication start-ups were closed, content producers are directly syndicating their content – including news, articles, commentary, photos and video clips – to business subscribers. The new clients come from very different areas such as ISPs, portals, financial institutions or wireless access providers.

Content production and distribution

Digitisation has also changed the process of producing and publishing content. Content can now be produced for various media from one single data source. Content management systems (CMS) allow content to be directly produced by editors in various formats (HTML, XML, WML) without additional technical knowledge. However, while CMS and DMS are widely used for the production and management of online-content, the integration with offline content production has not yet been realised in many publishing companies. Most companies still operate two large-scale production processes, one for print and one for the website that run on parallel but separate tracks. To eliminate the inefficiencies of this dual approach is an important challenge for publishing companies.

Media companies in the consumer business always have to be at the forefront of technological progress. Even in companies that are behind in the adoption of new technologies for internal processes, the interface with the consumer is often up to the latest technical standards. Firstly they use ICTs – especially the Internet – as new distribution and marketing channels for traditional, i.e. physical, content products. On almost all online-versions of newspapers customers can subscribe to the print-version of the respective publication; publishers directly promote and distribute their publications; music companies sell CDs on their websites; cinemas offer online movie reviews coupled with online possibilities for searching timetables and ticket reservations. Such services are increasingly also made available on wireless technologies.

Secondly, the digitisation of content has enabled companies to distribute their products online at low marginal cost over various distribution channels such as the Internet, wireless networks, cable and satellite. The combination of offline and online content distribution potentially allows for an increase in profit margins by exploiting the “create once, distribute many” concept. These new forms of distribution, however, require completely new business strategies, since online content products are frequently not just a 1:1 copy of the traditional products. They usually offer new features such as customisation, flexible access or interactivity that allow for new value added services. So far, these features and services are primarily regarded as important tools for building and supporting the respective brand rather than providing major sources of income. During the heyday of the Internet hype, content on the Internet was generally provided free to the user and financed by advertising income. Companies have now realised that other revenue strategies need to be implemented, and there is an increasing pressure for websites to become profitable ventures in their own right. But it is still very unclear which of these new product features and services can provide the basis for profitable business models and which consumers are really willing to pay for.

Not content-related products and services

Many companies in the sector have recently opened up additional revenue streams by getting directly or indirectly engaged in activities that are not or only indirectly content-related. E-commerce offerings are common on most content websites today. Customers are linked to e-commerce-partners, which not only pay advertising fees but also commissions to the content provider. New interactive technologies also open up e-commerce revenue opportunities to audiovisual companies. Radio

stations, for example, are offering SMS-services where customers can get information on a song played on the programme and the respective CD can be ordered at an e-commerce-partner, thereby generating commission revenues to the radio station. With the increasing dispersion of broadband technologies, similar revenue models will be possible for TV broadcasters. However, so far revenues from e-commerce sources provide only a marginal fraction of overall revenues for broadcasters.

2.2.3 Statistics: ICT Infrastructure, skills and e-business integration

Infrastructure

Survey results of the *e-Business W@tch* confirm that the IT infrastructure in this sector is significantly better developed than on average. This is true especially for the use of the World Wide Web and the implementation of Local Area Networks. Concerning computers, Internet access, e-mail and WWW usage, small companies are almost as well equipped as large companies. Other infrastructure, such as intra- and extranet, is clearly better developed in large companies. However, this reflects to some extent the larger benefits from employing such infrastructure in large companies. Small enterprises with only one or two computers do not have as much to gain from a LAN or Intranet.

Resulting from the need to exchange larger files with business partners and customers, companies in this sector generally have more powerful Internet connections than on average. While 57% of employees in this sector work in enterprises with DSL or other Non-ISDN fixed line, only 52% do so on average in the EU-4. The percentage of firms that still use analogue modems is higher for small than for large companies. Nevertheless, SMEs in this sector are well-equipped with powerful DSL connections. ISDN is also very popular, due to the early use of ISDN to transfer data directly between companies.

Table 2-4: Media and printing industry: Internet connection speed

Connection speed	Media and printing			
	All enterpr.	0-49 empl.	50-249 empl.	250+ empl.
< 2 Mbit/s	65	74	59	54
2-10 Mbit/s	22	9	22	40
>10 Mbit/s	6	4	12	6

Base: EU-4 (D, F, I, UK), enterprises with internet access. N=391 (for media & printing sector), N=5417 (for all sectors).
Note: figures weighted by employment, ("enterprises comprising ...% of employment"). Reporting period: June/July 2002.

Source: *e-Business W@tch* (2003)

IT skills

The generally high level of IT usage in this sector also places high demands on the IT skills of employees and should result in a comparatively large demand for IT education. Most media and printing companies offer at least some support for the development of networking and IT skills. However, data shows that in many enterprises employees are more or less left alone with the task of learning how to use the new technologies. Learning-by-doing on the job is regarded as the most important training scheme, followed by self-learning activities. Formal training is not regarded as very important. SMEs in particular do not consider it as very important and are thus likely to underestimate the necessity for training schemes.

E-business integration

As shown above, the increasing digitisation of the workflow makes collaboration between companies easier, because digital content can seamlessly be exchanged over the Internet. The media and printing sector is already characterised by a relatively high interlocking of different companies in the value chain. Data confirm that the use of e-business will push this development even further. Online technologies in media and printing are used for collaboration and sharing documents to a much larger than average extent.

In particular, online collaboration with business partners for designing products and the electronic exchange of documents with suppliers and customers is significantly above average in this sector, which also holds true for small companies.

Table 2-5: Media and printing: Usage of online technologies within the value chain

Value chain activities	All sectors	Media and printing			
		All enterpr.	0-49	50-249	250+
Online collaboration with business partners for designing products	13	24	24	31	48
Online collaboration with business partners to fore-cast product demands	10	7	7	17	23
Online management of capacity / inventory	9	10	10	17	35
Electronic exchange of documents with suppliers	42	59	59	61	66
Electronic exchange of documents with customers	39	62	62	61	58
Online negotiation of contracts	16	24	24	14	15

Base: EU-4 (D, F, I, UK), all enterprises. N=404 (for media & printing sector), N=5917 (for all sectors). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

2.2.4 Statistics: Procurement and sales

At first sight, survey results seem to indicate that purchasing online is strongly developed in this sector. Almost half of all enterprises are engaged in buy-side e-commerce activities, which is clearly above average. Even half of all small companies are already purchasing online. However, a different picture emerges when the share of online purchases in total procurement volume is considered: the fraction of all products purchased online is relatively small and clearly below the EU-4 average. These numbers also show more pronounced differences between small and large enterprises, with more of the latter showing relatively large shares of online procurement.

Table 2-6: Media and printing industry: Buy-side e-commerce activity

Activity	All sectors	Media and printing			
		All enterpr.	0-49 empl.	50-249 empl.	250+ empl.
Procure online	36	46	45	66	60
... > 2 years	42	53	53	57	39
... 1-2 years	40	35	35	35	46
... < 1 year	15	10	11	8	8
Plan to procure online	7	7	7	3	9

Base: EU-4 (D, F, I, UK), all enterprises (for first and last row). N=404 (for media & printing sector), N=5917 (for all sectors). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Table 2-7: Media and printing industry: Share of online purchases in total purchases

Share in all purchases	All sectors	Media and printing			
		All enterpr.	0-49 empl.	50-249 empl.	250+ empl.*
> 50%	9	2	2	3	(5)
26 to 50%	10	9	9	3	(25)
11 to 25%	19	21	21	12	(--)
5 to 10%	25	27	27	34	(15)
< 5%	37	41	41	48	(55)

Base: EU-4 (D, F, I, UK), enterprises purchasing online. N=186 (for media & printing sector), N=2251 (for all sectors). In % of enterprises. Reporting period: June/July 2002. *No. of observations <20.

Source: e-Business W@tch (2003)

A similar picture emerges for sell-side e-commerce. Many companies already have experience with sell-side e-commerce in this sector. Not only is the fraction of enterprises engaging in such e-commerce activities larger than EU-4 average, the fraction of companies having such plans is also larger. Thus the head start will increase, if these plans materialise. However, considering the importance of online sales for those companies that sell online, the picture of an advanced position of the media and printing sector in sell-side e-commerce is slightly modified. The share of companies that sell more than a quarter of their total turnover volume online is below EU-4 average.

Very significant differences exist between the online sales shares of small and large companies. Large companies are twice as active in sell-side e-commerce than small companies. While this may be interpreted as a better e-commerce execution by large companies it can also be due to the inappropriateness of sell-side e-commerce for the SMEs in the sample. For instance, large companies are more likely to have a B2C business than small ones which might have established B2B relationships with a small set of customers).

Table 2-8: Media and printing industry: Sell-side e-commerce activity

Activity	All sectors	Media and printing			
		All enterpr.	0-49 empl.	50-249 empl.	250+ empl.
Currently sell online	12	17	17	35	36
... > 2 years	42	39	39	45	65
... 1-2 years	36	42	43	37	8
... < 1 year	20	17	17	18	9
Plan to sell online	9	12	12	12	13

Base: EU-4 (D, F, I, UK), all enterprises (for first and last row). N=404 (for media & printing sector), N=5917 (for all sectors). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Table 2-9: Media and printing industry: Share of online sales in total sales

Share in turnover	All sectors	Media and printing			
		All enterpr.	0-49 empl.	50-249 empl.	250+ empl.
> 50%	9	2	2	6	27
26 to 50%	10	9	10	--	--
11 to 25%	11	18	18	12	16
5 to 10%	26	26	26	23	21
< 5%	46	45	45	59	37

Base: EU-4 (D, F, I, UK), enterprises selling online. N=78 (for media & printing sector), N=805 (for all sectors). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

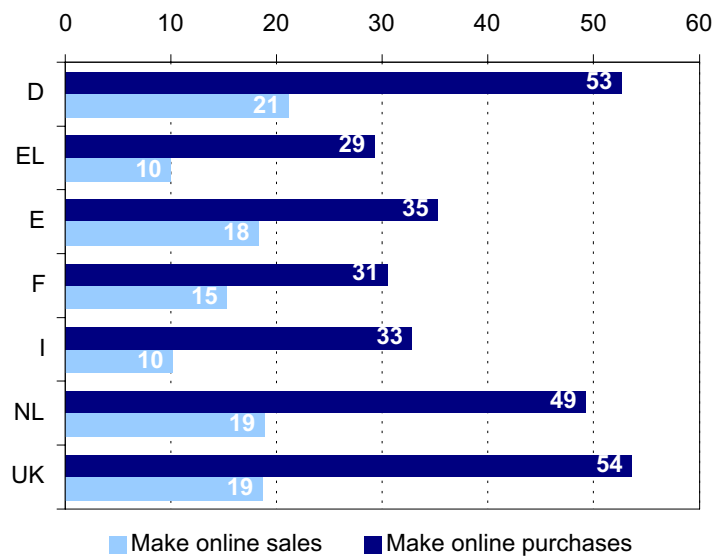
Looking at regional differences in the adoption of e-commerce activities, it appears that media and printing companies in the UK, Germany and the Netherlands are more likely to procure online than their counterparts in France and in Southern Europe. The sector thus confirms the general trend and dynamics in the regional diffusion of e-business. However, the countries currently lagging behind may catch up, as adoption plans suggest. 10% of companies in Italy and France said in 2002 that they intended to start purchasing online by mid 2003, compared to "only" 3-6% of non-users in the more advanced countries. Intentions to launch sell-side e-commerce activities are exceptionally high in some countries. In 2002, 17% of enterprises in Spain, Italy and in the Netherlands reported plans to start selling online by mid 2003. The figure was between 8-12% in the other countries covered by the survey.

Figure 2-1: Media and printing industry: Companies purchasing and selling online across countries

Base: EU-7 (D, EL, E, F, I, NL, UK), all enterprises, excl. "no answer" / "don't know" (N=657).

Figures enterprise weighted

Source: e-Business W@tch (2003)



2.2.5 Statistics: Barriers and impact

Barriers to buying and selling online

One of the most important barriers to buying online in the media and printing sector is the need for face-to-face interaction. Insignificant cost advantages are a much more important barrier in this sector than in other sectors. This is on the one hand due to the low standardisation of most inputs in this sector. On the other hand, this outcome is also influenced by the small-company-bias of this sector: large enterprises, for which the cost advantages of e-procurement are typically larger, are less frequent in the media and printing sector than in other sectors (e.g. in the chemical industry). In addition, e-commerce offerings by suppliers to this sector are below average.

Barriers to procuring online play a much larger role for SMEs than for larger companies. SMEs seem to have severe technical problems, as technology is considered to be expensive and often incompatible. This is a finding which is quite specific for the media & printing sector.

Table 2-10: Media and printing industry: Barriers to online procurement

Completely agreeing to statement	All sectors	Media and printing			
		All enterpr.	0-49 empl.	50-249 empl.	250+ empl.
Requires face-to-face interaction	38	38	38	41	29
Suppliers do not sell online	32	37	37	31	15
Concerns about data protection and security issues	31	31	31	24	30
Technology is expensive	24	25	25	18	14
Suppliers' technical systems are not compatible	13	14	14	9	3
Cost advantage is insignificant	22	28	28	20	11

Base: EU-4 (D, F, I, UK), all enterprises. N=404 (for media & printing sector), N=5917 (for all sectors). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Barriers to selling online in media and printing are similar to other sectors. A large deviation from the average can be found in the statement "Goods / services do not lend themselves to selling online". This is at first sight astonishing, as digital goods can easily be sold online. However, the sector

includes all sorts of different enterprises of which some produce goods and services that are indeed difficult to trade online. One example is movie content, where technology is still insufficient for online distribution. The second large deviation from average is in the statement "Revenue of online sales is still low". This confirms the finding that up to very recently content was often provided for free on the Internet and new revenue models for selling content online are just being tested.

Table 2-11: Media and printing industry: Barriers to selling online

Completely agreeing to statement	All sectors	Media and printing			
		All enterpr.	0-49 empl.	50-249 empl.	250+ empl.
Few customers online	20	20	20	19	13
Customers hesitant to buy online	31	31	31	27	24
Goods / services do not lend themselves to selling online	47	57	57	49	45
Processing of payments for online orders is a problem	22	23	23	18	25
Technology too expensive	21	24	24	24	20
Revenue of online sales is still low	34	41	41	37	47
Delivery process causes problems	15	15	15	9	6
Adapting corporate culture to e-commerce is difficult	24	27	27	20	15

Base: EU-4 (D, F, I, UK), all enterprises. N=404 (for media & printing sector), N=5917 (for all sectors). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Impact of e-business

The impact of e-business on the media and printing enterprises is very much in line with the average of all industries. As digitisation changes the product characteristics and offers new possibilities for more efficient and faster workflows in this sector, the strongest impact of e-business is on internal work processes. Impacts on the organisational structure and internal work processes are considered more important in large enterprises. Obviously, e-business has opened up more opportunities for restructuring in large enterprises than in small ones (there is not much to restructure in companies with one or two employees). However, this outcome may also indicate that large companies have implemented e-business more thoroughly.

Table 2-12: Media and printing industry: Impact of e-business on companies

E-business has significantly changed ...	All sectors	Media and printing			
		All enterpr.	0-49 empl.	50-249 empl.	250+ empl.
the organisational structure	6	6	6	8	12
internal work processes	10	10	10	11	18
customer relationships	8	8	8	7	2
the relationship to suppliers	7	4	4	3	2

Base: EU-4 (D, F, I, UK), all enterprises. N=404 (for media & printing sector), N=5917 (for all sectors). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

2.3 Conclusions

The media and printing industries are currently undergoing far-reaching structural changes, which are not only changing the organisational processes, but also the products and services produced by this sector. Apart from coping with cyclical issues, companies have to develop entirely new business strategies and have to adapt to increasing internationalisation of the industry. An additional major issue, especially for the audiovisual industries, are new measures for copyright protection of digital content goods.

Companies in this sector make extensive use of ICTs and e-business. Firstly, they use ICTs and e-business applications for the support of internal processes and B2B transactions such as procurement and production. Electronic procurement, however, is limited to a small fraction of inputs, since most inputs cannot be fully standardised and require face-to-face contact between buyer and seller. The use of ICTs plays a major role in the print transaction and production process. In text-based content production the use of ICTs is mainly confined to online content, in audiovisual content production the entire value-chain is increasingly impacted by the use of new technologies.

Secondly, companies use ICTs as new distribution channels on B2C markets. Traditional, physical content products are distributed and marketed over the Internet. More importantly, the new distribution channels are used to distribute online content products with new features and value added services, which form the basis of new sources of income in the sector. With rising availability of broadband connections, audiovisual content will also increasingly be distributed over the Internet.

Implications for individual enterprises

Changes in workflow, the value chain and products: Firstly, digitisation considerably changes the workflow and value chain within companies. Steps in the value chain become obsolete or are conducted by other actors in the company. Secondly, digitisation and ICTs have significant impacts on the workflow with external business partners and customers. The necessity of companies to collaborate and build networks with partner companies and sub-contractors has increased considerably. Thirdly, products and services provided by this sector change, which can have severe implications for traditional business models.

Typical strategies to cope with the new challenges are diversification or specialisation. For example, printers can diversify into cross media services by offering data management, logistics, layout, etc. and thereby extend their coverage of the value chain. This, however, requires strong IT skills and constant investment in new technologies. Such strategies are very difficult to achieve for those companies that do not have sufficient resources available, e.g. many SMEs. Specialisation, e.g. on printing specific products, is another strategy that is often more suitable for smaller companies, but also requires investment in specific knowledge.

New business opportunities: Entirely new business opportunities come along with these new strategies as well. For example, printers can offer print on demand or small-scale printing. Publishers can and do diversify into content syndication, e-commerce, direct selling of content to consumers, including new features in their products or new sales modes. Audio-visual companies have a variety of new distribution media and channels available such as video on demand, pay-TV or interactive-TV.

Challenges: The realisation of these new opportunities, however, poses many challenges to companies in the media and printing sector. As these challenges relate to a large extent to investment requirements, many budget-tight SMEs are less prepared to cope with them than larger companies. Many of the opportunities are ventures in the strict sense of the word as the bursting dot-com bubble has shown. Most new media business models still have to prove their usefulness and profitability and it is not clear yet what customers really want and what they are willing to pay for. As customers typically do not know the answer to these questions either when they are asked, a process of trial and error is necessary to find it out the hard way. Large companies often have the financial strength to take this significant investment risk, while a failure of an investment can more easily break a small company. The high speed of technical change in the current period of transition requires companies in

the media and printing sector to constantly invest in new technologies – even if they do not invest in new business opportunities – simply to remain competitive. Apart from investment needs and risks, copyright issues pose a major new challenge for companies in this sector.

Implications for the industry structure

Concentration, vertical integration and cross-media ownership: Digital content goods have specific economic properties that imply strong economies of scale in producing and distributing such goods. Large content producing and distributing companies can exploit these economies of scale, which in turn favours industry concentration. As this is easier when the companies also own the distribution channels, there is an additional incentive for vertical integration.

Polarisation: The tendency towards concentration is therefore strong in those areas of media and printing where content rights are owned, brands are important or other reasons for economies of scale exist. This does not apply to the whole media and printing sector, however. A large number of smaller companies have been trying to find specialist niches within the sector. Those companies are able to serve the demand for highly segmented, special interest information or other products and provide superior services to customers. Opposed to the large players that offer an often confusingly large amount of different products and services to choose from, those niche players are focused on a rather narrowly defined customer base. By increasing the reach to potential customers, the Internet provides specialists with a larger market and thereby enables an increasing degree of specialisation.

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3 The chemical industries

3.1 Economic profile and trends

Analysis of the chemical industries as presented in this chapter comprises the NACE Rev. 1 Codes 24 (Manufacture of chemicals, chemical products and man-made fibres) and 25 (Manufacture of rubber and plastic products).

NACE Rev.1		Activity
division	group	
24		Manufacture of chemicals, chemical products and man-made fibres
	24.1	Manufacture of basic chemicals
	24.2	Manufacture of pesticides and other agro-chemical products
	24.3	Manufacture of paints, varnishes and similar coatings, printing inks and mastics
	24.4	Manufacture of pharmaceuticals, medicinal chemicals and botanical products
	24.5	Manufacture of soap, detergents, cleaning, polishing
	24.6	Manufacture of other chemical products
	24.7	Manufacture of chemical fibres
25		Manufacture of rubber and plastic products
	25.1	Manufacture of rubber products
	25.2	Manufacture of plastic products

Together, the combined chemical industries account for approximately 15% of the production value of EU-manufacturing. The four main areas of these industries are:

Basic chemicals: Basic chemicals form the foundation of the chemical industry. Its manufacturers produce inputs for the remainder of the chemical industry from raw minerals, crude oil, gas and energy, typically in large-scale plants. Much of the produced output remains in the chemical industry itself, where it is refined to downstream products. The production is characterised by large output volumes, and high capital and energy intensity. R&D intensity is comparatively low.

Fine and speciality chemicals: Fine and speciality chemicals are the next element in the value chain of the chemical industry. The companies in this segment use basic chemicals, including monomers, polymers, solvents, and petrochemicals, as a major input to produce a huge variety of special substances, often in relatively small volumes. These inputs are typically bought within long-term contracts, typically from a small number of strategic key suppliers of raw materials. The life-sciences industry is an important user of fine and speciality chemicals.

Formulated chemicals: Formulated chemicals are further along the value chain. This sub-sector typically uses basic chemicals as well as speciality chemicals as inputs. The formulated chemicals sector also differs from the other two chemical industries in that its products are mostly produced for end use by individuals, government institutions or other companies and not as inputs for other parts of the chemical industry. The most important sub-sector within formulated chemicals is the production of pharmaceuticals, medical chemicals and botanical products.

Rubber and plastic products: The manufacture of rubber and plastic products is similar to the formulated chemicals sector in that it uses considerable amounts of speciality chemicals as inputs. While synthetic rubbers and rubber chemicals are important inputs for the rubber products industry, the plastic product industry's major input are resins. Rubber production is relatively concentrated with the production of tyres being the most important single element.

Economic situation and key figures

In 2001, the combined chemical industries together (chemicals as well as rubber and plastic products) accounted for 14.6% of the manufacturing production value in the European Union. The chemical industry alone accounted for 10.7% of production value and 11.7% of value added (Eurostat New

Cronos). These values have remained relatively constant in recent years. The produced output was worth more than 650 billion Euro in 2001. Value added at factor cost was roughly a third of the production value, reflecting the great importance of direct production inputs. There were an estimated 29,000 enterprises employing 20 or more people in the EU combined chemical industries (2000). These enterprises provided jobs for more than 2.9 million people in 2001, corresponding to a share of 12.4% of total manufacturing employment.

Eurostat SME statistics (employment distribution by enterprise size class) show that for the mid 1990s most people were employed in larger enterprises. By now, this share has probably increased rather than decreased. In 1996, 72% of chemical workers in the EU were employed in large enterprises (250 persons or more). The manufacturing of rubber and plastic products shows a completely different picture. SMEs have a far larger importance here, creating jobs for more than half of all employees in this sub-sector. Productivity in the combined chemical industries is high. In 1999, value added per person employed was at 66,900 Euro, 15,100 Euro more than the EU manufacturing average (Eurostat 2001), reflecting the high capital-intensity of production.

According to CEFIC (2000), Western Europe is the largest chemicals producing area in the world, accounting for 29% of the world chemicals production. According to Eurostat (2001), the chemical sectors with the most successful trade performance were those where competition is based on quality rather than price. Examples are perfumes, soaps and detergents, pharmaceuticals and other speciality chemicals as well as plastics.

3.2 Usage of ICT and e-business

3.2.1 Main drivers of e-business

There are a number of important drivers for e-business activities in the chemical industries. These differ, however, from sub-sector to sub-sector. Commodity-producing companies in the basic chemicals industry have different expectations of e-commerce than R&D-intensive pharmaceutical companies. Major drivers are:

Decreasing processing costs for commercial transactions: As Air Products and Chemicals, a US gases and chemical company pointed out "64% of what we sell is purchased."² Procurement of input materials – and the costs associated with this process – is not surprisingly an important element in the chemical industry. A large part of this spending – 50% in the case of Air Products – is for direct materials such as chemical feed stocks, electricity, catalysts and natural gas; 34% are capital plant expenditures and 16% are purchases of indirect materials. Decreasing processing costs for the purchase of these inputs is a large motivation for e-business in the chemical industry. In accordance with these numbers much e-business activity focuses on procurement of direct goods and only a smaller number of projects and activities on the procurement of MRO products.

Speeding up the flow of information and thereby accelerating processes: While cost savings from bringing processes online are the main e-business motivation in some parts of the chemical industry, speeding up information flow and thereby processes are the primary driver in other areas. The formulated chemicals industry in particular, among them the pharmaceutical industry, benefits from e-business this way. In the pharmaceutical industry, research and development as well as clinical trials constitute a major part of business activity. As patent protection for new products is limited to a certain time-span, companies have to conduct time-consuming R&D and trial procedures as quickly as possible to move from a scientific idea to a marketable product. At the same time, many regulations and prescribed procedures have to be observed. Companies that are able to make the corresponding

² Tulio, Timothy D. (2002): E-Procurement – A Changing World at Air Products, EyeforChem Strategic Sourcing and Procurement for Chemicals 2002 conference, 12-14 March 2002.

processes as efficient as possible enjoy a longer period of competitive advantage with their product and thus higher profits. Therefore, the pharmaceutical industry is interested primarily in four areas of e-business: Knowledge management solutions, Internet and mobile devices, electronic collaboration, and connecting field workers to ERP and CRM systems.

Improving information about the market: One of the main uses of the Internet is for information gathering. This also applies to the chemical industries. As basic chemicals are to some extent traded on stock exchanges, Internet platforms can provide up-to-date information about the current prices of commodities. Buyers can use this data to renegotiate current contracts or to connect prices to the spot prices on stock exchanges, resulting in greater market transparency. This benefits buyers most, making this a more asymmetric driver than the previous two. Another information-related driver are improvements in obtaining scientific information about the markets for chemical products as well as about patents and other specialities of these markets. Thanks to the Internet, such information can be gathered in a much shorter time than before and from all over the world.

Managing financial risks: Some online chemical exchanges do not confine their value proposition to the trading of chemicals, but also offer financial instruments to manage financial risk associated with manufacturing, buying and selling chemical commodities. The desire to hedge financial risk has increased during the previous years, as prices have become more volatile due to greater price transparency in the Internet and online exchanges.

Extending the market: Being able to extend one's market is one of the hopes placed on e-business. One has to distinguish two aspects, though, indirect and direct effects. The indirect effects are based on the cost savings and process improvements a company can achieve by conducting e-business. As the company does so, its competitiveness improves, and it will win contracts more easily – with new customers as well – and thereby extend its market. The direct effects are based on the idea that the company can be more easily found on the Internet and on electronic marketplaces and can thereby conduct business with new partners, which previously were unaware of its existence. As most of the trade within the combined chemical industries is conducted with repeat customers, though, this aspect has so far not been the main driver of e-business in a transaction sense. It has, however, led companies to set up websites with information about themselves and their products.

3.2.2 The role of ICT and e-business in the sector

Results from the *e-Business W@tch* survey indicate that the role of e-business is less pronounced for the European chemical industries than for the average of all sectors in the EU-4. Even though the share of companies stating that e-business constitutes some part of the way they operate today is in line with the average, very few companies in the chemical sector state that e-business plays a significant role for their operations. At 4% the share is far below average of all sectors in the EU-4. For more than half of all chemical enterprises in the EU-4, e-business does not play any role today.

Table 3-1: Chemical industries: General importance of e-business

E-business constitutes a ... of the way the company operates today	All sectors	Chemical industries			
		All enterpr.	0-49 empl.	50-249 empl.	250+ empl.
significant part	12	4	4	4	2
some part	36	36	36	36	54
no role	48	55	55	58	41
No significant role today but expected in the future	25	30	29	34	46
No significant role today nor in the future	55	57	58	55	46

Base: EU-4 (D, F, I, UK), all enterprises. N=350 (for the chemical industries), N=5917 (for all sectors). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Comparing different company size classes in the chemical industries shows that on the one hand more large companies than small ones ascribe at least some role to e-business. On the other hand, for a larger share of SMEs e-business constitutes a significant part of their operations. Obviously, if small companies do e-business, the impact on the overall organisation is much stronger than in large companies.

3.2.3 Diffusion of ICT infrastructure

On the infrastructure side, the prerequisites for using e-business can be considered as rather good in the combined chemical industries. Due to the comparatively high importance of large companies – particularly in the chemical industry – a large number of employees in the sector work in companies that are equipped with an above average IT infrastructure.

98% of all employees in the sector work in companies that use the Internet, compared to 91% in all sectors. An above average share of employees also works in companies that use e-mail and the World Wide Web.

Significant differences can be observed between company size classes. Large enterprises are clearly better equipped than small ones. For example, only 78% of small companies use the WWW while 93% of the medium-sized and 99% of the large companies do. Large gaps can also be observed in the use and the planned use of intra- and extranets. A significant share of large and medium-sized companies plans to implement intra- and extranets within the next twelve months.

A surprisingly high number of large and medium-sized companies in this sector make use of an application service provider (ASP) today or plan to do so in the future. When ASPs first entered the market in 1999 and 2000, their value proposition was predominantly aimed at small companies. However, the use of interconnection platforms, which can be understood as a specific type of ASPs, is very common among large companies of the chemical industries.

Table 3-2: Chemical industries: Current and planned IT infrastructure

IT infrastructure	All sectors	Chemical industries			
		All enterpr.	0-49 empl.	50-249 empl.	250+ empl.
Internet					
• Current	91	98	88	100	100
• Planned	3	1	3	<1	<1
E-mail					
• Current	87	95	85	100	95.9
• Planned	1	<1	<1	<1	<1
WWW					
• Current	84	94	78	93	99
• Planned	1	<1	<1	<1	<1
Intranet					
• Current	51	62	31	50	74
• Planned	8	15	4	14	18
Extranet					
• Current	20	23	7	10	32
• Planned	8	9	5	8	10
Use of an ASP					
• Current	13	15	5	10	19
• Planned	3	3	2	2	4

Base: EU-4 (D, F, I, UK), all enterprises. N=350 (for the chemical industries), N=5917 (for all sectors). Note: figures weighted by employment ("% of employees working in enterprises with..."). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Employees in the chemical industries on average have faster Internet connections than employees in other industries. Only about 40% of all employees work in companies that have narrowband connections (analogue modems or ISDN) compared to 58% on average.

Table 3-3: Chemical industries: Internet connection speed

Connection speed	All sectors	Chemical industries			
		All enterpr.	0-49 empl.	50-249 empl.	250+ empl.
< 2 Mbit/s	62	51	74	66	40
2-10 Mbit/s	17	26	11	11	34
>10 Mbit/s	7	7	2	9	8

Base: EU-4 (D, F, I, UK), enterprises with internet access. N=322 (for the chemical industries), N=5417 (for all sectors). Note: figures weighted by employment ("% of employees working in enterprises with..."). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

3.2.4 E-business within and between companies

Specific IT-solutions

Companies in this sector make above average use of ERP systems compared to the average of all sectors in the EU-4. In general, production processes in the chemical industries are very well suited for ERP systems: a large number of inputs are used to produce a wide variety of outputs. Large companies in particular use ERP systems to optimise their production processes: Two thirds of all large but only one third of the medium-sized and one tenth of the small enterprises use ERP systems. The strong use of ERP systems in the sector provides a good prerequisite for e-business processes that are based, e.g., on ERP-to-ERP connectivity.

Customer relationship management (CRM) and knowledge management (KM) solutions are also used by a higher share of large than small enterprises. In addition, there seems to be a significant future potential for CRM and KM systems in large companies in this sector, as around 20% of the large enterprises plan to invest in these new concepts during the 12 months period ahead.

The R&D intensive industries are interested in knowledge management solutions that can help researchers and product developers to improve the information flow and information sharing. In industries with large sales forces (e.g. the pharmaceutical industry) CRM systems can significantly improve the efficiency of the sales force and the quality of customer service.

Table 3-4: Chemical industries: Current and planned usage of specific IT solutions

IT system solution	All sectors	Chemical industries			
		All enterpr.	0-49 empl.	50-249 empl.	250+ empl.
CRM					
- current	7	7	6	9	31
- planned	2	4	3	7	21
Knowledge management					
- current	5	6	5	4	24
- planned	2	2	1	6	17
ERP					
- current	7	13	9	29	67
- planned	3	2	2	4	6

Base: EU-4 (D, F, I, UK), all enterprises. N=350 (for the chemical industries), N=5917 (for all sectors). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

B2B e-marketplaces

The chemical industry was once perceived as a prime candidate for electronic marketplaces, since a significant part of chemical companies' output is sold within the chemical industry itself, the industry is rather fragmented and the products can be well-described. Survey results, however, show that even though the preconditions in the chemical industries for trading on e-marketplaces are good, the usage is slightly below cross-industry average. Other forms of selling and buying online seem to be more important. Direct trading with selected business partners is regularly found more suitable, particularly in sub-sectors with specific product requirements, e.g. specialty chemicals.

Large companies use e-marketplaces to a much larger extent than small ones. One explanation for this outcome is that many platforms specifically serve the needs of large enterprises such as facilitating integration with others or providing an industry-specific meta-catalogue of maintenance, repair and operating (MRO) materials. Another explanation is that many large companies in the combined chemical industries are active in basic chemicals, where a participation in e-marketplaces is especially useful.

Table 3-5: Chemical industries: Current and planned participation in e-marketplaces

	All sectors	Chemical industries			
		All enterpr.	0-49 empl.	50-249 empl.	250+ empl.
Participation in e-marketplaces	5.3	4.3	3.8	2.4	23.2
Planned participation in e-marketplaces	3.4	2.7	2.8	1.9	2.3

Base: EU-4 (D, F, I, UK), all enterprises. N=350 (for the chemical industries), N=5917 (for all sectors). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

E-procurement

30% of all companies in the sector do procure online compared to 36% over all sectors. This gap will close if the companies' plans to increasingly procure online will materialise over the next years. Those companies that already procure online do so for a relatively low share of their overall purchases. For only 15% of the companies in the sector online procurement makes up for more than 10% of overall purchases (vs. 39% on average over all sectors).

One explanation for the gap between the chemical industries and the average seems to be that a comparatively low number of suppliers already sells online: To 45% of all enterprises in the sector a major barrier to online procurement is that suppliers do not sell online, compared to only 32% over all sectors. The requirement of face-to-face interaction is the second most important barrier to online procurement in this sector. However, this problem is significant in all sectors and not specific to the chemical industries.

Table 3-6: Chemical industries: Current and planned online purchases

	All sectors	Chemical industries			
		All enterpr.	0-49 empl.	50-249 empl.	250+ empl.
Purchase online	36	30	30	34	40
Plan to purchase online	7	9	9	5	19
Purchasing online for					
• > 2 years	42	35	34	44	28
• 1-2 years	40	40	40	39	43
• < 1 year	15	25	26	16	29

Base: EU-4 (D, F, I, UK), all enterprises (for first two rows), enterprises purchasing online for rows 3-5. N=350 (for the chemical industries), N=5917 (for all sectors). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Marketing and selling online

Chemical and plastics companies are more often present on the Internet than companies from other sectors. Currently, almost 90% of the large, about 80% of the medium-sized and almost 60% of the small enterprises in the combined chemical industries have their own website on the Internet. However, the share of enterprises with a website will probably increase to 80-90% regardless of the size of the company over the next year, since 18% of the small and 11% of the medium-sized companies in the sector plan to implement a website during the 12 months period ahead.

The share of companies selling online is slightly below EU-average. In addition, the companies' plans to sell online in the future do not point to an above average activity of the sector in sell-side e-commerce. This might partly be due to the strong B2B focus in the sector. More than three quarters of all companies in the sector report that other businesses are their primary customers. However, businesses do not seem to be the primary target of selling online.

While the overall share of companies selling online in the chemical industries is below average, the importance of online sales for those companies that actually sell online is comparatively high. The percentage of companies for which the share of online sales in total sales is above 10% is at 37% in the combined chemical industries, compared to only 29% on average over all sectors.

At 10% the share of enterprises selling online is clearly lower than the share of enterprises procuring online (30%). Obviously there is a better business case for procuring online in the chemical industries than for selling online.

Table 3-7: Chemical industries: Current and planned selling online

	All sectors	Chemical industries			
		All enterpr.	0-49 empl.	50-249 empl. ¹	250+ empl. ¹
Sell online	12	10	11	(4)	(19)
Plan to sell online	9	9	8	(11)	(10)
Selling online for					
• > 2 years	42	20	21	(43)	(--)
• 1-2 years	36	54	54	(57)	(56)
• < 1 year	20	26	26	(--)	(44)

Base: EU-4 (D, F, I, UK), all enterprises (for first two rows), enterprises selling online for rows 3-5. N=350 (for the chemical industries), N=5917 (for all sectors). In % of enterprises. Reporting period: June/July 2002.
¹ Number of observations <10, to be interpreted with care.

Source: e-Business W@tch (2003)

3.2.5 Impact of e-business

Internal processes

The e-Business Survey 2002 has shown that both selling online and procuring online tend to positively influence internal processes. However, the positive effects of online procurement on internal processes are stronger than those of online selling. Not only do more chemical companies procure online than sell online, but the share of those reporting a positive impact on internal processes is higher for online procurement (55%) than for online sales (47%).

The share of companies reporting positive impacts on internal processes is slightly lower in the chemical industries than on average over all sectors. This reflects the peculiarities of the chemical and plastics industry, which can be characterised as a process industry where overall efficiency is mostly determined by (physical) production processes. This differentiates the chemical industries from other sectors where interaction with business partners is part of the key business activity (e.g. trade) or where the products and services themselves can be influenced significantly through e-business (e.g. media and printing).

Comparing the impact of e-business on the internal business processes of small and large companies in the chemical industries again shows that a much higher share of large companies (78%) than of small ones (53%) state a positive impact of online procurement on their internal business processes. One explanation for this gap could be that small companies have not yet captured the full benefits of online procurement. However, one could also conclude that internal (procurement) processes in large companies are often more inefficient and the potential for increasing efficiency is much larger than in small companies.

Buy-side

Even though the overall assessment of procuring online is positive in the combined chemical industries, it is less so than on average. Quite surprisingly, there are many more negative assessments of e-procurement in the chemical industries than there are on average.

Major arguments in favour of online procurement have always been, firstly, savings in processing costs through increased efficiency and, secondly, lower prices for products by contracting with new suppliers. These savings in procurement costs could indeed be realised in the chemical industry. 54% indicate a positive impact of procuring online on their procurement costs. While the survey does not provide an explicit distinction between product and process cost savings, the higher share of companies stating that online procurement has influenced their internal business process positively is an indication for a stronger impact on process cost savings.

The savings seem to come at a price, though: Only 37% of the chemical companies indicate that the relations to suppliers have been improved; for 13% they have deteriorated. This is by far the highest negative value of all impacts. Taking into account the fear of suppliers that online procurement is simply a new tool to squeeze their margins, it comes at no surprise that its influence on the supplier relationship is not unequivocally positive.

Comparing company size classes shows that online procurement clearly has more positive effects for large than for small companies. This applies to all potential impacts of online procurement. As in the case of internal business processes, large companies seem to benefit more from online procurement than small ones.

Table 3-8: Chemical industries: Perceived impacts of purchasing online

Impact on...	Very positive	Fairly positive	Neither positive nor negative	Fairly negative	Very negative
... procurement costs					
chemical industries	9	46	41	3	2
all sectors	13	46	39	2	1
... relations to suppliers					
chemical industries	3	34	50	13	<1
all sectors	11	34	45	8	2
... internal business processes					
chemical industries	8	47	38	5	2
all sectors	17	42	39	2	1
... costs of logistics and inventory					
chemical industries	6	35	52	3	4
all sectors	12	35	48	2	3
... number of suppliers					
	Increased	Constant	Decreased		
chemical industries	29	70	1		
all sectors	24	70	5		

Base: EU-4 (D, F, I, UK), enterprises purchasing online. N=186 (for the chemical industries), N=2251 (for all sectors). In % of enterprises (reporting that ...). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Sell-side

Selling online generally has positive impacts for the majority of companies in the combined chemical industries. More than half of all enterprises in the sector report very or fairly positive impacts on the volume of sales, the number of customers, the sales area and customer care. Nevertheless, there is a significant share of companies in the chemical industries for which sell-side e-commerce has brought about negative impacts. A certain polarisation can be observed: positive impacts for a majority of companies but negative impacts for a not negligible share of others. This polarisation is specific to the chemical and plastics sector. In other sectors, the share of companies feeling negative impacts of selling online is considerably smaller.

One of the major motivations why companies started selling online a number of years ago was the expectation that they could increase their sales volume by winning new customers and increasing their sales area. These hopes have to some extent materialised in the chemical industries. More than half of the chemical companies that sell online report a positive impact on the volume of sales (57%) and on the sales area (59%). However, only 43% indicate a positive impact on the number of customers. From the very positive assessment of online sales on customer care (59%) one could conclude that increasing sales volumes in chemical companies was largely due to offering a better customer care to existing customers rather than only due to acquiring new customers.

Positive effects of selling online were most strongly felt by small companies. 62% of them observed a positive influence of online selling on customer care, while only 28% of the larger companies did. Obviously, online selling is a means for small companies in the chemical sector to overcome some of the disadvantages of being small and thus closing part of the gap with large companies with respect to customer service and market presence. These activities also seem to be paying off: 65% of the small companies indicate a positive effect of online sales on their sales volume, while only 12% of large companies do.

3.3 Conclusions

3.3.1 Implications for the industry

Increasing market transparency, rising internationalisation and stronger competition

As companies can extend their sales area by selling online, this should lead to a greater internationalisation of the sector. While this provides new opportunities for some companies, it is detrimental for companies that have previously benefited from the lack of market transparency.

One example are so-called “bulk speciality chemicals”, which are produced by a large number of manufacturers and sold to a variety of buyers. Online sales of these chemicals – or even only online information about their availability from different suppliers – increases competitive pressure on the suppliers of these goods. Although these effects will not be equally strong in all sub-sectors of the chemical industries, the improved information flow will most likely lead to an increase in competition in most sub-sectors.

To avoid increasing price competition, companies have an incentive to bundle their products with services or improve other service-like components, e.g. after-sales support or customer care. As many parts of the chemical industries such as speciality chemicals or pharmaceuticals develop many products in cooperation with their buyers, these companies have relatively good preconditions for following such a strategy. Due to these incentives it is rather likely that the services' share in the output of the chemical sector will increase.

Large and small companies improve productivity in different ways

Both large and small companies can use e-business to reduce their weaknesses. However, they do so in different ways: large companies mainly benefit from online procurement and the process improvements involved. Smaller companies are able to overcome disadvantages of being small by using online sales to improve customer care and provide better service, not least in markets not previously served. Both effects should lead to an increase in productivity. Large companies can decrease costs of internal processes and small companies can spread fixed costs over a larger volume of sales, thereby making better use of economies of scale. The effects on overall productivity in the sector will, however, most likely take some time before they can be observed in productivity statistics. If a large company aims at improving its procurement process, the main productivity increase does not result from buying a new computer and software, but rather from adapting the processes to new opportunities offered by e-business technology. This is not an issue of IT investment, but rather a management task that takes time to complete.

3.3.2 Policy implications

One policy size does not fit all

The companies in the combined chemical industries are rather diverse with respect to their products, business processes, distribution by size class, and value chains. This diversity is also reflected in the companies' motivation for engaging in e-business activities as well as in the different priorities attached to the various possibilities. While a basic chemical company, for example, might have cost reduction for order processes on top of the agenda, improvements of their internal knowledge management might be more important for a pharmaceutical company.

This implies that different sub-sectors of the chemical industries as well as companies from the same sub-sector but of different size will follow different "optimal" e-business strategies. This has implications for measurement as well as for policy. Differences in the usage of certain types of e-business solutions might reflect different optimal strategies rather than different states of "e-readiness". Or, following a saying from the software industry, these differences "are a feature, not a bug."

For policy it has the implication that policy measures targeted at improving the usage of e-business should aim at closing the gap between best practice enterprises and laggards *within* the relevant peer group rather than across groups of enterprises.

Availability of information about e-business alternatives

It is important that companies do have sufficient and correct information to make a decision about their e-business activities. This information includes a correct assessment of the actual costs and benefits of each potential e-business activity. Investigating the available information on e-business in the combined chemical industries shows that this information is very much biased in two ways:

One bias is towards chemical and pharmaceutical companies. There is not much information available on e-business in the rubber and plastic producing industry, neither about the state of e-business nor about the way to conduct e-business properly. The second bias is towards large companies. Many of the available e-business examples and case studies are from larger companies, if not from global giants. Also, many Internet platforms have large companies as their primary target groups.

Thus, many e-business examples and best-practices are unsuitable as role models, since they are not considered by SMEs as *relevant* best-practice examples. Policy can help to change this situation by compiling appropriate best-practices.

Internationalisation requires appropriate framework and informed actors

While extending the market is a potential benefit from selling online, fully capturing this benefit requires first of all that the selling company is informed enough about the target market to act there successfully. And it requires secondly that no legal and trade barriers inhibit these sales or – at least – that the company can cope with these barriers. For the chemical industries in particular, which are in some parts tightly regulated to avoid harm to humans as well as nature, crossing borders often requires becoming familiar with foreign regulatory regimes.

Thus, having the technology available to sell online is not enough. This technology must be accompanied by information about the respective framework in the target market. For smaller companies this is often a difficult task due to insufficient resources. While traditional policy was aimed at removing the barriers to trading internationally, the new information and communication technology also offers opportunities to pursue less ambitious goals. By providing better information about different legal and regulatory frameworks, e.g. human safety and environmental regulations, or by compiling existing information, policy can already reduce the barriers to some extent and by doing so improve the chances that the opportunities of e-business materialise.

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4 Manufacture of metal products

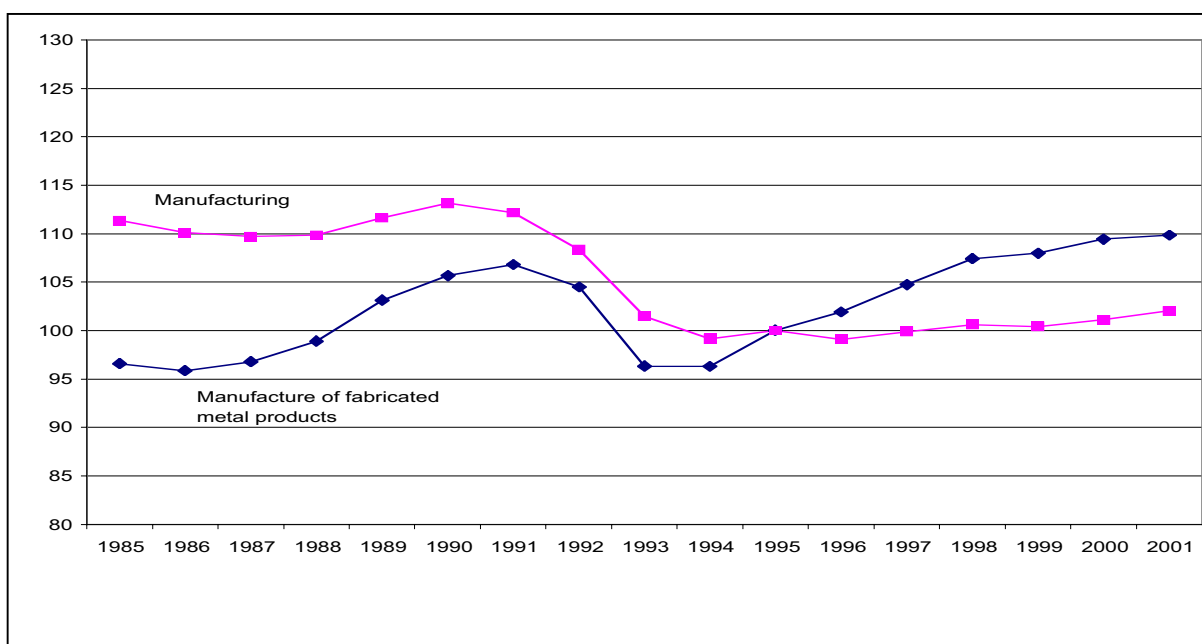
4.1 Economic profile and trends

In 2000, about 270,000 enterprises belonged to the sector “manufacture of fabricated metal products except machinery and equipment” according to NACE Rev.1 28. They produce a wide range of metal products, from structural steel constructions, central heating radiators and boilers, to containers and packaging for food and drinks, cutlery and tools.

NACE Rev.1 division	group	Activity
28		Manufacture of metal products
	28.1	Manufacture of structural metal products
	28.2	Manufacture of tanks, reservoirs and containers of metal; manufacture of central heating radiators and boilers
	28.3	Manufacture of steam generators, except central heating, hot water boilers
	28.4	Forging, pressing, stamping and roll forming of metal, powder metallurgy
	28.5	Treatment and coating of metals; general mechanical engineering
	28.6	Manufacture of cutlery, tools and general hardware
	28.7	Manufacture of other fabricated metal products

The value of production amounted to 260 billion Euro or 5.3% of total manufacturing, which was created by some 2.2 million persons employed – 9.3% of the employment in total manufacturing. The annual growth rate of real production value in the period from 1991-2001 amounted to 3.6% compared with 3.5% for total manufacturing. But there is more cyclical movement in the development of output of fabricated metal products than in total manufacturing. This is due to the fact that the most important customers of that sector, such as the automotive industry, the producers of machinery, or the construction industries are vulnerable to changing business climate.

Figure 4-1: Number of persons employed in Manufacture of fabricated metal products (NACE Rev.1 28) and in Manufacturing (NACE REV.1D) in the European Union – Index (1995=100)



Source: Eurostat NewCronos 2002, calculations and estimate by DIW Berlin.

As far as employment is concerned, the metal product sector shows some remarkable differences from manufacturing in general. The cyclical movements are more pronounced, and from the bottom in 1993, employment in the metal products sector expanded at an annual rate of 2.1% compared with stagnating employment (+0.1% p.a. from 1994 to 2001) in total manufacturing.

The estimated value added – representing the incomes created in this sector – amounted to 134.5 billion Euro in 2000 (EU 13) or 8.6% of total manufacturing. The income share compared with that of employment indicates that income per person employed is less than average.

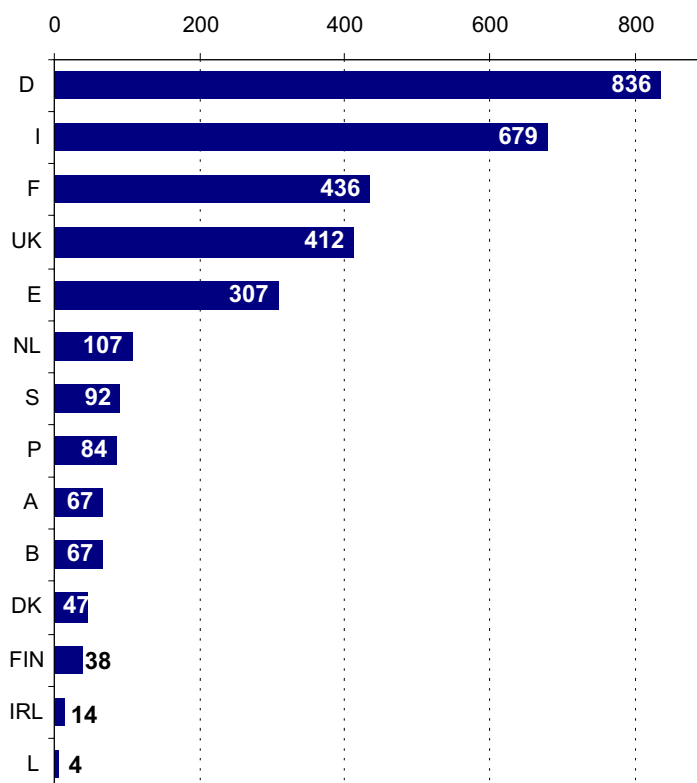
The three largest producers of fabricated metal products are Germany, Italy, and France with a total share of 62.5% of the sector's production value in thirteen EU countries. Nearly half of the employment in the EU metal product sector can be attributed to Germany and Italy. Together with France and the UK, these four countries account for about three quarters of employment in this sector in the EU.

The manufacture of metal products is characterised by a predominance of smaller enterprises. The importance of small enterprises for the sector's employment (57%) is considerably higher than in total manufacturing (36%). The lower employment weight of large enterprises in this sector – 18% compared with 41% in total manufacturing – is a reflection of the low average number of employed persons per enterprise – 560 – compared with 844 in total manufacturing.

Figure 4-2: Manufacture of metal products (NACE Rev.1 28): Number of persons employed in the EU countries (2000) (in thousands)

Data concerning L refers to 1999

Source: Eurostat NewCronos 2002.



Indicators for productivity and labour costs are lower in the metal products sector than the average of total manufacturing. The levels of productivity and labour costs differ considerably between countries. The average productivity of the 12 countries in 2000 amounts to a value added of 41,376 Euro per person employed. It was lowest in Portugal and highest in Belgium, where it was nearly three times as high as in Portugal.

4.2 Usage of ICT & e-business

4.2.1 Opportunities and risks

E-business opportunities

E-business solutions support strategies to improve competitiveness. Furthermore, they can enhance the efficiency of markets by speeding up the exchange of information and by increasing market transparency. When expanding into new geographic regions, e-business offers a variety of tools to support staff at foreign locations, raise customer awareness and improve customer relations and sales. In addition, excess supply can be sold in online auctions, which also offer the possibility to create first-time contacts with new customers.

Many companies in the sector are under pressure to reduce inventory and working capital. Sales cycles can in general be accelerated by improving communication with key customers, and by using alternative distribution channels for excess capacities. Cost savings could also be realised by streamlining procurement activities. However, most of these applications promise the biggest cost savings when they reach a certain order of magnitude. This might constitute a limit for the adoption of many e-business initiatives in SMEs in the metal products sector.

A variety of Internet-based B2B services help companies to outsource elements of administration processes. For example, web-based services are available for payroll accounting and travel expense management. These activities are usually routine tasks that do not belong to the core competencies of a company. External service providers that specialise in these tasks can often offer them at comparatively low costs and high quality. Electronic communications offers excellent possibilities of outsourcing functions without losing control and efficiency.

Firms from the metal products sector might sooner or later be asked by their larger customers to join their supply-chain-management (SCM) initiatives. These initiatives usually hold benefits for both sides – the supplier and the customer:

- The automation of sales steps reduces transaction costs. Routine tasks become automated, and thus faster, more reliable and cheaper.
- Placing product catalogues into electronic procurement systems of key customers strengthens the bonds with these customers, which often leads to increased order volumes.
- The seamless flow of information provides up-to-date insight into market demand; forecasting becomes more accurate, which helps to reduce inventories and production costs.

The Internet has provided an efficient means to improve a company's image, brand, and visibility by launching a website. Internet investment is often strongly motivated by the expected positive impact on company image.

E-business risks

E-business offers opportunities, but also involves risks. Implementation is accompanied by strategic and financial commitments that have to be carefully weighed against the expected benefits in each individual case. The considerable investments required for many e-business solutions have to be considered under opportunity cost principles: they might be better spent on other areas. Firms (regardless of size) have only limited budgets for investment projects. Thus, resources should be spent on the investment opportunities with the highest positive discounted cash flows. This does not necessarily have to be e-business.

In online marketplaces information costs for customers are relatively low, and market transparency is higher than in offline business. On anonymous electronic markets it is difficult to promote "soft" benefits, such as trust and reliability. This works towards shifting competition to prices. Many metal manufacturers complain about destructive price competition. European firms are often confronted with

competitors from Eastern Europe or Asia whose overall cost levels are lower. Competing entirely on the dimension of price would therefore be an unwise strategy. Cost savings from more efficient logistics may be needed to compensate for lower margins due to more transparent and competitive online markets.

Although e-business technologies have already reached considerable maturity, there are still technical and organisational implementation risks. IT and software systems are unique in every individual firm, so compatibility and fluent data exchange cannot be guaranteed. Often, the costs for implementing a new complex software system are underestimated. However, technical problems are usually not a major obstacle in e-business initiatives. A much greater risk arises from a lack of acceptance by employees of e-business systems. Implementation should therefore include a thorough analysis of business processes and work routines of employees.

The potentials of e-business described above suggest that – despite the risks involved – there should be a strong interest in the industry to engage in e-business. However, this is currently not the case. Opportunities have been discussed during the initial expansive phase of e-commerce around 2000, but the topic seems to have lost its appeal and is not an important issue at the moment. Most of the available publications, and initiatives date back to 2000 and early 2001. Since then, interest in the topic has plummeted. Even during the period of more intense interest, firms in the metal products sector did not rank e-commerce as a top priority business issue (see Strategem Limited 2000, p.4).

The following reasons might explain the low level of e-business activity:

- In the metal products sector, business is frequently conducted on the basis of personal and long-standing relationships.
- Firms are specialised in niche products and serve rather small market segments. The number of potential suppliers and customers for each individual firm is limited, leaving little room for efficiency gains from e-business tools.
- Large shares of business are often based on fixed lot production for specific customers and thus not freely available for sale to an anonymous marketplace.
- For those products that are produced “on stock” and sold to an anonymous market, pressure on price margins from online competition may be valued higher than the potential for increasing market reach and acquiring new customers.
- The need for collaborative engineering or other forms of data-intensive communication is limited. Metal products are often interim products that are not very engineering-intensive.
- Customisation of production and of engineering services exists, but does not require interactivity to an extent that would justify full-scale Internet-based product development solutions.
- Back office management in metal product firms is often limited to the most basic functions (accounting, administration and rudimentary human resource management).
- Production is not as knowledge-intensive as in other industries.

This does not mean, however, that no e-business opportunities exist at all. As many firms in the sector are suppliers of the automotive or other industries where e-business is currently being introduced on a broad scale, these firms will probably be confronted with customer initiatives to enter into web-based supply-chain management (SCM) solutions or e-procurement.

4.2.2 The state of e-business diffusion in the metal products sector

The following section discusses some of the results from the *e-Business W@tch* survey. The sample of the metal products sector covers seven countries (D, F, UK, I, EL, FIN, L). It comprises 580 interviews across three different firm size classes.

Computers and Internet access can be considered a standard endowment for metal product companies throughout Europe. However, there are some significant differences between countries.

The UK, Finland and Greece remain far below EU averages, whereas France, Germany and Luxembourg are countries with an advanced diffusion of network access.

The use of network applications varies significantly between enterprises of different size. Differences are considerable for more sophisticated applications, such as intranets, LANs, WANs and EDI, although some of these tools are not suitable for small enterprises.

A prerequisite for starting E-commerce activities is the existence of a company website. The related indicators can be seen as expressing the readiness for e-business activities in the metal products sector of each country. The table below gives an overview.

More than half of the metal product firms in Europe have a website; differentiation by country shows Italy at the high and Germany at the low end. A large number of websites are hosted by external service providers; this practice is fairly common in the UK and in France, and much less widespread in Finland. Drastic differences between countries indicate a strong dominance of “national” practices; they may also show the quantity and quality of the supply of web related services in a country.

Table 4-1: Manufacture of metal products: Companies with a website

	D	EL	F	I	L	FIN	UK	EU-7
Company has a website	43	44	54	64	53	48	52	55
Of those:								
Web hosting by external service provider	58	66	74	56	68	30	74	62
Web design by external service provider	64	65	68	70	51	57	77	70
Website maintenance/ updating by external service provider	64	71	57	74	63	84	77	71
Usage of a Content Management System	8	14	3	15	--	<1	<1	9
Information about products on the website	88	87	94	89	98	100	97	91

Base: “Company has a website”: all enterprises (N=580); other questions: enterprises having a website. In % of enterprises.

Source: e-Business W@tch (2003)

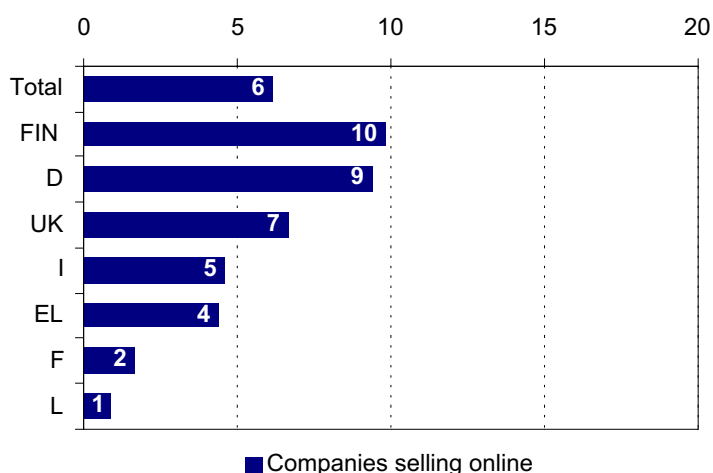
E-business activities are not very widespread in metal product sectors throughout Europe. The following figures report the percentages of companies already selling and procuring products online.

Figure 4-3: Manufacture of metal products: Companies selling online (by country)

Base: EU-7 (D, EL, F, I, L, FIN, UK), all companies (N=580).

Figures weighted by employment (“enterprises comprising ...% of employees say that they sell online”).

Source: e-Business W@tch (2003)



Only 6% of employees work in companies that have already engaged in online sales. This is far below the average of all industries in the sample (17%). And only 9% of companies intend to sell online in the near future, compared with 10% for the average of all sectors. Thus, metal manufacturers will

hardly catch up with other industries in the next few years. As could be expected, online sales are less widespread in small than in larger companies. However, the very large enterprises obviously lag further behind than those between 50 and 249 employees. Reasons for this could be that the organisational restructuring required to introduce e-sales efficiently is considerable in a large company, and smaller firms might be more flexible. In addition, there might be less competitive pressure to introduce new sales channels.

Although the procedures are similar, the patterns of introduction of online *procurement* differ considerably from those of online *sales*. Online procurement is much more common than online sales: more than 35% of companies procure at least part of their inputs via electronic channels. However, this average hides considerable differences between countries. German metal manufacturers engage more than three times more often in online procurement than their Italian counterparts. However, even with respect to procurement the metal products sector remains significantly below the average of all industries (43%). But metal manufacturers seem to be catching up – they express plans to introduce e-procurement slightly more often than firms in other industries.

Here the size distribution of companies reflects the “normal” or expected situation of e-business diffusion. Large firms take the lead, and the smaller ones are more reluctant. Whereas only 6% of the bigger companies sell online, almost 58% buy via electronic channels.

Figure 4-4: Companies making online purchases by country

Base: EU-7 (D, EL, F, I, L, FIN, UK), all companies (N=580).
Figures weighted by employment ("enterprises comprising ...% of employees say that they purchase online").

Source: e-Business W@tch (2003)

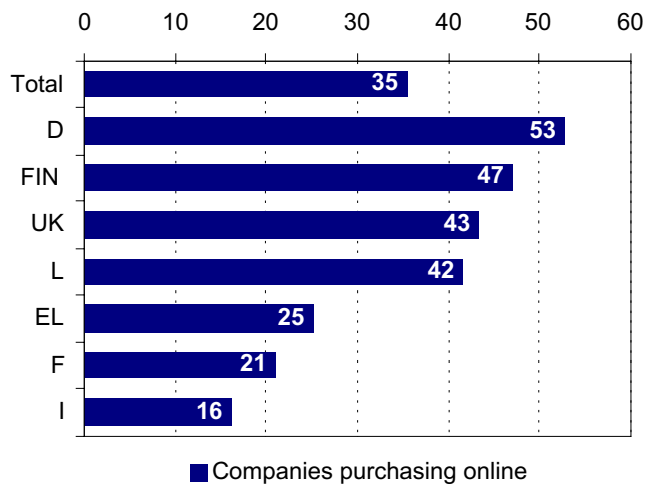
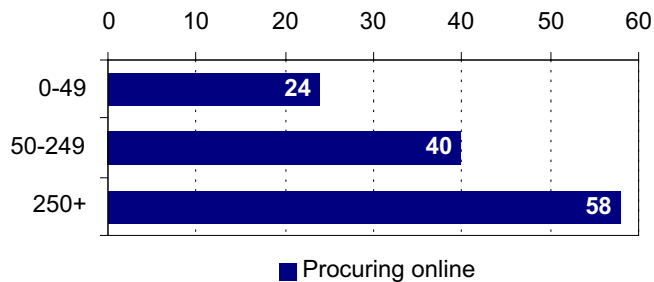


Figure 4-5: Companies making online purchases by size class

Base: EU-7 (D, EL, F, I, L, FIN, UK), all companies (N=580).
In % of enterprises.

Source: e-Business W@tch (2003)



4.3 Conclusions

The metal products sector comprises a set of quite heterogeneous industries. Metal product manufacturing is characterised by internationalisation trends, pressure on prices and margins, and a strong emphasis on cost control and environmental issues. Companies in the sector respond to these

challenges by intensifying innovation activities, focusing on niche products, expansion into new markets and the development of brand identification measures. E-business offers the same opportunities to the sector as to any other sector of the economy. However, one of the central (and surprising) findings of this report is that metal product manufacturers are very reluctant to implement ICT and e-business systems. This attitude is being confirmed by a whole series of indicators and is shown by firms in all countries and across size classes.

The risks deriving from an engagement in a new field of technology, new business models and organisational patterns do not seem to be higher than in other industries, but are perceived differently by companies. Opportunity costs play a significant role, since substantial investment (mainly in software and training) is needed; increased market transparency might erode margins and lead to an intensification of competition. Some applications and systems are still in a pilot phase, which increases the risk of failure in implementation.

There seems to be a certain cyclical influence: a period of excitement and high-flying hopes with respect to e-business has been followed by a sobering-up period induced by the end of the dot.com boom in the United States and not entirely convincing experiences in Europe. Companies and industry associations alike emphasise the fact that their products and transaction methods do not lend themselves to doing e-business. In addition a rather conservative atmosphere seems to prevail, making it difficult to implement major changes within firms or between business partners.

Nevertheless, individual companies have begun to engage in online procurement and sales systems, and a majority have achieved positive results. Industry associations are not pushing the issue actively at the moment, but some are continuing activities that they had started during the boom phase of e-commerce. Companies' plans with respect to future e-business initiatives show that diffusion has not come to a stop, but will continue at a reduced pace. Hence, it can be concluded that – due to the specific nature of products traded and transaction patterns that have been established, this sector is somewhat less suitable for e-business than others.

Economic implications

The generally low level of adoption of e-business implies that no drastic impact on cost and price structures, in market organisation and innovation activity can be expected in the metal products sector. Changes will be more visible and will occur earlier on the input side. However, even on the procurement side, online trade volumes are still rather insignificant in relation to overall transaction volumes. Volumes and shares are likely to increase slowly but steadily and reach a threshold where impacts on prices, input quality, supplier constellations and value chain configuration will be noticed and reflected in profits and loss accounts.

An important question is whether small firms will be able to take advantage of the new opportunities to the same extent as their bigger counterparts. Whereas only slightly more than half of the small firms have a website, three-quarters of the medium-sized and more than four-fifths of the large firms do. An important finding of this report is that the cost of having an ICT department and of establishing and maintaining a web presence is much higher proportionally for small than for medium and large enterprises. Hence, it is more difficult and takes longer for these firms to cover sunk costs from the gains to be derived from doing e-business.

Theoretical considerations on the impact of e-business on firms are confirmed: indeed, a large share of firms have stated positive impacts on costs, customer and supplier relations, the efficiency of procedures and the scope of markets. However, experience was less often “very positive” than in other sectors. Since electronic marketplaces are only used by a very small number of companies (1% of the sample).

Policy issues

Policy issues mainly arise with respect to the integration of SMEs in e-business initiatives and the general lagging behind of the sector and its impact on European competitiveness.

SMEs must improve their readiness to do e-business: Awareness of e-business opportunities should be improved in SMEs. As a result of the public debate following the recent dot.com failures, expectations in relation to the benefits of electronic markets have shrunk considerably. Small firms in particular seem to have severe doubts about the usefulness of electronic forms of doing business. A discussion of features that have led to failures could help to shed new light on the advantages of e-business still existing. Obviously the relative cost of building up and maintaining modern ICT solutions is higher in SMEs than elsewhere. Measures that might help SMEs gain access to external resources for establishing e-solutions might provide some compensation for this disadvantage.

Such measures are useful where the introduction of e-business could improve the efficiency of procedures in SMEs. It has to be borne in mind, however, that to a certain extent the reluctance of SMEs to adopt certain e-solutions is due to inappropriateness of the tool, or to sound cost considerations (lack of substantial turnover to justify the costs).

Enhancing competitiveness via sensible e-solutions: Part of the reluctance of metal product manufacturers to engage in e-business is due to sector-specific peculiarities. Here it would not make sense to push firms into e-business. On the other hand, barriers that are related to critical mass phenomena seem to be important. Here, diffusion measures, such as credit support for introduction, or awareness programmes might help to reach a level at which systems develop out of their own dynamics. In some markets e-business will become the common standard in procurement and sales systems, even if strict cost considerations would not justify their adoption. Here a new paradigm for doing business has to be accepted by firms that want to remain competitive. A close observation of the development of competition in international markets is necessary to be aware of the relationship between e-business intensity and competition.

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5 Manufacture of machinery and equipment

5.1 Economic profile and trends

The NACE Rev.1 division of "Manufacture of machinery and equipment" (29) is subdivided into seven groups. The e-Business Market Watch will focus on the groups of industrial processing machinery (i.e. codes 29.1, 29.2, 29.4 and 29.5) and of agricultural machines and tractors (29.3).

NACE Rev.1		Activity
division	group	
29		Manufacture of machinery and equipment
	29.1	Manufacture of machinery for the production and use of mechanical power, except aircraft, vehicle and cycle engines
	29.2	Manufacture of other general purpose machinery
	29.3	Manufacture of agricultural and forestry machinery
	29.4	Manufacture of machine-tools
	29.5	Manufacture of other special purpose machinery

The machinery and equipment manufacturing sector is one with predominantly small and medium sized companies. Industrial output, in terms of growth, value added and production value has only experienced marginal growth over the last decade, with significant fluctuations over that period. In comparison to manufacturing generally, the sector has lost significant ground in production prices, and to a lesser extent in value added and employment. In terms of employment some sectors have been more resilient at retaining their staff numbers, most notably in special and general purpose machinery. Pressure on this sector has been as a result of significant international growth, especially within the triad. This growth has particularly hit machine tools, which is now facing tough international competition from Japan and Far Eastern producers.

Companies have displayed small-batch and customised (or turnkey) production strengths, with series machine production displaying significant resilience despite strong price competition within both the EU's domestic and overseas markets – especially in China and the Far East. Production appears to be still labour-intensive and needs highly qualified staff to produce high performance quality products. Additionally, cyclical demand variations require companies that are able to flexibly adjust their capacities and products to better meet customer demands.

The EU still produces innovative products, and in many sub-sectors it holds more patents than NAFTA or Japan combined. This position needs to be maintained, as 65% of innovations within manufacturing emanate from innovations from within the machinery and equipment sector. Throughout the sector though, there are significant differences between member states: Denmark and Ireland are good innovators, whereas Spain and Portugal are some of the poorest. Within many of the sectors, R&D (42% of innovations emanate from this source) and interaction with clients (30-50%), enterprise groups (30%) and suppliers (18-21%) were considered valued sources of innovation. Consequently, innovative activities could be enhanced from networked infrastructure, which provides a platform to progressively link up firms to valued sources of innovation.

Even though this sector has demonstrated remarkable resilience through increased price competition and the continuous introduction of innovative products, import statistics especially for some sub-sectors, as in mechanical power, have highlighted a rapid growth in domestic demand for products manufactured by Japanese producers – their focus of series production and price competition produces an effective competitive formulae. On the upside, certain sectors still remain strong within the EU, especially in food and beverage equipment, machinery for metallurgy, and construction equipment. Unfortunately, within the EU, some member states have lost out to others, as opposed to the whole market expanding; therefore one must still remain cautious as to the long-term strength of these sectors across all member states.

The cyclical nature of the markets that these products serve has hampered long term investment in some member states. The ability to weather cyclical demand through extending current sales routes, perhaps to more diverse markets (or ones cornered by other members of the Triad), would prove a considerable advantage. This, however, entails significant challenges, especially in the UK, where many of the SMEs appear to have limited capacity for product innovation and establishing a presence in other EU and overseas markets. Similarly, in other countries where SMEs are used to provide other manufacturers with parts or sub-assemblies, the ability to access new markets is an issue.

Table 5-1: EU, US and Japanese macro market & business issues illustrating triad impacts of ICTs & e-commerce

Drivers of EU and international competitiveness in machinery and equipment manufacture			
Market	EU	USA	Japan
Product range	Broad product range in all sectors & in amount of specialisation. <i>E-commerce allows access to disparate producers and broader product range.</i>	Narrow product programme. <i>E-commerce allows dominant producers to promote technological improvements in series products.</i>	Focus on serial machines. <i>E-commerce supports price strategy of Japanese producers.</i>
Market size	Large open domestic market - representing significant market value €360 billion. <i>Easier market penetration of overseas producers through e-sales, distribution and maintenance portals.</i>	Large open domestic market €319 billion. <i>Easier market penetration by European producers through e-sales, distribution and maintenance portals.</i>	Substantial closed domestic market €215 billion. <i>Sales and distribution portals could be used to offset the EU's foothold in some African/Middle Eastern markets.</i>
Access to labour	Highly regulated labour market with strong unions – less in UK, but dominant in Germany, Italy and France. <i>E-training and recruitment could be used to support Europe's QSE shortage (e.g. lifelong learning, promoting employment best practice etc.)</i>	Limited flexible/liberal labour markets	Labour training & education supported by policymakers.
Market strengths	Strong position in customised engineering and know-how. <i>Strengths in knowledge intensive sectors could be supported by greater information dissemination/interactivity. Good access to customers with good working relationships.</i>	Key players in serial machine markets. <i>Enhanced EDI & portals could improve after-sales services & support. Strong customer focus.</i>	Strong position in volume markets. <i>Volume markets could be supported by customer information, downloadable maintenance procedures & sales promotions etc. Strong focus on price.</i>
Business Environment	Reduced price competitiveness. <i>Product support could add value and enhance product competitiveness</i>	Increased price competitiveness. <i>ICT & e-Business have been successfully used to improve the US price competitiveness</i>	Success in restructuring. <i>The pace of sectoral restructuring could be enhanced.</i>
Market Type	Leading in mature technologies.	Focus on advanced technologies.	Focus on advanced technologies.
Supply Environment	Further losses in serial machines could harm overall competitiveness.	Increase in R&D efforts by players in the value chain.	Growing competence in customised and plant engineering.
Political / Capital Environment	Restricted access to venture capital	Readily available venture capital	Openness between SMEs and capital markets

Source: Understanding Machinery and Equipment Competitiveness – adapted from numerous sources

Accessing markets with good growth and medium-term stability, as in Asia, still offers great potential for the EU's manufacturers, especially in machine tools. Asian domestic growth remains strong, and the technological prowess of Europe's manufacturers needs to be exploited. However, cultivating the appropriate distributor/sales/technical support can be a major issue. It is here that ICT and appropriate e-market activities could play a role in supporting this activity.

5.2 Usage of ICT & e-business

Presence and connectivity

Overall it appears that most enterprises in the machinery sector have an electronic presence, whether it is simple internet access, WWW usage, or more sophisticated network connections. In the main though, dial-up and ISDN technology dominate. General usage of the internet appeared to fall within the sector average. The use of extranets, LANs and WANs followed this, with actual and planned usage making good progress in comparison to the other fourteen sectors surveyed.

Simple website presence was above average; unfortunately, this was let down by well below average selling online. This was anticipated, as the goods sold in these sectors were considered unsuitable (capital intensive and complex plant, requiring complex and significant technical negotiation) – and this issue was supported by survey responses. The issue of “will this hamper future investment?” is of interest in this respect. According to the survey, across size class and country, around a third of the businesses stated that they would continue to increase investment in presence and connectivity – most notably in France, Italy, and Spain. Austria, the UK and Germany's uptake/investment would actually remain at current levels. Very few companies across all sizes and countries would decrease current investment levels.

Sophistication

First generation systems are still widespread. Electronic Data Interchange (EDI) has a good usage, above industry average. The newer second generation e-commerce applications have not had as big an impact as initially envisaged, and this was evident across all sectors. With respect to Customer Relationship Management (CRM), machinery and equipment fared slightly better than the industrial average. The sector fared better with Supply Chain Management (SCM) than the industrial average, but in both cases the presence of this activity was biased towards larger enterprises (250+ persons), and it is also probable that the complexity of these systems varied. For example, Enterprise Resource Planning (ERP) was stated as being used by almost a fifth of all enterprises. Whilst this may be generally regarded as very good uptake, it was considered that the complexity of those applications would vary significantly between small and large enterprises. SMEs were more likely to install a simple time/price management system, whereas large enterprises, especially the multinationals, were more likely to install multi-site, internationally linked applications. For the most part, these systems would support just-in-time/zero defects activities.

Exchange and Interaction

Machinery and equipment manufacturing are complex and knowledge intensive. The sector requires the continuous feeding of innovations from R&D to improve design and production techniques. For many enterprises in differing countries, sources of innovations emanated from differing sources, even though some countries (e.g. Germany and France) conducted significantly more in-house R&D. Even though exchange of information was considered good, above the industrial average, many countries did not significantly engage in online design collaboration. Reasons for this were both technical and business/culture orientated. Difficulties in the compatibility of design/testing software were an issue – gradually being overcome by IHC, although there are still significant obstacles to be overcome. Other issues included confidentiality, as exchanging commercially sensitive documents over the web is still considered a security issue. Concerns over IPR issues, especially over digital media, are an issue for many SMEs. In collaborative work, where there is less of a prejudice to commercial sensitivities,

enterprises exchanged documents significantly more, between 4 and 5 times more. The compatibility or widespread use of Microsoft, Adobe, etc., of many document formats has assisted this activity. Unfortunately though, the exchange or use of online collaboration to forecast product demands was below the industrial average. Similarly, the online management of capacity was significantly lower than the other fourteen sectors. This was attributed to the differing systems implemented by SMEs. Case studies revealed a variety of methods were used to manage product demands, producing a one system fits all was expensive and needed significant collaboration across supplier and customer applications. This was deemed possible only by larger players, with which small producers would cooperate, generally when selling a significant volume to one major supplier.

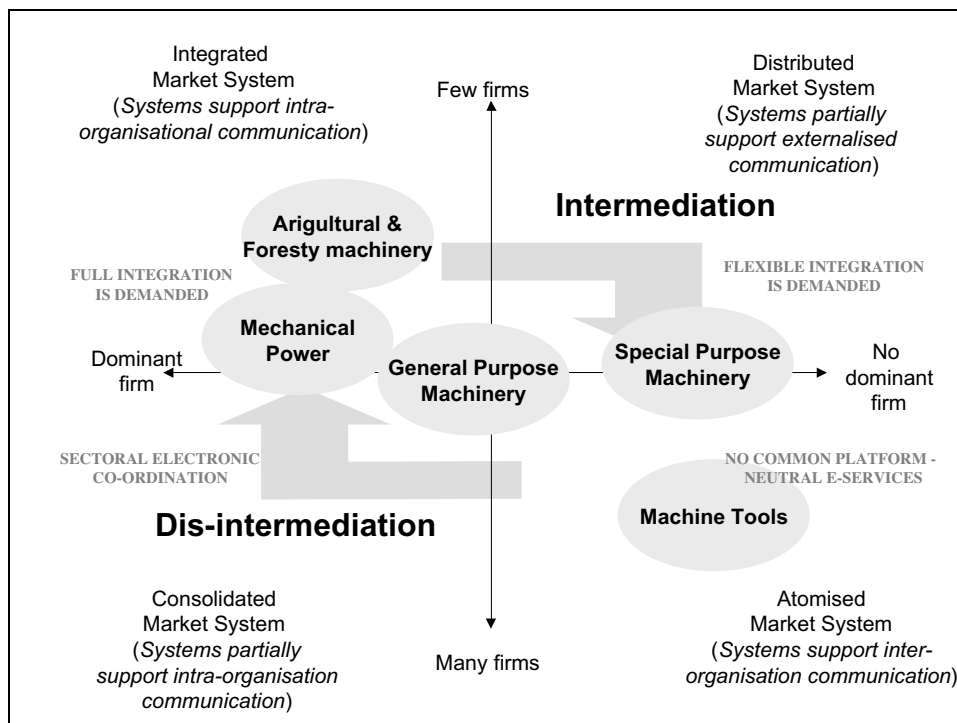
Closing deals and conducting online negotiations was also well below the industrial average. Consistent issues arose as to why negotiations had to be undertaken face-to-face – again the unique, capital/technological intensive nature of the purchases prevented such activity. This is likely to prevail in the majority of the activities that make up this sector. Some sub-sectors that could undertake online negotiations are in the manufacture of agricultural machinery – especially for appliances that are purchased by public authorities or the do-it-yourself (DIY) sector.

Only a limited number of companies had integrated front-end to back-end systems – generally the larger enterprises. Even where front to back end systems were present, their complexity could not be established, but inferences from the data hinted that such activities were aimed at marketing and simple processes rather than complete business transaction capability. The medium to long-term picture of increased back-end systems is considered good. Small investments in the last two years in this activity are considered a positive foundation for greater activities in the next two to five years.

Sales & Markets

Within several sub-sectors intermediation within the marketplace has taken place. Here third parties play a crucial role in the distribution of products; however, the pressure exerted by ICTs and e-commerce allows suppliers to transact directly with buyers – essentially forcing disintermediation. The strength of intermediaries will be the type of value added services they provide, and whether there is price transparency in the products sold.

Figure 5-1: Intermediation and disintermediation in the machinery manufacturing sector



Source: Understanding market impacts within manufacture of machinery and equipment (developed from IPTS/JRC 2001)

Companies that have managed to trade online have in the main only been able to generate between 1-5% of sales from such activities. Most companies, whilst undertaking some selling online activities, appear to be limited to no more than producing brochures. Websites tend to be static, with minimal interaction going beyond e-mail or obtaining company information. Emphasis appears to still remain on establishing a presence rather than developing e-business structures that enable procurement, marketing, and sales activities.

The trading of goods on B2B e-marketplaces was above average – almost double the industrial average. This was anticipated though, as this sector primarily serves other business. This current performance is however dampened by future plans to trade in B2B e-marketplaces – slightly less than the uptake across other sectors.

The impacts of selling are mostly (over half), linked to no improvement in sales volumes, with a third of companies stating that it only fairly positively had an impact – and of those Germany, France and Sweden concurred the most. It was a similar picture for increasing the number of customers through selling online, and the effect it has on the sales area – with Germany, Austria and the UK concurring the most. The impact of e-business on customer and supplier relationships was small across all size classes and countries. Therefore, it may be concluded that whilst firms in this sector displayed good activity in B2B e-markets places and procuring online, these do not appear to have translated into market or sales benefits as yet.

Table 5-2: Manufacture of machinery and equipment: Impacts of selling online

Impact of selling online on . . .		Total EU6
. . . volume of sales	• very positive	7
	• fairly positive	25
. . . number of customers	• very positive	7
	• fairly positive	25
. . . sales area	• very positive	11
	• fairly positive	27

Base: enterprises selling online (N=43). Figures weighted by employment ("enterprises comprising ...% of employment say that ..."). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Table 5-3: Manufacture of machinery and equipment: Impacts of selling online to the business in general

Impact of e-business in general on ...		D	F	I	A	S	UK	Total EU-6
. . . customer relationship	• significant	8	5	7	8	7	1	6
	• somewhat	6	20	18	10	23	26	15
. . . relationships with suppliers	• significant	7	5	5	6	7	2	5
	• somewhat	18	22	15	22	26	24	19

Base: all enterprises (N=593). Figures weighted by employment ("enterprises comprising ...% of employment say that ..."). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Strategies

A feature of machinery and equipment manufacturing is its export capability. Trading activity within the EU is a significant activity, fiercely competitive but with limited capacity for significant growth. This leads to international strategies being developed. The capacity for EU manufacturers was reviewed, with Germany and Italy achieving success in international activities. Hence, slightly more German and Italian (as well as Austrian enterprises, which have undertaken significant ICT/e-business investment) acknowledged that e-business is a significant part of the strategy, whereas over half of all French rate it as not playing any role.

Table 5-4: Manufacture of machinery and equipment: Experienced importance of e-business for the enterprise

E-business . . .	D	F	I	A	S	UK	Total EU-6
. . . constitutes a significant part of the current business activity	7	1	8	11	--	2	6
. . . constitutes some part of the current business activity	63	45	29	65	62	61	53
. . . does not yet play a role	30	54	52	19	38	37	39
. . . is not important today, but will play an important role in the next two years	16	23	21	25	35	42	23
. . . will not play an important role in the next two years ("E-Business sceptics")	67	75	53	62	65	50	62

Base: all enterprises (N=593). Figures weighted by employment ("enterprises comprising ...% of employment say that ..."). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

SMEs

The experience of SMEs in e-business and in utilising ICT was varied. Some had adopted sophisticated applications, utilising them across high bandwidth networks, with compatibility across suppliers and customers systems; unfortunately, these were the exception rather than the rule. Cost, complexity, training, lack of skills in developing or adopting applications, and low volume sales were often cited as reasons for poor adoption. This was confirmed when the survey's respondents were asked to consider the broader impacts of e-business. Many enterprises stated that they believed larger companies would be the major beneficiaries. Interestingly, companies in Austria and Sweden and Italy had significant faith in these activities solely benefiting SMEs.

Table 5-5: Manufacture of machinery and equipment: "Who will mainly benefit from e-business?" (assessment by companies)

	D	F	I	A	S	UK	Total EU-6
mainly SMEs	10	11	22	18	34	19	15
mainly large enterprises	67	56	22	35	31	20	45
will equally benefit	21	29	37	30	33	53	32
no one to benefit	1	3	2	16	2	--	2

Base: all enterprises (N=593). Figures weighted by employment ("enterprises comprising ...% of employment say that ..."). Figures don't add up to 100 because of "don't know" answers. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Enablers and barriers for e-business in machinery and equipment manufacturing

Within the Survey 2002 the types of barriers faced by organisations within the machinery and equipment manufacturing sector were considered. The first, and most obvious barrier is the lack of online customers. On the whole, under half (47%) of all companies surveyed considered (completely and somewhat agreed) that there were too few customers online – with relative conformity across size and country groups. Another important issue is, do potential online customers actually purchase online? Again, it appears that business perceive customers to be hesitant to buy online, albeit the bias being towards only *somewhat* hesitant to buy online. An overwhelming issue, which has recurred throughout the report, is the nature of products within this manufacturing sector. It has been argued that limited production runs, high capital intensity, and complex equipment does not lend itself to online sales. This has been supported by the survey in that 76% of companies (58% agreeing completely and 17% agreeing somewhat) believed that goods and services did not lend themselves to being sold online. This issue was, predictably, consistent across size class and countries.

Table 5-6: Manufacture of machinery and equipment: Barriers to selling and procuring online

		D	F	I	A	S	UK	Total EU-6
Main barriers to selling online								
"Few customers online"	• agree completely	17	10	23	10	19	25	19
	• agree somewhat	21	35	31	13	27	39	28
"Goods do not lend themselves to selling online"	• agree completely	62	46	52	60	65	65	58
	• agree somewhat	13	30	15	28	17	21	17
"Processing of payments is a problem"	• agree completely	3	27	26	14	32	9	14
	• agree somewhat	27	27	31	21	23	26	28
"Technology is too expensive"	• agree completely	35	44	12	9	12	22	27
	• agree somewhat	24	35	16	22	43	30	25
"Revenues still low"	• agree completely	57	38	28	39	50	32	43
	• agree somewhat	35	38	26	35	25	40	34
Main barriers to procuring online								
"Suppliers do not sell online"	• agree completely	25	45	47	27	29	52	37
	• agree somewhat	43	36	26	28	28	33	36
"Concerns about protection and security"	• agree completely	12	28	34	11	15	34	23
	• agree somewhat	32	33	31	24	33	42	34
"Suppliers' systems are not compatible"	• agree completely	11	16	17	11	23	10	13
	• agree somewhat	38	33	24	33	42	43	35

Base: all enterprises (N=593). Figures weighted by employment ("enterprises comprising ...% of employment agree that ..."). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Other important barriers also remain. 41% of businesses stated that online payment was a major, or somewhat of an issue, in preventing greater uptake of selling online – especially in France, Italy, and Sweden. The cost of technology to enable online selling was also a major issue, with over a quarter (27%) of firms stating it was too or somewhat expensive.

Investment in ICT and e-business technologies is hampered by the apparent lack of return on investment (ROI) as previously stated. Just under half (43%) totally agreed and a third (33%) somewhat agreed that this was an issue. Concern was also expressed about delivery. Obviously, some equipment within machinery and equipment manufacture is extremely bulky, or fragile, and requires specialist delivery equipment and the crafting of suitable delivery schedules, etc. Hence 21% of firms stated it was a problem, with relative conformity across size class and countries.

Technical compatibility has also been an issue, reported across most sectors in the e-Business W@tch Survey (2002), and has blighted low cost e-business and ICT activities. Surprising then that major compatibility problems were not considered an issue (only 13% with no major biases). However, over a third (35%) considered them as somewhat of an issue.

5.3 Conclusions

5.3.1 Economic implications

Diverse and burgeoning literature has promised many positive economic impacts through the adoption and diffusion of ICTs and e-business activities. In some sectors the dot.com bubble created much speculation and hype, and with it many fortunes, but the reality within the machinery and equipment manufacturing sector appears to be somewhat different.

Boost sales revenues: Only a small percentage (7%) of companies that traded online stated strongly that an online sales presence contributed to increasing sales revenues. Whilst a not so insignificant number (19%) stated that it fairly positively contributed to boosting sales, the overwhelming feeling (48%) was that an online selling capability neither positively nor negatively contributed to increasing sales.

Reduces design or development time: There was no real evidence to suggest that ICT or e-business activities reduced the design or development time. However, times associated with document shipment/transfer have been significantly reduced – especially if designs or testing were outsourced or undertaken in other countries.

Cuts production cycle times – and thus costs: There was no real evidence to suggest that ICT or e-business activities reduced production times.

Reduces technological risk: The re-configuration of manufacturing islands of activity, to align procurement, design, manufacture, production, and the installation of SCM, ERP etc. systems was seen as significantly increasing technological risk. Companies either had to outsource such development, weighing up the risks of cost escalation, or undertake it in-house (with very small IT departments or limited capability). The costs of front-end development, and the complexities of back-end development present significant risks for SMEs; consequently this sector tends to address these issues by simple, pragmatic and small/timely investment.

Reduces customer service costs: The widespread reduction of customer service costs was difficult to determine. Case studies, predominately in the large (250+) range, illustrated how costs attributed to catalogue production (including sales and technical manuals) costs are reduced through online databases – obviously recouped over a number of years. In the main though, over a third of respondents (both strongly and somewhat agreeing) stating that online selling did not reduce CRM costs, although it was found to improve customer service quality.

Broadens market share: Broadening market share has a significant economic impact through expanding market share, potentially reducing cyclical demands in local or national markets, and presents the possibility of diversifying into alternate product ranges etc. The survey revealed that there was growing support for the view that online sales supported sales area growth (at just over a third). However, the majority of enterprises stated that selling online neither positively nor negatively contributed to improving the sales area. Cross checking these statements against their own buying behaviour offered an alternative perspective. A third of machinery and equipment manufacturers buying online had increased the number of sources from which they procured. Whilst just over a fifth had reduced the number of sources, there was still a net gain (of around 10%) in the number of suppliers.

Delivers new products and services faster and better, and at lower cost: This is often the mantra of the equipment and software vendors within manufacturing. Online collaboration, the exchanging of important design or production documents/information and the ability to access data (production times, schedules, product information) through extranets, mail groups, and other electronic communication media, have all been demonstrated to potentially reduce costs. This is because increased integration allows closer synchronisation of the supply chain with the aim of reducing inventory and shortening cycle times. Reducing time to market reduces development and set-up costs and potentially increases revenues due to the benefits of being first to market, etc. Unfortunately, the take up of collaboration with business partners for designing products and forecasting product demands was low – in fact below the industrial average. This was because companies operating in this sector, on average, did not really see e-business as having a major impact on business relationships. In fact, there was a lack of case studies that demonstrated the impact of ICTs and e-commerce activities in bringing products to markets more quickly and innovatively.

Creates interactive relationships with customers and suppliers: Interactive relationships are economically difficult to quantify; they comprise a variety of features that are generally considered as being positive in reducing costs through reviewing and improving organisational inefficiencies and activities through open and trusted communication.

Increases value with preferred suppliers: There was an element of lock-in demonstrated by the mutual investment between companies in compatible trading/exchange platforms. Whilst this is true in some cases, it is in fact more likely that customers will source from alternate suppliers – especially where applications are flexible and are capable of communicating with differing systems (i.e. those using flat files or XML).

Improves transaction transparency: This is true in MRO (maintenance, repair and operating) activities, where standard services tend to be more price transparent and sensitive.

Cost savings from more standardised processes – back office activities: The automation of back office processing has very clear economic implications. Highly repetitive tasks of data storage, e-mail acknowledgements, checking inventory levels etc. and the associated cost of staff to deal with it can in many industries represent a significant part of the costs for customer services. In machinery and equipment, such costs do not form a significant part of operational activities, and so in the medium term the costs of establishing back-systems, particularly in smaller and medium sized firms, will probably not produce a significant return on investment (ROI). Therefore only limited uptake is considered in the medium term.

The reduction of personnel costs requires automated/integrated CRM, SCM and ERP: E-markets allow international sources of suppliers to be chosen on price comparison. The transaction costs associated with purchasing online, especially overseas, are reduced. Errors, in the form of incorrect or out-of-date information, leading to delays in payment etc. and delay of goods, are more controllable through E-commerce. Although when errors do occur in e-business initiatives they can have potentially horrific consequences for the firm.

Consolidates inventory requirements: The use of ICT and e-business tools were demonstrated to potentially cut total inventory levels, work in progress levels, and finished goods levels. Indeed, case studies did demonstrate that these issues could be tackled through the progressive development of the organisations existing ICT infrastructure and significant investment in new applications (i.e. adapting EDI systems and developing electronic supplier link (ESL) systems etc.). However, it is anticipated that very large firms, with complex and costly to manage supply chains, will be the pioneers of these application. Even then, the successful development of such systems did require significant assistance from numerous enterprises within the supply chain.

5.3.2 Policy issues

The crafting of suitable recommendations is difficult and vexing especially when dealing with a dynamic phenomenon, changing rapidly across a heterogeneous industrial group with size and country variations. Nevertheless, recurrent themes have emerged and these issues need to be addressed, not through an about policy change, but rather through the emphasis of current activities.

Supporting SMEs in establishing a presence in overseas markets

International trade, within the Triad and without it, in the fast growing Asian economies, presents significant opportunities for growth for Europe's machinery and equipment manufacturers. Small and medium sized enterprises that make up this sector have difficulty in accessing overseas markets, not only because of the costs of establishing the traditional sales distribution route, but also in developing an e-business presence that can be effectively used to support such activity. The development of ICT/e-business activities and infrastructure, poised to exploit market demand in these countries, needs to be fostered. Presently, SMEs see a significant gulf between their actual experience of e-business activities, and the type of transformation needed to support international activities. The promotion of case studies, in which SMEs (especially micro and small enterprises) have used innovative and low cost approaches to support the penetration of international markets, should be increased. This study found examples of this type of promotional/best practice activity, but their profile needs to be enhanced.

Promoting skills development – the need for a multi-skilled workforce

E-business activities underscores the need for a more multi-skilled workforce. The flexibility of organisations is, in electronic environments, dependant to a significant degree on the adaptability of their workers. Several member states are making good progress in this regard; however, others are not. The upgrading of workforce skill in digital literacy is not something that should be left to enterprises, as it includes many stake holders, e.g. unions, colleges, universities and government. Whilst it is acknowledged that at European and national levels this issue is being tackled, there remains scope for greater collaboration across the economic sub-groups within machinery and equipment – responding to specific industrial sector needs.

The US's lead in ICT/e-business activity is guided by three policy principles: private sector leadership, avoidance of unnecessary restrictions, and a minimalist government role. These principles would be appropriate in a protected domestic market, containing a significant portion of large multinational enterprises, and placed outside the context of growing international competitive pressures. However, the predominance of SMEs in Europe competing for international as well as domestic markets, against large conglomerates in the US and Japan, face significant challenges. Up to now, Europe has handled interventionism, in terms of fostering debate, sharing experiences, developing appropriate standards, and assisting micro/small/medium enterprises in rising to the challenges of second generation systems, appropriately. To meet the challenges set in Lisbon, of making the EU the most progressive ICT/e-business economy in the world, consistent funding at EU and national levels needs to continue (or possibly increase), because the current economic conditions will probably limit an organisation's investment in these activities – especially in Europe's four leading economies.

Further improvement of the legal environment: resolution of judicial uncertainties

Companies and consumers alike would appear to benefit from the resolution of judicial uncertainty over transactions undertaken during e-commerce activities. Many SMEs displayed reluctance to engage in commercially sensitive activities over the internet for fear of intellectual property leakage, or general security concerns. The ability of enterprises to authenticate the appropriate use of security and data integrity, to a European/international standard, would be an advantage. Also, in the event of a breach in security, the possibility of seeking legal redress across European member states is an issue that needs to be overcome.

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6 Manufacture of electrical machinery and electronics

6.1 Economic profile and trends

Enterprises manufacturing electrical machinery and electronics (NACE 30, 31, 32) account for approximately 11% of the total production of the EU manufacturing sectors and are important employers, providing jobs for about 2.4 million people in the EU.

NACE Rev.1 division group	Activity	Share in total manufacturing in %*
DL 30	Manufacture of office machinery and computers	2.41
DL 30.01 ²⁾	Manufacture of office machinery	0.25
DL 30.02	Manufacture of computers and other information processing equipment	2.16
DL 31	Manufacture of electrical machinery and apparatus	4.54
DL 31.1	Manufacture of electric motors, generators and transformers	0.76
DL 31.2	Manufacture of electricity distribution and control apparatus	1.90
DL 32	Manufacture of radio, television and communication equipment and apparatus	4.35
DL 32.1	Manufacture of electronic valves, tubes and other electronic components	1.15
DL 32.2	Manufacture of television and radio transmitters and apparatus for line telephony	2.55
DL 32.3	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	0.65
DL 30-32	Manufacture of electric machinery and electronics	10.96

Notes: 1) For Luxembourg and partly also for other countries missing data has been estimated. 2) The weights of the sub-sectors have been approximated by assuming structural constancy to 1999 data. *Source: Eurostat (2002)

The sector comprises a variety of sub-sectors, each having different market dynamics, value-chains and market players. However, sub-sectors can roughly be counted either towards the ICT-producing industry (NACE 30, 32), or towards the more traditional, albeit engineering-intensive, electrical machinery industry (NACE 31).

These two industries experienced quite different dynamics during the last few years. The ICT-producing industry has been the fastest growing business sector in many European countries during the last few years, contributing considerably to the overall productivity gains and economic growth. Production increased on average by 10.2% in NACE 30 and 8.4% in NACE 32 per annum from 1995 to 2001. Some countries that have strongly specialised on ICT-manufacturing, such as Finland and Ireland, experienced a period of high economic growth in the second half of the 1990's. Enterprises in the ICT-producing industry profited from a variety of factors:

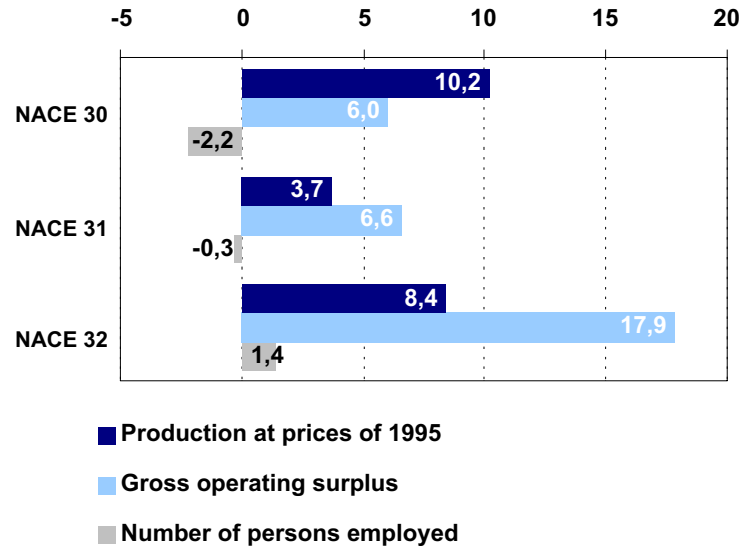
- high expenditures of telecommunication firms into their network infrastructures,
- growing penetration of PC's in homes and offices,
- growing penetration of mobile telephony across Europe,
- the trend towards multimedia applications and hardware,
- the emergence of the Internet as a mass medium,
- strong corporate account investments into ICT,
- and the debate about the year 2000 bug that gave a boost to early replacement sales in the late 1990's.

However, with the end of the Internet-hype in late 2000, the ICT-producing industry dived into a deep recession that is not over yet.

The electrical machinery industry was more in line with the overall economic development. Production increased by 3.7% per annum from 1995 to 2001 (compared to 2.6% for all manufacturing sectors) and only experienced a slightly stronger than average recession in 2001.

Figure 6-1: Electrical machinery and electronics industry: Average annual changes from 1995 to 2001 in %

Source: Eurostat (2002)



Large firms dominate in sectors 30 and 32

The sector is characterised by a high degree of concentration. This is particularly the case for NACE divisions 30 and 32, where rapid technological progress and the production of electronic mass products enhanced economies of scale and hence the concentration process. Taking advantage of these economies of scale contributes positively to productivity levels in large firms in this sector. As a consequence, large firms contribute more to turnover than to employment shares within the three size classes. The enormous growth rates of the ICT-producing sectors in the second half of the nineties were mainly achieved by a few very large firms in some of the highly specialised smaller countries, like Nokia in Finland, Ericsson in Sweden, and American firms active in the Irish computer industry.

Table 6-1: Size class distribution in the manufacture of electric machinery and electronics in the EU-15 (2000)

	Enterprises with . . . persons employed			
	1 to 9	10 to 49	50 to 249	250 and more
	share in %			
	NACE 30			
Turnover	1.3	3.6	7.4	87.6
Persons employed	4.0	7.6	13.0	75.4
Number of enterprises	74.6	16.7	5.9	2.8
	NACE 31			
Turnover	3.7	10.0	16.5	69.8
Persons employed	7.3	15.2	19.4	58.1
Number of enterprises	71.0	21.9	5.4	1.7
	NACE 32			
Turnover	2.1	4.3	9.0	84.6
Persons employed	5.8	9.6	14.2	70.4
Number of enterprises	79.7	14.4	4.2	1.7

Notes: 1) For confidentiality reasons, these estimates of the size class distribution in the EU-15 do not include Belgium and Portugal at all. In addition they do not include Spain, Austria and Finland in sector 30, Ireland and Finland in sector 31 and Ireland and Austria in sector 32. 2) Estimates for 2000 have been achieved by assuming the same structure as in 1999.

Source: Eurostat (2002)

In sector 31, smaller-sized firms are more efficient than the firms of the same size class belonging to sectors 30 and 32. In the former, the relationship of turnover and employment shares in the three lower size classes is higher than in the latter two sectors. One reason is that the goods belonging to sector 31 are more specialised and tailor-made, such that smaller firms can efficiently supply these markets. However in all three sub-sectors, only the largest size-class contributes more to turnover-shares than to employment-shares.

Value chains

The electrical engineering and the electronics industries exhibit significant differences in their production schemes and their degree of vertical integration. In electrical engineering, Original Equipment Manufacturers (OEM) are often highly vertically integrated, keeping large parts of the entire production and value-creation process in-house. In contrast, the electronics industry is characterised by high specialisation of firms along the value chain. The highly modular set-up of electronic products allows OEMs to outsource production steps and to purchase parts and modules from specialised manufacturers. As a consequence, the value chain in the electronics industry is more complex, involving more players and stages.

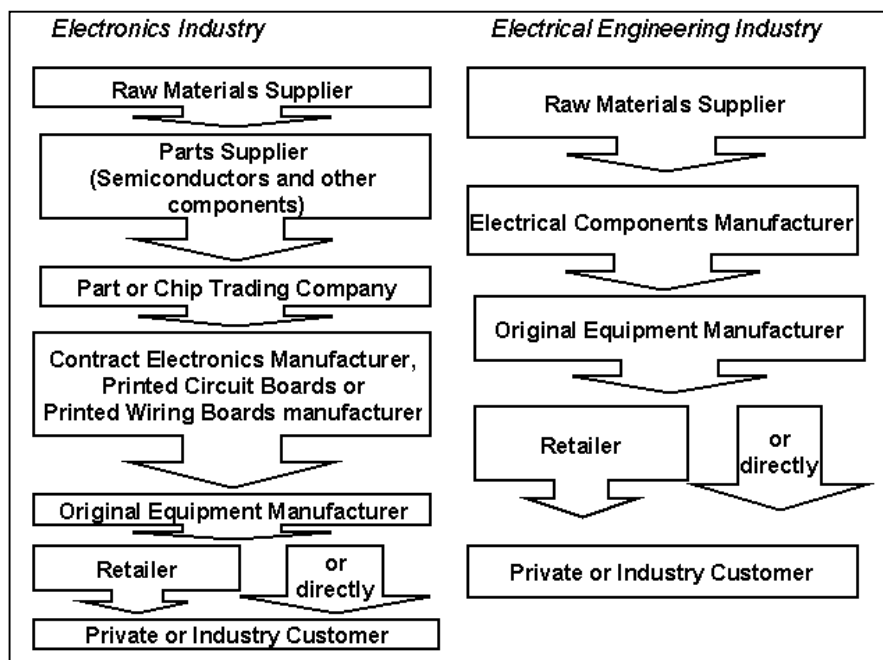
In the electronics industry, Raw Materials Suppliers provide silicon, plastics and other basic inputs needed for production. These raw materials are generally purchased by Printed Circuit or Printed Wiring Board Manufacturers or by Parts Suppliers that manufacture bare boards, resistors, switches or other components. Typical companies on this step of the value chain would be Intel or Epcos.

Chip brokers and other trading companies often act as intermediaries between the suppliers of basic electronic components, semiconductors, and boards on the one side and so-called Contract Electronics Manufacturers (CEM) on the other. CEM assemble boards, chips and components as a contract-based service to OEMs, who have outsourced these simple production steps. A typical example of a CEM is Solectron (www.solectron.com), the world's largest electronics manufacturing service company. OEMs, such as IBM or Nokia, only assemble the final products, which are then sold to the customers (either directly or via retailers).

In Electrical Engineering, the first two steps are similar to those in the electronics sector. The main difference is that electrical components in most cases are not traded via an intermediary. Furthermore, manufacturing is mainly carried out by OEMs themselves.

Figure 6-2: Supply chains of the electrical machinery and electronics industry sectors

Source: DIW (2002)



6.2 Usage of ICT & e-business

ICT-manufacturing industry is predestined for e-business

The electronics industry features characteristics that make the entire sector especially suitable for e-business.

- Electronics is a truly global business. Design, production and marketing activities for a product are frequently carried out in different parts of the world, exploiting comparative advantages of regions.
- Components and products are highly standardised, easy to describe and traded in considerable quantities.
- Value chains are complex and deep. Outsourcing is very common and requires intense co-operation between enterprises, often across cultural and geographical borders.
- Product life-cycles are short. Time to market is one of the most important strategic variables in the industry. In addition, products and components depreciate very quickly in value due to technological progress.
- Manufacturers of ICT are naturally IT-savvy and open to experiment with IT-driven management solutions.

All this contributes to a very high fit of e-business to this sector. A variety of Internet-based tools help the sector to communicate efficiently, to automate processes, and thus to save time and reduce costs. These e-business potentials also exist for the electrical machinery industry, but not to such a large extent.

Sector is already advanced in e-business usage

The sector is among the early adopters of e-business, with the electronics industry being more advanced in usage than the electrical machinery sector. Overall, basic Internet infrastructures are widely implemented and do no longer constitute a barrier to e-business. Although basic Internet infrastructures are widely implemented, actual usage of IT varies considerably between countries. Nordic countries are heavy users, whereas Italy and France seem to have a different business culture.

Table 6-2: Electrical machinery and electronics: Employees using IT

	D	F	FIN	I	S	UK	Total EU-6
Working with computers	62	40	84	60	94	80	63
Access to e-mail for external communication	87	91	99	95	99	94	92
Access to the WWW	79	90	97	67	99	81	80
Access to intranet	84	83	86	65	87	72	78

Base: enterprises using computers. N=514 (for EU-6). Figures weighted by employment ("%" of employees working in enterprises where the majority of employees works with / has ...")

Source: e-Business W@tch (2003)

E-Procurement is "hot"

E-Procurement is currently the most accepted and widely used application. The reasons why e-procurement remains in front of other e-initiatives are clear: There are tools available to implement it, it is relatively easy to conceptualise, and it promises (and delivers) advantages and cost savings. E-procurement significantly affects economic structures of supply networks as well as the costs of the underlying activities. This takes place on a number of different levels:

- The automation of purchasing steps reduces transaction costs: simple work steps (for instance filling out forms, aggregating orders, identifying needs) become automated, and thus faster, more reliable, and cheaper.

- Using the Internet for procurement provides timely information about price levels and availability. This can significantly speed up time-to-delivery and help to purchase at best prices. This is especially important when large amounts of highly comparable and valuable components have to be purchased, and when price levels are very volatile.
- Orders from different business units and departments can be consolidated and aggregated, so that every unit can make use of favourable purchasing conditions with preferred suppliers.
- Placing auctions and calls for tender on the Internet is simple, transparent, and efficient. It increases the likelihood of receiving comparable and lowest cost bids. Auctions are primarily used for commodity products and create opportunities for lowest cost manufacturers. In addition, auctions can be used to sell excess capacities.

Overall, the sector has early recognised the advantages of e-procurement. For the IT-producing industry in particular, using the Internet for procurement is becoming more common because it allows firms to speed up processes and make decisions based on timely information about price levels and availability – all indispensable in this fast-moving and competitive market. Interestingly, SMEs also make frequent use of e-procurement: 48% of even the smallest firms (<50 employees) already use the Internet for procurement. However, despite promising diffusion figures, utilisation levels of e-procurement systems are often not yet very high. E-catalogue-based procurement in particular often remains behind initial expectations and makes reaching positive ROIs a rather long-term objective. To realise all benefits of e-procurement, senior management support and continuous activities to raise utilisation are indispensable.

The uptake of e-procurement varies between the EU countries. Finland, Sweden, and the UK are most advanced. Germany reports slightly above average adoption, whereas France and Italy remain sceptic.

Figure 6-3: Electrical machinery and electronics: Regional differences in e-procurement

Base: EU-6 (D, F, FIN, I, S, UK), all companies, excl. "no answer" / (N=517).

Figures weighted by employment ("enterprises comprising ...% of employees say that they make online purchases ...")

Source: e-Business W@tch (2003)

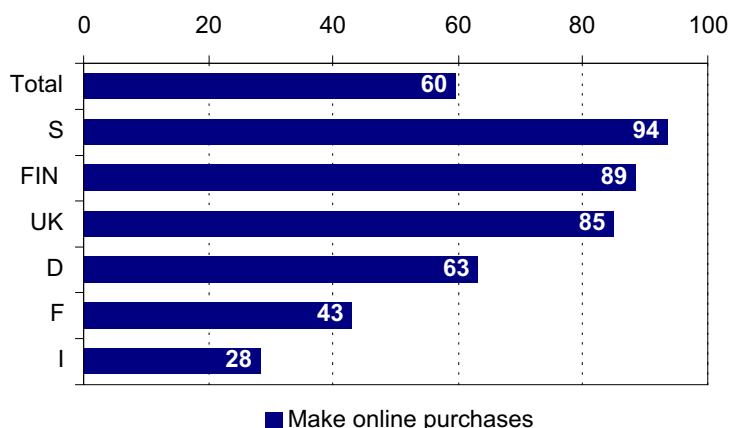


Table 6-3: Electrical machinery and electronics: positive impacts of procuring online

	All enterprises	0-49 empl.	50-249 empl.	250+ empl.
Procurement costs	54	52	68	73
Relations to suppliers	43	43	40	46
Internal business processes	59	59	65	81
Costs of logistics and inventory	41	40	40	66
Number of suppliers*	27	27	28	26

Base: enterprises selling online. N=55 (for EU-6). In % of enterprises ("% of enterprises reporting positive or very positive effects on ...", except *: "% of enterprises reporting that number of suppliers has increased").

Source: e-Business W@tch (2003)

The majority of e-procurement users are satisfied with the impact on procurement costs and internal business processes. In both cases, however, large firms report significantly higher satisfaction levels than small firms. The impact of e-procurement on the relation to suppliers and the costs of logistics and inventory seems to be somewhat problematic. Less than half of all users report positive experiences in these areas.

Online sales less popular

In contrast to e-procurement, where adoption rates are already very high, online sales do not seem to be extremely popular in the sector. Many firms are reluctant to implement online sales solutions because they fear increased price pressure and implementation costs. The market transparency that helps them to save costs as a buyer puts pressure on their own margins as a seller. Survey results reveal an ambiguous rating of online sales: Many firms that do not sell online said that their goods do not lend themselves to selling online. In addition, low expectations about online sales volumes are named as a major barrier to implementation of online sales. On the other hand, those firms that already sell online reported positive effects on sales volumes, number of customers, efficiency of internal business processes and an expansion of the sales area.

However, it is surprising that the adoption rate of e-procurement is almost four times higher than the adoption rate of online sales. Part of the explanation might be that firms that contributed electronic catalogues to the e-procurement systems of their customers do not consider these e-catalogue-triggered orders as online sales.

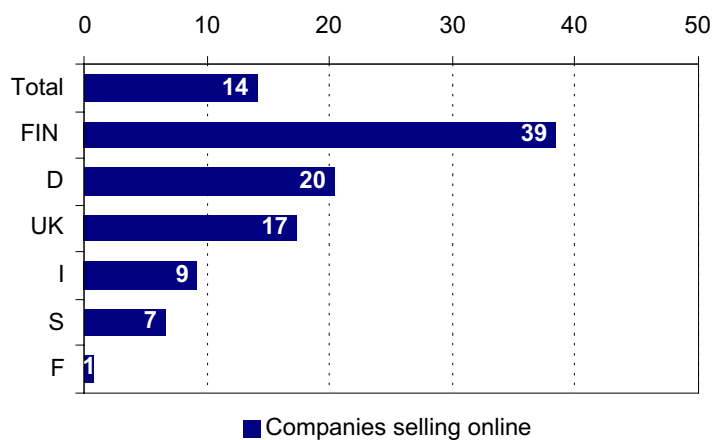
Online sales are most common in Finland, Germany, and the UK. Italy, Sweden, and France report surprisingly low adoption rates.

Figure 6-4: Electrical machinery and electronics: Companies selling online (by country)

Base: EU-6 (D, F, FIN, I, S, UK), all companies, excl. "no answer" / (N=517).

Figures weighted by employment ("enterprises comprising ...% of employees say that they sell online")

Source: e-Business W@tch (2003)



Differences between large firms and SMEs

The survey also reveals an insight into the different dynamics of e-business adoption in large firms and SMEs. For some applications, e.g. e-procurement and online sales, SMEs and large firms exhibit similar adoption rates and report similar barriers to adoption and usage experiences. However, small firms often rely on less complex solutions cheaper to purchase and easier to implement and maintain. For other solutions, for instance for CRM, e-product development, and e-learning, SMEs report significantly lower adoption rates than large firms. In contrast to some common statements, reasons for this reluctance are manifold, not only because SMEs generally lack information about these tools. One of the most important factors is the typical cost-benefit structure of many IT-solutions: high fixed cost often accompany economies of scale in usage, so a critical size of firms is necessary to profitably run such solutions. SMEs therefore remain reluctant to implement solutions that are either too complex or too expensive for their needs.

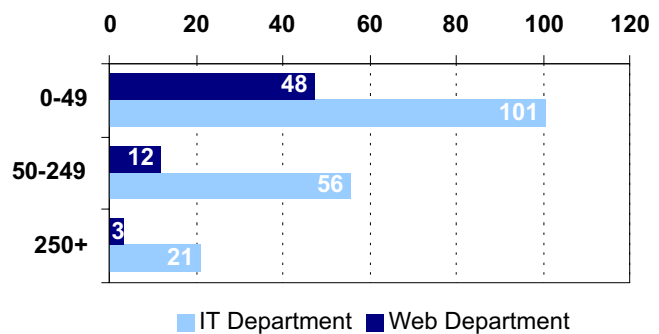
E-business related economies of scale become visible when comparing the relative manpower needed to maintain a website which is 14 times higher in small firms than in large firms of the sector (measured as headcount per 1,000 employees occupied with this task). Even when granting that this figure (which has been calculated based on data provided by the e-Business Survey 2002) may include some interview-related uncertainties, it clearly implies that the relative personnel costs for maintaining a website are much higher for small firms and highlights the fact that IT solutions require substantial fixed costs. Large firms can scale these fixed costs over many employees and higher revenues, which makes IT investments relatively more attractive to large firms. Findings for the relative size of companies' IT departments are similar, though less extreme: small firms employ on average 10 persons per 100 people in their IT department, medium sized firms 5 and large firms 2 people.

Figure 6-5: Electrical machinery and electronics: Relative size of the IT and web departments (2002) by company size class (average staff per 1000 employees)

Base: EU-6 (D, F, FIN, I, S, UK), all companies, excl. "no answer" / (N=517).

In % of enterprises.

Source: e-Business W@tch (2003)



6.3 Conclusions

E-business further speeds up globalisation and specialisation

At the sector level, it is likely that the Internet and e-business solutions will further speed up the process of globalisation and specialisation. These trends towards specialisation (both of firms and of economic regions) should exploit comparative advantages and thus improve the overall sector productivity and economic growth.

Exploiting comparative advantages does not lead to equal benefits

However, this does not automatically mean that all regions and all firms will benefit equally. Exploitation of comparative advantages does involve re-allocation of production and development facilities to regions with particularly profitable surroundings. The re-allocation of chip and component manufacturing facilities to Asia and the emergence of CEMs during the last decade is such a consequence. In the electronics industry, further specialisation and outsourcing enabled by e-business could eventually contribute to a further disintegration of individual firms, strengthening the position of highly specialised firms, service providers and contract manufacturers. On the other hand, high value-added research, engineering, and development tasks often remain in the high-skill industrialised European countries. The electrical engineering industry in particular is likely to remain a strong presence in Europe.

Effects of e-business on SMEs: the two sides of the coin

The typical cost-benefit structure of e-business projects seems to imply that large firms can more easily profit from e-business than small firms. The relative cost-advantage of large firms in maintaining IT solutions is impressively supported by our survey results. This is backed up by the general impression of sector firms that SMEs will not be the primary beneficiaries of e-business. The majority of sector firms believe instead that large firms will be the real winners of e-business, or that a fair share of benefits will be achieved by all business partners. Small firms have fewer internal incentives to implement e-business (the wide implementation of e-procurement in SMEs is an exception that

seems to be limited to the electronics sector). However, SMEs are confronted with external pressure and incentives from their larger business partners to join in. This offers positive opportunities, such as maintaining good relations with business partners and possibly higher sales volumes, but it also involves implementation and maintenance costs and risks: Higher market transparency can further increase price pressure, and a lock-in effect to consortium-led marketplaces or customers can limit strategic options. This could increase competitive pressure on SMEs, contributing to a consolidation of the market to the benefit of large firms and price-leaders.

On the other hand, e-business also offers a range of opportunities to SMEs, such as benefiting from market transparency for procurement activities, or expanding the geographical reach of the sales area. Our survey results further indicate that SMEs in general do not complain about higher e-business barriers and that they are generally not less satisfied with the impact of e-business than large firms.

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7 Manufacture of transport equipment

7.1 Economic profile and trends

The transport equipment manufacturing industries are composed of the NACE Rev.1 Codes 34 and 35, including the following activities:

NACE Rev.1		Activity
division	group	
34		Manufacture of motor vehicles, trailers and semi-trailers
	34.1	Manufacture of motor vehicles
	34.2	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers
	34.3	Manufacture of parts, accessories for motor vehicles
35		Manufacture of other transport equipment
	35.1	Building and repairing of ships and boats
	35.2	Manufacture of railway, tramway locomotives, rolling stock
	35.3	Manufacture of aircraft and spacecraft
	35.4	Manufacture of motorcycles and bicycles
	35.5	Manufacture of other transport equipment

Whereas the activities in the sub-sectors of NACE sector 34 – which will be called the “automotive industry” in the following – form a cluster of closely interrelated firms, the shipyards, the railway equipment industry, and the aircraft and spacecraft industries (NACE 35 “other transport equipment”) operate in markets with rather different profiles.

The two sectors together contributed a value of 677 billion Euro to production in Europe (EU except Greece, Ireland and Luxembourg) in 2001. Almost 80% can be attributed to the automotive industry (NACE 34) and one fifth to other transport equipment (NACE 35). Within the automotive industry, the manufacture of motor vehicles, i.e. the very large producers of final products, which are often called Original Equipment Manufacturers (OEM,) is by far the biggest industry. Nearly two-thirds of the production value in the other transport equipment sector was produced in the aircraft and spacecraft industry.

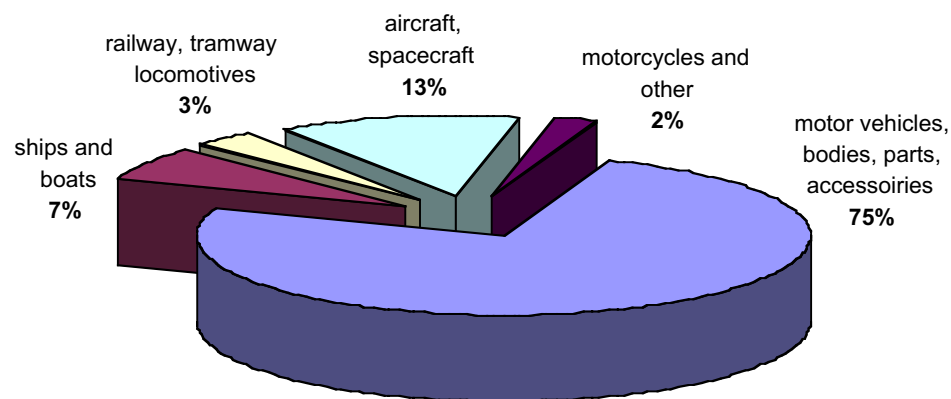
Regional distribution

The three largest producers of automobiles (Germany, France and the UK) account for 76% of the production value in the 13 EU countries. Regional concentration is also pronounced in "other transport equipment". France, the UK and Germany lead the list in production value, adding up to 77% of production. The weight of the car industry in total manufacturing as a whole is relatively high in Europe (11.4%), but varies considerably between countries. Germany, Sweden, Spain and France exceed the European average and are strongly specialised in the production of cars. The "other transport equipment" sectors do not have such a high share in total manufacturing. The European average for this category lies slightly over 3%.

Employment, productivity and labour costs

The manufacture of motor vehicles and related parts accounts for three-quarters of the total sector employment and represents the most important sub-sector of the transport equipment industry. The aerospace and shipbuilding industries form relatively smaller branches, but still contribute considerably to employment in the European transport equipment sector.

Figure 7-1:
European
transport
equipment
sector:
estimated
share of the
sub-sectors
by number of
employees
(2002)



Source: Eurostat New Cronos 2002, estimates and calculations by DIW Berlin 2002.

The regional structure of employment shows the heavy weighting Germany has in the European transport equipment industry. Employing more than 44% of the industry's workers in Europe, Germany is ahead of the UK, France, Italy and Spain, which together contribute slightly less than half of the industry's overall employment.

Sector production is highly concentrated in large firms

The transport equipment sector is characterised by an extremely high degree of concentration. In the automotive industry, 84.8% of the entire sector turnover is generated by firms with more than 250 employees, although large firms only account for 5.7% of the total number of enterprises in the sector. Out of 15 sectors covered by the *e-Business W@tch*, the automotive industry exhibits the highest degree of concentration in large firms – a similar situation to the "other transport equipment" sectors. Here, 83.4% of total turnover is generated by large firms accounting for 1.8% of the total number of enterprises. The consolidation and concentration of the entire transport equipment sector is being driven by high sunk costs for production facilities, high fixed costs for engineering, and highly competitive markets.

Table 7-1: Size class distribution in the transport equipment sector 2000 in EU 8*

NACE	Total	Enterprises with ... persons employed			
		1 to 9	10 to 49	50 to 249	250+
	Number of enterprises	Structure in % of total			
34	9,897	53.3	29.3	11.7	5.7
35	12,066	78.6	15.0	4.6	1.8
	Turnover in million EUR	Structure in % of total			
34	511,567	9.6	1.7	4.0	84.8
35	94,100	2.7	4.2	9.6	83.4
	Number of persons employed	Structure in % of total			
34	1,589,876	1.2	4.2	8.3	86.3
35	456,858	5.1	8.5	13.0	73.4

* EU 8: EU excluding Greece, Ireland, Luxembourg, Netherlands, Austria, Portugal, UK.

Source: Eurostat 2002, estimation and calculation by DIW Berlin (2002).

Trade balance

The transport equipment sector shows a high degree of integration in international trade. Some industries in the sector are dominated by large international firms operating across national borders

and stimulating export and import activities, but the larger part of trade is still taking place within the EU. The total sector trade balance is positive for the EU as a whole.

Given the heterogeneity of the sector, which includes final and semi-final products, trade figures tend to reveal that in fact there is a high degree of international division of labour in the industry. High import and export figures, for example, can relate to sophisticated export and re-import schemes, where components are exported to a third country to be further processed there and are then re-imported to be assembled as a final product. Some internationally operating firms have concentrated the production of specific parts in one country, which then exports these parts to other branches of the same firm in another country.

Challenges

The globalisation of markets and excess capacity in the industry have led to a rapid horizontal concentration. In the automotive sector, for example, 99% of all passenger cars and light-duty trucks worldwide are produced by approximately 50 automotive companies, controlled by 33 corporations (AMM 2001). Consolidation is also visible in the manufacturing of aircraft and spacecraft. A few big European players dominate the industry, most notably EADS with its majority shares in Airbus Industry, Eurocopter, Ariespace and others.

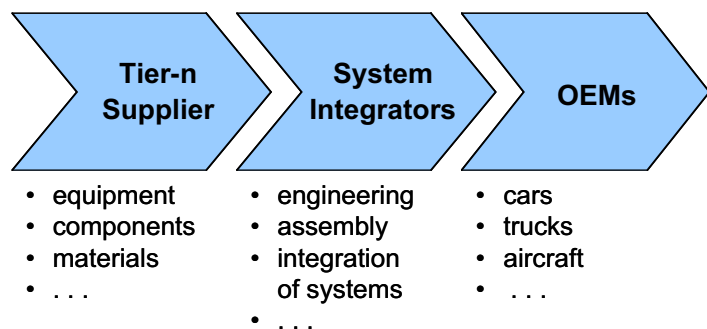
Industry supply chains are broad and deep. Their technological challenges span a wide gamut across aerodynamics, fluid dynamics, mechanical, electrical, material and civil engineering, strict safety guidelines and ecological issues and regulation, among others. The transport equipment sector (and the automotive sector in particular) is the largest end-use market for production materials such as steel, aluminium, powder metals, lead, magnesium, or platinum metals. Design costs are large and sunk, driving chronic industry over-capacity and price competition into all segments except those most in demand.

The supply chain

The figure below shows a simplified model of the sector value chain. At the end of the supply chain, a few usually extremely large firms assemble the final products. These firms are often referred to as *Original Equipment Manufacturers* (OEMs), and include Fiat, Volkswagen, DaimlerChrysler and Airbus, among others. One level below, *System Integrators* (SIs) or Tier-One-suppliers, assemble and integrate entire components or systems for the later final product. These Tier-One-suppliers, such as Robert Bosch GmbH or Delphi Automotive Systems Corp., usually also have a strong engineering competence. Their products stretch over multiple modules, and their sub-supplier connections are frequently diverse and numerous. From here, the supply chain can be further followed down to *n-Tier suppliers*, who either deliver to the System Integrators, the OEMs or other n-Tier suppliers. This is the complex supplier network which lies behind the e-enabled industry restructuring and the accompanying shift of power. The supplier market at the n-Tier level is much more heterogeneous than at OEM level and also comprises a large number of smaller firms. However, consolidation is also visible at the SI level, with a few large Tier-One-suppliers generating a large share of overall supplier revenues.

Figure 7-2: Value chain in the transport equipment sector

Source: DIW (2002)



The transport equipment sector was once a prime example of Old Economy vertical integration, but now faces the same pressures to reconfigure the value chain that has transformed the faster-paced high technology industries. OEMs are increasingly dependant upon and co-operant with large and sophisticated Tier-One-suppliers that take on design and logistics responsibilities and make investments in capital equipment and advanced technology development. Alliances among car manufacturers as well as with firms outside the industry are becoming increasingly common, not least because of the high costs of developing new technologies and serving global markets, which put strain on the resources of even the largest firms (IMVP Research 2002).

The role of suppliers to the automotive industry is currently undergoing a process of change, marked by their increasing share of responsibility for the end-product. This can be seen in the widening scope of their activities in terms of production and, most importantly, in product development. According to various analyses the proportion of development expenditure by supply companies relative to overall expenditure (which is estimated to be currently at about 25-30%) will increase to 50% or more within the next ten years (VDA 2001). Automotive OEMs were therefore able to shift some of the development costs for essential parts onto the supplier industries. In order to keep technological development under control, these R&D projects are entirely delegated to a specific (or several) supplier(s) or OEMs instead of just closely co-operating with the developing supplier.

7.2 Usage of ICT & e-business

Fame of the sector as an early adopter of e-business could not be confirmed

In the late 1990's the transport equipment sector was generally considered to be an excellent area for e-business applications and an early adopter of the associated technologies. Some scenarios that were discussed proposed dramatic changes in the industry with the emergence of Internet-based sales and procurement activities, ranging from reconfiguration of supply chains to the emergence of completely new ways of building and selling cars.

However, research and survey results of the *e-Business W@tch* indicate that up to now the impact of e-business on the sector is still limited. Up until 2000, many firms considered e-business to be mainly an IT-issue with little strategic implication. Currently, the sector is still lagging behind the all-sector average in many e-business indicators although all major firms have meanwhile started some major e-business initiatives that will show their full effects in the years to come.

UK and Germany lead in e-business adoption, France is sceptic

Despite the late start of the sector into e-business, now roughly every 6th employee in the European transport equipment sector works in a company where e-business constitutes a significant part of business today.

Table 7-2: Manufacture of transport equipment: Attitude towards e-business (by country)

Transport Equipment	D	E	F	I	S	UK	Total EU-6
E-business constitutes significant part of business today	19	16	<1	9	13	24	15
E-business not significant part yet, but will be in two years	20	32	3	39	16	23	21
E-business not significant, nor will be in two years	61	49	96	44	71	44	62

Base: all enterprises. N=509 (for EU-5). Figures weighted by employment ("enterprises comprising ...% of employment say ..."). Reporting period: June/July 2002.

Source: *e-Business W@tch* (2003)

However, regional differences are remarkable. The UK and Germany report the highest share of employees working in firms where e-business already constitutes a significant part of business today, while Italy and Spain are currently planning to catch up within the next two years. France, however, is dominated by e-business sceptics. Almost 97% of employees in this sector in France work in companies that believe that e-business will still not be an important part of their business even within two years from now. This high rate of e-business sceptics can hardly be explained by economic factors only. Rather, cultural beliefs about how business should be done seem to influence the attitude towards e-business to a great extent.

EDI is still popular

Classic EDI is still widely implemented and used in the transport equipment sector. From all sectors included in the survey, EDI usage is most common among transport equipment manufacturers. EDI systems still seem to work well in many cases, such that many firms do not seem to have a very urgent need to switch to a newer Internet-based e-business technology. In a way, the success of EDI in the sector became somewhat of an obstacle for the uptake of more advanced e-business solutions.

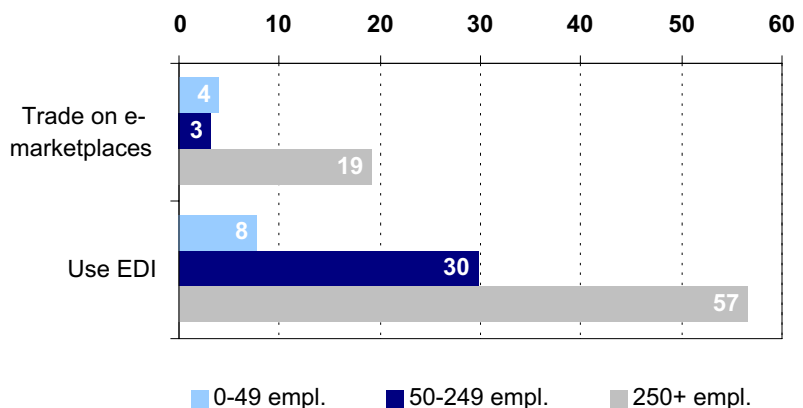
E-marketplaces have not yet gained wide acceptance

E-marketplaces in this sector are currently still not widely used, although major initiatives such as Covisint have been on their way for quite a while already. Only large firms currently respond to the availability of e-marketplaces with a participation rate of roughly 20%. Small firms are less enthusiastic, with less than 4% participation. Overall, the acceptance of e-marketplaces has remained behind initial expectations. However, plans to join an e-marketplace within a 12 months period indicate that medium sized enterprises are likely to catch up in the near future, possibly adding some new momentum to e-marketplaces.

Figure 7-3: Manufacture of transport equipment: Participation in B2B e-marketplaces and EDI usage

Base: all enterprises. N=509 (for EU-6).
In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)



E-Procurement is the most widely used application

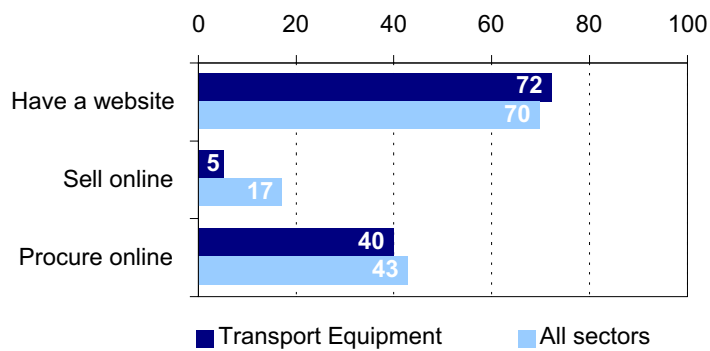
We found that currently e-procurement seems to be the most widely used application. Procurement and supply undoubtedly play a major role for firms in the transport equipment sector. Every third enterprise in the sector already uses the Internet to purchase goods or services (see figure 9-6). Large firms are most active in e-procurement, trying to realise efficiency gains and cost advantages. Small firms lag slightly behind, but the differences in adoption levels are less pronounced than for other e-business solutions. However, although e-procurement systems are already widely implemented, utilisation levels are still pretty low. Almost 60% of all sector enterprises purchase less than 5% of their total purchasing volume over the Internet, more than 90% purchase less than 25% of their total order volume online. In order to realise the cost savings and efficiency gains that e-procurement promises, it will be essential to raise utilisation levels in the future.

Figure 7-4: Manufacture of transport equipment: E-commerce activities

Base: EU-4 (D, F, I, UK), all enterprises, excl. "no answer" / "don't know" (N=356).

Figures weighted by employment ("enterprises comprising ...% of employees")

Source: e-Business W@tch (2003)



Users are satisfied with e-procurement, but relations to suppliers do not always benefit

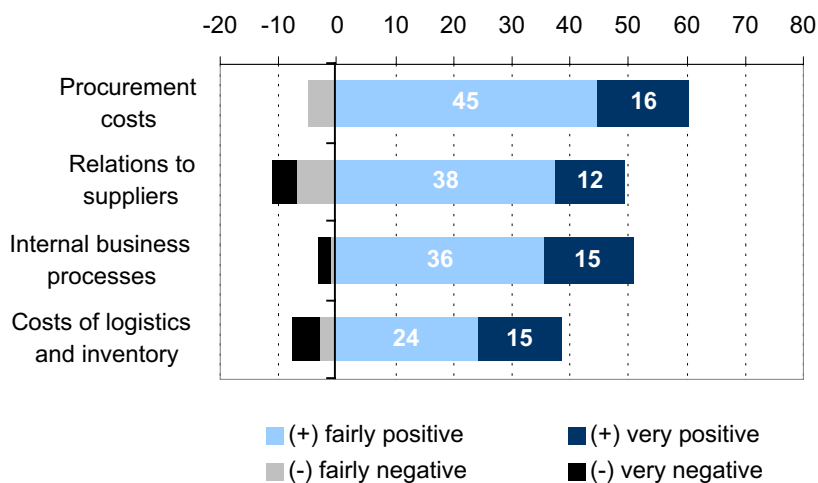
Most of the e-procurement users already report positive experiences, most notably involving on procurement costs and the efficiency of internal processes. However, the effects of using e-procurement are not entirely positive. Large firms in particular had to agree that the implementation of e-procurement systems did not have a positive effect on the relation to their suppliers.

Figure 7-5: Manufacture of transport equipment: Perceived impacts of procuring online

Base: EU-6 (D, E, F, I, S, UK), enterprises procuring online excl. "no answer" / "don't know" (N=178).

Figures enterprise weighted

Source: e-Business W@tch (2003)



E-Product development is already common

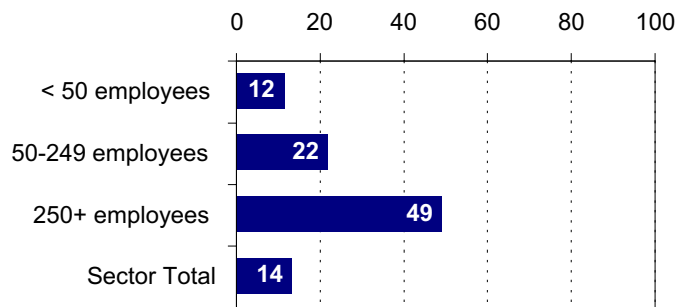
The Internet can also be used to support cross-company co-operation processes for the design of new products, ranging from sending product plans, managing project schedules, design and CAD/CAM tools to online meetings. These Internet-based tools can help to shorten development times and to save costs. E-product development has already gained acceptance in the sector. 40% of the sector employees work in firms that use according tools. However, in sharp contrast to e-procurement, where small firms already showed high adoption rates, e-product development is much less popular in small firms than in large enterprises. The adoption rates in large enterprises are more than four times as high as in small firms. This could be either because small firms are less frequently involved in larger cross-company product development projects, or because the cost of implementing the necessary technologies is too high compared to the benefits.

Figure 7-6: E-product development in transport equipment manufacturing

Base: EU-4 (D, F, I, UK), enterprises with internet access excl. "no answer" / "don't know" (N=324).

Figures enterprise weighted

Source: e-Business W@tch (2003)



No business case for online sales?

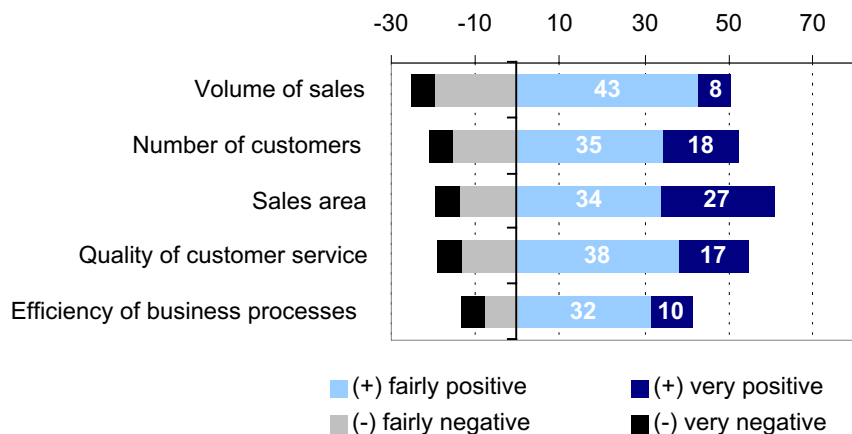
In sharp contrast to e-procurement, the adoption level of online sales is still very low. Online sales hardly play a role in the transport equipment sector up to now. Car manufacturers largely abstain from online sales in order not to harm their dealer networks, whereas OEMs from the other transport equipment industries produce mostly heavily customised end products that are not suitable for mass production and do not easily lend themselves to online sales (aircraft, ships, and railways are hardly imaginable to be sold via an anonymous online shop). Overall, the positive effects of selling online seem to be limited in this sector. Consequently, the adoption rates of online sales in the transport sector are well below the total sector average. Only 5% of the sector firms actually use the Internet as a sales channel. In addition, large firms have currently almost completely stopped to adopt online sales solutions. Overall, the barriers to sell online seem to be higher in this sector than on average. Presumably, online sales are going to remain the exception in this industry even in the future.

Figure 7-7: Manufacture of transport equipment: Perceived impacts of selling online

Base: EU-6 (D, E, F, I, S, UK), enterprises selling online excl. "no answer" / "don't know" (N=41).

In % of enterprises.

Source: e-Business W@tch (2003)



However, this does not mean that firms do not use the Internet heavily to raise customers' interest about their products. Actually, the web is already intensively used for such purposes, either by offering product information on the company's website, or by participating in online auctions or submitting electronic catalogues to online purchase systems of customers and OEMs, or by similar means.

Sector will slightly increase e-business expenditures in 2003

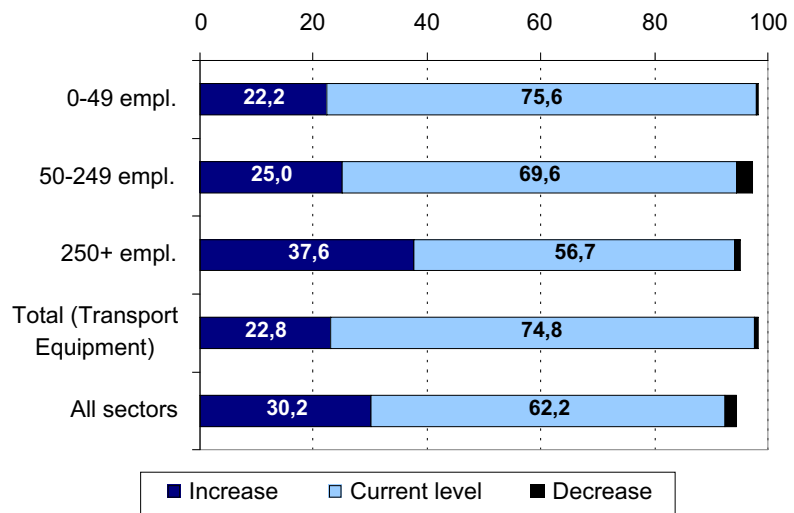
Firms in the transport equipment sector will continue to invest in e-business solutions in the coming months. 75% of all enterprises plan to maintain e-business spending at the current level, while 23% plan to increase their e-business budgets. Less than 1% plan to decrease their expenditure on e-business in the 12 months period ahead. Altogether, this should sum up in a slight increase of e-business spending in the transport equipment sector in 2003. The dynamic will mostly be coming from big firms, where 38% plan to increase their budgets. Smaller firms have a higher tendency to maintain their budgets at the current level. Compared to other sectors, the number of enterprises planning to

increase their e-business budgets is below average. Given this outlook, it is not very likely that the transport equipment sector will exhibit a gigantic leap into e-business by mid 2003. Changes seem rather to be occurring less rapidly and dramatically as originally predicted by many.

Figure 7-8: Companies manufacturing transport equipment: Planned expenditures on e-business technologies during the 12 months period ahead

Base: EU-4 (D, F, I, UK), all enterprises (N=356). In % of enterprises.

Source: e-Business W@tch (2003)



7.3 Conclusions

Structural changes in the industry - the question of power

The broad adoption of e-business in the sector will go along with structural changes, both within companies and the entire industry. However, the outcome of the structural changes and in the way business is conducted will not be determined by technology but by strategic decisions on how to use it. Much of what we will see in the future depends on how the current e-business barriers will be dealt with.

The shift of power between suppliers, system integrators and OEMs is an issue of particular importance in that respect. At first glance, it seems the question of power in e-procurement has to be answered in favour of OEMs. They have led the e-procurement initiatives in the early phase, designing solutions that allow them to maintain power in the level of information required, the pricing pressure and the expansion of the supplier pool. While SIs have ceded power to OEMs that way, they have later been able to gain some power back in interactions with their own supply base. In product development, there seem to be fundamental differences between what SIs and OEMs see as the ultimate goal of Internet-based product development initiatives. While many SIs consider them as a way to gain more power from OEMs by taking on greater design responsibilities and weakening OEMs' ability to engineer in-house, OEMs take them as a chance to delegate more engineering, design, and financial responsibility, while still being able to control the entire process.

The standardisation dilemma

Standardisation e.g. of file formats and communication protocols is a necessary condition for implementing industry-wide e-tools on a grand scale. The big challenge, however, is to accommodate the diverse and sometimes conflicting interests of industry players. Everybody wants standardisation for using external data, but proprietary stand-alone systems for their own data. As a result, there is no driver in the standardisation seat yet and many technical issues still need to be resolved in the future.

Transparency issues

Transparency and free access to real-time information between business partners is central to most of the advantages e-technologies promise. But in real life, questions exist about intellectual property

rights, data security, the fear of losing valuable information to competitors, and the fear of providing OEMs with too much information about cost structures and inventories that could be used to squeeze margins of suppliers. These issues have to be resolved, and more experience is needed to create mutual confidence in data-sharing.

E-business is slowly changing the way business is done

The transport equipment sector has not been among the early adopters of e-business solutions. However, particularly in the areas of procurement and product development, Internet-based solutions and process changes are beginning to have an impact on how business is done. E-business has not yet resulted in a dramatic reconfiguration of the supply chain or the products and services being offered by companies, but firms start to adopt e-business to automate existing supplier relations, to realise efficiency gains in internal processes, and to save costs in a variety of ways. Step by step e-business solutions are gaining momentum and are recognised as tools to boost corporate productivity and to remain competitive. Although the design and production of superior products is the number one prerequisite for success in this industry, e-business solutions add to the portfolio of possible strategies to gain comparative advantages.

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8 Retail

8.1 Economic profile and trends

The *e-Business W@tch* analysis focuses on the retail trade, particularly retail sales in non-specialised stores with a prevalence of food and beverages (Nace Rev.1 52.11) or non-food items (55.12), or in stores specialising in the sale of new goods other than food and beverages or cosmetics and pharmaceuticals (52.4).

NACE Rev.1		Activity
division	group	
52		Retail trade, except of motor vehicles and motorcycles; repair of personal / household goods
	52.11	Retail sale in non-specialised stores with food, beverages or tobacco predominating
	52.12	Other retail sale in non-specialised stores
	52.4	Other retail sale of new goods in specialised stores (a)

The retail sector plays an important role in the economy of the EU, in which it represents 30% of companies (4.7 million units), 16% of the jobs (22.5 million employees), and 13% of GDP and added value. It comprises retail and wholesale trade, specialised and non-specialised stores. There are a significant number of medium-sized enterprises, a few very large multinational enterprises, and numerous small independent traders.

The sector is polarised between a very large number of SMEs and a few large enterprises which exploit economies of scale, using large distribution outlets with centrally co-ordinated distribution networks. The competitive scenario of the past decade has been influenced strongly by the strategies of the largest players. Most of the biggest European food retailers figure amongst the 50 largest business groups in Europe.

The sector has experienced important changes which have dramatically reshaped its competitive framework. These changes have largely been driven by increasing concentration of the sector connected to geographical expansion (of retailers); differentiation in sales formats; vertical and horizontal diversification. The expansion process achieved through internal routes (opening new stores) or external ones (takeover of chains in foreign countries) has led a group of large retailers (established originally in France, UK, Germany and The Netherlands) to assume front running positions at an international level, deepening the gap between the mass of the smaller operators.

The organisations have become increasingly complex, and this has led to the need for exchanging a huge amount of data and information both internally and with the various players along the value chain. The increase in the average size of retail companies over the past few years has enhanced their investment capability, especially in IT systems, which are particularly used in the two areas of purchasing and sales. The evolution of the competitive scenario of this sector represents a driving element toward the spread of ICT in the retail sector and the changeover to procedures for performing company functions and activities with the support of new technologies (e-business).

8.2 Usage of ICT & e-business

ICT infrastructure in retail companies

Internet is the most diffused technology amongst European retail enterprises (82% of the EU4). Traditional connections (via modem and ISDN) are the most common, as shown by the fact that approximately three quarters of the sector's enterprises use them, without significant gaps between small enterprises, medium and large ones.

Table 8-1: Retail sector: Usage of network applications (2002)

	D	EL	F	I	NL	A	P	UK	EU-8
Access to the Internet	83	77	66	88	72	92	33	88	80
World wide web	75	39	56	68	69	87	21	84	70
Website on the Internet	59	34	28	58	71	66	13	76	56
Intranet	31	45	56	34	41	49	15	48	41
Extranet	9	4	21	6	15	15	9	15	12
Local Area Network	50	65	47	39	39	54	15	73	52
Wide Area Network	21	24	22	10	25	19	11	52	27
Electronic Data Interchange	17	15	41	3	23	22	12	21	20

Base: all enterprises. N=744 (for EU-8). Figures weighted by employment ("enterprises comprising ...% of employment have / use..."). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

A relevant percentage of these last ones, however, simultaneously own and use better performing connections: DSL and particularly cable, fibre optics and dedicated lines (39%), basically unaffordable by smaller enterprises. The analysis of the typology of connection is more meaningful if carried out paired with the one regarding the bandwidth, which measures the effective potentiality of the web to be used like a working tool, i.e. as a technology in a position to assure an adequate capability of data loading and speeding both downstream and upstream. Most SMEs use a connection of less than 2M/Bit, showing a significant gap with enterprises with more than 250 employees which use larger bandwidth connections (almost 80%).

The importance of the internal exchanges is evidenced by the development of Intranet and LANs, these being used above all for the exchanges between the points of sale and the head office. Amongst the other networking technologies, Extranet is used on average only by 13% of European retailers (but by 23% of the larger ones) with an intensity directly correlated to the size of companies.

However, the access to technologies is not equally spread among enterprises: only in 48% of the cases have the majority of office workers access to the web, and in 32% to the company intranet; the latter however shows a smaller spread in absolute terms.

In general it is possible to expect a reduction of the gap between the percentage of enterprises where that determined technology is diffused according to the level of responsibility inside the organisation, the function held inside the Company and the percentage of enterprises that give access to a certain technology to the majority of employees.

E-commerce

The penetration of e-commerce amongst companies with a website is less than half: about 57% of the retail enterprises have their own website, and 22% make online sales (mainly through their website). This indicator registers a significant change amongst the various European Countries: the highest peak is represented from UK, where 3 out of 4 of the Retail's enterprises have their own website, while in Portugal only 13 % have their own pages on the net.

The main barriers to the spread of online sales amongst the sector's retailers are related to the demand (few customers are online and they are hesitant to buy online). As a consequence of this, the revenues of online sales are still low. The usage of electronic payment system – uneven across the various countries – and concerns about transaction security are also major issues, as well as the fact that time-sensitive goods do not lend themselves to selling online. Expensiveness of technology and corporate culture are important factor on the company side.

However the impact of online sales with respect to total company sales is less than 5% in most cases, but there are already rather significant figures. For examples, in the UK approximately one-quarter of the companies that sell online generate over 50% of their turnover from these sales.

The e-commerce experiences have not significantly affected the territorial spread of the companies: in 81% of the cases businesses remain within national boundaries.

E-business

On average, 37% of the enterprises (nearly 1 out of 2 of larger ones) manage at least some of their purchasing online. The most commonly used technologies are the "first generation" ones (EDI), but also Extranet (almost 30% access their own trade partner's Extranet) and Marketplaces (6% of the enterprises are already a part of them and 7% are planning to join them as soon as possible).

EDI is important in the sector, where it is used for the exchange of orders and administrative documents with suppliers. On average, 21% of the enterprises in the sample have implemented EDI. Of these, about three quarters use private networks based EDI and one quarter internet based EDI. The prospect of using EDI and the EDIFACT may be accompanied by the use of XML. The critical variable in this regard will be represented by the level of uniformity characterising the diffusion of the XML language, which could invalidate some of the advantages offered by its flexibility of use.

The diffusion of the Extranet is definitely more limited. Extranet, on the other hand, measures the attitude of a company to the exchange of information with the other operators and, generally, their level of integration in the Retailer's organization: on average only 13% of the EU4 use it (but practice nearly a quarter of the enterprises with more than 250 employees).

Digital technologies are used by the companies with various levels of involvement of their functions and their activities: online technologies are usually used in order to exchange documents in electronic format with their own suppliers (53%), but also in order to forecast the market's evolution (in 24% of the cases) and manage capacity or inventories (21%); more rarely in order to design new products (15%) or for the actual negotiation of contracts (16%).

For most of the enterprises that procure online, the share of online purchasing is over the threshold of 5%. Even though there are only a few enterprises (9%) which exceed the threshold of 50% of the online purchases, it appears that in the retail sector e-procurement is impacting companies more than selling online. The amount of products managed through e-procurement and the typologies of the operations involved varies according to company size.

The need for face-to-face interactions is by far the most important barrier to online purchasing, being quoted by 60% of companies (nearly 80% in France). Other relevant barriers are related to the expensiveness technology, security of the exchanged data and compatibility with the suppliers' information systems. Concerns about the actual advantages that can be achieved through online procurement are likely to be the most important barrier also in the near future. 48% of enterprises think that cost advantages are not relevant; this prevents them from taking into consideration the trade-off between the costs of investment and the burden of technologies' management and the advantages that can be achieved. The technological evolution and the push exerted by suppliers are likely to overcome the other barriers mentioned.

Impacts on sector value chain

E-Business applications carry out the dual goal of improving the profit margins and overall efficiency of the system. In fact, the main areas in which retailers are investing in applications are:

- supply chain configurations;
- management of store operations;
- interaction with customers (this sometimes lead to the creation of a full-fledged sales channel as an alternative to the physical one).

The diffusion of e-business in the retail sector is of utmost importance because of some structural elements:

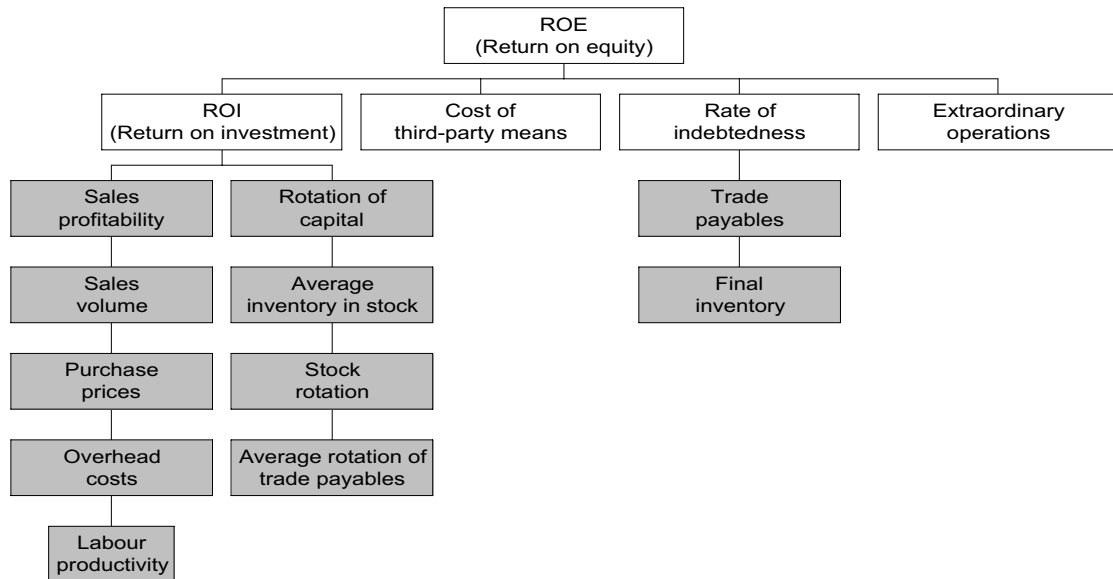
- high degree of complexity, dependent on the large number of products, the seasonal characteristics of demand, and the differences in shelf life and stock rotation time;
- the relevance of inter-business exchanges. In fact retailers, besides their upstream relationships with suppliers and their downstream relationships with customers, have significant inter company exchanges through CEDI (Centres of Distribution).

Particularly for large companies, the connection and the exchange of information within the same company is a consequence of network organization of the points of sales and distribution network.

In taking a detailed look at the role that the adoption of e-business is destined to play in the retail sector, we must consider that the sector is characterised by low unit margins.

The diagram below highlights the elements that can be directly influenced by the e-business solutions adopted by firms, as part of the mechanism for generating value for these companies.

Figure 8-1: Impact of e-Business solutions on determinants of ROI



Source: Databank Consulting

An increase in turnover that is proportionately higher than the increase in employed capital has a positive effect on ROI. In the sector:

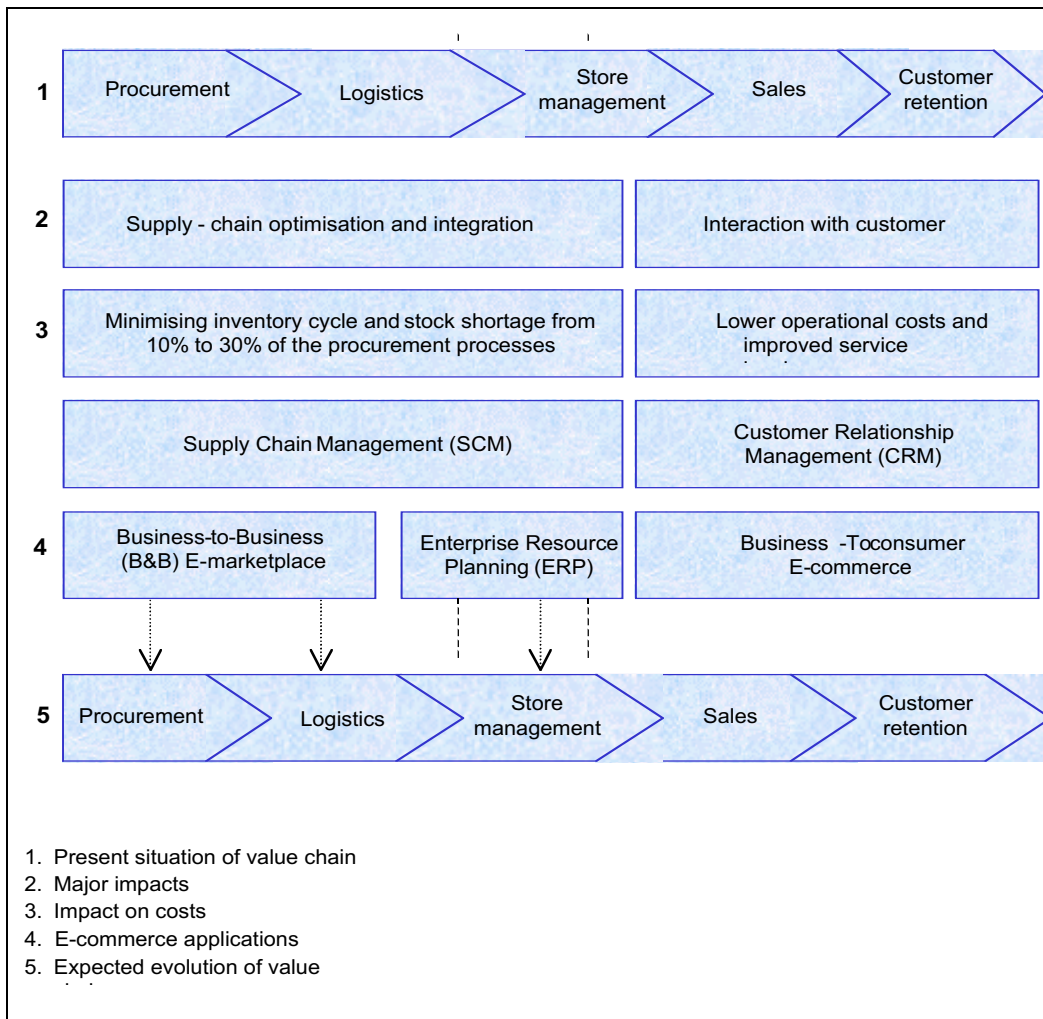
- the ROI (return on investment) of the enterprises is strongly affected by the rotation of capital, which essentially consists of stocks of products to be sold. Therefore, the chance to improve profits is primarily based on the optimisation of the company's supplying flows, which turns into an increasing stock rotation speed. The challenge is to be able to ensure availability of products in the points of sales;
- the return on sales (ROS) are affected on the one hand by the range of offer and the competitors' ability to differentiate their own offer, and on the other hand by the terms of purchase which represents the cost item that has the greatest impact on the P&L (Profit & Loss).

Being retail companies, only intermediaries of goods, the critical processes in this sector involve procurement and the management of logistical flows and the main challenge is to optimise inbound and outbound flows.

E-business initiatives therefore mostly involve procurements and sales and are essentially conceived by the companies as instruments to:

- rationalize and reduce the costs of supplying and of management of the supply chain, starting from purchasing costs;
- differentiate their own offer from the competitors, exploiting CRM techniques as to communication, sales and customers' loyalty.

Figure 8-2: Impact of e-Business and evolution of the value chain the Retail Sector



Source: Developed from EITO 2001

Impact on Efficiency

The diffusion of e-business initiatives in the procurement area has a strong impact on the efficiency of internal business process and on the relations to suppliers (33,3% according to companies procuring online).

Major logistic impacts are:

- the possibility of accelerating the flows of goods;
- improvement in the quality of the process by sharing information;
- the very close partnership between retailers and the providers of logistical services, increasingly integrated in the chain of value of the former through the performance of additional services simply with the handling of goods.

Major store management impacts are:

- time-savings (scanning the barcode represents a 25% reduction in the time needed to key in the price at the checkout counter) and the elimination of keying errors. These advantages can be considered as already acquired: it has been calculated that in cost terms, the EAN-POS scanner systems has generated cost economies ranging from 0.7% to 2.2%.

- the possibility of utilising sales data from the checkout counters to supply the procurement cycle in a continuous cycle, by generating restocking proposals and, as already shown, rather intensive levels of integration with the suppliers' IT systems;
- the reduction of stock outages at the store, which turn into 6% loss of potential sales. According to Roland Berger, the internal processes at the store are responsible for stock outages in 45% of cases. At the same procurement conditions, effective monitoring of sales data would halve the rate of stock outages, above all during product promotions.

Impact on Costs

18% of enterprises report a very positive impact on the procurement costs, but evaluations are quite evenly split between those who think that there is a real cost advantage and those who don't. The analysis of these evaluations leads to the conclusion that e-procurement initiatives are not necessarily profitable for the participants but, if carefully planned and implemented, advantages for the participants can be remarkable. Major impacts are:

Potential impacts of e-business on costs the retail sector	
• Reduction of logistics and distribution costs	Reduction of the time for delivery, coupled with the exploitation of economies of scale: holistic assessment of logistics through improved data acquisition and analysis techniques allows both parties to fully explore areas for improvement (e.g. ratios of storage to transport costs).
• Lower administration and personnel costs	... through the application of integrated information systems: staff scheduling (to cope with periods of increased demand), monitoring, and payment were traditionally labour-intensive activities.
• Reduction of product purchasing costs	Structured long-term procurement (supported with forecasts on customer purchasing) allows retailers to negotiate very favourable rates.
• Rationalisation of warehouses (geographic centralisation)	Reduction of required inventories: The balance between central versus regional refrigeration and warehousing capability has significant effects on logistics costs and delivery time, while increased transparency helps to prioritise resources.
• Opportunity to develop new trading platforms with lower transaction costs	E-business directly modifies the trading activity because of the following factors: independence from opening hours, frequent updates of prices and promotion, smaller shops and showrooms, better stock control, online automatic support and after-sales service.

Impact on sales

In the area of sales the most important innovation is the start up of online selling, thus integrating the **traditional physical channel with the virtual one**. The volume of sales made online is still very limited and has not fulfilled more optimistic expectations.

As a consequence of this, e-commerce is unlikely to develop significantly as an independent channel, with its own characteristics and features, but more probably as an important opportunity of communication and improvement of **interaction, and therefore of knowledge of the customers and their expectations**.

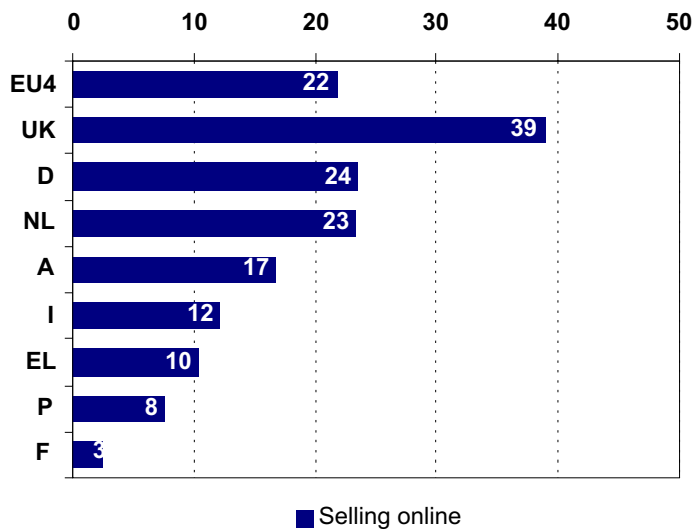
With an eye to creating customer relations and retention, the Internet represents a channel that, in various respects, is more flexible for communications initiatives that are targeted and personalised based on the customer's needs. It permits greater interaction with the site visitor, starting with the interface and the navigation routes to arrive at e-mail or customised banners.

In some cases, though, the integration of the traditional channel with the online one has proven particularly effective thanks to the exploitation of the fact that the two complement each other: a chain can use the online channel to penetrate or test a given area where it does not have significant local coverage, while in other cases it can integrate its choice of location.

Figure 8-3: Retail companies selling online

Base: EU-8 (A, D, EL, F, I, NL, P, UK), all companies, excl. "no answer" / (N=744).
 Figures weighted by employment ("enterprises comprising ...% of employees say that they sell...")

Source: e-Business W@tch (2003)



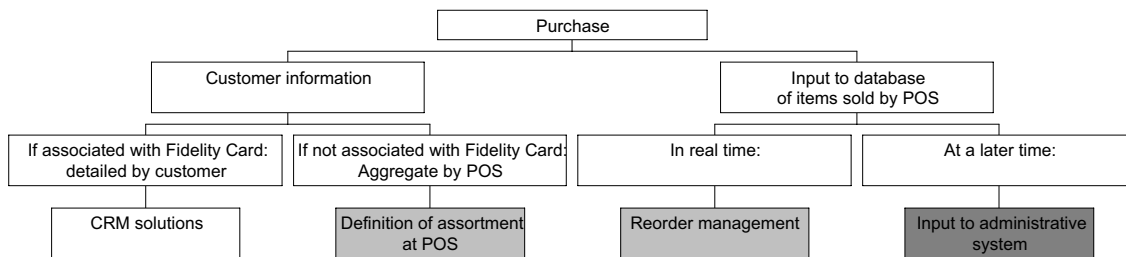
One of the most demanding challenges for retailers, considering the static nature of the various markets and the limited territorial scope of the points of sale, is to maintain and possibly increase the level of **customer loyalty**.

The most widespread tool used by retailers to become acquainted with their customers and foster their loyalty is the fidelity card. Companies use this to collect personal information as well as data on consumer spending habits, offering additional advantages for the customers (e.g. discounts, point promotions and, in some cases, consumer credit facilities). The cards can also be used as a payment instrument.

In other words, the companies tend to identify groups of customers united by economic characteristics that make them more open to a certain type of promotion.

The use of more powerful disaggregation on the level of the individual consumer is in fact compared with evaluations on the effective economic sustainability of the customer-retention initiatives.

Figure 8-4: Flow of information on data of sold items



Source: Databank Consulting

Overall e-business impacts

The overall evaluation on the e-business impacts, independently of the distinction between adopters and non-adopters, divides companies again quite evenly between those who owe a significant part of the way they act today to e-business processes and those who don't. It's interesting however to notice how the percentage of sceptics is destined to drop strongly in next two years (32%). The most significant impact of e-business concerns the organisation structure, and particularly the internal work processes.

Table 8-2: Retail sector: Significance of e-business (2002)

	D	EL	F	I	NL	A	P	UK	EU-8
e-business constitutes ...									
... a significant part of the way they operate today	7	20	4	10	10	12	1	4	7
... some part of the way they operate today	54	40	18	26	33	56	18	56	41
e-business does not play a role in operations	38	40	77	54	50	28	53	38	49
... not a significant part of operations today but will within the next 2 years	30	44	15	35	16	20	27	43	32
... neither a significant part of operations today nor will in the next 2 years	58	22	73	39	70	65	39	51	56

Base: all enterprises. N=744 (for EU-8). Figures weighted by employment ("enterprises comprising ...% of employment say that ..."). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Table 8-3: Retail sector: Perceived impacts of e-business on business processes (2002)

Significant changes in ...	D	EL	F	I	NL	A	P	UK	EU-8
... organisational structure of the company	9	21	<1	11	9	3	4	7	7
... internal work processes	11	15	1	13	10	12	3	19	11
... customer relationships	9	12	<1	14	11	9	3	14	9
... relationship to suppliers	4	12	<1	13	11	7	4	8	7
... the offer of products / services	8	15	<1	12	10	4	3	15	9
... the way in which they conduct business	5	12	<1	15	9	3	3	8	7

Base: all enterprises. N=744 (for EU-8). Figures weighted by employment ("enterprises comprising ...% of employment reporting significant changes"). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

The evaluation of who are e-business beneficiaries partly explains the different perception of the nature of the impacts and in some cases the scepticism as well. In fact, only very few people think that there will be no beneficiaries at all. Only 11% of the enterprises think that the e-business' adoption will favour small and medium companies, while 42% think that the larger enterprises will be the ones to benefit the most from new technologies.

Table 8-4: Retail sector: "Who will benefit most from e-business – SMEs or large enterprises?" Assessment by companies (2002)

	D	EL	F	I	NL	A	P	UK	EU-8
"SMEs are most likely to benefit from e-business."	15	9	2	20	4	8	13	10	11
"Large enterprises are most likely to benefit from e-business."	45	39	69	40	40	50	42	21	42
"SMEs and large enterprises will benefit equally from e-business."	35	49	25	29	48	37	23	65	41
"No one will benefit from e-business."	3	<1	1	2	3	3	--	1	2

Base: all enterprises. N=744 (for EU-8). Figures weighted by employment ("enterprises comprising ...% of employment). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Although the growth of online retailing has not been fast, there are factors that could drive adoption of this model in the future. These include changing customer lifestyles, the adoption of the European single currency, which has further increased transparency of prices and the potential reduction of facility costs (point-of-sale management costs).

8.3 Conclusions

Encourage and promote the diffusion of Internet based communication standards (XML, Web-EDI)

The standardization of data format, provided e.g. by XML, supports the exchange of data and their acquisition to the information systems of the various players in the value chain, due also to the set-up and diffusion of formats reproducing the documents most frequently exchanged among the enterprises (invoices and orders). When it comes to standard messages, the Internet can support the more complex functions previously carried out through the EDI net; this in turn encourages a greater integration amongst players previously excluded because of the amount of investment requested to implement and maintain the dedicated infrastructures and networks. A broadening of the players involved in the e-business' initiatives can also be supported by Web-based EDI. This could enable the expansion of the electronic data's transmission to the companies until now not involved in EDI net, as well as the chance for the others to be connected with them without having to disinvest.

Facilitate faster and cheaper Internet connections

Reduction of connection costs and availability of higher bandwidth should continue to receive attention at policy level. The shift from proprietary networks to the Internet will foster the participation and the competitive positioning of SMEs. This shift however is conditional upon accessibility and affordability of the necessary infrastructure. This issue is also important on the demand's side. The sector is strongly oriented to B2C, therefore the size of the potential market is fundamental for ensuring the sustainability of e-commerce initiatives.

Facilitate and encourage the access to information and raise awareness of the potential of both B2B and B2C initiatives

The sharing of best practices and possibly of comparative studies on the economic sustainability of e-business initiatives would encourage their adoption particularly among SMEs. The aim should be to provide companies with information about available low cost solutions and decision-supporting tools for cost-benefit evaluation.

The failing of a number of Dot.Com initiatives, in fact, has led the players to consider more carefully the economic sustainability of the e-business initiatives. Industry associations and ICT providers should be encouraged to take up these actions. Policymakers should support companies through the definition and dissemination of the "State of the Art" concerning transactions' security both on the B2B and the B2C side, supplying official certification of the procedures which can be adopted.

Promote partnerships and enterprise clusters i.e. shared portals and open marketplaces

Sharing costs could enhance the sustainability of e-business initiatives and the additional services required (i.e. logistics). Clustering and partnerships could also help SMEs to be more visible online, especially if innovative approaches were adopted, such as category management clustering.

The increasing spread of open marketplaces where SMEs can purchase and sell online would bring important benefits. It is important to ensure that SMEs can fully exploit these possibilities. There are, in fact, indications that in a number of marketplace initiatives the threshold of exchanges required is not affordable for smaller companies.

Raise awareness and trust of both consumers and companies about the regulatory framework of e-commerce

Companies and consumers' approach to e-commerce would benefit from more awareness about the security of e-commerce (for instance with respect to the regulation of online purchases, payments, consumers' rights, diversity amongst different countries, requirements and standards). This issue is likely to become more important in the prospective of a broadening of supranational initiatives but it already affects the current level of e-commerce initiatives' diffusion.

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9 Tourism

9.1 Economic profile and trends

Tourism is usually defined as services for people travelling to and staying outside their usual environment for less than one consecutive year for leisure or for business purposes. This sector does not fit easily into any current industry classification. In fact, generally speaking, tourism involves a wide range of activities (transport, accommodation, restaurants, cultural activities, leisure) and could be more effectively viewed and evaluated as a market rather than an industry. For the purposes of *e-Business W@tch*, we have employed two selection criteria to define the scope of the sector to be analysed, based on NACE categories:

- activities which constitute a significant share of the tourism market as defined above;
- activities which bear at least some relation to tourism and are very important as potential and actual users of IC.

NACE Rev.1		Activity
division	group	
55		Hotels and restaurants
	55.1	Hotels
	55.2	Campsites and other forms of short-stay accommodation
	62.1	Scheduled air transport
	63.3	Activities of travel agencies and tour operators; tourist assistance activities n.e.c.
	92.33	Fair and amusement park activities
	92.52	Museum activities and preservation of historical sites and buildings
	92.53	Botanical and zoological gardens and nature reserve activities

As one of the fastest-growing sectors in the European economy, tourism contributes significantly to the EU economy: the tourism sector as a whole contributes to generate 5.5% of GDP in EU countries and, including related businesses, it accounts for about 6% of overall employment. The development of the tourism sector has been supported by the impressive evolution of mobility and communications and by the growing internationalisation of the world economy.

The WTO's most recent estimates regarding short-term international tourism are somewhat cautious. There was some settlement in early 2002 as tourists' level of confidence increased steadily. In the second half of the year tourism will likely be up, restoring the growth rates to the levels registered prior to the crisis in the sector following the tragic events of September 11 2001. Observers agree that the crisis has led to overall redistribution of tourism flows and a change in the type of trip preferred by tourists, at least at the level of macro-trends: generally speaking, there has been growth in domestic and medium-range tourism rather than long-range tourism and greater use of means of transportation other than the aeroplane. The top fifteen nations attracting the most arrivals and revenues continue to constitute 60% of all arrivals and revenues

Table 9-1: Growth of world tourism, from 1997 to 2001

	1997	1998	1999	2000	2001	% change 2001/00	CAGR 2001/97
Arrivals (millions)	619.7	636.6	650.4	696.7	692.7	-0.6	2.8
Revenues (billion euro)	418.0	420.0	428.1	513.6	516.1	0.5	5.4

Source: developed from WTO 2002

Table 9-2: Ranking of the top-15 countries in terms of visitors' arrivals (2000/2001)

Rank	Country	Arrivals (million)		% change		% of world total
		2000	2001	2001/00	2000	2001
1	France	75.6	76.5	1.2	10.85	11.04
2	Spain	47.9	49.5	3.3	6.88	7.15
3	USA	50.9	45.5	-10.6	7.31	6.57
4	Italy	41.3	39.0	-5.6	5.93	5.63
5	China	31.2	33.2	6.4	4.48	4.79
6	UK	25.2	23.4	-7.1	3.62	3.38
7	Russian Fed.	21.2	n.a.	n.a.	3.04	n.a.
8	Mexico	20.6	19.8	-3.9	2.96	2.86
9	Canada	19.7	19.7	-	2.83	2.84
10	Austria	18.0	18.2	1.1	2.58	2.63
11	Germany	19.0	17.9	-5.8	2.73	2.58
12	Hungary	15.6	15.3	-1.9	2.24	2.21
13	Poland	17.4	15.0	-13.8	2.50	2.17
14	Hong Kong (China)	13.1	13.7	4.6	1.88	1.98
15	Greece	13.1	n.a.	n.a.	1.88	n.a.
Total 1-15		429.8	386.7	-10.0	61.69	55.83
World total		696.7	692.7	-0.6	100.00	100.00

Source: WTO 2002

The supply side

The tourism industry as a whole incorporates a variety of different types of businesses operating in different sectors, each of which has its own characteristic scenario in terms of number and size of companies, success factors, competitive game, and approach strategies. For the purpose of the present research the sub-sectors analysed are:

- Tourist service suppliers, including: hotel **accommodation**, (single and chains), other short stay accommodation, **air carriers**, other players offering **amusement and entertainment services**;
- Tourist service **intermediaries**, including: **tour operators** who purchase a series of services from service suppliers, putting them together and selling them in the form of more or less standardised packages, distributed mostly through the traditional travel agency channel; **travel agencies** purchasing individual services or complete packages from tour operators and reselling them to consumers.

The industry structure is very fragmented. SMEs prevail in number but the sector is dominated by large integrated companies.

The demand side

The travel and tourism market has been going through a phase of profound transformation in recent years on the demand side too, driven by evolution in values, lifestyles and demographic trends in a scenario which currently appears rather optimistic despite the dramatic events of September 11 and the crisis which followed, paralysing the entire travel and tourism industry worldwide for months. New trends on the demand side also appeared with the emergence of a "new tourism" characterised by greater flexibility, demand for a strongly customised product, a desire to stand out from the masses and assert one's individuality resulting in demand for more varied, active forms of tourism which are not just a matter of "having fun" but also include elements of adventure, and a form of tourism which shows greater respect for the environment, in which consumers want to "see and enjoy without destroying". Another emerging trend is the attitude towards shorter and more frequent holidays.

Finally, growing use of new technologies by a growing number of households has made consumers more mature, aware and without doubt more experienced and better-informed; consumers are certainly more spontaneous and unpredictable, not only when it comes to their choice of vacation but also in their ability to "combine" products from different price categories in order to achieve final satisfaction.

9.2 Usage of ICT & e-business

The tourism sector has been a pioneer in adopting and developing the new information and communication technologies. There have been three main innovation waves impacting on the tourism scenario in the last decades: the development of the Computer Reservation System (CRS) in the 1970s, the development of the Global Distribution System (GDS) in the 1980s and the Internet in the 1990s. CRS and GDS acted to create, develop and globalise the availability of basic tourist services through the intermediation of travel agencies which had unique access to the automated booking systems. They are based on proprietary networks and are very sophisticated from the technological point of view, with very high implementation and running costs. They are the means currently used for purchasing tourist services and packages through Travel Agencies. The offer of such services is presently very concentrated with four global suppliers, owned by airlines companies: SABRE, Amadeus, Galileo International and Worldspan.

The Internet has deeply influenced and re-shaped the sector scenario. It has become the new medium for interactions which were previously carried out through different means (e.g. between hotel chains and their direct customers), it has allowed the direct interaction between customers and suppliers (e.g. with tour operators), it is impacting on the role of traditional intermediaries and has favoured the entry of **new e-intermediaries**. Moreover, there has been a general trend towards the **integration** and **concentration** of the various players in the sector value chain (tour operators, carriers and hotels), with the aims of: achieving economies of scale; ensuring the availability of places from suppliers of tourist services; gaining control of the whole process and of the prices; and ultimately increasing margins.

These developments are posing important challenges to all the players and especially to SMEs: on the one hand competition is getting fiercer, on the other new windows of opportunities are opening up, for those players able to readjust their strategy towards new value propositions of tailored services. For SMEs in particular, opportunities to be exploited lie in their ability to set up co-operation structures such as DMS (Destination Management Systems). The exploitation of the opportunities related to the Internet, however, is not automatic as it requires the definition of a marketing strategy calling for changes in structure and organisation, not to mention the importance of a communication strategy.

Connectivity

The Internet and the access to the Web are now present in almost all sector companies. There are in fact further penetration margins only amongst small-size, whereas among medium-and large-size companies the diffusion rate is close to the total. Traditional connections, via modem and ISDN, are the most common. Intranet is used by 40% of companies and LANs by 47%. As for the latter, however, no further increase is expected, as evidence of the progressive migration towards the Internet protocol adopted by Intranet. The website presence, now about 80%, is expected to reach 90% by mid 2003. An important factor holding back ICT development is the strong dualism of supply, namely a situation where the presence of big players with great economic and financial resources and with a corporate culture aiming at fostering the spreading of the new technologies, clashes with a majority of small and medium sized companies, mainly family-run businesses with limited resources to invest in technology and unfavourable cultural attitude. Addressing this issue is critical for regional development.

Sophistication

The newer generation of e-commerce applications has not had as big an impact as initially envisaged, and this was evident across all sectors. The survey shows that in reality only a small number of tourism firms implement such systems. Of those that participate, large firms are two to four times more likely to participate than their small and medium sized counterparts. There have been poor investments in integrated systems, such as SCM and ERP, while CRM fared slightly better (12%), the presence of this activity was biased towards larger enterprises.

Exchange and Interaction

Due to the complex and intangible nature of tourism products, the exchange of information and the interaction inside and among the different players in the value chain are pivotal. E-mail is the most common communication means both for internal and external purposes. However, the overall percentage of enterprises providing their employees with ICT access is slightly lower compared with other sectors. The reasons for this lie in the high number of small size companies active in sector, and in the still widespread usage of dedicated systems for booking services.

Sales

Although currently the penetration level of Websites among tourism companies is not one of the highest in comparison with other sectors, the rate of companies using the Web as a distribution channel for their own services is second only to insurance and pension funding services. This attitude to selling online, however, has not brought yet significant business results. Nearly half the companies, in fact, record a share of online sales out of total sales of less than 5%. Customers tend to use the Websites for information purpose and price comparison, rather than for actual purchasing. Customer related reasons, and most of all consumers' hesitance, are perceived as the main obstacles to selling online. According to the survey results, over half of the companies are worried about the fact that sector products are not suitable for online exchange and therefore they need interaction during the purchasing process.

Table 9-3: Tourism: Companies selling online (2002)

	D	EL	E	F	I	A	UK	EU-7
Have a website on the internet (1)	77	57	67	67	80	87	85	76
Sell online (on the internet or other channels) (1)	46	32	22	28	23	62	38	34
Out of which: sell online via website (2)	85	75	83	84	81	75	87	84

Base: (1) all enterprises. N=699 (for EU-7); (2) enterprises selling online (N=260 for EU-7).

Figures weighted by employment ("enterprises comprising ...% of employment). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Procurement

On average (EU4) over one third of sector companies have adopted online procurement even if figures are affected by a certain variability between the different countries. Online procurement of MRO (maintenance, repair and operating goods) is quite popular in all countries with the exception of Italy and Spain. For direct goods there is less of a differentiation between size class and limited differences across countries.

The ability of SMEs to undertake online procurement is evident in the number participating, with small and medium sized enterprises outperforming large firms. The most relevant barriers to online procurement lie in suppliers' online availability and technology, together with security and expense. Very positive effects on savings of cost and efficiency of internal processes are reported by about 17% of the companies procuring online.

Table 9-4: Tourism: Companies purchasing products and services online (2002)

	D	EL	E	F	I	A	UK	EU-7
Purchase online	41	16	21	29	33	58	38	34
Plan to purchase online during within next 12 months	3	7	13	10	7	11	6	7

Base: all enterprises. N=699 (for EU-7). Figures weighted by employment ("enterprises comprising ...% of employment).

Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Impacts on organisation structure

The results of the *e-Business W@tch* indicate that nearly 46% of companies in the Tourism sector have experienced a positive change in the way they conduct business, and these positive changes have been driven by the introduction of e-business practices. Internal processes and the relation with customers are the main beneficiaries. Companies record lower impacts on the relationship with suppliers and the product range offered.

Changes in business processes follow different patterns across the various sub-sectors analysed and among SMEs with respect to larger firms. Big players, such as air carriers and large hotel chains, have increasingly moved to the Internet operations and transactions traditionally carried out through proprietary systems, while SMEs have increasingly adopted networking for broadening their customer base. It also appears from the results of the survey that the adoption of e-business has brought changes in the way the tourist product is marketed and offered to customers.

Table 9-5: Tourism: Perceived impacts of e-business on business processes: enterprises reporting changes (significant / somewhat) (2002)

Changes ...	D	EL	E	F	I	A	UK	EU-7
... in the organisational structure	27	46	20	22	37	52	31	29
... in internal work processes	38	46	20	23	39	55	43	35
... in customer relationships	33	30	22	37	45	63	34	34
... in the relationship to suppliers	26	22	14	22	38	40	24	25
... in the offer of products / services	17	38	19	31	36	32	31	27
... the way in which they conduct business	45	56	23	36	47	72	51	43

Base: all enterprises. N=699 (for EU-7). Figures weighted by employment ("enterprises comprising ...% of employment say that ... has changed somewhat or significantly"). Reporting period: June/July 2002.

Source: *e-Business W@tch* (2003)

Impacts on sales revenues

Although in this sector the rate of companies using the Web as a distribution channel is second only to insurance and pension funding services, only a small percentage of them stated that an online sales presence contributed to increasing sales revenues. About half of online sellers declared they have recorded less than 5% of their sales through the Internet. The moderate impact on revenues is related to customers' behaviour and hesitance. Customer's trust, personalised services and price competitiveness are key factors for boosting sales. The broadening of the sales area is, conversely, the positive effect which companies record more. This impact, with the enhanced quality of customer service and better internal efficiency, seem to indicate that e-business is bringing its effect firstly on the overall competitive positioning.

Impacts on procurement

About 36% of the companies procure online and the percentage of SMEs undertaking online procurement outperform large firms. The reported effects on costs and efficiency of internal process indicate that e-procurement is likely to become an increasingly central success factor in a scenario where price competition is getting fiercer.

Impacts on relationships with customers and suppliers

Interactive relationships are economically difficult to quantify; they comprise a variety of features that are generally considered as positive in reducing costs through reviewing and improving organisational inefficiencies and activities through open and trusted communication. The main impact of e-business in this sector is the opportunity to establish direct means of communications relying on the Internet rather than on proprietary systems, therefore opening major opportunities for SMEs.

CRM, fairly well diffused (13% of companies) is likely to bring very positive impacts. Tourism companies, in fact, can rely on long-existing customer databases and the content of those can be fully exploited for marketing purpose

Future ICT developments

One of the impacts of e-business in the tourism sector is the thrust towards further investments in ICT. Being a pioneer in the adoption of Information technology, tourism developed and adopted proprietary networks which are still largely diffused and which have conditioned the adoption of new technologies. It is likely that the tourism industry as a whole will have to keep on investing in the updating of their systems in order to make more and more content available on the Internet and to facilitate direct contact with all players. These growth expectations are confirmed by the results of our survey. About 40% of sector operators expect to increase their investments in e-business technology within the 12 months period ahead while little more than half of them forecast to keep expenditure on technology unchanged.

Table 9-6: Tourism: Forecasts about expenditure on e-business technologies (2002)

	D	EL	E	F	I	A	UK	EU7
Increase	21	64	47	33	55	41	46	40
Decrease	8	6	4	0	2	8	5	5
Maintain	64	27	47	66	31	44	41	49

Base: all enterprises. N=699 (for EU-7). Figures weighted by employment ("enterprises comprising ...% of employment say ..."). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

However, in spite of the important results achieved, it will be necessary to make further efforts to strengthen and increase the adoption of new technologies inside the tourism sector and especially among SMEs which are so relevant for the industrial structure but which are mostly "held back" by the limits deriving from the available resources, the existing managerial culture and know-how.

The confirmation that there are still, at a sector level, wide growth opportunities comes once again from the research conducted amongst sector companies, most of which state that e-business currently does not account for a significant share of the business as shown by the figures in the following table.

Table 9-7: Tourism: Perceived importance of e-business systems in 2002 (% of enterprises)

	D	EL	E	F	I	A	UK	EU7
E-business ...								
• constitutes a significant part of the way the business operates today	22	18	13	10	27	35	6	16
• constitutes some part of the way it operates today	45	53	34	43	25	50	61	45
• does not play a role in their operations	32	29	53	47	38	11	26	36
... does not constitute a significant part of their operations today but will do so within the next 2 years	17	50	50	45	33	21	51	39
... neither constitutes a significant part of their operations today nor will do so within the next 2 years	61	20	33	42	22	40	37	40

Base: all enterprises. N=699 (for EU-7). Figures weighted by employment ("enterprises comprising ...% of employment say ..."). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

9.3 Conclusions

The tourism industry has been a pioneer in the adoption of ICT

Largely supported by proprietary networks, tourism firms have been conditioned in the adoption of new technologies for their operation. It is important to support the diffusion of standardised systems. It is important to ensure that all the players in the value chain can fully exploit the opportunities of e-business. This therefore requires carrying out all those actions, both at a national and EU level, aimed at widespread technological progress: increasing Internet access speed, transaction security, the set-up of platforms and architectures for open and flexible systems to improve the management of internal and external exchanges and, at the same time, progressively lower ICT access costs for both companies and end-users.

Co-operation among SMEs is a key challenge for facing increasing competition.

The set-up of collaborative initiatives among small and medium-sized tourism enterprises should be encouraged as a part of regional development policies. On the one hand, e-business is posing new challenges to SMEs. On the other hand, the availability of the Internet offers unique opportunities for collaborative initiatives aimed at promoting local and regional tourism. A few successful initiatives have been set up, based on the so-called DMS (Destination Management Systems), which can be defined as a resort integrated information system enabling the collection of all the tourist information and services required, making them available for promotion and sale through a Website. Thanks to these activities, local SMEs can play a proactive role in promoting their business and can achieve important goals both in terms of promotion and sales. It is necessary to underline how fundamental is the co-ordination role for ensuring success. This role can be performed by local government, by an ad-hoc structure managed by the same operators or even a proper Internet marketing structure.

Build customers' trust through awareness raising actions. Customers' hesitance has been highlighted as one of the major barriers to the performing of online sales

Customers are now well informed and aware of the price competitiveness of the Internet. They are however still reluctant to finalise their purchasing after collecting commercial information. The enhancement of customer awareness in terms of enabling them to recognise the advantages of e-business should be encouraged.

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10 Credit institutions, investment and leasing firms

10.1 Economic profile and trends

It is estimated that there are about 300,000 financial services enterprises in the EU. Of these, more than half (56%) had no employees at all (mainly self-employed persons) and over a third (38%) had between 1 and 9 employees. Altogether, however, these very small enterprises (most of which were financial auxiliaries), whilst numerous, did not account for a significant share of activity, as they accounted for just 12.2% of employment and 3.9% of turnover. The *e-Business W@tch* focuses on a sector within this industry that includes all of the financial intermediation activities – whether monetary or not – except insurance and pension funds, as well as financial auxiliaries.

NACE Rev.1		Activity
division	group	
65		Financial intermediation, except insurance and pension funding
	65.12_652	Total credit Institutions
	65.12	Other Monetary Intermediation
	65.22	Other credit granting

Other monetary intermediation (65.12) mainly refers to activities of saving banks, co-operative banks and commercial banks. Credit institutions considered by the e-business survey will be primarily universal banks (commercial banks, saving banks, co-operative banks, public banks) as well as specialised banks (merchant or investment banks). The only credit institutions to be excluded from analysis are central banks, partly because of their general reluctance to be interviewed.

Structural changes in the sector

The European banking and financial systems have experienced structural changes in the past decade, the most important of which are the launch of the euro and the deregulation of traditionally protected markets. The usage of ICT, and especially of the Internet, is the other factor that has drastically impacted on the sector and reshaped the competitive scenario.

The volume of mergers and acquisitions in the European financial sector accelerated and, as a result of this process, the level of concentration significantly increased. The wave of mergers recorded within the banking industry during the 1990s resulted in fewer but larger credit institutions. Between 1983 and 2000 the number of banks in the European countries reduced by more than 4,400 units, from 12,700 to approximately 8,300 banks. This concentration process has not been consistent across all types of credit intermediaries. In fact, saving and co-operative banks have dramatically decreased in number whilst commercial banks have significantly increased. Saving banks and co-operative banks tend to be small in size: the merging process was prompted by the need to increase in size with the result of achieving economies of scale.

The trend of a declining number of banks varied from country to country: the highest decline rate was recorded in Germany, with over 800 M&As in the second half of the 1990s. Despite wide-spread M&A activities, Germany still has the lowest level of concentration in Europe, due to its structure, which is characterised by a few large sized banks and many smaller sized regional banks.

The system has thereby experienced deep organisational changes. Plans for reorganisation and restructuring, alliance and partnerships, and privatisation have been accelerated. Product and process innovation, redefinition of strategy and revision of organisation patterns are among the main issues with which credit institutions have been dealing in recent years. Strategic alliances and co-operation agreements between banks on the production side (development of common standards, sharing of development costs, processing of payments) and on the distribution side (compatible ATMs) have taken place.

New businesses

The deregulation process which has been introduced gradually but progressively in several countries has led to an increase in market freedom. This has allowed banks access to adjacent but traditionally un-catered markets for services, such as insurance, mortgages and life assurance under the same trusted brand. The success of joint selling initiatives (offering standards products) through banking channels in several European countries is a clear example.

Non banks operators

Competition, financial disintermediation, along with the opportunities offered by the new technologies, are the major factors that enhanced competition for traditional banking products such as mortgages, consumer credit and deposits. These factors also operated between domestic and foreign banks, between banks and other financial institutions (especially insurance companies), and between banks and other non-financial operators, such as: online brokers; intermediaries intermediary companies offering multiple services through more distribution channels (Virgin direct); retailer companies selling banking products through in-store network (Safeway); operators referring to car companies and financing for the purchasing of cars (BMW Financial Services); operators specialising in the supply of financial services to air companies' customers (Lufthansa); Postal Services Operators which have been developing a broad range of services, exploiting the opportunities of the Internet and relying on a diffused and distributed network.

Organisational changes: impact on employment and productivity

Changes in market structure are forcing Credit Institutions to reconsider their overall strategy and the business areas in which they intend to operate, to revise their organisation models and growth patterns. The growing importance played by alternate distribution channels has modified the organisation of personnel with respect to the employees located in head offices and those working at the counter: 64% (2000 figures) of Europe's bank employees work at the counter (front-office staff), a growth of 5% since 1997. The composition of front-office staff figures has also changed: an increase in the number of professional employees capable of carrying out consulting activities (over 33% of front-office total) and a decrease in the number of back office employees and traditional staff (such as cashiers).

According to Eurostat, 2.7 million people were employed in EU 15 Credit Institutions in 1998. The overall employment trend is rather stable. It is interesting to note that indicators of value added, production and cost per employee vary remarkably between different countries. Although data may be vulnerable to differences in national accounting as well to the various economic situations, it is however worth noticing, for example, that the average production value ranges from nearly 310,000 Euro in the UK to 122,000 in Portugal. Value added on production per employee is about 65% on the average, ranging from 61% in France to 78% in the UK. Cost of the personnel on value added is around 40% in most of countries, while in some it is remarkably lower (especially in the UK, Sweden and Portugal).

Internationalisation and cross-border activities

Cross-border activities have been increasing in the last decade, although markets are still quite segmented. The most common strategies for entering cross-borders markets are mergers and acquisitions of local banks rather than the opening of local branches. For the full deployment of the integration process the main obstacles lie in the regulatory framework, price harmonisation and trust towards "foreign intermediaries". "Imported" business models have ultimately to adapt to the different domestic situations, especially as far as the organisation and labour market aspects are concerned.

10.2 Usage of ICT & e-business

10.2.1 The role of ICT in the sector

As information constitutes the core asset of the banking sector, it is easy to understand the great potential of ICT-related innovations in the industry. ICT are crucial for the development, production and delivery of financial products and services, since they allow increasing flexibility, which in turn permits a great diversification of the business in a variety of activities.

The development of ICT networks has enabled the distributed access to central records and has allowed a faster and easier capture and processing of data. ICT offer a growing possibility for integrating distributed activities and for improving the quality of service through the collection and the storing of information on single customers. In particular, the use of ICT is critical for the automation of an extensive range of data, for the performance of online transactions, for the efficient execution of processes, for a better communication between different units within a bank, for a better decision process (because of the availability of information in different areas), for the development of remote banking, for a higher security of activities. Furthermore, the technological change in the ICT area enhances the functionality of the banks in terms of availability of information, and this increases the reliability of decisional processes, the integration at the internal and external level through the improvement and standardisation of the technical systems, and the innovation in the distribution channels that makes the bank close to their customers.

The banking and other financial services sector is one of the most advanced in the usage and diffusion of technologies. As essentially an information business, it does not produce physical products and has been trading electronically for decades. For these reasons, hardly any other sector is better suited for e-business which, in fact, is progressing very quickly in this sector. ICT impacts on all aspects of the activity and is undoubtedly one of the main driving forces in the sector.

Major opportunities offered, in principle, by technological developments are:

- reducing costs per transaction;
- broadened and easier access to the target customers;
- more efficient systems and techniques for dealing with information on customers (CRM);
- possibility of diversifying into new business;
- more efficient tools for controlling internal processes efficiency.

The technological development and the spread of the Internet also poses a number of strategic challenges:

- increased competition from financial and non financial institutions;
- increase in investments required for establishing and managing the information systems, increase of operational, legal and strategic risks; and
- the ability to manage increasingly complex multi-channels distribution systems.

Business processes in B2B and B2C relationships

The advent of open network architectures and a sharp reduction in costs have made computerised transactions between financial institutions and clients, previously the preserve of relatively few large companies, available to the broad community of enterprises. Main developments in the B2B market have been:

- The development of Electronic Trading Systems, such as ECNs, are increasingly impacting on the competitive scenario through price competition because they have blurred the roles of the different market operators, brokers and market makers, and the market itself.
- Developments fostered by technological innovation have impacted on both the retail bond market and the wholesale fixed income markets but mostly on the latter. At the end of 1998, most

wholesale markets in the EU were telephone-based while now they depend heavily on electronic trading also in Europe.

- The creation of digital marketplaces for non-financial firms is a way for banks to expand their role as intermediaries, combining traditional banking business with a broader range of value added services in connection with e-commerce and tailored to the needs of the firms engaged in e-commerce.

The market for retail financial services has been dramatically changing in the last few years, the main trends being the increase of direct delivery and the enhanced competition and the introduction of new online services.

The trends of online banking negate both the prediction of massive diffusion of such services and the disappearing of traditional banking organisation.

In Europe, the diffusion of e-business in retail financial services varies widely among different market segments and countries. The preferred business model seems to be the setting up of a separate unit for internet banking, integrated in the mother organisation, rather than the establishment of a separate legal entity. Only a handful of banks use a stand-alone, "internet-only" banking model in which websites are the sole delivery channel. The most commonly adopted strategy is the multi-channel one which better suits the preference of the customer according to his/her various needs. Physical branches are still the most important contact point with customers and the more frequently used channel for purchasing banking products. This explains why the number of local units is not diminishing, but even increasing in some countries. Also related to this customer attitude is the very limited spread of cross-border banking through the internet despite the technological potential inherent in it.

Multi-channel strategy is quite expensive, especially in the long run, as it implies a broad range of investments, technological among others, over all the channels. However, services in this area have to be maintained and enhanced to cope with increasing competition.

10.2.2 Diffusion of ICT infrastructure

After the flurry of recent mergers, many banking firms deal with the challenge of decentralised systems, data redundancies and non-standard applications across non-integrated platforms. Key areas for investment in the short-medium term are intra-group and multi-channel integration, solutions aimed at improving relationships and contacts with customers (CRM), e-banking and call centres, branch renewal. Moreover, being information-intensive organisations, with huge and complex information systems, financial institutions will have to continue investing in IT upgrading, even in uncertain competitive environments.

Most countries show a high level of availability and usage of infrastructure as far as computer, Internet, e-mail, Intranet and Local Area Networks are concerned, while there is a less prominent presence of extranet, Wide Area Networks and EDI solutions.

Empirical evidences suggests that medium size banks tend to adopt new technologies more quickly than large banks and small banks. This finding is in line with some recent literature on the diffusion of ICT in the financial sector, which emphasises the higher flexibility and propensity of medium size banks to innovate. In most countries these institutions coincide with savings banks, which have been pioneers in the adoption of sophisticated technological platforms for the provision of financial services. Small banks are usually cooperative or rural and trade banks, which do not have enough financial resources to invest in new technologies and tend to prefer a direct contact with the end-users.

Table 10-1: Credit institutions: Availability and usage of ICT infrastructure according to size classes

	All sectors	Credit institutions		
		0 – 49 employees	50 – 249 employees	250+ employees
Computer	94	99	100	100
Internet	84	95	100	94
E-mail usage	81	92	100	94
WWW	73	84	98	94
Intranet	30	42	81	80
Extranet	9	12	42	32
LAN	43	56	87	100
WAN	9	16	55	77
EDI	9	13	17	36

Base: EU-4 (D, F, I, UK), all enterprises. N=402 (for the banking sector), N=5917 (for all sectors). In % of enterprises.
Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

The diffusion of ICT is strongly associated with the digital literacy of the personnel operating within financial firms. There is a clear correspondence between the degree of employees' access to ICT and the general availability and usage of ICT infrastructure. In particular, a high percentage of employees use e-mail and Intranet, while less use the WWW: banks typically have a strong orientation towards internal processes and communication, and in some countries access to the Intranet is more common than access to e-mail for external communication.

10.2.3 E-commerce in the banking sector

The percentage of banks having a website is very high if weighted by employment, but not quite as high if displayed as a percentage of enterprises. This can be attributed to the particular structure of the sector, which in most countries is made up of many small banks (cooperative banks). Recent empirical research has shown that these banks are quite slow in adopting new technologies and in particular in implementing Internet banking. This finding is confirmed by the information concerning the diffusion of website by size classes, which shows that 62% of small banks have a website, compared to 94% of medium banks and 97% of large banks.

About 12% of banks sell online which is the average of all sectors. However, the picture is totally different if data are weighted by employment. 32% of people employed in the sector work in banks that sell online, while the sector average is only 17%. Furthermore, it is important to underline that most banks have been selling online for more than one year, and half the banks have been selling online for more than two years. This evidence signals the relatively good performance of financial institutions in terms of early use of new technologies.

In terms of provision of services to customers in connection to online sales, banks are advanced and sophisticated operators of sales systems. Their e-commerce solutions tend to be integrated with the back-end systems. 56% of enterprises selling online (weighted by employment) report that this is the case; this is the second highest percentage of all sectors after ICT services 66%). Obviously, banks are intensive users of secure servers (based on SSL) for their e-commerce activities.

Banks representing 37% of employment say they make online purchases themselves. In contrast to sell side e-commerce, this is below the sector average (43%).

Table 10-2: Credit institutions: E-commerce activities by country

	B	D	E	F	I	L	UK	EU-7
Website	95	97	86	90	95	68	89	93
Plans to have a website	2	2	1	1	2	13	10	4
Selling online	36	32	47	46	35	22	19	33
Planning to sell online	2	30	14	7	14	12	10	16
Online procurement	47	38	26	27	29	30	50	36
Planning to procure online	10	10	12	1	1	12	1	5

Computation base: all enterprises (N = 641 for EU-7). Data weighted by employment (enterprises comprising ...% of employment). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

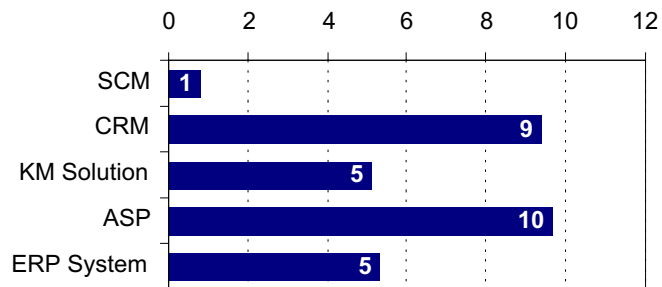
The relative intensity of e-commerce (e-sales and procurement as % of total sales) is still limited. Most banks declare that both account for less than 10% of total sales and procurement. However, there is an intrinsic difficulty in measuring "e-commerce" in the financial services sector, as it is unclear how to account for electronic banking. Banks have an interest that their customers (both consumers and businesses) make their "normal" transactions online rather than doing it the traditional way at the front desk inside the bank. From a bank's perspective, e-banking is e-commerce. However, this kind of activity is different from "selling online" as conceptualised in other sectors, and also does not comply with standard definitions of e-commerce. This should be considered when studying statistics about sell side e-commerce of banks.

An important issue related to the diffusion of electronic commerce in the banking sector concerns the usage of various solutions for online commercial activities. According to the empirical findings, Customer Relationship Management is widely diffused (compared to the sector average), especially if weighted by employment. Banks are also more likely than other sectors to use the services of Application Services Providers. These data confirm that financial institutions adopt the most advanced technological solutions and use technology to improve the quality of service for their customers.

Figure 10-1: Credit institutions: Usage of e-business solutions

Base: EU-7 (B, D, E, F, I, L, UK), all enterprises, excl. "no answer" / "don't know" (N=621). In % of enterprises.

Source: e-Business W@tch (2003)



Barriers to e-commerce

The reluctance of customers to buy online and the low propensity of financial products to be traded electronically are perceived as the most important obstacles to the further adoption of electronic commerce. This is in line with the common idea that there are still problems of privacy and security of information on the Internet and that consumers feel unsafe in performing online commercial transactions. As far as the low "adaptability" of financial products and services to an Internet-based environment is concerned, the issue is more controversial. On the one hand it is well known that some products and services (among which also financial ones) can be more easily delivered in an electronic version; on the other hand, the nature of the content of financial products and services makes it difficult to bypass the face-to-face interaction between users and suppliers.

Table 10-3: Credit institutions: Barriers to online selling

	B	D	E	F	I	L	UK	EU-7
Few customers online	53	26	54	54	57	24	50	51
Customers hesitant to buy online	57	61	84	75	62	73	63	67
Goods / services do not lend themselves to selling online	75	60	75	87	70	72	67	73
Processing of payments for online orders is a problem	38	34	42	53	50	29	43	46
Technology too expensive	53	47	49	58	48	72	59	55
Revenue of online sales is still low	68	72	62	55	66	63	60	61
Delivery process causes problems	34	18	33	33	49	14	22	31
Adapting corporate culture to e-commerce is difficult	58	54	58	54	62	60	42	51

Base: all enterprises. N=641 (for EU-7). In % of enterprises (% of banks agreeing completely or somewhat). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

10.2.4 Impact of e-business

In spite of the fact that the financial sector is a forerunner and advanced user of ICT and their e-business related applications, even among banks almost half of all enterprises state that electronic business does not yet play a role in their operations.

Figure 10-2: Credit institutions: Perceived importance of e-business

Base: EU-4 (D, F, I, UK), all enterprises. N=402 (for the banking industry), N=5917 (for all sectors). % of enterprises saying that e-business plays a significant/some part of the way they operate.

Source: e-Business W@tch (2003)

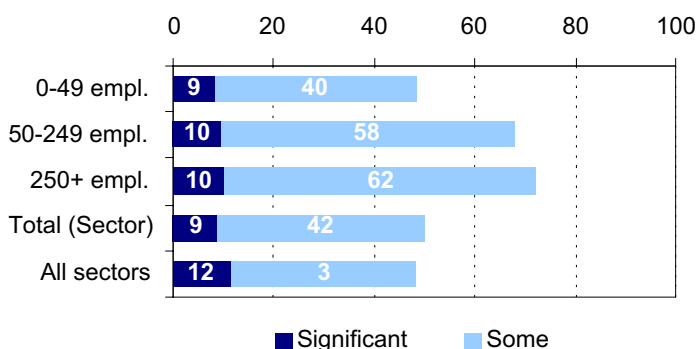
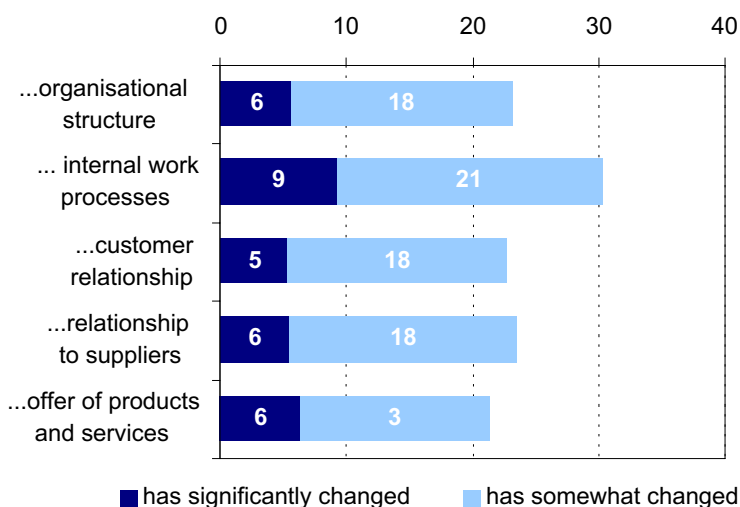


Figure 10-3: Credit institutions: Perceived impacts of e-business: Induced changes on business activities

Base: EU-7 (B, D, E, F, I, L, UK), all enterprises, N=641. In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)



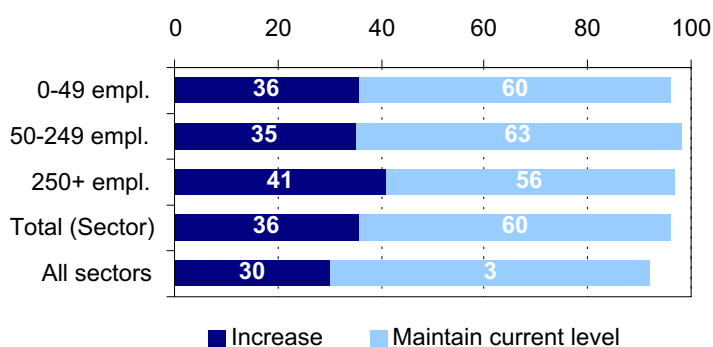
41% of banks declare that e-business will play some part in their activities, and only 9% report that e-business already constitutes a significant part of their business. It seems that banking activities are still very much based upon traditional commercial transactions and that new technologies have a more significant impact on the efficiency of internal processes than on the overall business activity of the banks. This negates some common but misleading statements that banks will substitute their activity with Internet-based transactions.

As regards expenditures on electronic business technologies, most banks (almost 60%) state that they will maintain the current level of expenditure on electronic business technologies. However, a significant proportion of banks plan to increase the expenditures – mostly the large banks.

Figure 10-4: Credit institutions: Intention concerning expenditure on e-business technologies for 12 months period ahead

Base: EU-7 (B, D, E, F, I, L, UK), all enterprises, N=641. In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)



10.3 Conclusions

The rapid advance of e-finance products and services presents new challenges and opportunities to financial institutions and supervisors. The growth in new technologies and the fast pace of their adoption directly influence strategic, transaction, and compliance risk. Recent economic uncertainty has already affected e-finance and its market acceptance. Technology projects are being re-evaluated for their business case and strategic relevance. Security, privacy, and customer service problems present additional threats to customer acceptance of the online channel. In the long-term, Internet technology developments could threaten the status quo by further introducing outside competitors, unproven business strategies, increased price transparency, dis-intermediation, and cross-border issues.

For financial institutions, conducting these activities online may result in the amplification of traditional risks. Three immediate e-finance related concerns are: appropriate planning and internal controls to govern new and emerging electronic delivery channels, products and services; protecting the integrity of information and the privacy and confidentiality of customer information; risk oversight of third party technology service providers.

Financial firms will have to concentrate on a number of issues:

- innovation of products, both in B2B and B2C e-commerce: “wealth management” services and portals for SMEs and B2B trading portals for large corporations are examples of personalisation of services. Innovation in organisation and delivery mechanism will be the key for providing value added products and services and for differentiating. In particular, customisation will be one of the most important competition strategies in the foreseeable future.
- development of alliances both with financial and non financial institutions and with technological partners for developing newly integrated offerings in insurance, asset management and B2B

marketplaces. In several countries more forward-looking alliances are between banks and national telephone companies aiming at positioning themselves for the future delivery of financial services (mobile telephony and, to a lesser extent, interactive television). Such alliances and outsourcing give rise to concerns that banks' interaction with clients increasingly relies on unsupervised enterprises whose activities are outside bank managements' usual field of competence.

- achieving higher process efficiency and cost reduction by exploiting technological opportunities through process automation, knowledge management and e-learning, collaborative applications and by implementing new ways of working and innovative organisation.
- improving decision support and risk management systems as a response to the uncertainty of the economic scenario. It is important to make these instruments available not only at strategic but also at operational levels.
- development of skills and overall profile of staff changing to become more marketing oriented.

More specifically in B2C market segments, competitors will have:

- to improve relationships with customers and develop more tailored and integrated offerings. Collaborating with customers and using information acquired will be essential in order to properly build and customize value added services. Online technology enables financial institutions to exploit more efficient systems and techniques for dealing with information on customers' needs and behaviour, including product preferences. The Internet allows companies to market more precisely than ever before. Banks can tailor a customer-oriented approach which may lead customers to concentrate their demand in a single institution (one-stop-shop). Privacy and security issues need be addressed properly in order to exploit these opportunities
- to deal with the issue of integrating new and traditional channels (multi-channel integration) channels and back office processes, channels and CRM solutions. Integration is critical because most of the value from online activities is related to offline ones (cross-selling, process cost-cuts). Integration poses relevant challenges on the organisation side, as different units/departments inside the organisation – with their own business objectives – address the same customer base. How and when to start cutting cost on traditional distribution channels is another challenge.

Incumbent institutions will have to exploit e-business to restructure and optimise their operations while relying on their traditional strength points: capital resources, information systems, established brands. They will have to focus more on customer needs, as one of the big advantages of online businesses is the ability to collect and exploit huge amounts of information on their customer. As Internet-only banks age, they accumulate experience with this new business model which may allow them to run it more efficiently in the future. Moreover, as Internet-only banks grow larger, they may generate scale economies in excess of those available to traditional banks that use less capital-intensive production and distribution technologies. If these effects are substantial, Internet-only banks may be able to close the performance gap with traditional banks.

In B2B markets, financial institutions will also need to improve their value proposition and enhance their service quality to address a growing demand for both financial and non-financial services and to exploit CRM function with business. E-marketplaces addressing specific customer segments (e.g. a specific industry sector) or providing specific services (e.g. asset management) are likely to be a major line for developing strategies in this area.

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11 Insurance and pension funding services

11.1 Economic profile and trends

The insurance sector covers long and short-term risk spreading activities. The relevant NACE Rev. 1 chapter 66 comprises three basic activities: "Life insurance" includes common life insurance and life reinsurance with or without a savings component. "Pension funding" includes the provision of retirement incomes, but not non-contributory schemes where the funding is largely derived from public sources, nor compulsory social security schemes. "Non-life insurance" comprises insurance and reinsurance of non-life insurance business, e.g. accident, fire, health, property, motor, marine, aviation, transport, pecuniary loss and liability insurance. Reinsurance activities are included in one of the three sections, according to the kind of risk reinsured.

NACE Rev.1		Activity
division	group	
66		Insurance and pension funding, except compulsory and social security
	66.01	Life insurance
	66.02	Pension funding
	66.03	Non-life insurance

The insurance sector is one of the most important service sectors regarding its basic function for the whole economy and society. Modern, highly industrialised and technology-driven economies are threatened by higher risks than ever; and individuals need to protect themselves against private risks as well as saving individually for their retirement. Insurance companies also play an important role as investors and shareholders.

Economic key figures

In 2000, about 4,800 insurance companies were active in the EU, a 3.8% decrease from close to 5,000 in 1992. During this period of time, the number of companies decreased in Belgium, Spain, France, Greece, Italy and Sweden. It increased in Denmark, Ireland, Luxembourg, the Netherlands and Portugal and remained almost the same in Austria, Germany, Finland and the UK. Employment in EU insurance firms was estimated at around 900,000 persons in 2000, which was slightly less than 1992. There is a trend towards large insurance or financial groups which operate on a European level and dominate the market. However, these are leaving space for specialist insurers on a national or even regional level.

The most important insurance nations in terms of premium volume are the UK (around 30% of the EU market), Germany (18%), France (18%) and Italy (10%). Total direct premium in the EU grew by 50% from 1992 to 1999, calculated with inflation-adjusted data. Growth was particularly high in Luxembourg, Portugal, Ireland and Italy. While life insurance accounted for half of the EU insurance market in 1992 (49%), it increased to almost two thirds (63%) in 1999.

Current issues in the insurance sector

Pressure from external shocks: The terrorist assault on the World Trade Centre in New York, as well as ongoing terrorist attacks since then, have put the insurance industry – the reinsurers in particular – under huge pressure. Due to the enormous sums the insurance companies will have to pay for claims, they are no longer able and willing to account for the risk of incalculable terrorist damages. Furthermore, the dramatic situation in the investment markets has forced the insurance companies to use up reserves and to adopt new business models. Customers are also affected, because life insurance returns decrease. With financial reserves declining or even vanishing, the insurance business is currently experiencing a wave of rationalisation. Personnel costs are to be reduced, automation of processes and standardisation of products are sought.

Far-reaching structural change: The insurance market is developing towards a highly competitive customer market with supply greatly surpassing demand. Facing individualised customer requirements, insurance activities are becoming increasingly differentiated, with modular products, marketing to target groups, improving service, developing brands, and offering product packages in certain fields such as travelling. Multi-channel distribution including the Internet has become a standard. Market and environment have increasingly become dynamic and international. Insurance enterprises used to have an administration mentality, to be inward-oriented, hierarchical and organised into distinct business lines. Today, the change of structures and processes is almost continuous. A trend towards globalised activities has led to mergers, acquisitions and co-operatives in the sector.

11.2 Usage of ICT & e-business

The role of e-business in the sector

Insurers have invested enormous sums in the extension of their Internet activities. The “pioneers” in the Member States have realised useful, interactive and modern Internet presentations. However, these are largely information-oriented and more factual than exciting. In Europe and in the USA, the expectations of e-commerce success (B2C) as well as the success of internal e-business new processes have not yet been fulfilled.

New information and communication technologies and e-business practices can impact greatly on the insurance industry. The Internet increases transparency on the insurance market, giving customers more market power. It allows virtualisation of organisational networks, increasing the opportunity for systematic co-operative service offers. It also reduces the amount of capital needed to enter the insurance market, so that new firms find lower barriers to compete in the market. ICTs offer opportunities to rearrange all stages of the insurance value chain: product development, marketing, sales, administration, asset management and claims management. The automation of business processes in the insurance sector can reduce costs significantly.

The suitability of insurance products for Internet distribution varies, depending mainly on how much individual advice the customer demands. Products particularly suited for Internet distribution are private motor, household, private liability and term life insurance. In this classification, the share of products suitable for Internet distribution in the insurance policy market was between 15 and 20% of premiums in Germany and France in 2000.

The importance of the Internet as a distribution channel is questioned mainly because insurance policies are so-called “low-interest products”, i.e. individuals do not normally think about sourcing information about insurance and concluding insurance contracts. Further barriers include: product complexity requiring individual consultation, security reservations and different priorities set by the insurers, internal conflicts in the insurance companies over rationalisation consequences of e-business, fear of technical faults, customers’ preference for personal consulting, the young generation that is most frequently using the WWW is not a insurers’ target group, and regulatory issues. However, a broad variety of insurance business models using the Internet as a distribution channel has already emerged. Functions such as underwriting, policy administration, claims management, investment or risk management are outsourced to an increasing number of specialised external providers.

The Commission formulated a “Communication from the Commission to the Council and the European Parliament on e-commerce and financial services” in 2001. However, hurdles are to be overcome, above all a number of significant divergences in national rules, fragmenting the financial services internal market.

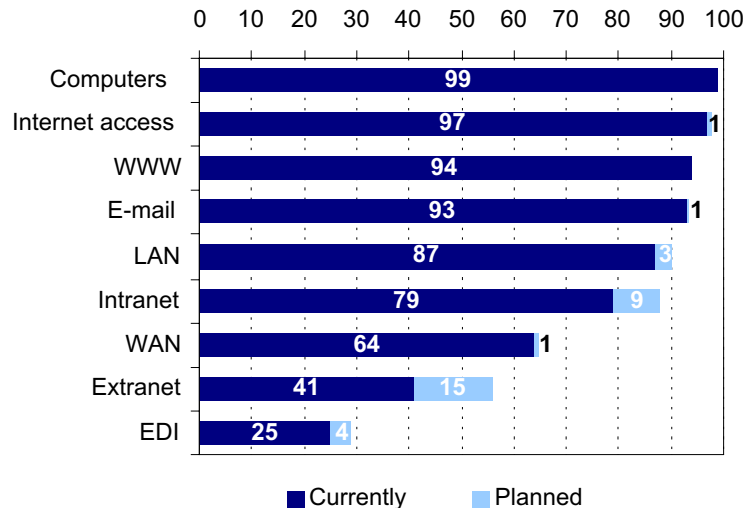
Survey findings in the insurance sector

Importance of e-business today: The insurance sector is characterised by high e-business importance, widespread intention to further invest in e-business technologies, and strong satisfaction with e-business. In 9% of the insurance enterprises in the sample countries, e-business does already constitute a significant part of the way the companies operate today, and in 65% some part. 36% of insurers intend to increase their e-business investments within the 12 months period ahead, 3% want to decrease it and in 58% the level is expected to remain the same.

Figure 11-1: ICT use and usage plans in EU insurance enterprises

Base: EU-7 (D, EL, F, I, L, S, UK), all companies, excl. "no answer" / (N=426).
 Figures weighted by employment ("enterprises comprising ...% of employees"). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)



ICT use: The EU insurance sector is characterised by a very highly developed ICT infrastructure. Computer use (97%), Internet access (99%)³, e-mail use (93%), and world wide web use (WWW) (94%) are found in almost all companies; Local Area Networks (LAN) (87%), intranets (79%) and Wide Area Networks (WAN) (64%) are frequently used – see figure 2-1. Extranets (41%) are found in a large minority of companies. Electronic Data Interchange (EDI) is traditionally not so important in the insurance business (25%). Within the next twelve months, enterprises report that the technologies most intended to be introduced are extranets (15%) and intranets (9%).

ICT access and skills: The share of insurance firms allowing the majority of employees access to e-mail for internal communication is 91%. To e-mail for external communication it is 89%, to the WWW 78% and to the intranet 75%. 60% of the insurance enterprises have tried to recruit IT specialists in the past 12 months. Of these enterprises, 11% reported significant recruitment difficulties and 46% some difficulties. The difficulties may be related to the existence of legacy systems in many insurance firms: The insurers may need specialists for outdated computer programmes which are hard to find.

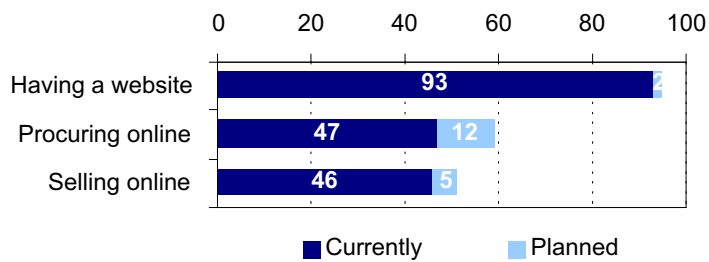
E-commerce activities: 93% of the enterprises have a website, 2% plan to introduce one within one year – see figure 2-4. Almost all of those that have a website present their products and services on the site (95%). Selling online is quite widespread, with 46% of enterprises and 5% planning to do so. Online procurement is similarly common: 47% of insurance enterprises pursue this practice and 12% have plans to do so.

³ Internet access is higher than computer use because of employment weighting of the data.

Figure 11-2: E-commerce practices in EU insurance enterprises in %

Base: EU-7 (D, EL, F, I, L, S, UK), all companies, excl. "no answer" / (N=426).
Figures weighted by employment ("enterprises comprising ...% of employees"). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)



Characteristics of selling online: The vast majority of assurance firms appear to use the Internet as an additional sales channel of minor importance: In 77% of insurance enterprises selling online the share of online sales is less than 5%. Further details include:

- 33% of insurance enterprises selling online enable online payment;
- 41% of online sellers sell via electronic marketplaces;
- 55% of online sellers in insurance have been conducting this practice for more than two years, 39% between one and two years and 6% for less than one year;
- 86% of insurance and pension-funding online sellers practise online sales to consumers, 51% to other businesses and 46% to the public sector.

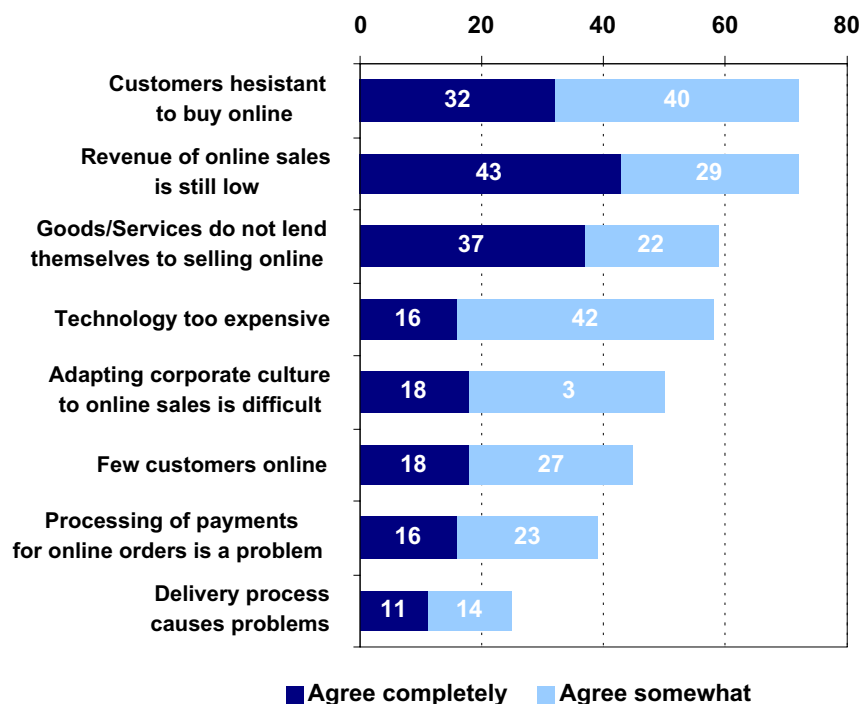
Characteristics of procuring online: Most enterprises practising online procurement procure only a small share of their goods online: 66% of insurance and pension-funding enterprises in the sample countries procuring online conduct less than 5% of their total procurement online.

Barriers to selling online: Four of eight pre-formulated barriers are agreed to by more than half of the enterprises. The most important barriers are "customers are hesitant to buy online" (32% agree completely and 40% somewhat), "revenue of online sales is still too low" (43% / 29%), "goods do not lend themselves to selling online" (37% / 22%), and "technology is too expensive" (16% / 42%). "Adapting corporate culture to e-commerce" is also an important problem with 18% of enterprises agreeing completely and 32% somewhat.

Figure 11-3: Insurance and pension funding: Barriers to selling online

Base: EU-7 (D, EL, F, I, L, S, UK), all companies, excl. "no answer" / (N=426).
Figures weighted by employment ("enterprises comprising ...% of employees"). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)



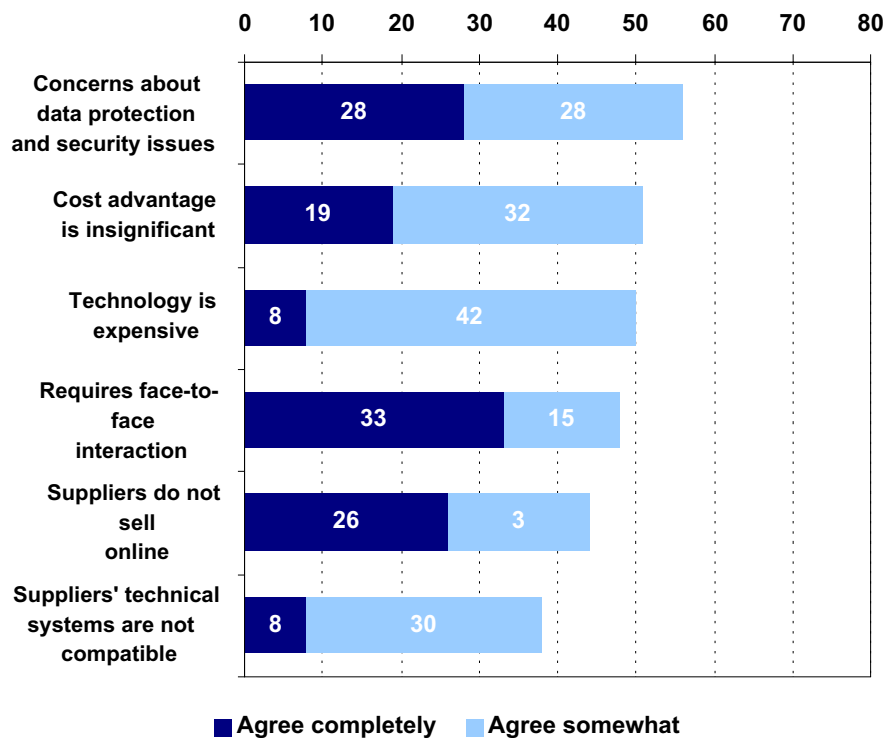
Barriers to procuring online: Three of the six pre-formulated barriers to procuring online were agreed by 50% or more of the interviewees in the insurance and pension-funding sector: “Concerns about data protection and security issues” (28% completely and 28% somewhat), “cost advantage is insignificant” (19% / 32%), and “technology is expensive” (8% / 42%). The highest level of complete agreement (32%) was revealed for “requires face-to-face interaction”. This may be due to the fact that the most important suppliers of insurers are reinsurance firms. The reinsurance business is largely carried out face-to-face.

Figure 11-4:
Insurance and pension funding: Barriers to procuring online

Base: EU-7 (D, EL, F, I, L, S, UK), all companies, excl. “no answer” / (N=426).

Figures weighted by employment (“enterprises comprising ...% of employees”). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)



Online business processes: Online collaboration with business partners with ICTs other than e-mail is practised by only a minority of insurance and pension-funding enterprises, except online exchange of documents with suppliers (54%). The relevant questions were posed to enterprises with Internet access. Electronic exchange of documents with customers (40%) also takes place fairly often.

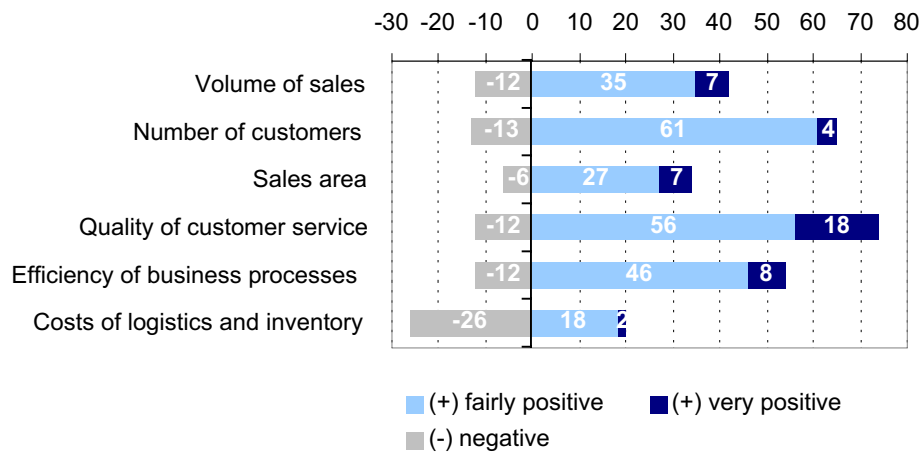
Usage of special applications: Specific e-business solutions are used only by a minority of insurance and pension-funding enterprises. 39% make use of Application Service Providers (ASP), and 31% of a Customer Relationship Management (CRM) solution. As regards CRM, the applications in many firms are likely to be limited to a few operations. CRM is the application most often planned to be introduced (by 12% of the enterprises). Knowledge management (KM) solutions (12%), Enterprise Resource Planning (ERP) (12%) and Supply Chain Management (SCM) (5%) are not so common. The low level of ERP and SCM is due to the insurance value chain that includes neither the procurement of raw material nor a large number of suppliers.

Impact of online sales: Enterprises selling online were asked about impacts of their online sales. Three of six pre-formulated impacts revealed positive assessments from more than 50% of the interviewees (see figure 2-11). Most positive was “quality of customer service” (18% answered “very positive”, 56% “fairly positive”), followed by “number of customers” (0.4% / 61%) and “efficiency of internal business processes” (8% / 46%). The impact on costs of logistics and inventory are rather negative, with only 20% of interviewees stating positive impacts and 26% negative impacts. This may be explained by high investment volumes that have not yet created sufficient returns.

Figure 11-5: Impact of online sales in EU insurance enterprises (in %)

Base: EU-7 (D, EL, F, I, L, S, UK), companies selling online (N=196).
Figures weighted by employment ("enterprises comprising ...% of employees"). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

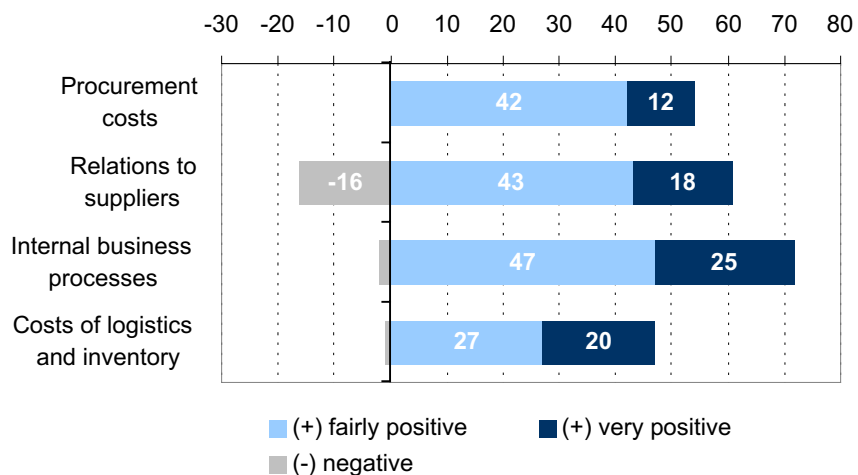


Impact of online procurement: Insurance and pension-funding enterprises procuring online were asked about the impacts of this practice. Three of four pre-formulated impacts revealed positive assessment by more than 50% of the interviewees. Most positive was the impact of online procurement on internal business processes: 25% "very positive" and 47% "fairly positive". Relations to suppliers were influenced very positively in 18% and fairly positively in 43%; the equivalent figures for procurement costs are 12% and 42%. Costs of logistics and inventory were improved in 47% (20% very positive, 27% fairly positive).

Figure 11-6: Impact of online procurement in EU insurance enterprises (in %)

Base: EU-7 (D, EL, F, I, L, S, UK), companies procuring online (N=200).
Figures weighted by employment ("enterprises comprising ...% of employees"). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)



Impacts of e-business in general: The largest impact e-business had in insurance enterprises is on work processes. 13% of the interviewees reported a significant change, and 45% some change. All other pre-formulated impacts were agreed by less than half of the enterprises: change of customer relationships (9% / 35%), change of organisational structure (7% / 36%), change of relationship to suppliers (4% / 31%), and change of offer of products and services (12% / 19%). The level of products and services change appears to be rather low, considering the need to present products and services differently on the Internet.

Benefits for SMEs: A majority of 57% of the interviewees believe that both large enterprises and SMEs will benefit equally from e-business. 29% express the opinion that large enterprises are the beneficiaries of e-business, 14% say that SMEs are the beneficiaries, and a negligible share of 0.8% says that no one will benefit.

Survey findings in sector comparison

In sector comparison, the insurance sector is among the top ICT and e-business users:

- **Importance of e-business:** The percentage of insurance and pension-funding enterprises where e-business constitutes a significant or some part of the way the companies operate today is the largest of all sectors.
- **ICT infrastructure:** Insurance has the highest penetration of Internet access, the second highest level of extranet use, the third highest level of intranet and WAN use, one of the highest levels of WWW use, a high share of LAN and an average share of EDI users.
- **ICT access and skills:** Recruitment efforts of IT specialists within the past 12 months as well as reported difficulties in recruiting IT specialists were higher only in one other sector. The difficulties may be related to a need for specialists for outdated computer programmes to run legacy systems. Staff access to ICTs is well developed in sector comparison.
- **Internal e-business applications:** No other sector has a higher share of enterprises supporting the human resources management by e-business means. As regards tracking working hours and production time, insurance is also at the top. The share of enterprises practising collaborative work and e-learning is the fourth highest. However, it remains unclear whether or not the applications are of high quality and if they are used beyond the IT department.
- **E-commerce practice:** The insurance sector has the highest share of enterprises with a website and of enterprises selling online. Online procurement practice is above average. Insurers have the highest share of firms selling less than 5% of their sales and purchasing less than 5% of their procurement volume online. The level of insurance firms taking part in B2B marketplaces is slightly below average.
- **E-commerce barriers:** The share of insurance firms reporting that customers are hesitant to buy online is the highest of all sectors, while the share of those complaining that few customers are online is average. The share of firms saying that their goods do not lend themselves to be sold online is the second lowest of all sectors. The share of insurance firms agreeing to the procurement barriers is always below average. As regards "technology is expensive", insurers have the lowest share of all sectors.
- **E-business applications:** Together with two other sectors, insurance has the highest share of enterprises collaborating online to forecast product demands, and electronic exchange of documents with suppliers is well above average. However, electronic exchange of documents with customers is well below average. In the other forms of online collaboration insurance is average. Insurance has the highest share of enterprises using Application Service Providers and the fourth highest level of electronic Customer Relationship Management (CRM) use. In Supply Chain Management (SCM) use, insurance is slightly below average, and the share of insurers applying Enterprise Resource Planning (ERP) is only half of the average of all sectors. SCM and ERP are not particularly suited to assurance's value chain requirements.
- **E-business impacts:** Insurance has relatively high shares of enterprises reporting negative impacts of online sales. The negative answers all come from enterprises with more than 250 employees. Nevertheless, the insurance sector is in the group of sectors with particularly high shares of positive answers as regards number of customers and quality of customer service. The insurance sector's position in impact of procuring online varies. Considering the impact on internal business processes, insurance has the fourth highest share, and considering procurement costs, the sector has the fourth smallest share of answers of positive. Finally, the insurance sector performs some of the highest shares of enterprises reporting significant or some impact of e-business on the organisational structure, work processes, relationships to suppliers and customer and the impact on the offer of products and services.

Survey findings broken down by country

The *e-Business W@tch* Survey 2002 revealed some notable national features of the insurance and pension-funding sector:

In **Germany** 92% of the enterprises reported that e-business plays a significant or some part. All German insurers have Internet access, use e-mail and the WWW; the share of enterprises using LAN and WAN is the largest of all countries, while EDI use is the lowest. Staff access to ICT is also on a high level. Recruitment efforts of ICT specialists have been largest in Germany, and recruitment difficulties were some of the highest. In internal applications, Germany has the highest levels of tracking working hours and automated travel reimbursements, and is above average in collaborative work as well as about average in human resources management and e-learning. 99% of insurance enterprises have a website, all provide product information on the website, the level of online sellers is slightly above average, but the level of online procurers is well below average. The single most important barrier of online sales appears to be that revenues of online sales are still low. Germany has the lowest share of answers of “completely” for “concerns about data protection and security issues”. Germany has a low level of online management of capacity and inventory and the lowest level of online negotiation of contracts. The country is above average in all special applications and plans, top in ASP use and, besides Italy, is the only country with a notable level of SCM use. German insurers report the second highest impacts on work processes, organisational structure and on customer relationships.

France: The share of insurance enterprises reporting that e-business plays a role is lowest of all countries. France is above average in WWW and EDI use, average in Internet access and extranet use, below average in Intranet, LAN and WAN use, and has the lowest e-mail use. French insurance firms perform the lowest shares of access to internal and external e-mail as well as intranet. France has the lowest shares in having a website and providing information on it, and France is below average in selling and procuring online. It has a very low level of complete agreement to “customers are hesitant to buy online” and a very high agreement to “delivery process causes problems”. The latter may be a consequence of the low levels of ICT and e-business use. Reservations about expensive technology for online procurement are among the highest of all countries, and the face-to-face issue reveals concerns significantly above average. In internal e-business processes, French insurers have always the lowest or second lowest levels. France has the highest share of enterprises forecasting product demands online and online negotiation of contracts as well as the lowest share of online management of capacity and inventory and electronic exchange of documents with customers. It has almost no use of special solutions at all except CRM. The e-business impacts are below average except “change of relationships to suppliers”.

Greece has the highest share of enterprises stating a significant part of e-business as well as of enterprises intending to invest more in e-business technologies. Greek enterprises reported a 100% access to the Internet and 100% e-mail use as well as an above-average use of intranet, LAN, WAN and EDI. Recruitment efforts were medium-level and recruitment difficulties among the highest. In ICT access, Greece tends towards the average. It is below average in having a website and selling online, lowest in procuring online and has the highest shares of enterprises intending to introduce e-commerce practices. As regards barriers to online sales, Greek interviewees are below the average of agreement in all barriers and tended towards responses of complete agreement. In Greece, concerns about data protection and security are reported to be the single most important barrier to online procurement. Greece performs the lowest or second lowest shares in all forms of online collaboration. Greek insurers reveal a high level of CRM, KM and ERP but do not use SCM at all. Greek enterprises report lower than average levels of e-business impacts except for “offer of products and services”.

Italy tends to be average in e-business use, with below average e-business significance and a high level of e-business satisfaction. Italy has the lowest levels of Internet access and WWW use and is well below average in WAN and EDI, but has high shares of intranet and LAN use and tends towards the average ICT use in most cases. Italian enterprises reveal the second highest level of e-learning and average or below-average levels in the other forms. The country is well below average except in

having a website. Italian insurers' agreement to barriers of online sales is well below average in "processing of payments", "technology too expensive", "revenue is still low" and "adapting corporate culture" and above average in "delivery processes". In Italy, the most important barrier is that procuring online requires face-to-face interaction. Italy is below average except in electronic exchange of documents with suppliers, average except a level below average in ASP, and always below average in general impacts of e-business.

Luxembourg is frequently in the lead or at least above average in ICT and e-business use. The highest level of satisfaction with e-business is found in Luxembourg. The country has a 100% Internet access and e-mail use as well as above-average levels in intranet, extranet, LAN and WAN. In e-commerce practices, Luxembourg's performance is average except for an extremely small share of online sellers. It has the highest levels of complete agreement in five barriers to online sales and the highest agreement to data protection and security barriers of online procurement of all countries. Luxembourg has the highest share of enterprises practising online management of capacity and inventory. Enterprises from Luxembourg reported the highest levels of CRM, KM and ERP but no SCM use at all. Luxembourg is below average in e-business impacts except for "change of organisational structure".

Sweden appears to be the country with the furthest developed insurance enterprises in terms of e-business. 92% of the enterprises reported that e-business plays a significant or some part. Sweden demonstrates 100% Internet access as well as almost complete use of e-mail and the WWW. Intranet and extranet use is the highest of all countries; LAN, WAN and EDI use is above average. Recruitment difficulties were reported to be very low. Sweden is characterised by the single highest shares of online selling and online procuring. It is characterised by low levels of agreement to customer-related barriers of online sales and above-average agreement to "revenue is still low" and "goods do not lend themselves to selling online". Sweden has the highest agreement to "suppliers' systems are not compatible" and a high agreement to "requires face-to-face interaction". In online business collaboration, the country is highest in designing products online and exchanging of documents with suppliers and customers. It is quite high in CRM but performs small use of SCM and no use of KM. Sweden always performs the highest shares of e-business impacts.

The **United Kingdom** reveals quite low levels of e-business use. Disappointment about e-business is highest in UK insurance firms. The country has the lowest intranet, extranet, LAN and WAN use and is below average in e-mail and WWW use. Difficulties in recruiting ICT specialists were reported to be very low. The UK has high shares of website owners and product information providers and performs second best in online selling and online procuring. The UK has high agreement to "goods do not lend themselves to selling online", but the most important barrier appears to be that customers are hesitant to buy online. As regards barriers to online procurement, UK insurers have the highest level of complete agreement to data protection and security concerns. The UK is particularly high in online management of capacity and inventory and average in the other forms of online collaboration with business partners. Its firms are below average except for ASP in applying special e-business solutions. As regards e-business impacts, the UK has a particularly high agreement to "change of relations to suppliers". Possible explanations for the low performance include that its insurance industry is oriented towards pensions and life insurance which are unlikely to be sold online, that UK insurers had established efficient and convenient distributions channels – telephone sales in particular – before the arrival of the Internet, and that swiftly changing regulatory structures since the late 90s have absorbed management time rather than e-business.

Survey findings by company size class

The survey findings broken down by company size classes – enterprises with 0–49, 50–249 and more than 250 employees – reveal that SMEs generally lag behind large companies, but not in all respects:

- **Importance of e-business:** In large enterprises, e-business plays a much more important role than in SMEs. The intention to increase e-business investments is largest in medium-sized enterprises and almost the same in small and large enterprises. Medium-sized enterprises may

seek to catch up while large enterprises are waiting for returns of their IT investments and small enterprises lack investment power. The levels of satisfaction with e-business are rather similar.

- **ICT infrastructure:** ICT use increases by company size class which is likely to be due to scale effects: mass processes are necessary to make technologies profitable. For every technology except EDI, the share of users is smallest in small companies and largest in large companies. Considering the basic ICT infrastructure (Internet access, e-mail, WWW), SMEs do not lag much behind the large ones.
- **ICT access and skills:** Recruitment activities were highest in large companies, medium-level in medium-sized enterprises and lowest in small companies. Large companies also reported the highest levels of recruitment difficulties. ICT access is more widespread in large enterprises than in SMEs. The differences between large and small companies are distinct, whereas medium-sized companies perform quite the same shares as large ones in external e-mail and WWW.
- **Internal e-business applications:** Internal e-business processes are much more widespread in large companies than in SMEs. Only in collaborative work do medium-sized companies reveal the same level as large ones.
- **E-commerce practice:** Almost all large insurers have a website, while only three quarters of medium-sized enterprises and half of the small enterprises have one. Among those which have a website, the share of enterprises providing information about products on the website is quite similar in the size classes. The level of online sellers increases by company size. The level of online procurers is quite the same in small and medium-sized enterprises and higher in large enterprises.
- **E-commerce barriers:** Agreement to the barriers of online sales tends to be similar in the three size classes, with differences in the levels of answers of completely and somewhat. Complete agreement to a barrier is always higher among small companies as compared to large companies, with the exception of "revenue is still low". Further striking deviations are particularly high shares of agreement to "goods do not lend themselves to selling online", "processing of payments" and "adapting corporate culture" among medium-sized companies. Agreement to barriers of online procurement are quite evenly distributed across company size classes. The largest difference is found in concerns about data protection and security, where agreement of large enterprises is much smaller than that of SMEs. The reason is likely to be that security applications are necessary for online sales but expensive, creating an investment hurdle for small firms. Large insurers have already installed secure applications.
- **E-business applications:** The levels of online collaboration for designing products to forecast product demands as well as online management of capacity and inventory are below 10% in small companies. However electronic exchange of documents with suppliers is not much smaller in SMEs than in large companies, and document exchange with customers is even higher in SMEs. Special e-business applications are a clear domain of large companies. For every application, the share of users is smallest in small enterprises, medium in medium-sized enterprises and largest in large enterprises, with quite distinct levels of use.
- **E-business impacts:** Medium-sized insurance enterprises report the highest level of positive impacts of online sales. Online procurement appears to be most beneficial to large and small insurance enterprises. Medium-sized enterprises report the lowest levels of positive impacts in all cases except procurement costs. The reported changes due to e-business are largest in medium-sized and large companies and smallest in small companies.

11.3 Conclusions

Situation of small and medium enterprises

The *e-Business W@tch* survey shows that online sales offers opportunities for SMEs and for medium-sized companies in particular. The fact that the middle size class reports distinctly more positive impacts than large companies is an encouraging finding for SMEs that have not yet dared to step into online selling. A crucial opportunity for SMEs is networking. For marketing purposes SMEs can cooperate with enterprises or associations from other industries – e.g. automobile sellers for motor insurance – to tap into their customer base. SMEs can use the portal of large enterprises to draw attention to own products. However, in the case of marketing success SMEs need to be able to manage automation and call centre operations in order to cope with a sudden large number of inquiries and contracts to be processed.

The rationalisation and outsourcing process currently ongoing in the insurance business offers opportunities for small and medium-sized companies supplying special insurance services. Reduced transaction costs due to Internet applications change the make-or-buy decision of insurance firms. Special services in the field of product development, distribution, administration, asset management and damage management can be outsourced to special suppliers. This may be an opportunity for SMEs, giving them specialisation strength parallel to the strengths acquired by large business units through mergers and acquisitions.

Improvement of application quality

The extent to which insurance products will be sold via the Internet will depend on how much the barriers of Internet sales can be lowered or removed. This applies mainly to impediments on the part of the companies and the customers. For example, companies may introduce automated applications which provide information on more complicated insurance products, like tax-efficient life insurance policies. Product design could be adjusted to Internet requirements, e.g., as there may be less confidence in Internet products due to non-personal interaction, contract duration could be shorter and contract termination could be easier than offline. This may at least apply to non-life insurance. Trust in Internet products could be increased by hallmarks of good quality. Products could be presented more clearly, e.g., insurers could explain unanimously which risks are covered and which are not. Website functions could be easily manageable, without hang-ups and without losing data input when moving back to previous sites. Special website tools helping to find the right product could meet the customers' need for information and consulting.

Outlook

With financial reserves declining or even vanishing, the insurance business is currently experiencing a wave of rationalisation. Personnel costs are to be reduced, and automation of processes and standardisation of products are planned. Internal e-business applications are likely to expand in the course of this development.

In terms of IT investment, the insurance market may experience a two-fold development in the coming years. Life insurance is likely to benefit from the crisis of social insurance systems and pension reforms in European countries in the coming years. Growth in the life and pensions market will continue to be one of the key trends within EU insurance. In order to benefit from this development, IT investments to boost synergies in the course of mergers and acquisitions will be called for, as well as to innovate products and policy administration systems. Datamonitor expects spending on packaged software to increase at 14% annually between 2001 and 2004. On the other hand, non-life insurance is currently facing intense cost pressures, keeping IT budgets tight. The IT investment in the property and casualty sector is expected to grow only 9% annually by 2004.

Internet insurers are likely to become particularly important within personal line insurance, such as motor or homeowner insurance. By 2005, 3-5% of the European market in this segment is expected to

be represented by Internet insurers. This is not much, but the situation is likely to change as generations of individuals who grew up with the Internet become wealthy customers. In the course of increasing Internet affinity in large parts of the population, insurers' investments in intelligent insurance applications will become more likely to pay off. Both developments may lead to a significant increase of the market share of online insurance in the future.

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12 Real estate activities

12.1 Economic profile and trends

The real estate sector comprises five activities: developing, dealing with, letting, broking and managing real estate. According to the NACE Rev. 1 classification, chapter 70, real estate activities are subdivided into the categories shown in the following table:

NACE Rev.1		Activity
division	group	
70		Real estate activities
70.1		Real estate activities with own property
	70.11	Development and selling of real estate
	70.12	Buying and selling of own real estate
70.2		Letting of own property
70.3		Real estate activities on a fee or contract basis
	70.31	Real estate agencies
	70.32	Management of real estate on a fee or contract basis

Real estate activities belong to the service sector and are to be distinguished from construction activities. Other activities contributing to the construction sector such as architects or construction economists do not belong to real estate either but to business services. Real estate banks and funds belong to the financial services sector.

The real estate sector is of particular interest for any study of e-business implications because it serves important economic and social functions: The real estate sector has fundamental significance for both businesses and private individuals. As regards business, real estate is one of the basic preconditions for running a business at all. In respect of tenants and owner-occupiers, because it deals with a basic need, this sector is important in social policy terms.

Economic key figures

The real estate sector in the EU comprises around 755,000 companies. The number has increased in almost all countries for which time series data are available, maybe reflecting opportunities for new companies entering the market. Around 1.7 million persons work in the EU real estate sector, which is 1% of total employment in the EU. The share of real estate employees is particularly high in Sweden, Denmark and the UK and particularly low in Portugal, Austria, Belgium and Ireland. In the past ten years, the trend of the number of employees was to increase in most countries. The EU real estate sector is characterised by a high share of small companies: Around three quarters of them are run by a self-employed person with no employees. Considering the countries for which data are available, labour productivity is highest in the Netherlands, followed by Sweden and Denmark. The lowest labour productivity is to be found in Ireland, Portugal and Italy.

EU real estate market situation

In most EU countries, the number of purchases on the real estate market has increased since 1993, with the notable exception of Germany. Growth has been particularly strong in the UK, where almost twice as many transactions were carried out as compared to France or Germany. The most expensive real estate location in the EU is London with an average rent of 1,470 Euros per square metre and year in January 2001. The next most expensive cities are Paris (717), Stockholm (666), Frankfurt am Main (552) and Dublin (546).

According to the 2001 annual report of the European Council of Real Estate Professions, the general trend of the real estate market for in EU countries is good. Only Ireland reported a “weaking” real estate market, all other countries – except Greece, Portugal and UK for which no data are available – stated good conditions.

Current issues in EU real estate business

- **Sustainability:** The real estate industry has a growing understanding that it has a role to play in the wider debate about sustainable development both by providing more sustainable buildings for people to live and work in, and by ensuring that the industry itself works in a sustainable way.
- **Connectivity:** The realisation that the provision of high bandwidth telecommunications to buildings is a key facilitator for business is growing amongst all the stakeholders in the industry. Again this has implications both for new development and existing stock.
- **Securitisation:** Despite some limited national examples, there is no Europe-wide equivalent of the US Real Estate Investment Trust. Such a vehicle is said to bring greater liquidity to the market and make the sector more easily tradeable. Meanwhile, investing in securitised property requires the purchase of property company shares.
- **Valuation:** Comparability of valuations between national markets remains a live issue, particularly in the context of changes to reporting standards due over the next few years that will fundamentally change the way the value of property is treated in corporate accounts.
- **Regeneration:** The big issues of urban and rural regeneration are important to the real estate industry. The ability to provide commercially viable alternatives to obsolete building infrastructure is a significant factor in the generation of economic output.
- **Social responsibility:** Increasingly, investment in property is coming under the same governance pressures as other asset classes with respect to social responsibility.
- **Affordability:** The provision of affordable residential accommodation, particularly in urban environments is an important factor in economic health. Without it, the lower paid strata of the workforce can be priced out of the labour market.

12.2 Usage of ICT & e-business

The role of ICT and e-business in the real estate sector

Transparency increase: The real estate market is characterised by a particular lack of transparency and could thus benefit strongly from a more widespread use of ICT. In particular, the Internet can facilitate the identification of suitable properties by providing detailed information on basic object characteristics and the environment, also through visualisation. The Internet can also provide additional information such as price comparisons, financial services links, removal information, legal assistance and checklists.

Internet brokerage: Web-based brokers are trying to attract real estate companies by promising to supply them with contacts to individuals looking for housing. However, the share of objects sold through the Internet is still very small. The potential of Internet offerings is not uniform throughout the sector. It can be expected that the Internet will be more important for the mass-market of relatively small buildings transacted for individual housing than for the large buildings purchased by businesses. Marketing expenses for establishing a web-based real estate brokerage are said to be high. Thus there will probably only a small number of providers which survive with their business model.

Facility management: E-business applications internal to a housing company can support facility management tasks like client data administration, e-mail correspondence with tenants and owners, and bookkeeping. Service applications can support maintenance, cleaning and remote control of facilities. Such services can be integrated into an Internet-based customer care centre beneficial for both the administrators and the tenants. There are already notable examples of such applications.

No forerunner: The real estate sector is not a forerunner in ICT use and e-business applications. In general, the sector is taking up innovations rather late, because products are quite heterogeneous,

transaction volumes are high, and innovation cycles are long. Impediments at the firm level are lacking personal capacities within the companies, lacking Internet access among buyers and tenants, security issues of the Internet, clerical staff lacking PC know-how, and lacking compatibility of downstream systems.

ICT infrastructure and skills development

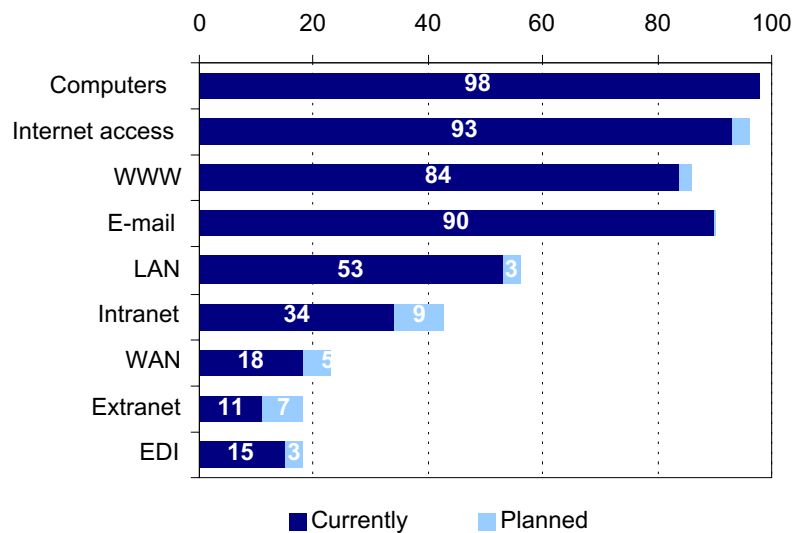
ICT use: The EU real estate sector is characterised by a highly developed ICT infrastructure. Computers are used in virtually all companies (99%) in the seven sample countries. Internet access (93%) as well as the use of e-mail (91%) and the world wide web (WWW) (84%) are very common, and the use of Local Area Networks (LAN) (53%) is also found quite often. Intranet (34%), Wide Area Network (WAN) (18%), Electronic Data Interchange (EDI) (15%) and extranet (11%) are not so common. Within the next twelve months, the technologies intended to be introduced most often are intranet and extranet; 9% respectively 7% of the enterprises reported according plans.

Figure 12-1: ICT use and usage plans in EU real estate enterprises

Base: all enterprises (EU-7: DK, D, F, I, P, FIN, UK).

Figures weighted by employment ("enterprises comprising ...% of employees"). Reporting period: June/July 2002.

Source: *e-Business W@tch* (2003)



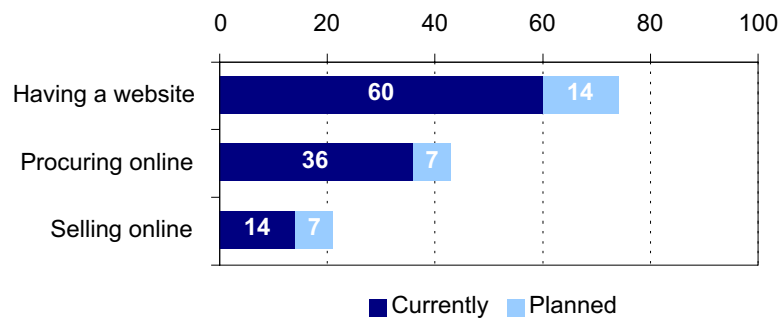
ICT access and skills: The share of real estate enterprises in which the majority of employees has access to ICTs is generally high. The average of real estate enterprises allowing their employees access to e-mail for internal communication is 62% of all real enterprises, the share of real estate enterprises allowing the majority access to e-mail for external communication is 78% of all enterprises using e-mail, and 69% of real estate enterprises allow the majority of their employees to use the WWW. However, intranet access appears to be somewhat restricted, with only 28% of real estate enterprises having an intranet allowing the majority of their employees to use it.

E-commerce activities

E-commerce activities appear to be a current challenge in real estate enterprises. 60% of the enterprises have a website, 14% plan to introduce one within one year – see figure 2-2. Almost all of those which have a website present their products and services on the site (95%). Selling online is not very widespread with only 14% of real estate enterprises and 7% planning to do so. Online procurement is much more common, but still only one third (36%) of real estate enterprises pursues this practice.

Figure 12-2: E-commerce practices in EU real estate services

Base: all enterprises (EU-7: DK, D, F, I, P, FIN, UK).
Figures weighted by employment ("enterprises comprising ...% of employees"). Reporting period: June/July 2002.



Source: e-Business W@tch (2003)

Characteristics of selling online: In the sample countries, in 25% of those real estate enterprises selling online the share of online sales is less than 5%. In 28% of the enterprises, the share is 5 – 10%, in 24% the share is 11 – 25%, in 15% the share is between 26 – 50%, and 8% conduct more than 50% of their sales online. It appears that many of those enterprises selling online regard this practice as an important distribution channel. Further characteristics of online sales in real estate:

- 11% of real estate enterprises selling online enable online payment,
- 28% of online sellers take part in electronic market places,
- 59% of online sellers in real estate have been conducting this practice for more than two years, 31% between one and two years and 10% for less than one year,
- 79% of real estate online sellers practice online sales to consumers, 51% to other businesses and 29% to the public sector.

Characteristics of procuring online: Most enterprises practicing online procurement procure only a small share of their goods online: 45% of real estate enterprises in the sample countries procuring online conduct less than 5% of their total procurement online. In the class of 5 – 10% of total procurement the share is 31%, in the class of 11 – 25% it is 17%, and in the class of 26 – 50% it is 7% of enterprises.

Barriers to selling online: The highest barrier to online selling in the real estate sector is that “goods and services do not lend themselves to selling online” (see figure 2-3). 57% of the all interviewees in the real estate sector agreed completely to this statement and 17% agreed somewhat. Two further statements were agreed by more than 50% of the interviewees: “Revenues of online sales are still low” (29% “completely” and 30% “somewhat”) and “customers are hesitant to buy online” (30% / 28%).

Barriers to procuring online: Three of the six pre-formulated barriers to procuring online were agreed by more than 50% of the interviewees in the real estate sector: “concerns about data protection and security issues” (35% completely and 26% somewhat), “purchasing requires face-to-face interaction with suppliers” (34% / 25%), and “suppliers do not sell online” (34% / 24%). At the other end of the scale, incompatibility of technical systems is not seen as a severe problem (10% / 23%).

Online business processes: Online collaboration with business partners with ICTs other than e-mail⁴ is practiced only by a minority of real estate enterprises. The according questions were posed to enterprises having Internet access. The highest shares are found for electronic exchange of documents with customers (38%) and suppliers (37%). Online negotiation of contracts takes place fairly often (23%). Online collaboration with business partners to forecast product demands (11%) or for designing products (9%) as well as online management of capacity and inventory (7%) are rare.

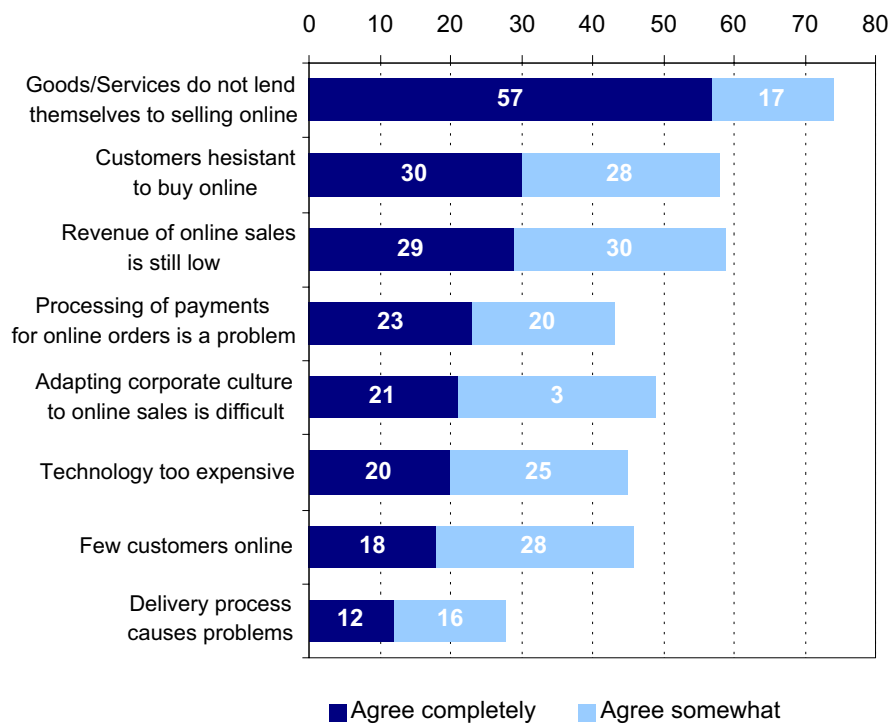
⁴ E-mail was excluded to prevent artefacts of e-business usage. An example for an online collaboration tool is a “restricted area” in a website where business partners can communicate.

Figure 12-3: Real estate: Barriers to selling online (agreement to statements)

Base: all enterprises (EU-7: DK, D, F, I, P, FIN, UK).

Figures weighted by employment ("enterprises comprising ...% of employees"). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)



Usage of special applications

Specific e-business solutions are used only by a minority of real estate enterprises – see figure 2-8. A knowledge management (KM) solution is applied by 6.8% of EU4 real estate enterprises, an Application Service Provider (ASP) by 6.4%, a Customer Relationship Management (CRM) solution by 5.7%, an Enterprise Resource Planning (ERP) system by 5.2% and a Supply Chain Management System (SCM) by 2.6%. CRM is the application most often planned to be introduced, namely by 2.8% of the enterprises. The low shares may be due to the high share of SMEs in real estate which may shy away from the high investment costs of special e-business solutions or for which special solutions are simply not economic. For example, it may not pay for a real estate broker with a few employees to invest in a CRM solution when his customers change constantly.

Impact of electronic business activities

Impact of online sales: Enterprises selling online were asked about impacts of their online sales. All except one of six pre-formulated impacts revealed positive assessments of more than 50% of the interviewees (see figure 2-5). Most positive was the impact of online sales on the sales area (17% answered “very positive”, 51% “fairly positive”), closely followed by “number of customers” (10% / 56%) and “volume of sales” (7% / 57%). Only a small share of interviewees – below 5% in every case – reported fairly negative or even very negative impacts.

Impact of online procurement: Real estate enterprises procuring online were asked about the impacts of this practice. All except one of four pre-formulated impacts revealed positive assessment by more than 50% of the interviewees. Most positive was the impact of online procurement on internal business processes: 15% “very positive” and 52% “fairly positive”). Procurement costs were influenced very positive in 10% and fairly positive in 49%; the according figures for costs of logistics and inventory are 12% and 39%. Relations to suppliers improved in 43% (13% very positive, 30% fairly positive), with a notable share of 11% of the interviewees reporting negative impacts.

Figure 12-4: Impact of online sales in EU real estate enterprises

Base: enterprises selling online (EU-7: DK, D, F, I, P, FIN, UK). Figures weighted by employment ("enterprises comprising ...% of employees"). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

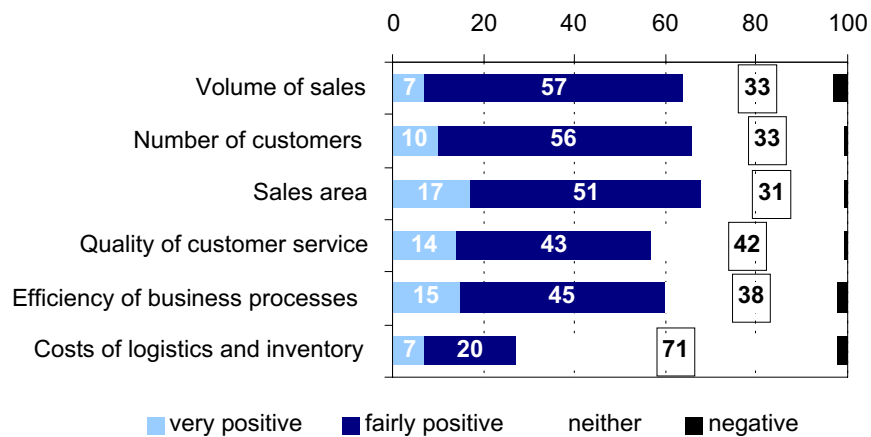
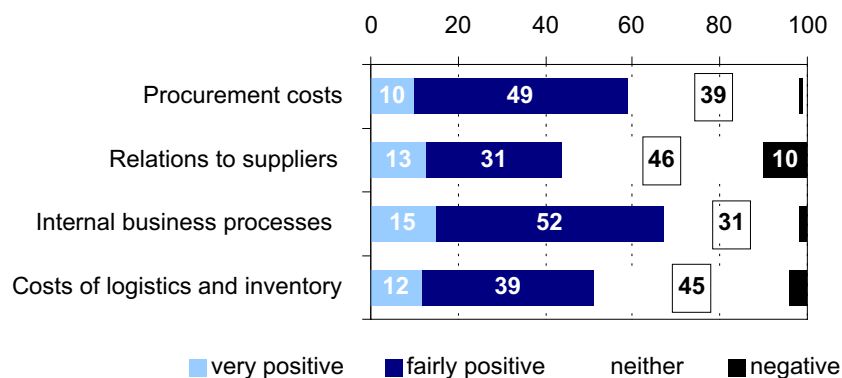


Figure 12-5: Impact of online procurement in EU real estate enterprises

Base: enterprises purchasing online (EU-7: DK, D, F, I, P, FIN, UK). Figures weighted by employment ("enterprises comprising ...% of employees"). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)



Importance of e-business today: In slightly more than half of the real estate enterprises in the sample countries (51%), e-business does already constitute a significant or some part of the way the companies operate today.

Benefits for SMEs: In the sample countries, a relative majority of 46% of the interviewees expresses the opinion that large enterprises are the beneficiaries of e-business. 40% believe that both will benefit equally, 14% say that SMEs are the beneficiaries and less than 1% say that no one will benefit.

Survey findings in sector comparison: real estate tends to be below average

In sector comparison, the real estate sector does not take a clear position as an e-business frontrunner or laggard but tends to be below average or even at the bottom. Real estate activities are top in practicing online sales for more than two years and in size of IT department, and they have a relatively high share of enterprises presenting products on their website. On the other hand, real estate activities are very low in the use of special ICTs like intranet and WAN, in enabling online payment, in conducting business processes online and in applying special e-business solutions. In detail:

- **ICT infrastructure:** The real estate sector is in the medium group of ICT users considering the "basics": computer use, Internet access, e-mail use and WWW use, but as regards intranet, LAN, EDI, WAN and extranet use, real estate has some of the lowest shares.
- **ICT access and skills:** Real estate businesses are average in allowing their employees access to e-mail for internal and external communication as well as the WWW, but low in allowing access to the intranet. Still the real estate sector takes the top position as regards average size of the IT or web department.

- **E-commerce practice:** Real estate has a low share of enterprises with a web site, a fairly high share in product presentation on the website, a medium share in selling online and a low share of online procurers. The share of real enterprises selling more than 25% of their turnover online is relatively high, and the share of enterprises practicing online sales for more than two years is the highest of all sectors. On the other hand, the share of real estate enterprises enabling online payment is the lowest of all sectors and the share of e-marketplace participants is the second lowest. Real estate is one of two sectors where no enterprises with more than 50% of total procurement conducted online was identified.
- **E-commerce barriers:** The share of real estate interviewees agreeing completely to “goods and services do not lend themselves to selling online” is one of the highest. “Customers are hesitant to buy online” performs the second highest share of “agree completely” answers. “Revenues of online sales are still low” is a more important barrier in all other sectors except one. Regarding complete agreement to barriers of online procurement, the concerns about data protection and security are the second largest of all 15 sectors. Considering concerns about expensive technology, the real estate sector has one of the highest shares. This may be due to the high share of very small companies in real estate.
- **E-business applications:** In sector comparison, real estate lags behind in four of six online business processes, performing worst of all sectors in designing products and in management of capacity/inventory, but revealing the third highest level of online negotiation of contracts. Real estate reveals the third lowest share of SCM users, the second lowest share of CRM and ASP users, and the lowest share of ERP users.
- **E-business impacts:** The impacts of selling online in the real estate sector tend to be more positive than in other sectors. As regards “number of customers”, the share of positive answers in real estate is the highest of all sectors. Real estate activities are close to the average in all impacts of online procurement except “costs of logistics and inventory”, where the sector reveals the third highest share of positive assessments. Considering the significance of e-business in the firms’ operations today, real estate is average in answers of “significant part” and slightly below average in “some part”.

Survey findings broken down by country: hints to a north-south gap

The first *e-Business W@tch* survey revealed some notable national features of the real estate sector. There are some hints to a North-South gap between Denmark and Finland on the one hand and Portugal on the other. Important findings by country:

- **Denmark** performs the highest shares of ICT use except WAN. ICT access is very high except external e-mail. Denmark has the highest share of enterprises with a website and of online procurers and is above average in information provision and online sales. Agreement to barriers of online sales and procurement is below average in most cases. Shares of electronic exchange of documents with suppliers and customers and online negotiation of contracts are the highest of all countries, and the use of most specific e-business solutions is high. Impacts of online procurement are assessed less positive than in other countries. Despite Denmark’s top position in real estate e-business, almost three quarters of the interviewees stated that e-business is not significant at all.
- **Finland** is above average in Internet, e-mail, WWW and intranet use as well as average in the other ICTs, and top in ICT access except intranet. The share of online sellers is the highest of all countries and online procurement is well above average. Agreement to barriers of online sales and procurement is always below average. Online collaboration practice is average in most cases, and the shares of special e-business solutions are above average. Impacts of online procurement are rather moderate. Only one third of the interviewees assessed e-business to play a role in the firms’ operations today.
- **France** has below-average use of WWW and e-mail but performs quite well in other ICTs. France has a low access to external e-mail and WWW as well as low shares of e-commerce practice except an average application of e-sales. Agreement to barriers of online sales tends to be above

average, agreement to barriers of online procurement is always above average. Online collaboration is average or above average, but the application of special e-business solutions is low. Accordingly, the share of interviewees stating that e-business play a role in today's operations is the lowest of all countries.

- **Germany** has average shares of ICT use except a low share of intranet use; Germany is in the top group in e-mail and WWW access as well as e-commerce practice. Agreement to barriers of online sales and procurement tends to be low. Germany is low or lowest in online collaboration. The share of users of special e-business applications is one of the smallest. Nevertheless, more than two thirds of the interviewees assess e-business to play a role in the company even today which is the most of all countries.
- **Italy** has a fairly high share of companies with Internet access as well as e-mail and intranet users but a low share of extranet, WAN, LAN and EDI users. The share of companies with websites is average, but online selling and procuring are quite rare. Agreement to barriers of online sales and procurement tends to be below average. Online collaboration tends to be slightly below average. Italy is among the countries with the highest shares of KM and ERP use, but among the countries with the lowest shares in SCM and ASP. Around half of the interviewees say that e-business plays a role in their company's operations.
- **Portugal** has particular deficiencies in the use of basic ICTs: Internet access, e-mail use and WWW use, and also low shares of ICT access and e-commerce practice. However, Portugal is performing best in online collaboration and very good at using special applications. Agreement to barriers of online sales and procurement is average or below average in most cases. E-business does not play a role in most companies and has a significant part in only 1%.
- The **United Kingdom** performs particularly high shares of use of WAN and low shares in extranet and EDI; high access to internal e-mail and intranet, a high share of companies with websites and of companies procuring online, but the lowest share of online sellers. Agreement to barriers of online sales is diverse, and agreement to barriers of online sales is above average in four of six cases. The share of companies exchanging documents with suppliers is particularly high, as is the share of companies expressing concerns about data security in e-commerce. The UK performs high shares of SCM and ASP but low shares in KM and ERP. E-business plays a role in more than 50% of the companies.

Survey findings by company size class: SMEs lag behind, but not always

The survey findings broken down by company size classes – enterprises with 0 – 49, 50 – 250 and more than 250 employees – reveal that SMEs generally lag behind large companies, but not in all respects. Large companies have higher shares than SMEs in ICT use and ICT access, website provision and online procurement practice, most practices of online collaboration with business partners and all specific e-business solutions. On the other hand, SMEs perform better than large companies as regards using the website for product presentation, online sales practice and amount of goods procured online as well as electronic exchange of documents with customers. More detailed:

- **ICT infrastructure:** For every single technology, the share of users is smallest in small companies and largest large companies. Considering the basic ICT infrastructure, SMEs do not lag much behind the large ones. The differences in the use of intranet, LAN, WAN, EDI and extranet are larger, but this may simply be due to the large share of enterprises with no or very few employees which do not need such technologies.
- **ICT access and skills:** The share of enterprises allowing the majority of their employees to use ICTs increases by company size for each technology. The differences are largest for e-mail for internal communication and for intranet use.
- **E-commerce practice:** While the share of enterprises with a website and with online procurement practice is higher among large companies, small companies have a higher share than large ones in website presentation and online sales. In companies purchasing online, the share of companies

purchasing 5% or more of their procurement online is 59% in small companies, 52% in medium-sized companies and only 39% in large companies.

- **E-commerce barriers:** The size classes are closely together in agreement to barriers of online sales. Agreement to the most important barrier, “goods or services do not lend themselves to selling online”, is higher among large companies (83%) than among small (73%) and medium-sized ones (71%). The share of large companies agreeing to a barrier of online procurement is the largest of the three size classes in all barriers except “cost advantage is insignificant”.
- **E-business applications:** The share of large companies practising online collaboration with business partners is highest in designing products, management of capacity/inventory, exchange of documents with suppliers, and negotiation of contracts. The share of enterprises exchanging documents electronically with customers is highest among small companies. The special applications of Supply Chain Management, Customer Relationship Management, Knowledge Management, Application Service Provider and Enterprise Resource Planning are much more widespread in large companies than in SMEs.
- **E-business impacts:** The share of interviewees from small enterprises reporting positive impacts of online sales is much higher than the according share of interviewees from large enterprises in volume of sales and much smaller in quality of customer service and costs of logistics and inventory. Medium-sized companies report particularly good results in quality of customer service. Small enterprises appear to benefit more from procuring online than large enterprises as regards procurement costs and costs of logistics and inventory, while the benefits are equal in relations to suppliers and internal business processes. The share of medium-sized enterprises reporting positive impacts is low in all cases. The share of small enterprises in which e-business plays an important role is larger than in medium-sized and in large enterprises.

12.3 Conclusions

Limited but notable impact on real estate value chains and business practices

In the opinion of many serious and important market players, telecommunication, Internet and e-business will neither have a remarkable impact on real estate business and real estate savings nor on supply and demand. In the real estate sector, key aspects of traditional business communication can possibly never be completely substituted by ICT. It is not possible today and difficult to imagine for the future how a majority of prospective purchasers could do without going to visit the property in question before purchase. Furthermore, legal requirements like concluding a building transaction by a notary can hardly be fulfilled through the Internet.

Real estate activities may be considered as a typical sector in which – due to the nature of the sector – particular parts of the ideal e-business sequence are of limited practical importance, e.g., online sales and online payment. Nevertheless, there is seen to be enormous potential for accelerated use of e-business techniques in the real-estate sector, particularly to improve the transparency of the market, support fluidity in transactions between tenants, housing providers and their suppliers, and improve service for tenants and owners.

Opportunities and threats for SMEs and new businesses

E-business offers particular opportunities for small and medium-sized enterprises. Since size is not apparent on the Internet, SMEs can potentially compete on a level footing with firms of any size. Companies can deliver information-rich content to a much wider audience at marginal cost thus expanding their potential client base. SMEs appear to take advantage of this opportunity: As the survey findings reveal, the share of small enterprises reporting positive impacts of online sales on number of customers and sales area is similar to large companies and is even higher as regards sales volume.

Since the real estate sector is characterised by a large share of small companies, entry barriers are relatively low. New companies with special e-business practices may challenge the traditional market. The increasing number of real estate firms in the EU points in this direction.

However, the Internet also endangers the traditional domain of SMEs. Typically small companies survive through practices in geographic or specialist niches. The aspatial nature of the Internet facilitates greater competition in these niche areas. Furthermore big firms might gain more importance in real estate by using their financial power. Investing in e-business technologies can be very expensive, putting SMEs at a disadvantage.

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13 Business services

13.1 Economic profile and trends

Services enterprises attributed to “business services” (NACE Rev.1 74) cover a wide range of activities, including knowledge intensive services such as legal and economic consultancy, technical and engineering services, advertising and labour recruitment, as well as activities such as industrial cleaning.

NACE Rev.1 division	group	Activity
74		Other business activities
	74.1	Legal, accounting, book-keeping and auditing activities; tax consultancy; market research an public opinion polling; business and management consultancy; holdings
	74.2	Architectural and engineering activities and related technical consultancy
	74.3	Technical testing and analysis
	74.4	Advertising
	74.5	Labour recruitment an provision of personnel
	74.6	Investigation and security activities
	74.7	Industrial cleaning
	74.8	Miscellaneous business activities not elsewhere classified (for example: photographic activities, packaging activities, secretarial and translation activities)

At first sight, these sub-sectors seem to have nothing more in common than mainly targeting the enterprise sector. Looking more closely, however, a few more common characteristics appear that apply to most enterprises in this sector:

- Small and medium sized enterprises dominate in each of these business services industries.
- National or even regional markets are most important for the majority of enterprises.

(Exceptions can be found in knowledge-intensive service activities, where specialised companies provide services on an international scale).

As the major potential of ICT and e-business is to make more efficient those processes of service provision that are a) recurring and b) standardised, a reasonable approach is to classify the services according to similarities in their business processes. Three types of services can be defined:

- **Project-based services:** This type of service typically consists of conducting a well-specified knowledge-intensive task, which requires the co-operation of a group of individuals, maybe even of companies.
- **Standardised ad-hoc services:** A second group of service activities is fairly standardised and provided on a case-by-case basis. Cleaning an oil-tank or conducting a direct mailing campaign are examples of standardised ad-hoc services.
- **Standardised continuous services:** The third group comprises typical outsourcing services such as office cleaning, security services or bookkeeping.

These service categories differ with respect to skill requirements, standardisation and automation possibilities.

The turnover of the business services sector in the European Union (excluding Greece, Ireland and the Netherlands) reached over 863 billion Euro in 1999. Over 55% of the total turnover was generated in knowledge-intensive sub-sectors (NACE 74.1, 74.2 and 74.3), characterised by high intensity of value creation. In 1999, the business services sector generated 461 billion Euro of value added at factor cost in the twelve European countries considered here. Again, knowledge-intensive services accounted for the largest shares. The smallest were investigation and security services and industrial cleaning.

Business services companies, above all the knowledge-intensive ones, have a considerable impact on the performance of other industries. By supporting the introduction of innovations, the implementation of new business strategies and the management of change, they enhance the competitiveness of their clients. Thus, a strong and innovative business services sector is an important part of a well functioning industrial system. When comparing countries, it has to be borne in mind, however, that in some countries business services are traditionally provided within the companies that use them. This means that, statistically, they are counted as part of the "using" industries.

Table 13-1: Structure of the business services sector in the EU-12 (1999) by kind of activity

NACE Rev. 1	Turnover		Value added at factor cost	
	EUR (m)	%	EUR (m)	%
74.1	316,871.3	36.7	174,947.3	37.9
74.2, 74.3	159,118.7	18.4	85,706.9	18.6
74.4	114,722.0	13.3	38,307.0	8.3
74.5	62,096.0	7.2	47,200.8	10.2
74.6	16,628.4	1.9	12,520.8	2.7
74.7	38,497.6	4.5	29,386.7	6.4
74.8	155,068.2	18.0	73,045.2	15.8
74	863,002.2	100.0	461,114.7	100.0

* EU-12: no data were available for Ireland, Netherlands and Greece.

Source: Eurostat New Cronos 2002 SBS ENTER. DIW 2002.

Business services sectors have grown in all European economies over the last few years. This hints at a particularly dynamic sector, but also at ongoing outsourcing of services. In 1999, the largest contributors to the total EU-12 business services sector were Germany (28.6%), the UK (24.7%) and France (18.5%). Taken together they accounted for 72% of the total turnover.

According to Eurostat data, more than 11.6 million people were employed in the EU-11 business services enterprises in 1999. The average share of employment in business services in total employment in the economy was 7.9%. The regional employment structure reveals that the largest number of people working in the business services sector in the eleven EU countries is found in Germany (27% of EU-11 sector employment). The second and third places are taken by the United Kingdom (24%) and France (15%). These three countries constitute 66% of the total EU-11 employment in the industry.

The business services sector is characterised by a strong dominance of small enterprises. More than 99% of the enterprises in the sector employed less than 50 people. The domination of small firms results from the specific characteristics of many services. In 1999, the smallest companies generated over 60% of the sector's turnover and employed more than half of the people working in the industry. Some common issues determine the pace of development of the sector:

Trends and issues in the business services sector

Constantly changing customer needs: Business services are to a large extent customer-driven. Customers are constantly asking companies to provide new services or to modify existing ones. Coping with these customer demands and continuously adapting services and processes to new requirements requires flexibility and high levels of qualification.

Availability and cost of staff: As services are labour-intensive, the availability of staff at conditions that are compatible with market prices for the services is a crucial issue. For different sub-sectors, however, the details of personnel requirements differ with respect to qualifications and wages. SMEs

often lack the resources of large companies for recruiting and educating employees as well as for competing with wages that large firms are able to offer in the so-called “war for talents”.

Intensive competition: In many business services competition is fierce. Barriers to entry are often comparatively low and are to a large extent built on brand, reputation and experience. Economies of scale favouring (large) incumbents are often weak. Thus, it is relatively easy for an experienced employee to leave and set up his/her own shop. New market entrants also come from other sectors of the economy. Business consulting firms in particular increasingly have to compete with IT consulting firms when it comes to e-business projects.

Financing issues: Many services companies, have started rather small. As they grew, they kept the legal form from the early days of operation, mostly partnerships with personal liability. This may be considered inappropriate as companies become larger. The personal risks for liable partners might become too high, and the funds available for expansion are typically limited. As a result, many business services companies have considered changing their legal nature, aided also by the introduction of new legal constructs like limited liability partnerships.

Current economic slowdown: Most business services are pro-cyclical. In times of an economic slowdown enterprises tend to cut marketing expenditures as well as future-oriented projects with uncertain return on investment. This affects business services supporting these activities. Some business services can compensate for a drop in demand by offering specific services for difficult times such as legal consultation or business consulting to help cutting cost. Others, especially those offering standardised outsourcing-oriented services (e.g. cleaning, direct mailing services), might even win some new business during a recession, as companies decide to buy these services on the market instead of producing them internally.

End of the e-business boom: Many sub-sectors of business services profited from the e-business boom of the late 1990s and 2000. Many business services companies built up new capacity during the boom to handle the sudden increase in demand for Internet-related services. With the end of the almost frenetic business expansion, these companies were badly hit. The extraordinary demand for e-business related services suddenly fell and made much of the newly created capacity redundant. The overcapacity resulted in an ongoing consolidation process.

Focus on core competences favours outsourcing: A major force driving the growth of business services is the tendency of companies to focus on their “core competences” and to buy everything else on the market. Services which are provided on a continuous basis, such as cleaning or bookkeeping, as well as more individual services, e.g. engineering or public relations, particularly profited from this trend.

Internationalisation: Some business services operate on global markets. As many of the (larger) clients of business services companies are increasingly becoming international, their service companies have to follow them. These new requirements place specific demands upon companies in handling international clients, international co-operation and adapting to different regulations.

Increasing complexity of projects: As client companies become more international and larger, the complexity of services to be provided increases. Examples are strategy consulting projects such as the introduction of e-procurement systems for large, internationally spread companies, conceptualising and starting a global advertising campaign for international consumer product

Recent events: Some sub-sectors of business services have also been influenced by recent events. The events of September 11, 2001 considerably increased security awareness all over the world. The accounting frauds discovered in large public companies in the US also had a significant impact on the sector. Within a short time, the major accounting firm Andersen dissolved in most countries, leading to a change in the industry structure. In the medium-run, tighter accounting rules will most likely lead to an increase in demand for such services so that the sector can expect further growth.

13.2 Usage of ICT & e-business

13.2.1 E-business application in the production and provision of services

Procurement

The most important direct inputs for this sector are knowledge and information. The use of the Internet significantly enhances the access to specialist knowledge, increases speed and reduces the cost of obtaining information. On the other hand, the availability of information on the Internet also offers everyone free and easy access to specialist information and thereby seems to enable customers to conduct research themselves. However, with an increasingly large amount of information available, the intelligent use and efficient management of knowledge becomes a core competence and a crucial part of the service activity.

Another major direct input in business services, and closely related to knowledge, is human capital. Survey results show that 50% of the large and 14% of small companies in the business services sector post job vacancies on Internet boards. While recruitment still requires face-to-face contact, searching over the Internet makes it significantly easier for companies to find people with specific skills. In addition, the Internet enhances the chances for SMEs to recruit a highly qualified workforce. It also reinforces the trend towards internationalisation by making experts across country boundaries accessible.

Services production and delivery

The use of enterprise resource planning systems (ERP) is relatively new for the services sector. Nevertheless, ICTs and e-business applications have lately become quite important for optimising business processes:

- The increasing complexity and internationalisation of projects has increased the demands on project management which involves the co-ordination of various and often dispersed project teams, contractors, suppliers, clients etc..
- Intense competition has resulted in a growing effort to reduce cost by standardising business processes. Although many business services are individual, most processes can be split into standardisable and non-standardisable components.
- An increasing number of standardised software packages for key business processes are offered at low prices that make them also affordable for smaller companies.

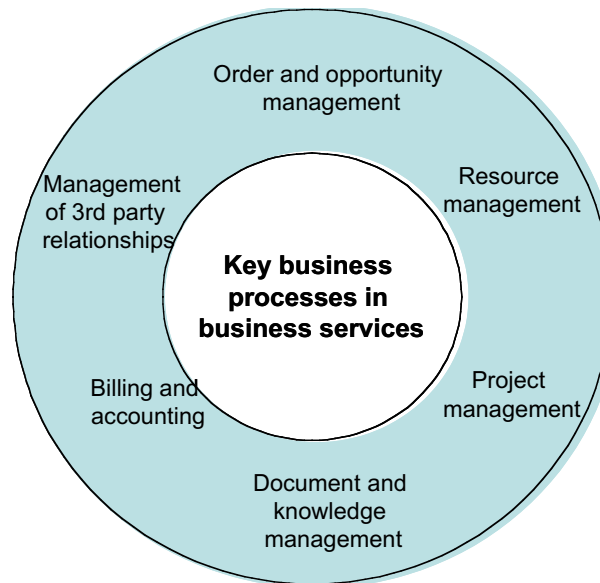
Order and opportunity management

Ensuring a continuous flow of orders is vital for the success of any services company. The Internet has become an increasingly important tool for potential clients to call for tenders, proposals or quotes. It has, therefore, become vital for service companies to know how to exploit the Internet as a source of new business opportunities. Calls for tender or proposals on the Internet offer smaller companies to compete for orders without being well known or having established relationships with the ordering parties. Additionally, on the Internet companies can easily gain information on potential customers and competitors.

Resource management

The efficient allocation of resources across the company is a central task for business services companies. Since personnel are not only an important cost factor, but also the most important resource, optimal utilisation of the workforce determines profitability. ICTs can significantly support this process by enabling real-time access to information on current resource use and expected future availability. Simple applications, such as time entry software, can already help to coordinate resources in smaller companies. Resource databases can be implemented that allow internal staff and external contractors to be searched by skills, availability, and other criteria.

Figure 13-1: Key business processes in business services



Source: Berlecon Research (2002)

Project management

Project management is at the heart of project-based business service provisioning and is one of the most important factors determining profitability and customer satisfaction. Most project-based service companies today use single software modules or integrated systems that are able to consolidate information from different sources to support project management. The term “project management software” is sometimes used for just one single application while others subsume a whole set of corresponding software tools to this term, including resource management, communication, accounting and billing etc.

According to the *e-Business W@tch* survey, 45% of the employees in the business services sector work in companies that offer remote access to the company’s computer system. 15% work in companies that even offer wireless access to central data. E-business applications also enable companies to outsource an increasing number of tasks to external parties. This allows business services companies to specialise in their core capabilities.

Document and knowledge management

The increasing amount of information available on the Internet has made the efficient management of documents/knowledge a key success factor for knowledge-intensive services. ICTs can help to support the process of efficiently managing documents and knowledge on three different levels:

1. *Storing and retrieving business documents:* Document management systems (DMS) help systemising the way business documents are stored and retrieved.
2. *Storing and retrieving of explicit knowledge:* Knowledge management enables organisations to generate value from their intellectual and knowledge-based assets. Knowledge management systems allow all employees easy access to all knowledge resources within the company even with staff turnover.
3. *Sharing of tacit knowledge:* Much harder to grasp is tacit knowledge, or the know-how shared in people’s heads. The sharing of tacit knowledge is predominantly a face-to-face process. For SMEs ICTs offer little support in this process apart from generally supporting communication. In large companies with various locations around the world, however, ICTs can be of tremendous value to support the sharing of this kind of know-how.

The *e-Business W@tch* survey results show that 7% of the small and 24% of the large companies in this sector use knowledge management systems. Obviously, there is still a large potential for better use of the advantages of knowledge management.

Billing and accounting

ICTs and e-business applications also play an important role in supporting billing and accounting of business services companies. Integration with various systems such as time and expense tracking makes billing and accounting systems most valuable. Integration with human resource management systems and financial systems makes them particularly efficient. Some systems offer online access to invoices by clients or present bills to customers electronically.

Management of third party relationships

An important part of the service of many companies in this sector is the coordination and management of third-party relationships on behalf of the client. For companies from the advertising industry (NACE 74.4), for example this is a core business. They do not only design advertising campaigns for their customers, but also manage the various relationships with suppliers, freelancers and contractors within the advertising value chain. ICTs and e-business applications play a major role in the management of such complex third party relationships. In almost 90% of all companies in the business services sector e-mail for external communication is available for the majority of office workers. More than half of all companies in this sector exchange documents with suppliers and customers electronically.

The possibilities for collaboration have been significantly enhanced by new technologies. To share documents and/or perform collaborative work is by far the most important use of online technologies other than e-mail in this sector, according to the survey results. About a fifth of all employees in this sector work in companies that have an extranet to support the collaboration with external parties. The high percentage of firms using an application service provider in this sector (11%) could be an indication for the use of web-based solutions for collaborative tasks.

13.2.2 E-business in marketing, sales and customer care

ICTs and e-business applications are extensively used by business services companies to support processes related to marketing, sales and customer care:

- They are used to improve customer service and manage customer relationships.
- They provide new sales channels.
- They have enabled companies to offer new products and services.

Marketing

ICTs and e-business applications have considerably changed the way companies in this sector can market services to their clients. Company websites have become a central element in the overall marketing strategy of business services companies of all sizes. Traffic to the website can be generated by listing the company in online directories and search engines, by using e-mail marketing, newsletters or by making use of other forms of online advertising. Such measures have the potential to significantly enhance the efficiency of brand building.

In face of intensive competition, brand and reputation building is the most important marketing challenge for business services companies. Providing work samples, case studies and research publications to a large audience over the Internet can significantly help build the brand and reduce trust problems of new customers.

Customer service and relationship management

Maximising customer satisfaction and building long-term relationships with clients is a key success factor for business services companies. ICTs can support this in several ways:

- *Customer relationship management* (CRM) systems provide a central database containing all data related to the company's prospective or actual customers. They are most advantageous for companies with a large customer base, which can reap economies of scale from automating client interaction. The survey results show that 6% of small companies and 35% of the large ones use CRM systems.
- *Service-related customer care*: Internet-based customer services allow for a high degree of interactivity. Internet-based services can be delivered at low cost and at the same time offer substantial value to the client if they complement (and not substitute) conventional service-offerings.
- *Relationship-building*: ICTs can be used to support long-term relationships with clients. E-Mail newsletters that inform clients about new products and services and keep them up-to-date with developments of the company are one of the most commonly used tools.

New sales channels

Contrary to many other sectors, ICTs offer only few opportunities for business services companies to open up new sales channels. The possibilities for selling online are strongly limited in this sector. The survey results show that only 10% of all companies in the sector sell products or services online and online sales only constitute a marginal fraction of overall sales. The most important barrier to a stronger online selling activity is that most goods and services in this sector do not lend themselves to selling online.

New products and services

The opportunities for companies in this sector to offer new products and services to their clients by using ICTs and e-business applications are more diverse. ICTs have enabled business services companies to offer new services with higher value to their customers and/or more standardised services at lower cost. Public opinion polling companies, for example, have developed Internet-surveys as a new service to their clients. Security firms have created online video surveillance systems, which offer clients a significantly higher quality of service.

13.2.3 The diffusion of ICT and e-business in the sector

In the following analysis of survey data it has to be kept in mind that complete data sets for cross sector comparisons are only available for EU-4 (Germany, France, Italy, UK). Sector averages are therefore based on EU-4 data. The composition of enterprises is different in different size classes.

Infrastructure

Large parts of the business services sector are based on gathering, compiling and distributing information. Indeed, survey results show above-average percentages for computer use, Internet access, e-mail and WWW use, which are the main basic technologies for accessing and exchanging information. One explanation is that much information that serves as input for business services is available on the WWW. The low diffusion of EDI networks and of WANs is to some extent explained by the small average size of business services enterprises, as these IT components are useful only for larger companies. EDI networks are also best suited to ordering and selling standardised products and services while business services are to a large extent individual.

Table 13-2: Business services: Availability of IT infrastructure

Available IT infrastructure	All sectors	Business services			
		All enterpr.	0-49 empl.	50-249 empl.	250+ empl.
Computers	97	99	98	100	100
Internet access	91	96	92	95	100
E-mail	87	93	92	95	95
WWW use	84	92	86	94	100
Intranet	51	51	36	55	71
Extranet	20	24	14	27	37
LAN	67	68	55	83	82
WAN	34	32	10	36	63
EDI	23	20	12	21	31

Base: EU-4 (D, F, I, UK), all enterprises. N=411 (for business services), N=5917 (for all sectors). Figures weighted by employment ("enterprises comprising ...% of employment have/use ..."). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Comparing the use rates of smaller and larger enterprises shows quite small differences for general-purpose technologies such as e-mail or computers. Basic IT infrastructure is well developed in all countries. Stronger differences exist in the percentages for WWW use. They are comparatively low in Italy, and for intranets, whose diffusion is lowest in Germany and the UK.

IT skills

The comparatively high IT use rates should imply that business services companies are aware of the need for training schemes to enable their employees to use IT as efficiently as possible. However, formal training schemes are not rated as very important by the majority of companies. Only 20% consider such training to be very important. Much more important (65%) is on-the-job learning. Obviously, the necessary IT skills are considered to be easy to acquire and/or the qualification of the employees is considered high enough to learn quickly.

Most business services enterprises offer at least some form of support, although there is a difference between small and large companies. While only 5% of the latter offer no support, this percentage is much higher for small companies (23%). Comparing the different training forms shows that training by third parties is more common than in-house training. This is due to the fact that many companies in this sector are small so that in-house training would not be economical.

Table 13-3: Business services: IT training offered to employees, forms of training considered as "very important"

Form of training / support offered	All enterpr.	Business services		
		0-49 empl.	50-249 empl.	250+ empl.
Consider as very important:				
• On-the-job learning	65	64	57	69
• Formal training schemes	20	19	19	22
• Self-learning activities	35	42	38	24
Any support of IT and networking skills development	85	77	89	95
• In-house computer / IT training	50	37	55	67
• Computer / IT training by third parties	58	50	62	69
• Use of working time for learning activities	69	67	79	70

Base: EU-4 (D, F, I, UK), all enterprises. N=411 (for business services), N=5917 (for all sectors). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Business services companies in all countries for which data is available offer at least some support for the development of networking and IT skills. Companies in France and Ireland are most supportive while one quarter of employees in Italy and the Netherlands are working in enterprises from which they do not receive any support.

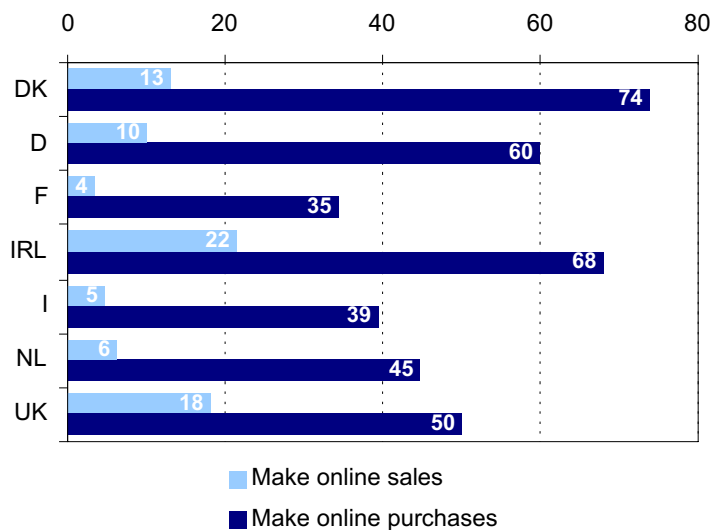
E-procurement

The percentage of companies procuring online (almost 47%) as well as the share of e-procurement in total procurement are higher in this sector than they are on average. At first sight, this result seems astonishing, as most business services companies do not have large purchasing departments. The survey results show that 70% of the small and 78% of large online-procuring companies procure maintenance, repair and operating (MRO) goods online.

*Figure 13-2: Business services:
Current online purchasing and
selling across countries*

Base: EU-7 (DK, D, F, IRL, I, NL, UK), all companies, excl. "no answer" / (N=692). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)



However, first, many inputs necessary for the provision of business services can easily be bought on the Internet. Second, the term e-procurement can be interpreted in a rather broad way. Booking flights or hotels on the Internet can be subsumed under e-procurement as well as ordering a new computer or accessing a database with content to be paid for.

The fraction of business services enterprises that already buy or sell online differs considerably across the seven EU member countries for which data is available. Especially Danish and Irish enterprises are familiar with online procurement. Both countries also show high rates of online sales, which points to some correlation between both activities.

While buying of MRO goods is more important than buying direct production inputs, the fraction of establishments that procure direct inputs (46%) is not negligible. Almost half of the business services companies buy direct inputs online, which might be explained to some extent by digital goods being inputs for knowledge production and also to some extent by difficulties to distinguish between direct inputs and MRO products, especially in the professional services sector.

Potential barriers for online procurement are generally considered less important by business services companies than by the average EU-4 company. Still, more than 30% of companies think that their business requires face-to-face contact, and about one quarter find that technology is not secure or their suppliers do not offer online service.

Selling online

Quite in contrast to e-procurement, selling online is less frequent in the business services sector than it is on average (10% in business services against 12% in all sectors). However, the plans of establishing online sales channels indicate that this gap will narrow if the plans materialise. Also the import-

ance of online sales for those using this channel is below average. For 59% selling online is responsible for less than 5% of total sales. Over all industries this percentage is only 46%. As the survey results show further, large companies are more prone to online selling than small companies, and online sales are also more important for those large companies that sell online than for small ones. High set-up costs of e-sales solutions might have played a role for this outcome as well as structural differences between the size classes. In addition, larger business services companies might be better in offering standardised services that are more suited for online selling than individual services.

Despite standardisation efforts, business services are still to a large extent individual activities. This might explain why online sales are less important in this sector than they are on average. Accordingly, the main barrier "goods/services do not lend themselves to online sales" is more often considered as very important than on average. All other barriers are considered less important than on average. Barriers with especially low importance for business services compared to the average are the adaptation of business culture to e-commerce, the expensiveness of technology and the number of customers online. This points to a considerable potential for online sales in this sector, once products and services are created that are more suitable for online-selling.

13.2.4 The impact of e-business on the sector

The overall impact of e-business on the enterprises' organisation differs only slightly between the business services sector and the average of all industries within the EU-4. Slightly stronger than on average are the effects on internal work processes as well as on the relationships with suppliers and customers. This result is not surprising taking into account the importance of collaboration for the sector as well as the impact of ICT and the Internet on collaboration.

The major impact of e-business on procurement is a greater variety of potential suppliers to choose from. In addition, online procurement had positive impacts on the efficiency of internal business processes and on procurement costs. The positive impacts have been stronger for business services than for the average of companies.

The main positive impact of selling online is improved customer care. 40% of companies indicate this as opposed to only 28% on average. The volume of sales and the efficiency of internal business processes are slightly more positively influenced than on average as well. This is also true for the sales area. Most likely, this is due to the service character of this sector's output. While there are tendencies to internationalisation of services, many business service activities (e.g. security or legal services) are nevertheless tied to the service providers' base-region.

13.3 Conclusions

This sector report has analysed the use of ICT and e-business in the business services sector, which comprises many very dissimilar service activities. Some services in this sector are very individual and offered on a project basis, others are standardised and provided on an ad-hoc basis, and a third group of services is offered on a standardised basis.

The following implications of the transition to e-business have been identified as particularly important:

- easier access to information
- easier distribution of information and brand building
- better opportunities for co-operation
- increasing standardisation and transformation of services in products
- service innovation opportunities

The implications of e-business and Internet for the industry as a whole can be directly derived from these impacts: lower barriers to entry enhance the intensity of competition, and more pronounced

specialisation requires more sophisticated schemes of co-operation. Despite several factors benefiting small companies in business services, there are also several technology-induced factors favouring larger entities. Standardisation of services, transforming services into products and building brands are activities that may create economies of scale. These make operation in larger entities relatively more profitable.

At the same time, e-business solutions such as knowledge or project management systems help to decrease the disadvantages that large companies have especially in the knowledge-intensive business services. As the economies of scale are not as strong as in other sectors, though, this effect should be comparatively weak.

These economic implications lead to several policy implications.

The legal framework for industries is not always compatible with e-business

Several e-business features are influenced by industry regulations. As some industries have to obey a variety of industry-specific regulations, not all e-business applications are possible that are allowed for other industries. These regulations might keep the industry from taking full advantage of e-business. It should be constantly monitored whether the benefits of regulation outweigh the costs from obstructing new ways of doing business.

Internationalisation requires reduction of trade barriers

Specialisation and extending one's market internationally is only possible for those business services for which no trade barriers exist. These can, for example, take the form of national regulations or of the requirement to establish a physical presence. Such barriers to trade should be continuously monitored to assess whether their benefits outweigh the costs of obstructing the internationalisation of business services.

Governments can serve as role model for public tendering

The decrease in the costs of information dissemination and information gathering allows a better match between supplier and buyer. However, the potential gains from distributing calls for tenders and related documents on the Internet are not yet exhausted, as for instance smaller projects are awarded without public calls. Government institutions with their experience in handling public calls can serve as a role model by increasingly using public tendering also for smaller contracts and especially by developing appropriate tendering procedures that keep the costs of tendering low for all parties involved.

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14 The ICT services sector

14.1 Economic profile and trends

For the *e-Business W@tch* report on ICT services activities in telecommunications (NACE 64.2) and computer related activities (NACE 72) have been analysed. The latter can be subdivided on the 3-digit-level into six further groups. As all of these are concerned with service activities as well as the production of immaterial goods (software), we will also use the term “computer services” in this report to describe all activities within NACE 72. For the combined sectors NACE 64.2 and 72 we will use the term “ICT services” for better readability, where ICT stands for information and communication technology. It has to be kept in mind, though, that ICT services can also be defined in a broader way, e.g. by also including wholesale of office machinery or even the renting of office machinery and equipment.

NACE Rev.1		Activity
division	group	
64		Post and telecommunications
	64.2	Telecommunications
72		Computer related activities
	72.1	Hardware consultancy
	72.2	Software consultancy and supply
	72.3	Data processing
	72.4	Data base activities
	72.5	Maintenance and repair of office, accounting and computing machinery
	72.6	Other computer related activities

ICT services are an important part of the ICT sector, which is often defined as consisting of ICT manufacturing, ICT wholesale, telecommunications and computer related activities. The exact definition of “the” ICT sector, however, differs from study to study, depending on the statistical data available, the focus of the study as well as the motivation behind it.

Table 14-1: ICT services: Industry structure by sub-sector (1999)

Country	Telecommunications			Computer services		
	Value added (m Euro)	Number of Enterprises	Persons empl. (1000)	Value added (m Euro)	Number of Enterprises	Persons empl. (1000)
Austria	2,555	186	24.4	1,562	6,425	27.7
Belgium	3,744	315	31.0	2,348	6,479	39.5
Denmark	2,330	245	20.5	2,122	5,221	34.7
Finland	1,886	224	19.4	1,480	3,535	25.5
France	-	2,362	-	15,387	31,285	262.1
Germany ¹⁾	29,099	551	221.4	27,229	46,544	349.0
Italy	14,441	583	105.3	9,939	69,515	263.7
Luxembourg	567	46	0.9	196	611	3.4
Netherlands	-	830	49.6	-	-	-
Portugal	2,514	149	21.2	595	2,280	15.0
Spain	7,455	1,040	74.4	3,599	17,702	113.3
Sweden	-	280	-	4,977	19,045	86.7
UK	26,402	5,946	230.1	33,945	124,501	507.2
EU-10 ²⁾	90,993	9,285	748.7	83,016	282,813	1379.0

No data available for Greece and Ireland. 1) Employment data from RegTP: Annual report 2001, p.6 per 31.12.1999.

2) EU-10: A, B, DK, FIN, D, I, L, P, E, UK.

Source: Eurostat New Cronos (SBS, Enter-L)

Telecommunication services account for slightly more than half of value added in the ICT services sector of the EU-10, for about a third of the employees in the combined sector but for only 3% of the enterprises. This already indicates that production and size structure in telecommunication services differ significantly from that in computer services.

Computer services produce value added of a similar size as telecommunication services, but in a totally different way: The average enterprise is considerably smaller than in telecommunication services and the production is significantly more labour-intensive. This explains why computer services companies employ about two thirds of all employees in the ICT services sector and make up for around 97% of all enterprises in this sector.

Telecommunications and computer services, have one thing in common: while they are potential users of e-business like every other industry – and only this aspect has been analysed in the *e-Business W@tch* – they also provide some of the most essential elements for conducting e-business. These elements are (i) the telecommunications infrastructure (including the infrastructure for data traffic), (ii) software and (iii) consulting and outsourcing services.

One could therefore assume that companies in these industries conduct e-business in the best way possible, being familiar with concept and technology, and competent in realising e-business projects.

14.2 Usage of ICT and e-business

14.2.1 IT Infrastructure and skills

Infrastructure

As one would expect in a sector that focuses on information and communication technologies, results from the *e-Business W@tch survey* confirm that ICT services companies are indeed noticeably better equipped with IT infrastructure than the average EU-4 company.

Table 14-2: ICT services: Current and planned IT infrastructure

IT infrastructure	All sectors	ICT services			
		All enterpr.	0-49 empl.	50-249 empl.	250+ empl.
Internet	91	99	100	100	98
E-mail	87	99	99	100	98
WWW	84	98	95	99	98

Base: EU-4 (D, F, I, UK), all enterprises. N=403 (for ICT services), N=5917 (for all sectors). Figures weighted by employment ("enterprises comprising ...% of employment say ..."). Reporting period: June/July 2002.

Source: *e-Business W@tch* (2002)

The Internet, e-mail and the WWW are standard tools used in every ICT services firm, regardless of its size. This is not equally true for companies from other sectors, where a lower percentage of companies – particularly a lower percentage of smaller companies – makes use of these tools.

Table 14-3: ICT services: Internet connection modus

Internet connection	All sectors	ICT services			
		All enterpr.	0-49 empl.	50-249 empl.	250+ empl.
Analogue modem	19	9	14	8	8
ISDN	39	23	31	20	21
DSL	25	25	42	28	18
Other fixed	27	60	18	57	75
Other connection	3	5	1	7	5

Base: EU-4 (D, F, I, UK), enterprises with Internet access. Multiple answers possible. Base: EU-4 (D, F, I, UK), all enterprises. Figures weighted by employment ("enterprises comprising ...% of employment say ..."). Reporting period: June/July 2002.

Source: *e-Business W@tch* (2002)

Companies in the ICT services sector need very powerful Internet connections for conducting business. Accordingly, 85% of the employees in the sector work in companies with broadband Internet connections such as DSL or other fixed lines. At 32% the share of employees working in companies with narrowband Internet connections, i.e. analogue modems or ISDN, is clearly below the average (58%).

Even small ICT services firms predominantly use broadband connections to access the Internet. Two thirds of them uses DSL or other fixed lines while only one third of the small companies in other sectors do. Still, the use of DSL and other fixed connections that are commonly used to connect several employees within a (large) company to the Internet are more frequently used in large enterprises.

IT skills

The efficient use of IT is one of the core competencies of ICT services firms and fast technological changes require considerable education efforts in the sector. One would, therefore, expect a strong support of IT skills development in ICT services firms. Indeed, 97% of the employees in the sector work in companies which offer at least some support of IT and networking skills development, which is above the average of 83%.

Table 14-4: ICT services: IT skills development

Form of support	All sectors	ICT services			
		All enterpr.	0-49 empl.	50-249	250+ empl.
Any support of IT and networking skills development	83	97	89	94	100
• In-house computer / IT training	52	83	57	65	93
• Computer / IT training by 3rd parties	58	72	53	64	79
• Usage of working time for learning activities	66	86	83	88	86

Base: EU-4 (D, F, I, UK), all enterprises. N~400 (for ICT services), N~5900 (for all sectors). Figures weighted by employment ("enterprises comprising ...% of employment say ..."). Reporting period: June/July 2002.

Source: e-Business W@tch (2002)

83% of the employees work in companies where IT training is offered in-house and 72% work in companies that offer IT training by third parties. This kind of formal IT training is, however, offered more often in large companies than in SMEs. In the latter, the availability of working time for learning activities is the most important form of support.

14.2.2 E-commerce

Purchasing online

ICT services firms are already very active in buy-side e-commerce. Not only is the fraction of ICT services companies already purchasing goods or services online extraordinarily high (81%), but also the share of companies for which online purchases constitute a significant share of their total purchases is clearly above the average over all sectors.

Indeed, the preconditions for buying online are good in the ICT services sector: First of all, many inputs necessary for the provision of ICT services can easily be bought on the Internet. This applies to software, hosting services, Internet and telecommunication services, office supplies, books, database content, research, etc. And secondly, the familiarity of ICT service companies with the possibilities of the Internet as well as the suitability of many intangible inputs for electronic delivery make online ordering a logical thing to do.

Table 14-5: ICT services: Current and planned online purchases

	All sectors	ICT services			
		All enterpr.	0-49 empl.	50-249	250+
Make online purchases	36	81	81	74	80
Plan to purchase online	7	4	4	2	2
Share in total purchases					
• > 50%	9	20	20	21	0
• 26 to 50%	10	22	22	15	3
• 11 to 25%	19	23	23	28	22
• 5 to 10%	25	19	19	18	15
• < 5%	37	16	16	17	60

Base: EU-4 (D, F, I, UK), all enterprises [N=403 (for ICT services), N=5917 (for all sectors)], enterprises purchasing online (incl. NA/DK) for lines 3-8. In % of enterprises. Reporting period: June/July 2002.

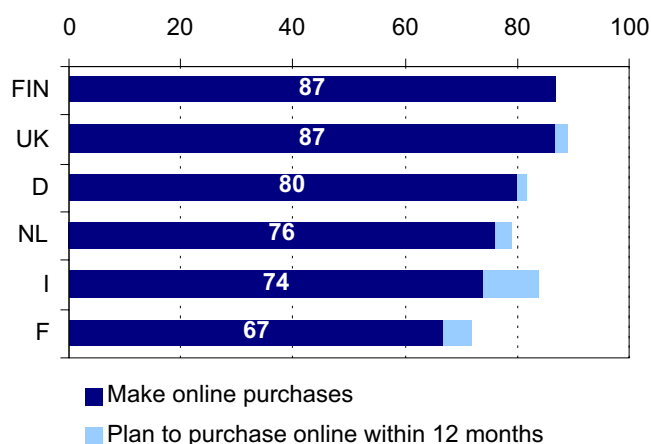
Source: e-Business W@tch (2002)

Purchasing online is of special importance for small companies in the ICT services sector. For 42% of the small companies that buy online, these online purchases constitute more than a quarter of their total purchases. The same value for large companies is only at 3%. (Due to few observations, however, these results have to be interpreted with care.) This outcome points at substantial differences between online buying of small and large companies. While small companies mostly buy manually using the Web, larger companies tend to use more sophisticated e-procurement solutions to order within pre-established contracts. The former solutions can more easily be conducted and are thus more frequent than the latter.

Figure 14-1: ICT services: Current and planned online purchases across countries (in% of all enterprises)

Base: all enterprises. N=567 (for EU-6). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2002)



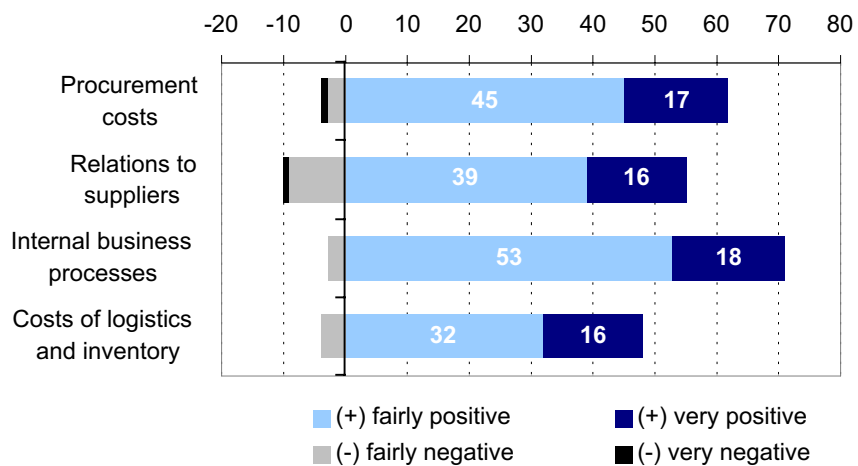
Online purchases are important in the ICT sector of all countries that have been surveyed. Even in France, which has been observed as one of the countries least active in e-business, around two thirds of the enterprises are currently purchasing goods or services online. Online purchasing is coming to a point of saturation in the ICT services sector. Only in Italy and to some extent in France a significant percentage of enterprises are planning to purchase online.

For ICT services firms the most important impact of purchasing online is on internal business processes and on procurement cost. 71% of the ICT services companies state that purchasing online has affected their internal business processes very or at least fairly positively. 62% indicate a positive impact of purchasing online on their procurement costs. This result seems to be surprising at first sight, as the ICT services industry contains many small enterprises, which tend to use rather unstructured ways of buying and selling online rather than implementing sophisticated procurement or integrated sales solutions.

Figure 14-2: ICT services: Perceived impacts of purchasing online (in % of companies purchasing online)

Base: companies procuring online. In % of enterprises procuring online.

Source: e-Business W@tch (2002)



An explanation for the nevertheless positive impact on internal processes might be that the reduction of paperwork is already considered as a relief by these enterprises, as it allows them to speed up internal processes. For online purchasing in particular this process improvement for a small company is obvious. Buying software, for example, can be done by making the purchasing decision, clicking on the appropriate item in the favourite online shop, and entering the firm's credit card number. Often the software can be downloaded and installed immediately. Comparing this process to a traditional telephone and catalogue order, or even to physical shopping clearly shows a much shorter process. Thus, "improvements of internal processes" should rather be interpreted as a speeding-up of processes, not necessarily as making them more structured and well-organised. Large companies, on the other hand, typically use more sophisticated systems that in addition to speeding up the processes also structure them more efficiently. And indeed large enterprises in the ICT services sector consider the impact of e-purchasing to be even more positive than small ones.

Selling online

22% of all companies in the ICT services sector already sell products and/or services online, and an additional 18% plans to do so over the 12 months period ahead. If these plans materialise, twice as many companies in the ICT services sector will sell online one year from now than on average over all sectors. Due to its digital nature, standard software is a product offered by the ICT services sector, which is particularly suitable for online selling. Software can be ordered online and delivered in physical form (e.g. on CD-ROM) or directly be downloaded from the seller's website. Indeed most of the larger consumer-oriented software companies now have web shops where the software can be bought for postal delivery as well as for download. But many small software companies also offer online sales possibilities to their customers and are constantly improving their online sales services.

Currently, a gap in online sales activities of large and small ICT services companies can still be observed: only 22% of the small but 36% of the large companies in the sector sell online. This gap will close, though, since 18% of the small but only 6% of the large companies plan to implement online sales systems within a 12 months period ahead. If these plans materialise, the medium sized companies will fall back behind their smaller and larger competitors.

The importance of online sales for those companies that actually sell online is notably higher in the ICT services sector than on average. The percentage of companies for which the share of online sales in total sales is above 10% is at 47% in the ICT services sector and only at 29% on average over all sectors. Significant differences in the various company size classes can be observed, though, although these have to be interpreted with care due to few observations. In the small company segment there seems to be a number of "online specialists" that sell more than 50% of their total sales online. None of the large enterprises is selling online to this extent.

The countries most active in selling online in this sector are Finland, the Netherlands and the UK. In Germany, where ICT services companies are very active in online activities on the buy-side, sell-side activities are least developed of all countries surveyed.

Table 14-6: ICT services: Current and planned selling online

	All sectors	ICT services			
		All enterpr.	0-49 empl.	50-249 empl.	250+ empl.
Currently sell online	12	22	22	30	36
Plan to sell online	9	18	18	7	6
Share of total sales...					
• > 50%	9	21	21	4	<1
• 26 to 50%	10	11	11	<1	19
• 11 to 25%	11	16	16	16	10
• 5 to 10%	26	19	19	24	10
• < 5%	46	33	33	56	62

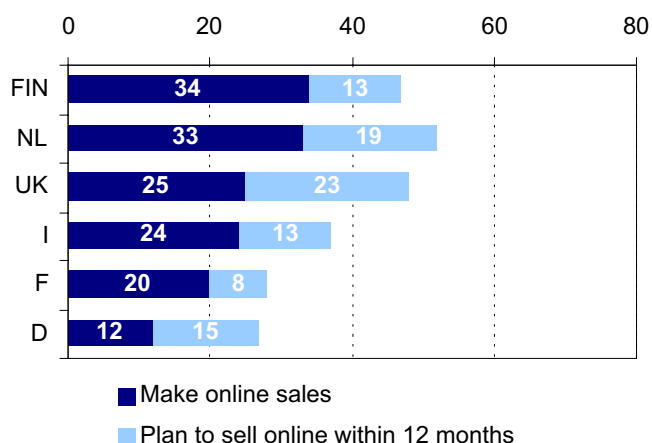
Base: EU-4 (D, F, I, UK), all enterprises [N=403 (for ICT services), N=5917 (for all sectors)], enterprises selling online (incl. NA/DK) for lines 3-8. In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Figure 14-3: ICT services: Current and planned selling online across countries (in % of all enterprises)

Base: all enterprises. N=567 (for EU-6). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2002)



The most important positive impacts of selling online in the ICT services sector are on the quality of customer service and on the efficiency of internal business processes. In particular large companies in the sector with very large numbers of customer relationships can profit from customer care services on the Internet to achieve cost savings and increase customer satisfaction

However, despite an overall positive assessment of the impacts of selling online, the impacts are considered less positive than on average over all sectors. A higher share of companies than on average even feels negative impacts of selling online. More than 14% of the ICT services firms that sell online, for example, believe that this activity negatively affects their volume of sales, the number of customers and their sales area.

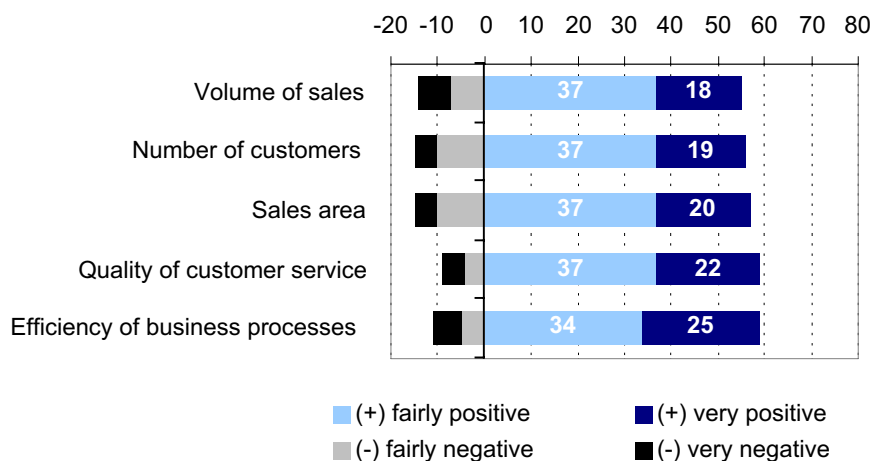
This outcome can best be explained by the assumption that the enterprises surveyed not only mean the impact of *their* online sales activity on sales volume and other variables but the impact of online sales *in general*. A more in-depth analysis has also shown that the comparatively negative assessment of selling online in the ICT services sector results to a large extent from the negative opinion of small enterprises. For example, almost 15% of the small ICT services firms in the six countries surveyed feel negative impacts on their volume of sales and the sales area, while none of the large companies reported negative effects here. In addition, while around 70% of the large enterprises report that selling online positively affects their sales, the number of customers, as well as customer care and efficiency of internal business processes, only between 55-60% of the small ones do so.

Small and relatively unknown enterprises, for example, for which personal service used to be a major value proposition, now have to compete with an increasing number of larger companies online that are marketing their products via their brand. New e-business technologies provide the larger companies with the means to personalise their services better and to become more customer friendly, thus reducing the comparative disadvantage of large companies with respect to this issue.

Figure 14-4: ICT services: Perceived impacts of selling online

Base: EU-4 (D, F, I, UK), companies selling online. In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)



14.2.3 E-business

While e-business is often strongly related to buying and selling online, the use of e-business solutions and ICT can also significantly enhance the efficiencies of the internal processes of an enterprise. As has been stated above, one should observe a more frequent use of e-business technologies in ICT services firms than in companies from other sectors since they are familiar with concepts and technologies, and since they are competent in realising e-business projects

Table 14-7: ICT services: Current and planned usage of specific IT solutions

IT system solution	All sectors	ICT services			
		All enterpr.	0-49 empl.	50-249 empl.	250+ empl.
ERP	7	8	8	37	51
CRM	7	22	22	40	53
Knowledge management	5	18	17	29	19
E-learning	12	30	30	30	44
SCM	2	3	3	4	12
EDI	9	12	12	27	40

Base: EU-4 (D, F, I, UK), all enterprises. N=403 (for ICT services), N=5917 (for all sectors). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Indeed, all IT solutions depicted in the table above are used by a significantly higher share of ICT services firms than by firms from other sectors. One of the most frequently used online technologies in ICT services are e-learning tools. 44% of the large and 30% of the SMEs in the ICT services sector use e-learning tools. Overall, the number is more than twice as high as in other sectors, which can be explained by ICT services firms being faced with the challenge to constantly keep their employees up-to-date with quickly changing technologies and technical innovations. Online e-learning tools can significantly help to support this process.

Employing e-business tools to improve customer-faced processes is a pressing issue in those areas of the ICT sector that deal with large numbers of customers. In telecommunication services in particular, where after liberalisation of the market customers can easily switch their provider when they are not

satisfied, companies have a strong incentive to improve customer care and intensify customer relations with the help of e-business tools. Overall, Customer Relationship Management (CRM) systems are used by 22% of the enterprises in the ICT services sector, compared to only 7% on average over all sectors. This gap will widen even further if the respondents' plans to implement CRM systems within a 12 months period materialise. CRM systems are most frequently used by large enterprises in the ICT services sector. Obviously, such systems are of higher value for enterprises with very large numbers of customers, like telcos. Smaller enterprises, for example IT consulting companies, can easier handle their comparatively few customer relationships manually. Particularly companies from the Netherlands and the UK make extensive use of CRM systems.

Improving internal co-ordination as well as the flow and management of knowledge is vital in those sub-sectors of ICT services that produce their services mainly from skilled labour. The efficiency of, e.g. accessing and sharing of knowledge can be significantly enhanced by the use of knowledge management (KM) solutions. Such solutions are used by 17% of the ICT services companies compared to only 5% on average. The highest share of companies using such systems is in the medium sized segment. IT consulting and software programming, for example, are knowledge-based activities where efficient knowledge management is business critical. In the UK and in Finland the highest shares of ICT services firms that use knowledge management systems can be observed.

The above average share of companies using ERP systems in the ICT services sector again reflect the sector's familiarity with the efficient usage of IT solutions. Many large enterprises in the sector have ERP systems implemented, which help them to support large number of internal processes. Finnish ICT services firms are the most active users of ERP systems followed by Italian companies from this sector.

While SCM is a concept with a history in the production of physical goods that have been used to optimise product flows and inventories, EDI networks have also been used for quite a long time in telecommunications. With ELFE there even exists a special EDI subset for electronic telephone billing.

Comparing the use of specific IT solutions across countries shows that Finland and the UK are the leading countries. Whereas in Finland especially the use of internal and buy-side oriented solutions is widespread, the UK has a lead in customer-focused CRM as well as in knowledge management.

Table 14-8: ICT services: Use of specific IT solutions across countries

IT system solution	D	F	FIN	I	NL	UK	EU-6
ERP	13	14	27	17	14	2	9
CRM	22	19	22	13	29	27	23
Knowledge management	16	12	21	7	17	23	18
E-learning	30	14	60	21	16	37	30
SCM	3	2	7	0	5	3	3
EDI	12	18	20	7	10	13	12

Base: all enterprises. N=567 (for EU-6). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

The ICT services sector is not only advanced in using ICT and e-business applications for improving internal processes, but also in co-operating with external business partners using online technologies. Almost all indicators are considerably above average. The strongest head-start is visible for online collaboration in the product design phase, online negotiation of contracts and having access to an extranet of business partners. Online collaboration for product design is very much favoured by the sort of products and services produced in this sector. Software, due to its digital nature, is ideally suited for a distributed development. For example, the whole distributed programming model for the development of Open Source software is based on this possibility. The advanced state of online co-operation in the ICT services sector strongly facilitates the division of labour in this sector. The decrease in costs for co-operation allows even very small and specialised companies to work together with others on larger projects.

Table 14-9: ICT services: Use of online technologies for co-operation with external business partners

	All sectors	ICT services			
		All enterpr.	0-49	50-249	250+
Online collaboration with business partners for designing products	13	32	31	45	51
Online collaborating with business partners to fore-cast product demands	10	21	21	27	21
Online management of capacity / inventory	9	8	8	18	33
Electronic exchange of documents with suppliers	42	59	60	53	60
Electronic exchange of documents with customers	39	63	63	63	61
Online negotiation of contracts	16	35	35	20	20
Access to an extranet of business partners	18	46	45	50	40

Base: EU-4 (D, F, I, UK), enterprises with internet access. N=400 (for ICT services), N=5417 (for all sectors). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

Accordingly, the use of online technologies for most forms of co-operation is also comparatively widespread among small ICT services firms, whereas in other sectors the large companies show higher usage rates. The electronic exchange of documents with suppliers or customers is as frequently observed in small as in large enterprises. Nevertheless, it is probably safe to assume that the technologies used to exchange documents differ between the size classes. While unstructured e-mail fits the needs of small companies quite well, large enterprises often need more structured ways of exchanging documents and might use special software to manage it.

14.3 Conclusions

The results from the *e-Business W@tch* survey clearly demonstrate that e-business plays an important role in the ICT services sector. At 17% the share of companies which state that e-business has significantly changed the way of conducting business is twice as high as on average. This is equally true for small and large companies.

The survey results also show that in the ICT services sector the impact of e-business on various areas of the enterprise depend very much on the size of the company. The most significant impact of e-business in large companies is on the offers of products and services and on the organisational structure. Large telcos, for example, are able to provide entirely new services, e.g. wireless data services. Similarly, large IT services companies now offer new concepts such as application service providing. In addition, large enterprises can use the new technologies to overcome organisational inefficiencies, which are typical in large entities.

Table 14-10: ICT services: Perceived impacts of e-business on companies

E-business has significantly changed ...	All sectors	ICT services			
		All enterpr.	0-49 empl.	50-249	250+
the organisational structure	6	10	10	8	21
internal work processes	10	14	14	11	15
relationships to customers	8	13	13	11	13
relationships to suppliers	7	15	16	6	9
the offers of products and services	7	13	13	21	29
the way of conducting business	8	17	17	16	17

Base: EU-4 (D, F, I, UK), all enterprises. N=403 (for ICT services), N=5917 (for all sectors). In % of enterprises. Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

In small companies, the most significant impact of e-business is reported on the relationship to suppliers and on internal work processes. Paperless processing of information associated with e-business, for example, allows SMEs to speed up internal processes.

Contrary to several other sectors covered by the *e-Business W@tch*, where small companies particularly profit from selling over the Internet, this does not seem to be equally true for the ICT services sector. Here it rather seems like online sales services help large companies to overcome the disadvantages of being large, for instance handling very large numbers of customers or handling complex internal business processes. New e-business technologies provide the larger companies with the means to personalise their services better and to become in general more customer friendly, which was often a comparative advantage of small companies. In addition, the Internet helps large companies to strengthen their brand name and to exploit economies of scale.

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15 Health and social work

15.1 Economic profile and trends

In section N "Health and social work" of NACE Rev. 1, division 85 "Health and social work" comprises three groups: human health activities (85.1), veterinary activities (85.2) and social work activities (85.3). The *e-Business W@tch* health sector reports concentrate on those sub-sectors where networking with other health institutions is of particular importance and where ICT ("e-health") can be expected to play a relatively more important role. In particular, they focus on hospital activities (85.11), medical practice activities (85.12) and social work activities (85.3).

NACE Rev.1		Activity
division	group	
85		Health and social work
	85.1	Health activities
	85.3	Social work activities

Concerning e-business (or also called e-health⁵) applications, *health and social services* is a particularly interesting sector. On the one hand, it

- is a leading sector as far as economic impact and employment relevance is concerned;
- has been growing at a higher rate than most other economic sectors in recent decades;
- has already been under cost containment pressure for quite some time, and is expected to be even more in coming years due to an ageing society with projected negative impacts on the economic basis of our society, on taxes and social security systems.

On the other hand, healthcare

- has the lowest penetration of ICT applications and e-business solutions; but,
- is expected to provide the greatest cost savings potential of all service sectors; and,
- has been forecast to lead – due to its innovative power and holistic applications also for wellness and sustainability – the next (6th) Kondratieff wave of economic growth and prosperity.

Economic relevance and key players

Apart from its fundamental importance for the health and well-being of European citizens, the healthcare sector is also important from an economic point of view. In 1997 - the latest year for which comprehensive data are available - total expenditure in the EU healthcare sector was more than 622 billion Euro, representing more than 8.5% of EU GDP. The expenditure per citizen - expressed in purchasing power standards (PPS) – has increased more than tenfold since 1970. Most of the healthcare expenditure in Europe is by the public sector, although the extent of public-private mix varies considerably by Member State. Overall, public expenditure averaged at 76% of total expenditure, with the proportion varying from 58% in Greece to 92% in Luxembourg.

The sector employs almost 10% of the active European labour force. In some northern countries the values are significantly higher with 19% in Sweden and 17% in Denmark. At the other end are southern countries such as Portugal with 4.1%, Greece with 4.7% and Spain with 5.4%. Remarkable is also the high proportion – almost one third – of professional employment in the sector, which furthermore underlines its key importance.

⁵ *e-Health* applications is a term usually used in a somewhat different way, mainly focusing on customer-facing and less on back-office services: "eHealth is the use of emerging information and communication technology, especially the Internet, to improve or enable health and health care" in: Eng, T.R. (2001) *The eHealth Landscape*. Princeton, NJ: The Robert Wood Johnson Foundation (www.rwjf.org).

Figure 15-1: EU total health expenditure per capita (in PPS) - 1970 to 1998

Note: Purchasing power standards (PPS) is a unit independent of national currencies, based on purchasing power parities (PPP) used as a factor of conversion.

Source: Eurostat (2001): Key data on health 2000, and Eurostat Yearbook 2002

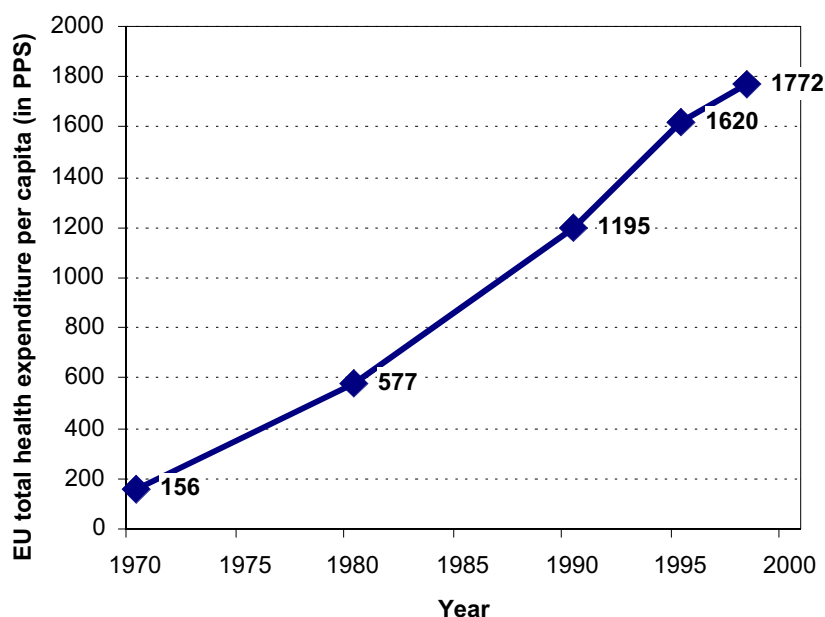


Table 15-1: Health and social work: The main clusters of countries with regard to financing models

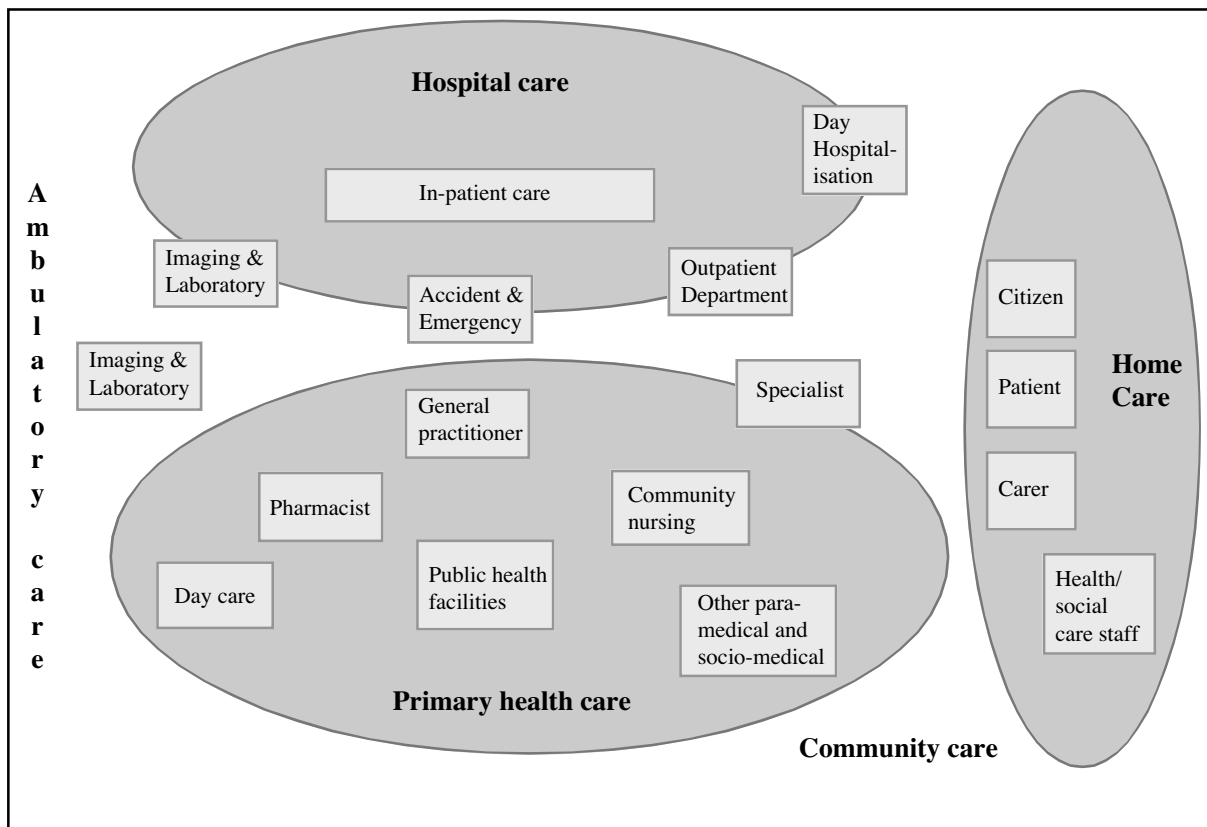
Country	Predominant system of finance	Main supplementary system of finance
Finland, Greece, Ireland, Italy, Sweden, Spain, UK	Public: Taxation	Private voluntary insurance, direct payments
Denmark, Portugal	Public: Taxation	Direct payments
Austria, Belgium, France, Germany, Luxembourg	Public: Compulsory social insurance	Private voluntary insurance, direct payments, public taxation
Netherlands	Mixed compulsory insurance and private voluntary insurance	Public taxation, direct payments

Source: SATS (2001)

Key health services players are:

- **Hospitals:** They form a central part of healthcare systems in all European countries, typically involving between 35% and 50% of total healthcare expenditure.
- **Practice-based doctors, health centres and other establishments:** For non-hospital or ambulatory services, the main delivery settings are doctors' practices, health centres and a variety of other forms of establishment, particularly home care services.
- **Citizens:** At any given point in time many citizens, particularly the very young and the old, are patients, experiencing a wide variety of acute and/or chronic conditions and diseases. Many citizens at any point in time are also carers, providing informal healthcare and support for family members or other citizens.

Figure 15-2: Generic structure of healthcare service provision



Challenges and trends

Population ageing is consistent across the globe. At the start of the twenty-first century, the world population included about 600 million people 65 years and older (10% of the world population), triple the number recorded 50 years earlier (or 8% of the world population in 1950). By mid-century, there will be some two billion older persons (21%), once again a tripling of this age group in a span of 50 years.

An ageing population, with the prevalence of chronic diseases growing and the number of disabled persons rising, will need considerably more informal carers if health and care systems are to remain sustainable. The fastest growing population segment is that of those 80 years and older, who are also most in need of supportive care at home and in institutions.

Traditionally, there has been a tendency to define fairly clear boundaries between "medical" and "social" services and between hospital and ambulatory care. Often this has resulted in poor communication across the sectors with a lack of co-ordination and continuity of care for patients. In many countries there are now moves to better integrate the medical and social aspects. The ageing of the population and the desire to reduce expensive and inappropriate institutional and/or in-patient care are encouraging this. Home care by social care professionals and by non-professionals is becoming increasingly important.

15.2 Usage of ICT & e-business

Deployment of e-business applications will continue to be a continuing stream of work, and implementation and diffusion will never be "complete". "Adoption of Internet business solutions, while driven by specific firm-level needs, seems to have followed a common progression across most organisations. Across all industries, adoption rates for E-Marketing, Customer Service & Support, and E-Commerce

solutions were higher, suggesting that most organisations tackled customer-facing solutions first before focusing on back-office solutions.⁶ This also holds for the health sector.

But the deployment of such applications presupposes an adequate infrastructure plus trained ICT personnel, aspects we will initially briefly look at and report about some key data from the *e-Business W@tch* survey. At the end of this section follows an outlook for e-business diffusion in the health and social work sector focusing on barriers perceived by decision makers in the sector and their expectations on future developments.

15.2.1 Infrastructure

Readiness

The health sector has made considerable progress towards accessing digital networks such as ISDN, DSL or fixed lines, and access to internet services has equally improved (particularly general practitioners and specialists in private practice, and social work organisations: hospitals were already well advanced). Here a value of 82.5% has been measured, indicating that organisations employing more than 82% of all employees in this sector had access to the internet in 2002; 3% planned to get an internet access within the coming twelve months.

In mid-2002, hospitals having access to the internet showed usage rates of around 90% for both e-mail and WWW services, social work organisations reached values of 80% and 72% respectively, and medical practices 74% and 65%.

Figure 15-3: Access to internet services by health sector class (2002)

Base: EU-7 (B, D, F, FIN, I, IRL, UK), all companies, (N=635).

Source: *e-Business W@tch* (2003)

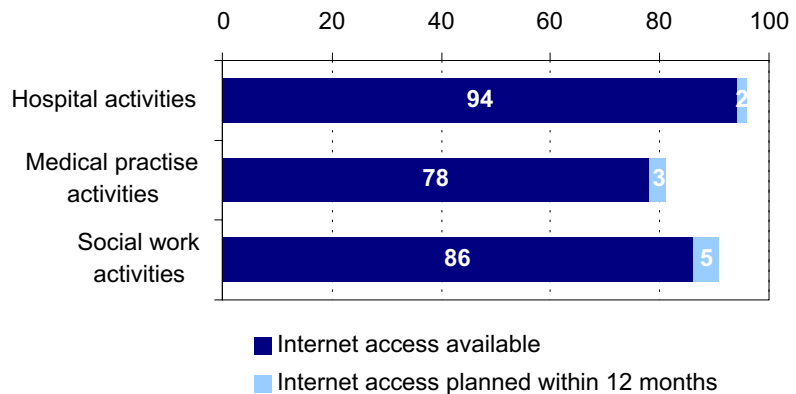
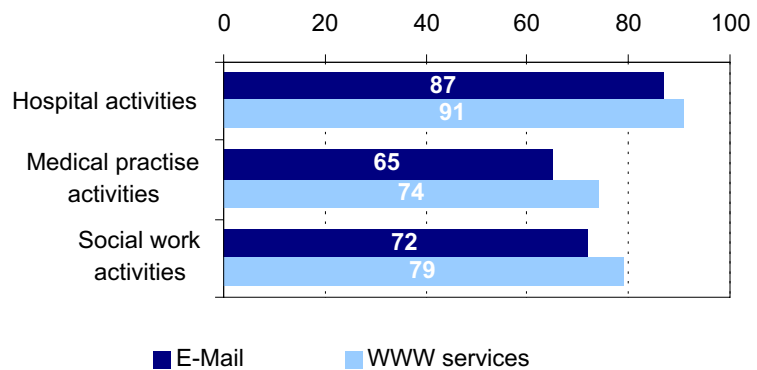


Figure 15-4: Usage rate of e-mail and WWW services by health sector class in % (2002)

Base: EU-7 (B, D, F, FIN, I, IRL, UK), all companies (N=635).

Figures weighted by employment ("enterprises comprising ...% of employees")

Source: *e-Business W@tch* (2003)



⁶ Varian, Hal et al. (2002): The Net Impact Study – The Projected Economic Benefits of the Internet in the United States, United Kingdom, France and Germany (V.2.0) at <http://www.netimpactstudy.com/>, p. 20.

The larger an organisation, the higher are these values. But in spite of this positive development, the health sector is still lagging behind most other European sectors. Implementation rates of LANs and WANs are also increasing considerably, with larger organisations, and in particular hospitals (75% for LANs, 38% for WANs) leading the way.

ICT personnel

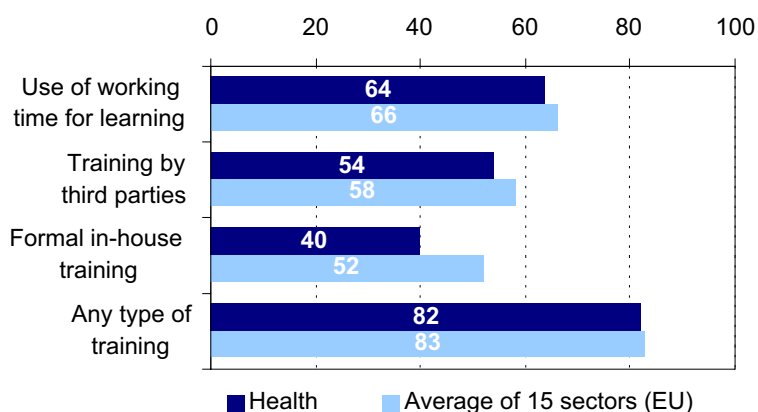
Besides an adequate ICT infrastructure, human capital is an even more important resource necessary for the implementation of ICT-based applications. When surveying the recruitment efforts for ICT personnel over 12 months, only 17% of all health-related organisations undertook such efforts – compared to 30% for the European average and around 60% in the insurance and ICT sectors. Only 7% of the small institutions, but 47% of the large ones have been recruiting. In 2002 the health sector – in line with all other European sectors – still faced considerable problems in finding well-suited employees with special ICT skills. In supporting the acquisition of ICT skills the sector almost meets the EU average.

Figure 15-5: Health and social work: % of organisations supporting the acquisition of ICT skills - compared to the European industry average (2002)

Base: EU-7 (B, D, F, FIN, I, IRL, UK), all companies (N=635).

Figures weighted by employment ("enterprises comprising ...% of employees")

Source: e-Business W@tch (2003)



15.2.2 Customer-facing solutions

Usually a website is the first step of an enterprise towards customer-facing e-business solutions. With close to 50% of all organisations having their own website, the sector lags considerably behind other sectors, and even the planned expansion by about 15% (or a growth rate of 32% within the 12 months period ahead) will not change this, as all other lagging sectors boost similar growth rates. The main thrust will come from the smaller organisations which presently show much lower values than the large ones. About 95% of all organisations providing a website use it (also) for presenting information on their various services; this holds for all sector classes and sizes of organisations.

Table 15-2: Having a website (%) by size of organisation (2002)

Size of organisation	Have a website	Plan to have a website by mid 2003	Total expected diffusion by mid 2003
0-49 employees	37	17	54
50-249 employees	53	21	74
250+ employees	82	11	93

Base: EU-7 (B, D, F, FIN, I, IRL, UK), all companies (N=635). Figures weighted by employment ("enterprises comprising ...% of employees"). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)

In the medical and social work sector, more advanced e-commerce activities in the sense of "selling" health and wellness, e.g. hospital beds for a certain therapy to consumers/patients, will both for ethical reasons and rules of professional code of conduct remain limited to niche applications. Therefore it is

not surprising that of medical organisations surveyed only 6% said that they engage in “selling” online (compared to 17% for all sectors in the EU and, e.g., 46% for the insurance sector). And only 1.5% indicated that they will start e-commerce activities within a 12 months period ahead (compared to an EU average of 9.5% and values between 7% and 24% for other sectors lagging behind like the health sector). Notably, these few health-related organisations already selling online are very advanced in their activities - but not at all typical for the health sector.

15.2.3 Back-office applications

Considering the key importance of “people” in this sector, it is not surprising that 25% post vacancies on internet boards, a value considerably higher than in many other sectors. Hospitals even reach a value of as much as 40%. Another interesting aspect is e-learning: with 16% of all organisations active in applying such techniques, health is close to the European average of 19%.

On a more advanced level, online-based human resources management systems could become a key application. Here, with a value of 21%, the health sector also comes close to the EU average of 23%. Size is again the determining factor: 57% of the largest organisations already make use of such systems, but only 9% of the small ones.

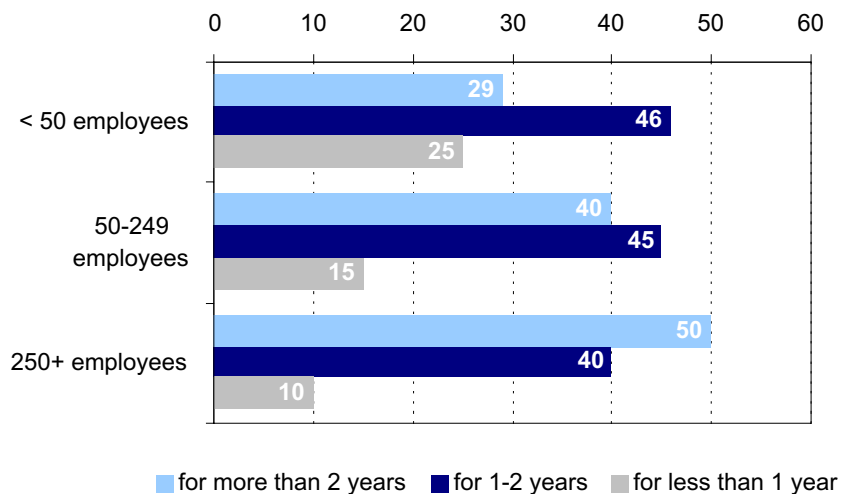
After personnel, *procurement* of supplies concerns the second largest cost factor. Online procurement has grown consistently and strongly in recent years and will continue to do so: the health sector, with 46% (37% in 2002 plus 9% planning to purchase online by mid 2003) is again close to the EU average of 50%.

Figure 15-6: Health and social work: Dynamics of online procurement by size of organisation (2002)

Base: EU-7 (B, D, F, FIN, I, IRL, UK), companies procuring online (N=219).

Figures weighted by employment (“enterprises comprising ...% of employees”). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)



When considering the wide variety and complexity of internal administrative and management tasks and of external relationships, a large potential for improving workflow through *advanced e-business applications* is likely. However, the survey data show that – in line with most other European sectors (cf. Part A of this report) – so far only marginal numbers of health organisations participate in e-marketplaces, or apply Supply Chain Management (SCM) or Enterprise Resource Planning (ERP) systems, or draw on the services of Application Service Providers (ASP).

Outsourcing of ICT activities to application service providers (ASP) would allow also micro establishments an easier participation in e-business activities. Initially seen as a perfect solution for the health industry with its multitude of different care service providers, many of which are capital-starved, the uptake has been very slow up to now: “Crowned early in the e-health age – in other words last year [2000] – as the information technology heir apparent, ASPs are suffering from an identity

crisis.”⁷ Lack of standardisation, security and privacy concerns, costly interfaces to integrate such systems with existing practice and hospital management systems, and the danger of being totally dependent on an external provider – many of whom have already failed – are barriers to the success of this model.

However, looking into the future, a core component in streamlining many administrative processes must be the Electronic Health Record – EHR – (or Electronic Medical Record – EMR) integrating all relevant information on a patient. “The holy grail of connectivity is the transformation of the current paper-based medical record into an electronic medical record that is accessible to all necessary providers and possibly to the patient.”⁸ The internet is regarded as *the* means to provide the necessary *connectivity*, offering lower costs, improved functionality, a greater potential for networking and for sharing complex data. However, as the *e-Business W@tch* survey data indicate, the sector still has a long way to go to reach this goal.

15.2.4 Outlook for e-business diffusion

Barriers

When asked about their assessment of various barriers commonly raised about *selling online*, health sector executives do not vary much from assessments voiced in other sectors. A considerable majority (72%) agrees strongly or somewhat that many of the goods and services of this sector do not lend themselves to be sold online. 51% regard as a barrier that only a few of their customers currently have online access, and data privacy or data security concerns of clients are assumed by 51%. The processing of payments for online sales (33%), the low revenue potential (28%) or the handling of delivery processes (22%) are not seen as major barriers.

On the other hand, those few *actually* selling online (6%) report to a large majority (78%) very positive or fairly positive effects on their sales area, on the quality of their customer services (69%), on their sales volume (67%) and on the number of customers (61%). It seems that these few innovators reap considerable benefits from their entrepreneurial behaviour and an early start in a new market.

With respect to barriers to *procuring online*, 54% regarded face-to-face interaction with suppliers as still relevant, 44% argued their preferred suppliers do not sell online, and 24% mentioned that the suppliers’ technical systems are incompatible with their own. 47% believe that the cost advantage is more or less insignificant. When *buying* products or services online, health sector managers are more than the European average concerned about data protection and security (58% to 54%). For large organisations this value reaches even 74%.

When considering the *impact* of online procurement, the assessment is fairly positive: 59% state that procuring online has a very positive or fairly positive effect on their procurement costs, 51% were able to improve the efficiency of their internal business processes, and 37% reduced the costs of logistics and inventory.

Developments expected

However, in spite of these relatively positive impacts, the overall assessment is rather sobering. Even for those organisations agreeing that e-business has already had a significant (9%) or at least some (42%) impact on their operations, these changes seem to be of minor relevance. And when assessing the near future, it is important to note that of those almost 50% of organisations for which e-business does not yet constitute a part of the way the organisation operates, only 20% expect that it will constitute a significant part of their operations within two years, whereas 68% foresee no change in

⁷ Lutz, S. and Henkind, S.J. (2001): *e-essentials – The Role of ASPs*, in: Healthplan, May/June, pp. 78-80.

⁸ Danzon, P M, Furukawa, MF: *Health Care: Competition and Productivity*, p. 195, in: Litan, R. and Rivlin, A. (2001) *The Economic Payoff from the Internet Revolution*. Brookings Task Force on the Internet. Washington, D.C.: The Internet Policy Institute, Brookings Institute Press, p. 208.

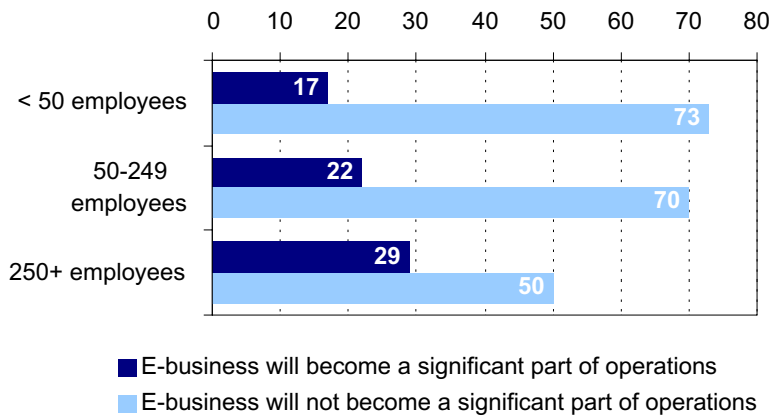
this respect. This correlates with size, i.e. larger organisations will continue to progress towards wider applications of e-business solutions faster than smaller ones. And these impressions of an only slowly developing e-business culture are further confirmed by the observation that only 26% of decision-makers foresee increases, but 67% a maintenance of current levels of e-business spending, values which imply that the health sector trails behind almost all other EU sectors.

Figure 15-7: Health and social work: Expected significance of e-business within 2 years by size of organisation (2002)

Base: EU-7 (B, D, F, FIN, I, IRL, UK), companies for which e-business does not yet constitute a significant part of business.

Figures weighted by employment ("enterprises comprising ...% of employees"). Reporting period: June/July 2002.

Source: e-Business W@tch (2003)



15.3 Conclusions

From "non-users" to "e-carers"

In summary, a generic typology of IST utilisation in the health and care sector can be observed:

- **"Non users"** do not at all use IST in their office or organisation (apart from a wired telephone).
- **"Office only users"** use computers for a variety of disconnected administrative purposes, but they do not maintain an own website.
- **"Onliners"** maintain their own website, but they do not utilise IST for the purposes of delivering care to their clients.
- **"E-carers"** will utilise IST for delivering to and supporting care for their clients.

The further progression will go towards the application of e-business back-office solutions, a field where large cost savings are expected. However, despite a high level of awareness about Internet-based administrative, procurement or supply chain management solutions, there is little activity to date in the EU. A large hurdle is issues of technical infrastructure – legacy information systems for purchasing, stand-alone systems for various administrative tasks, past investments in EDI. Another problem is that many EDI initiatives started in the 90s did not live up to the expectations created, and health managers are therefore sceptical to experiment with new applications.

The need for a holistic approach

E-business solutions will only become more successful and sustainable if and when they fully reflect the aligned interests and incentives of patients and consumers, physicians, hospitals, carers, and payers. Whereas first attempts at Internet-based e-health solutions have been and often still are what has been termed "vendor-centric", adding considerable costs to the health sector's expenditures and taking valuable time of professionals, the next wave is expected to be at least "physician-centric", involving new suites of e-business applications that address real workflow and the complexity of the health service value chain.

However, e-health will only become successful in the longer run and permeate the whole health care system if and when it evolves to a stage where it fully integrates and accommodates the aligned interests and incentives of patients and consumers, physicians, hospitals, carers, and payers. In other words, Europe needs a progression towards “system-centric” or holistic e-business solutions.

Re-inventing the healthcare enterprise

Some larger organisations in particular - (private) hospitals and health trusts - are already well on their way towards taking advantage of ICT and e-business solutions and thereby improving their competitive position in a highly regulated, but increasingly competitive market. They may become the hubs of regional e-business healthcare networks developing into integrated healthcare enterprises, thereby re-inventing themselves. A key trend is the development of *Integrated Healthcare Communications Systems* (IHCS), a trend which signals dramatic changes about to impact on the hospital information system market and healthcare provision in general across Europe. It will provide the much needed health care system (inter-)connectivity which may become *the* technical and economic driver for e-business diffusion in the health and social care sector.

Policy implications

Drivers of change: National and European strategies and policies for the development of an e-health infrastructure can become key drivers of change. Allowing benefit/cost stimuli to work, and supporting competition for quality oriented patient-centred service delivery processes will speed up the implementation of e-healthcare applications.

Barriers to change: To allow European health systems and patients to reap the expected benefits from the widespread diffusion of e-business solutions, policy measures will be needed to overcome a wide variety of barriers to change and to assure a fair distribution of costs and expected benefits amongst all players. This includes specific support for micro organisations, investment support for (national) ICT health infrastructure development or initiatives to provide solutions for security and privacy concerns acceptable to all.

Ageing of societies: Demographic change and its impact on European economies in general and health systems in particular necessitate policy action to speed up the diffusion process of e-business solutions to support cost containment in the health sector and the necessary expansion of services.

Medical divide: Specific policy measures are needed to allow people with special needs to take full advantage of the benefits e-health promises for all European citizens.

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Annex: Methodology of the e-Business Survey 2002

Background

Most of the data presented in this report are derived from the European e-Business Survey 2002, a cornerstone of the monitoring activities of the *e-Business W@tch*. In total, 9264 telephone interviews with decision makers in European enterprises in all EU Member States were conducted during June and July 2002. For the construction of the questionnaire and for underlying definitions, OECD recommendations were taken into account.

Field work

The field work of the survey was carried out by INRA Germany in co-operation with its partner organisations on behalf of the *e-Business W@tch*:

Country	Organisation	Country	Organisation
Austria	Spectra Marktforschung: Brucknerstr. 3-5/4, 4020 Linz	Italy	INRA Demoskopea S.p.A., Via Rubicone 41, 00199 Roma
Belgium	INRA Belgium, Avenue de la Couronne 159-165, 1050 Brussels	Luxembourg	ILReS Market Research, 46, Rue di Cimentière, L-1338 Luxembourg
Denmark	Gallup TNS Denmark, Masnedogade 22-26, 2100 Copenhagen	Netherlands	Blauw Contactcenter, Conradstraat 18, 3013 AP Rotterdam
Germany	INRA Deutschland GmbH, Papenkamp 2-6, 23879 Mölln	Portugal	Metris GfK, Av. Eng. Arantes e Oliveira 3-2, 1900-221 Lisboa
Finland	Taloustutkimus Oy, Lemuntie 9, 00510 Helsinki	Spain	INRA España S.A., C. Alberto Aguilera, 7-5, 28015 Madrid
France	CSA TMO, 22 rue du 4 Septembre, 75065 Paris Cedex 02	Sweden	GfK Sverige, Box 401, 221 00 Lund
Greece	MEMRB – K.E.M.E, 24 Ippodamou St., 11635 Athens	UK	Continental Research, 132-140 Goswell Road, EC1V 7DY London
Ireland	Lansdowne Market Research, 49 St., Stephens Green, Dublin 2		

Interview method

The field work was carried out in June and July 2002 using computer-aided telephone interview (CATI) technology. The decision maker in the enterprise targeted by the survey was normally the person responsible for ICT within the company, typically the IT manager. Alternatively, particularly in small enterprises which may not have a separate IT unit, the managing director or owner was interviewed.

Population coverage and sampling

The highest level of the population for the e-Business Survey was the set of all enterprises which are active at the national territory of one of the EU Member States and which have their primary business activity in one of the 15 sectors specified by NACE Rev. 1 codes. The most important used viewpoints for breakdown of the population in the survey were (i) the economic activity, (ii) the national territory of the enterprise and (iii) the size in terms of employees. The survey was carried out as an enterprise survey, i.e. data collection and reporting focuses on the enterprise (rather than on the establishment), defined as a business organisation of one or more establishments comprised as one legal unit.

The sample included enterprises from 15 sectors of the economy, defined by NACE Rev. 1 business activities (see table next page). The composition of sectors took into account their economic importance, homogeneity with respect to the analysis of e-business, and the relevance of e-business activities.

The sample drawn was a random sample of companies from the respective sector population in each Member State where the respective sector was to be surveyed with the objective to fulfil quota with respect to company size class. Target quota were to include a share of at least 10% of large companies (250+ employees) per country-sector cell and at least 30% of medium sized enterprises (50-249 employees).

Samples were drawn locally by the INRA partner organisations based on the acknowledged business directories and databases (cf. table next page).

Population coverage of the e-Business Survey (2002)

No.	NACE Rev. 1 Codes (Section – Division/Group)		Sector Name
01	D	15, 16	Manufacture of food products, beverages and tobacco
02	D / O	22, 92.1, 92.2	Publishing, printing, reproduction of recorded media, audiovisual services
03	D	24, 25	Manufacture of chemicals and chemical products
04	D	28	Manufacture of metal products
05	D	29 (except 29.6, 29.7)	Manufacture of machinery and equipment
06	D	30, 31 (except 31.3 - 31.6), 32	Manufacture of Electrical machinery and electronics
07	D	34, 35	Manufacture of transport equipment
08	G	52.11, 52.12, 52.4	Retail
09	H / I / O	55.1, 55.2, 62.1, 63.3, 92.33, 92.52, 92.53	Tourism
10	J	65.12, 65.2	Credit institutions, investment firms and leasing enterprises
11	J	66	Insurance and pension funding services
12	K	70	Real estate activities
13	K	74	Business services
14	I / K	64.2, 72	Telecommunications and computer-related services
15	N	85.11, 85.12, 85.3	Health and social services

Country	Directory / Database	Country	Directory / Database
Austria	Herold BUSINESS MARKETING database	Italy	Dun & Bradstreet
Belgium	SPECTRON database by Vicindo	Luxembourg	Répertoire des entreprises luxembourgeoises by STATEC (the official list of the National Statistic Administration).
Denmark	KOB (Købmandsstandens Oplysnings Bureau)	Netherlands	MarktSelect
Germany	Heins und Partner Business Pool	Portugal	Business directory by INE (the National Statistics Institute)
Finland	Blue Book - Salesleads database by the Helsinki Media Company Oy (Sanoma Magazines Finland)	Spain	Dun & Bradstreet
France	IDATA, based on "INSEE Siren file" (the National Institute of Statistics) and other directories	Sweden	Swedish Post Adress Register (PAR)
Greece	ICAP directory (the major database for Greece)	UK	Dun & Bradstreet
Ireland	Bill Moss / Dun & Bradstreet		

In total, 9264 interviews were carried out. The following table shows the breakdown by country and the average interview length:

Country	No. of interviews	Average length	Country	No. of interviews	Average length
Austria	308	17.0 min.	Italy	1517	22.5 min.
Belgium	300	18.2 min.	Luxembourg	102	17.4 min.
Denmark	304	20.2 min.	Netherlands	500	17.2 min.
Germany	1500	18.8 min.	Portugal	300	23.0 min.
Finland	308	20.6 min.	Spain	502	18.4 min.
France	1362	17.2 min.	Sweden	260	19.8 min.
Greece	308	16.5 min.	UK	1538	16.5 min.
Ireland	155	20.1 min.	TOTAL	9264	~ 18 min.

Problems encountered

No major problems were reported by the fieldwork organisations with respect to interviewing (e.g. comprehensibility of the questionnaire, logical structure). A statement from the institute that carried out the survey in the UK summarises this general assessment very well: "On the whole, the fieldwork went relatively smoothly. The questionnaire was logically structured and flowed naturally. Most problems stemmed from the difficulties of conducting research projects among ICT decision makers in general rather than from any specific flaws in design of this project itself. Dedicated ICT professionals are heavily researched and therefore securing their participation can be difficult. This is a particular problem in larger companies."

In some countries, it was not possible to accomplish the number of interviews envisaged, mainly in those cases where the total population of enterprises was relatively small (e.g. in the insurance sector in smaller countries). In some cases, the objective of including a share of 10% of large companies could not be accomplished; if possible, these were then replaced by interviews with SMEs.

An issue – which was known in advance but is unavoidable in telephone interviews – is that it is not always easy to find the right target person. Field work organizations reported that sometimes a data processing manager is not very aware of the consequences of e-business on the whole of the company, on the personnel level and on the financial level. On the other hand, the general manager may not always be aware of the implementation status and technical consequences.

Tabulations

Within the coverage specified above, and in line with the special task of the *e-Business W@tch*, results were compiled for mainly two sets of data:

1. An activity breakdown of the population of enterprises into 15 sectors. This breakdown is based on the aggregate of four countries (D, F, I, UK), as in these countries all 15 sectors were included in the survey and therefore comparability of the sample is given. These four countries represent more than 60% of the market volume in any of the 15 sectors and in most sectors actually more than 70%.
2. A size-class breakdown of the population of enterprises into three categories: small enterprises (including micro-enterprises, i.e. enterprises with 0-49 employees), medium sized enterprises (50-249 employees) and large enterprises (250+ employees).

A breakdown of the population by EU Member States is also available, but it is restricted to four countries (D, F, I, UK) for the same reason as explained in (1.) above. This implies that two different kinds of totals were calculated: (i) an EU-4 total consisting of the results from Germany, France, Italy and the UK and (ii) a sector total consisting of all countries included in the survey of a particular sector. For reasons of comparability and consistency, tables comparing sectors build on the EU-4 totals. Sector totals are composed of 6-8 countries per sector.

In addition, the activity breakdown was cross-tabulated with the country as well as with the size-class breakdown. These cross-tabulations are offered in special sector databases. However, depending on the indicator and the filter questions, the number of observations can become very small in many cells of this cross-tabulation. It is therefore recommended to limit the breakdown of data to one dimension (in the case of pre-filtered questions) or two dimensions (if all enterprises were asked).

Weighting principles

Two weighting schemes have been applied: weighting by employment and by the number of enterprises. Data are presented in either way depending on the kind of the analysis to be made.

- Values that are reported as weighted by employment figures should be read as "enterprises comprising x% of employees". To give an example: The indicator "*percentage of companies selling online*" is – if weighted by employment – defined as "*companies comprising x% of employees sell online*". The reason for using employment weighting is that there are very many more micro enterprises than non-micro enterprises. The unweighted figure would effectively represent mainly the smallest sizes of firm.
- Values that are reported as enterprise weighted figures are to be read as "x% of enterprises", reflecting the number of enterprises as legal entities but not their relative economic importance in terms of employment.

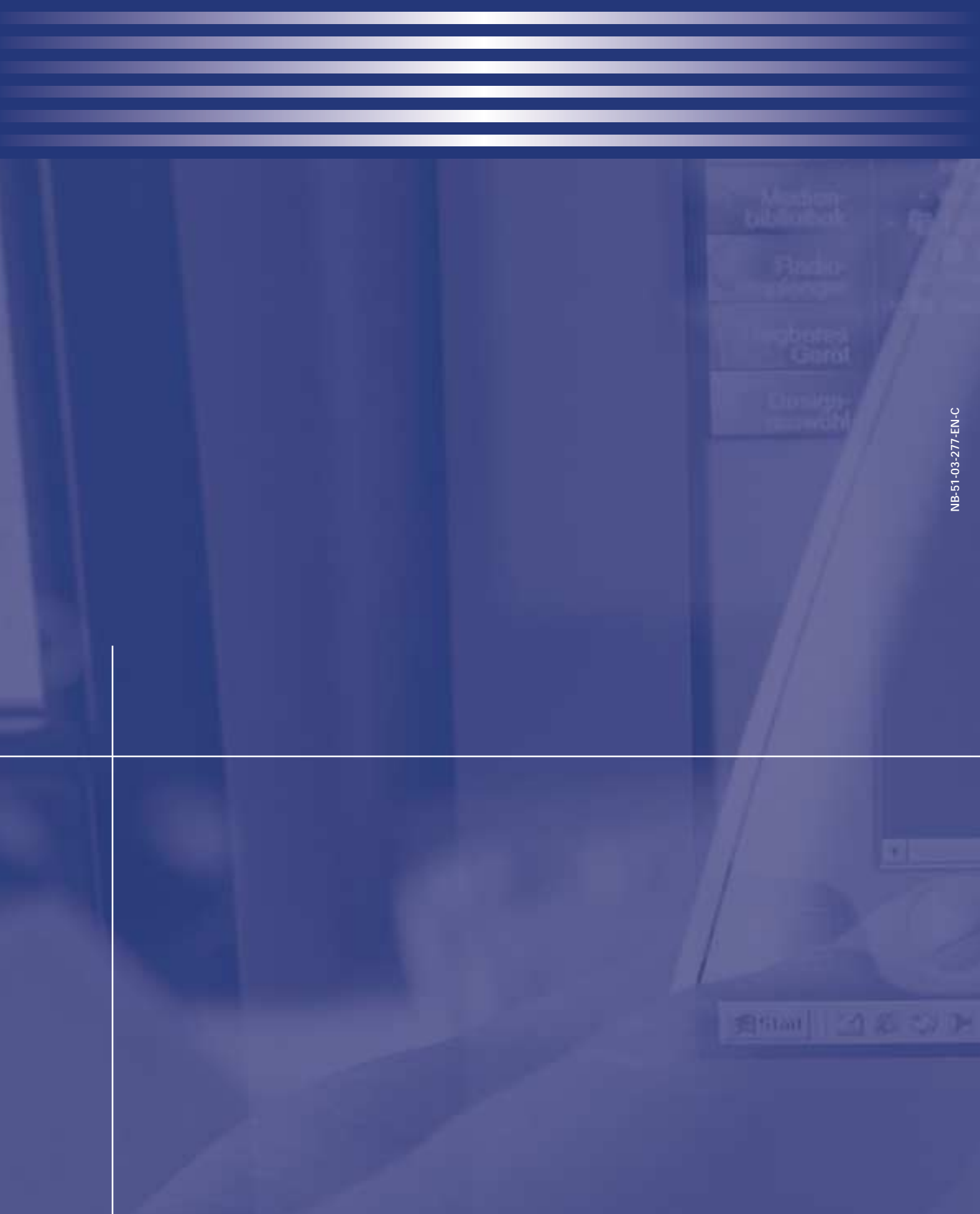
Weighting was based on the latest available universe figures by Eurostat. Missing or undisclosed universe data had to be imputed. The imputation procedures depended on auxiliary or proxy data availability, taking into account where available information about higher industry aggregations, nearest neighbour data, turnover-employment correlation and secondary sources other than Eurostat and allowing for the constraint of predetermined ranges such that imputed data had to be contingent with published sectoral, national and European universe totals as well as for final plausibility checks for every single imputed data item. The weighting cells correspond to the data reporting pattern used as regards industries and employment size-classes. Uniform expansion factors are applied to enterprises within one of the three size-classes per industry per country. As for data that refer to a base other than the universe of all enterprises (e.g. indicators appropriately reported for online selling enterprises only), expansion factors are adjusted to the different shares of observations per cell that build the computation base.

Variables - indicators

The set of ICT and e-business indicators for which data were collected in this survey can be structured into five main modules:

- Module A: ICT infrastructure and e-skills development in the company
- Module B: E-commerce and e-business usage
- Module C: Barriers to e-commerce
- Module D: Impact of selling and procuring online
- Module E: Impact of and satisfaction with electronic business

The choice of indicators includes a basic set of widely accepted measures for e-commerce and e-business (as used in related surveys on e-commerce and e-business e.g. by Eurostat), but also introduces a few innovative indicators which have a pilot character and are not yet widely tested. The full list of variables which was the basis for preparing the questionnaire can be downloaded (as a spreadsheet) from the *e-Business W@tch* website at its "database" section (http://www.ebusiness-watch.org/marketwatch/database/survey_info.htm).



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