Enterprise publications

The European **e-Business Report**

2003 edition

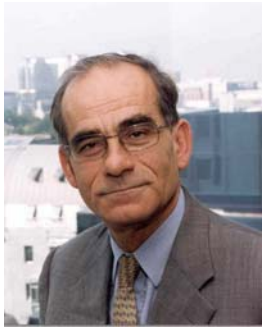
A portrait of
e-business in 15 sectors
of the EU economy

Second Synthesis Report of the

e-business w@tch

European Commission

Foreword



The improvement of competitiveness in Europe, through structural renewal and reform, is a critical factor in achieving the Lisbon Strategy goals. In this respect, Information and Communication Technologies (ICT) play an important role to foster innovative products and business processes. What is at stake is the productive use of ICT, not only Internet connections or selling online. Indeed, it is the competitiveness of companies and sectors that needs to be raised and this can be achieved by increasing their productivity through fully exploiting the potential of ICT that have been deployed in the last years. In other words, the challenge has now shifted to incorporating electronic business in both the internal and the external activities of companies – and that is a major structural change.

The *e-Business W@tch* provides valuable statistics and in-depth analysis on the progress made in this respect in various sectors of the European economy. In fact, it has proved that it is predominantly the sector and the size of the company that determine the nature and the level of e-business activities in Europe. National and regional differences have to be viewed in light of the sectoral differences between the national economies. Not all sectors and enterprises lend equally to e-business activities and this has to be taken into account when comparing the e-business performance in different Member States. This is an important lesson to be learned from the analysis of the *e-Business W@tch*, as presented in this report.

Another conclusion is that sectoral specificities and in particular the needs of SMEs should be duly taken into account when defining and implementing policy actions in support of e-business. The policy focus has to be shifted from promoting Internet connections and electronic commerce to facilitating structural change in general. E-business policies are part of enterprise policy, in order to raise productivity and to help industrial sectors and SMEs to better manage the change towards a knowledge-based economy. The *e-Business W@tch* is a very useful tool for basing e-business policies on clear rationale. The next step will be to further develop this tool with the view to providing European enterprises with a basis for self-assessing their e-business performance. This will assist enterprises in their effort to adapt their business strategies in order to reap the full benefits of ICT and e-business.

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Introduction

European policy is increasingly focussed on promoting business practices and new ways of working that will increase the competitiveness of enterprises and provide the economic and social foundation for the knowledge economy in Europe. The eEurope 2002 Action plan provided the basis for targeted actions to stimulate the use of the internet for accelerating e-commerce, acknowledging that "electronic commerce is already developing dynamically in inter-business trading […]" and that "it is important for SMEs not to be left behind in this process […]." The eEurope 2005 Action Plan, endorsed by the Seville European Council in June 2002, confirms and builds further upon these objectives with Action 3.1.2. "A dynamic e-business environment", which defines 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".[1]

To help policy-makers define their initiatives, 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.

Therefore the European Commission, DG Enterprise, launched in January 2002 the *e-Business W@tch*. During its 18-month period of operation, the *e-Business W@tch* has presented a set of e-Business Impact Studies for 15 sectors of the economy and carried out two representative surveys of close to 13,000 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 is based on a three-part-analysis of the uptake of information and communication technologies and their application for e-business: (a) infrastructure ("readiness"), (b) activities and (c) impacts (more information available at www.ebusiness-watch.org).

This is the second and Final Synthesis Report of the first period of the *e-Business W@tch*. The executive summary presents an assessment of the overall "e-proximity" of the 15 sectors analysed in 2002/03, using a concept similar to the "e-Business Index" of the Council Resolution on the implementation of the eEurope 2005 Action Plan. Part A summarises the statistical picture, focusing on results of the e-Business Survey 2003, and features an international e-business outlook. Part B of the report presents a synopsis of the Sector Impact Studies, focusing on the recent series of seven sector studies with 2003 data that were not included in the first Synthesis Report from March 2003. Part C adds contributions on specific electronic business issues from various authors, for example on internet trading platforms and on the challenges for small and medium-sized enterprises.

Research presented in this report is intended to contribute in benchmarking progress and in assessing how electronic business developments can be further enhanced to strengthen the competitiveness of European businesses. Special attention is paid to the SME dimension of e-businesses, notably SMEs. The *e-Business W@tch* will continue its operation on similar methodological lines, focusing on the ten most interesting sectors and increasing the dialogue with industry associations and e-business stakeholders across Europe.

[1] eEurope 2002 Action Plan, prepared by the Council and the European Commission for the Feira European Council, 19-20 June 2000; eEurope 2005 Action Plan, COM(2002)263 final

Part A: Synopsis of Main Findings

A.1 Executive Summary

1.1 Main findings and trends in 2002/03

In spite of the continuing overall difficult economic situation and market conditions for business innovation and investment, electronic business continues to show a dynamic development in the European Union. New technological developments (wireless access technologies, for example) on the one hand, and the increasing competitive pressure on companies in a global economy on the other, resulting in a constant search for opportunities to cut costs, are the main drivers. Innovation in electronic business always implies new opportunities as well as challenges for enterprises.

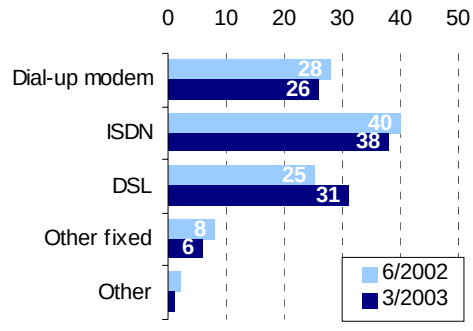
EU companies accounting for close to 60% of employment said in 3/2003 that e-business had already at least some significance for the way they operate. This is an increase by five percentage points compared to June 2002. About 11% said it constituted a significant part of their business activities. The share of companies which attribute significance to electronic business has increased in all size-classes, although in the smallest size-class only marginally.

Improvements in infrastructure – from basic access to quality connections

The e-Business Survey 2003 confirmed that a vast majority of enterprises from all sectors and countries uses computers and has Internet access. 93% of all employees from the seven sectors surveyed in March 2003 work in companies that use computers and 87% in companies with Internet access. As in 2002, the share of "offliners" was found to be highest in retail and in the food and beverages producing industry.

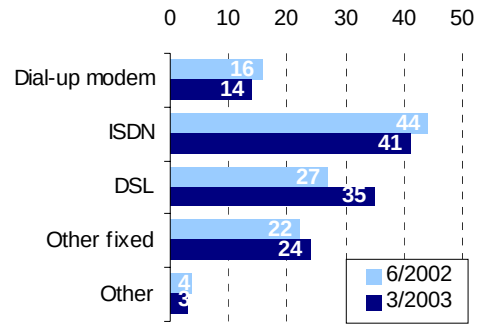
In the 2002/03 report, it was pointed out that "[…] there are still significant differences with respect to the quality of businesses' Internet access, especially with regard to bandwidth", and that the diffusion of broadband connectivity, particularly among SMEs, would be an important issue to be monitored. This objective is backed by the eEurope 2005 Action Plan which dedicates a whole action line to the deployment of broadband. In fact, the e-Business Survey 2003 indicates an incipient migration towards DSL connections among small and medium-sized enterprises. This is a promising trend, although it needs to be confirmed and consolidated by future research. The share of small companies using DSL connections has increased from 25% to 31% of all firms connected to the Internet, the respective share of medium-sized enterprises from 27% to 35%.

Exhibit 1-1: Internet connection mode in small enterprises (0-49 employees) – 2002/03



In % of enterprises. Base: small enterprises with Internet access, EU-4 (D, F, I, UK), 7 sectors. N=1393 (2002); N=1397 (2003).

Exhibit 1-2: Internet connection mode in medium-sized enterprises (50-249 employees)



In % of enterprises. Base: medium-sized enterprises with Internet access, EU-4 (D, F, I, UK), 7 sectors. N=779 ('02); N=819 ('03).

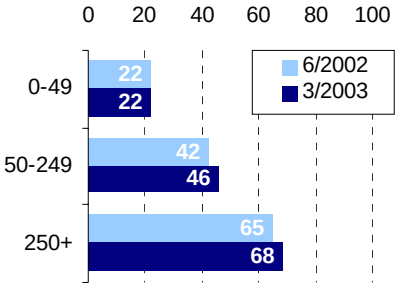
Source: *e-Business W@tch* (2002/03)

From remote to wireless

Enabling remote access to the company's computer network is a second important aspect and indicator of how advanced a firm's ICT infrastructure is. Remote access is a technical prerequisite to facilitate flexible work forms such as mobile work and homebased telework. The technical infrastructure is currently most widespread in high-tech manufacturing and service sectors. In ICT services, for example, more than 70% of employees already work for companies where remote access is possible. The average deployment of remote access was 43% (of employment) in the seven sectors covered in 2003, with an observable increase in medium-sized and large companies compared to 6/2002.

A rather recent development in the area of electronic business is the "wireless revolution". The current furious pace of wireless access technology development presents new opportunities and challenges for enterprises – for innovation of work and production processes on the one hand, and for new business opportunities on the other. Many IT and e-business experts forecast that the "wireless revolution" will dramatically change the way in which the Internet is being used by consumers and companies. However, at the same time, wireless access technologies open up a new field of relevant IT skills which companies need to possess in order to successfully implement and use them. As these technologies become more and more widespread, it will be important to monitor and assess their impact on business processes and companies.

Exhibit 1-3: Companies enabling remote access to their computer system



Base: all enterprises, 7 sectors, EU-4.

Source: *e-Business W@tch* (2002/03)

W@tchlist – this will be important:

- Continue monitoring of the diffusion of broadband connectivity, particularly among SMEs
- Assessment of regional ICT infrastructure policy with respect to demand from businesses
- Deployment of remote access to companies' IT networks as a prerequisite to facilitate flexible and mobile work
- Impact of emerging wireless web access technologies on business activities
- Assessment of the IT skills gap in 2003/04 – is it a phenomenon of the past?

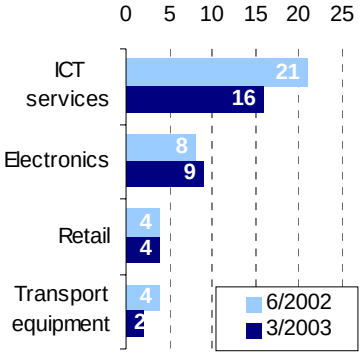
The IT skills gap has narrowed, but not totally disappeared

Results of the e-Business Surveys 2002 and 2003 suggest that the "IT skills gap" is less dramatic than in the Internet and IT boom years of 1999 and 2000. Linear projections from those years which could not anticipate the economic developments since 2001 are no longer valid. The *e-Business W@tch* has evidence that the percentage of companies seeking IT specialists in 2002/03 was even lower than in 2001/02. While 14% of all companies and close to 50% of large companies had reported recruitment activities for the 2001/02 period, only 8% of all companies and 40% of large companies reported demand in 2002/03.

However, in spite of the lower level of activities, the percentage of companies that reported difficulties in finding adequate personnel remained the same. On average, about 5% of all enterprises experienced difficulties (compared to 6% in 2001/02). It can be speculated that the percentage would not differ very much for other qualifications than IT.

At the same time, as the complexity of e-business implementation and integration is increasing (which demands managerial as well as technical know-how), career opportunities for people with a sound qualification mix in areas relevant to e-business will continue to be excellent. Furthermore, demand is likely to increase again once the economy starts to recover (albeit not at the frenzied recruitment level of 2000). It would therefore be short-sighted to step back from ambitious programmes and initiatives launched to improve the skills base.

Exhibit 1-4: Companies with difficulties in finding IT specialists in 2002/03 (selected sectors)



Base: all companies, EU-5 / EU-4.
In % of companies.

Source: *e-Business W@tch* (2002/03)

"Challenge 1: To improve managerial understanding and workforce skills for e-business"

"[…] In general, SMEs face greater difficulties than large companies, both in recruiting ICT and e-business specialists to cope with the associated organisational changes and to train their employees to acquire the skills required to implement these changes. Improving the e-skills of the general workforce is critical to the successful implementation of e-strategies in businesses. There are different paths to this goal, but in most cases a combination of different ways of learning (or "blended learning"), both formal and informal, will be the most effective, typically consisting of traditional training, self-learning and learning-on-the-job. […] a dialogue between all relevant stakeholders on the certification of skills developed through informal and on-the-job training should be fostered."

from: Adapting e-business policies in a changing environment: The lessons of the Go Digital initiative and the challenges ahead. Communication from the Commission, COM(2003)148 final.

E-commerce activities: rapid development of online purchasing

In a special report on "The development of e-commerce in the European Union" in May 2002, the *e-Business W@tch* assessed the maturity of e-commerce in the EU. The report concluded that "[…] a general disappointment with the speed of adoption of electronic commerce in the European Union may not be justified or at least exaggerated since it is partly based on a too limited and simplistic view of what constitutes electronic commerce" while acknowledging that "[…] growth dynamics has been very different across Member States, and that particularly small and medium sized enterprises – even in countries belonging to e-commerce forerunners – are now facing difficulties in taking the next step, which is to implement electronic commerce as an integrated part of their general business processes."

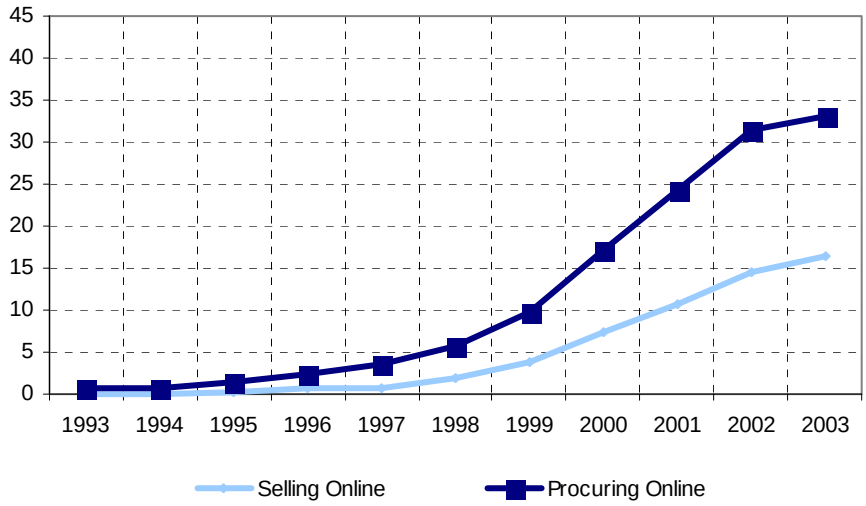
Now, about a year after this initial assessment, this finding is still valid, although a quite dynamic development can be observed in specific areas of e-commerce. The main trends can be summarised in three points:

- Online selling – at least in the narrow sense of making transactions with customers through online networks – has not yet reached the volumes that were anticipated a few years ago during the boom time of the Internet economy. This observation does not only apply to the percentage of companies that offer goods or services online, but also to the volume of online sales (as % of total sales). More than 70% of the companies selling online in 2003 report that online sales account for less than 10% of their total sales. Thus online selling is typically a sideline complementing the main sales channel(s).
- Electronic procurement, on the other hand, has shown a rapid development since the late 1990s, if simple forms of e-procurement such as making online purchases via the website of suppliers are included. One in three enterprises of the seven-sector-sample surveyed in March 2003 and 58% of large enterprises make online purchases of MRO[2] goods or direct production goods.
- With respect to online selling, particularly in the B2C arena, it should not be forgotten that web-influenced sales play a very important role in some retail areas (for example, used cars), but are not covered by most current statistics on "online sales", including the *e-Business W@tch* statistics. Web-influenced sales are sales where customers first search for information about the availability and the price of products and services on the Internet before buying the selected item in a "traditional" way, possibly in the shop that had the best online offer.

[2] MRO goods are "maintenance, repair and operating goods".

Exhibit 1-5: Diffusion of e-commerce in EU companies, 1993-2003

Computed based on questions on the starting time of online selling / procurement activities.



In % of enterprises. Base: Survey 2003, 7 sectors, companies selling / purchasing online

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

It is very difficult to assess the total share of online sales compared to the level of traditional forms of ordering and purchasing goods and services, including both B2C and B2B transactions. In the United States, the Census Bureau of the US Department of Commerce estimated e-commerce based sales as a share of total U.S. retail sales at approximately 1.5% in the first quarter of 2003, while the share of online transactions in the B2B area was estimated at a much higher level.[3]

The *e-Business W@tch* does not have figures on absolute (online) sales volumes, but has asked companies that sell online to estimate the percentage of their total sales volume that is actually conducted online, including both sales through websites and through EDI. A simple computation of the answers, assuming that the average share will rather be towards the lower end in each of the ranges offered as options for their answer,[4] suggests that companies from the 15 sectors surveyed in 6/2002 made about 2% of their total sales online (including both B2B and B2C sales).[5] Figures are highest for those sectors where one would, in fact, expect online sales to be particularly important: tourism (5%), media and printing, insurance, ICT services (about 4% each) and retail (3%).

The same computation based on results from the 3/2003 survey (which only included seven sectors) leads to very similar results, suggesting a total share of online sales of 2.3% for the seven sectors. Tourism is again the leading e-commerce sector, with 5%. However, these figures should be used with great care as the computation method is necessarily a crude approximation.

If the same method is used to assess the importance of e-procurement as a share of total procurement, results suggest that EU companies made about 5% of their total purchases online in 2002. This includes MRO goods and direct production goods. The e-procurement leaders are ICT services (10%), the electrical machinery and electronics industry and business services (7% each). Again, figures for 3/2003 point at a very similar share on the aggregate level (6%). Results differ for some sectors, though, most notably for the e-procurement leading ICT industry, where companies reported much higher volumes of goods and services purchased online than in 2002. Notwithstanding the many uncertainties implied by this computation, the figures are very much in line with a similar estimate by the UK Department of Trade and Industry for the UK. The international benchmarking study 2002 "Business in the Information Age" reports that "On average, UK businesses that order online place 15% of the total value of their purchases online." (p. 61). Considering that about 50% of

[3] cf. chapter on "Worldwide Trends in e-Business"

[4] Companies were given five options for their answer: "less than 5% of total sales", "5-10%", "11-25%", "26-50%" and "more than 50% of total sales".

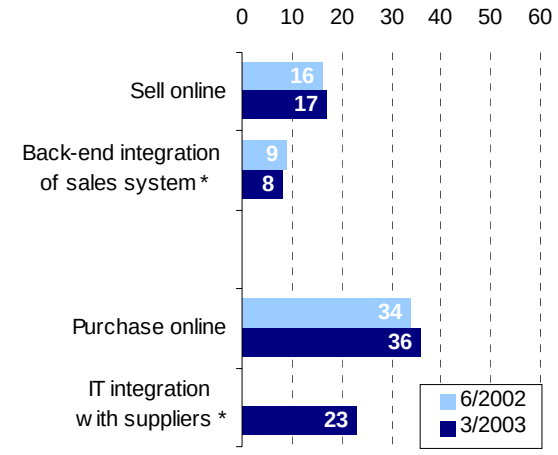
[5] The figure adjusts for the larger sales volumes of large companies by using employment-weighted figures. This is, of course, a crude approximation. As many companies did not provide information about their total turnover, however, it was the next best indicator for the sales volume.

all UK businesses place online orders[6], the share of orders placed online – as % of total procurement – would be around 7-8%, which reflects very closely the estimate of the *e-Business W@tch*, which computes a share of 6.3% for UK businesses in 2002.

E-commerce and e-business integration

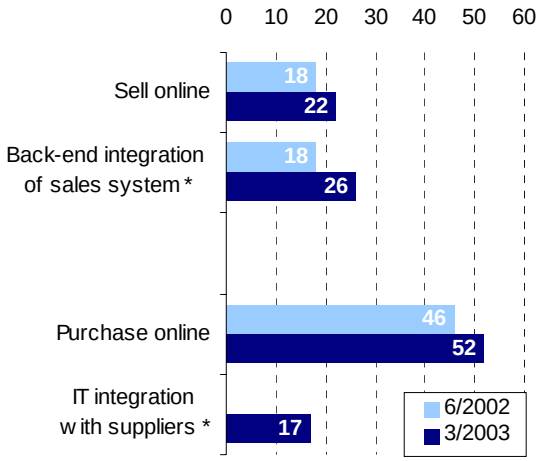
The European E-Business Report 2002/03 pointed out that one of the main challenges for companies was to move from e-commerce as a sideline activity to considering e-business as an IT based integration of business processes in general. The 2003 survey indicates that this process is under way, particularly among companies which have the critical minimum size – e-integration is less important for very small companies. One example that supports this observation is the share of online-sellers among medium-sized companies that reports that the e-commerce system is integrated with their back-end system. The share has increased from 18% (6/2002) to 26% (3/2003). About 20% of all companies that make online purchases themselves have integrated their IT system with the system of a supplier for that purpose.

Exhibit 1-6: E-commerce activities and integration in small enterprises (0-49 employees) – 2002/03



In % of enterprises. Base: small enterprises / * small enterprises selling / purchasing online, EU-4 (D, F, I, UK), 7 sectors. N=1637 for 2002; N=1697 for 2003.

Exhibit 1-7: E-commerce activities and integration in medium-sized enterprises (50-249 employees) – 2002/03



In % of enterprises. Base: medium-sized enterprises / * medium-sized enterprises selling / purchasing online,. EU-4 (D, F, I, UK), 7 sectors. N=798 for 2002; N=834 for 2003.

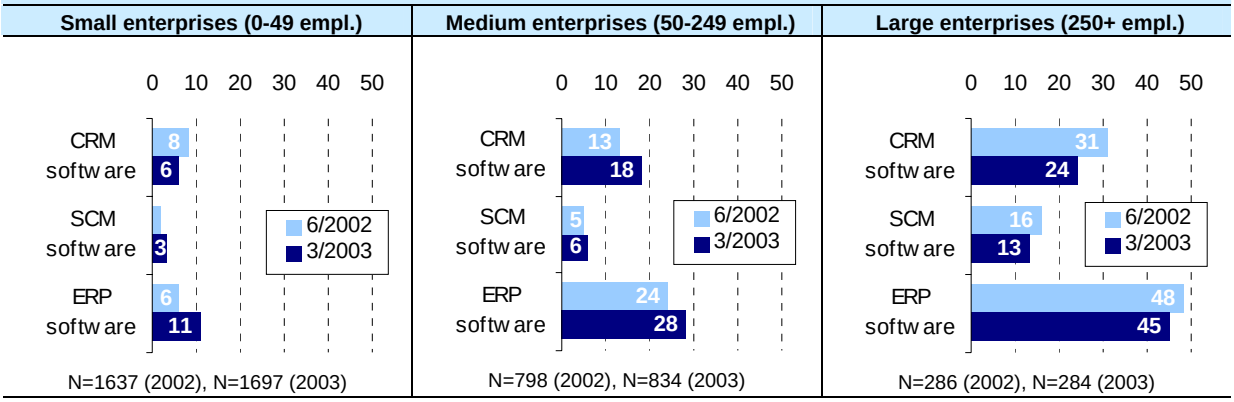
Source: *e-Business W@tch* (2002/03)

Business process integration can be greatly facilitated by – and, particularly in the case of large companies, may demand – quite advanced e-business solutions. Their implementation, however, is cost intensive, requires a high level of managerial skills, and can have a deep impact on processes in the enterprise. Such e-business software includes Customer Relationship Management (CRM), Supply Chain Management (SCM) systems and Enterprise Resource Planning (ERP) systems. There is no clear trend as regards their diffusion between 6/2002 and 3/2003. Medium-sized enterprises report increased use, while figures for large enterprises were lower than in the 2002 survey.

The rather low overall diffusion rates seem to be in contrast with the vast amount of market research and strategic literature on this software market. It must be considered, however, that they present a very important market for large software companies and IT consultants, and, secondly that these software systems are in fact widely used by the large companies in many sectors.

[6] This figure for UK companies is exactly the same in the DTI benchmarking study and in the *e-Business W@tch* survey 2002.

Exhibit 1-8: Diffusion of software solutions for business processes integration by size-class



In % of enterprises. Base: all enterprises in the respective size-class, EU-4.

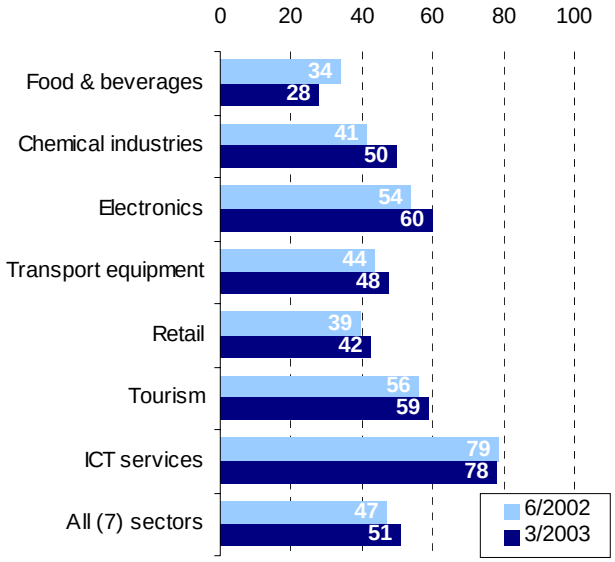
Source: *e-Business W@tch* (2002/03)

Integrating business processes is not restricted to the use of complex e-business software, though. Online technologies are increasingly used for a number of processes which characterise working routines in companies and facilitate exchanging information with customers and suppliers. 42% of employees work in companies that exchange documents electronically with suppliers and customers (2003). 12% of enterprises (accounting for 21% 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.

Every second enterprise considers e-business as relevant

More than 50% of the companies from the seven sectors surveyed in 3/2003 (accounting for 60% of employment) said that e-business constituted a "significant part" or "some part" of the way they operated. There are great differences, however, between sectors. In fact, in general the perception of companies of how important electronic business has become for their activities reflects very well the more "objective" profile based on indicators on the diffusion of ICT and e-business applications.

Exhibit 1-9: Companies reporting that e-business has at least "some significance" for the way they operate (2002/2003)



In % of enterprises from a sector. Base: all enterprises in the sector, EU-4 (2002), EU-5 (2003).

Source: *e-Business W@tch* (2002/03)

W@tchlist – this will be important:

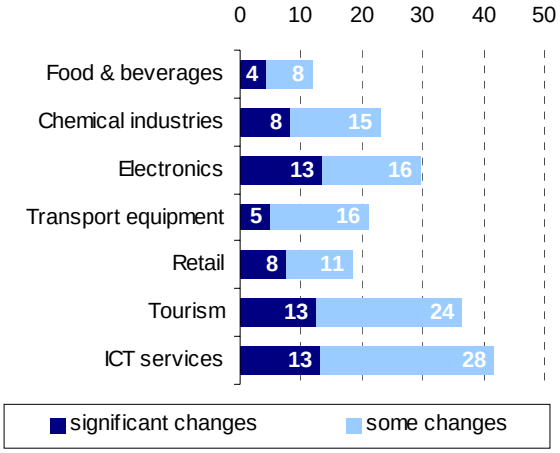
- Learning from others: To promote and disseminate good e-business practice for specific sectors and to consider requirements of SMEs
- Statistical effort to improve metrics for measuring impact, for example the impact of e-business adoption versus non-adoption on competitiveness
- Further monitoring of the impact of electronic business on industry value chains, for example on the distribution of power between different players in the supply chain
- Dis-intermediation or re-intermediation: Examine the role of intermediaries in various sectors and the emergence of new e-intermediaries
- Implications of e-business for competition policy on the national, European and global level

On the other hand, companies are not enthusiastic, but quite down-to-earth in their forecast of the role which electronic business will play in the future. "E-business sceptics", who say that electronic business does not play a significant role today for them and will not do so in the future, still constitute about 50% of all enterprises. This attitude need not necessarily be a pessimistic one in all cases, but can also be seen as an approach that considers e-business as a normality, rather than something which is "very significant".

The impact is currently perceived 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. As a general rule, and as can be expected, "high-tech" sectors which produce ICT components themselves or offer related services have a greater proximity to using information and communication technologies than other sectors. Secondly, there are sectors where e-commerce has had far-reaching impacts on the value and supply chain, for example on the role of intermediaries. Tourism is a good example. Although many tourism sub-sectors are basically "low-tech", the level of e-business awareness and the perceived impact is extraordinarily high.

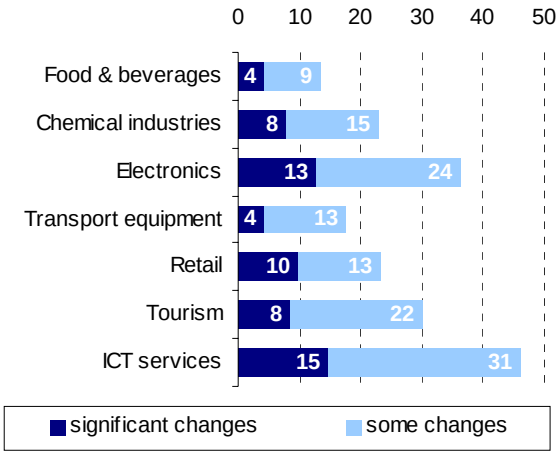
The most significant impacts of e-business concern the internal work processes. More than a quarter of all enterprises say that these have significantly or somewhat changed as a consequence of introducing electronic business processes. However, the assessment of changes on the organisation structure and the relations to customers and suppliers is very similar.

Exhibit 1-10: Impact of e-business on customer relationship (2003)



In % of enterprises.
Base: all enterprises, EU-5 (D, E, F, I, UK), 7 sectors. N=3515.

Exhibit 1-11: Impact of e-business on relationships to suppliers (2003)



In % of enterprises.
Base: all enterprises, EU-5 (D, E, F, I, UK), 7 sectors. N=3515.

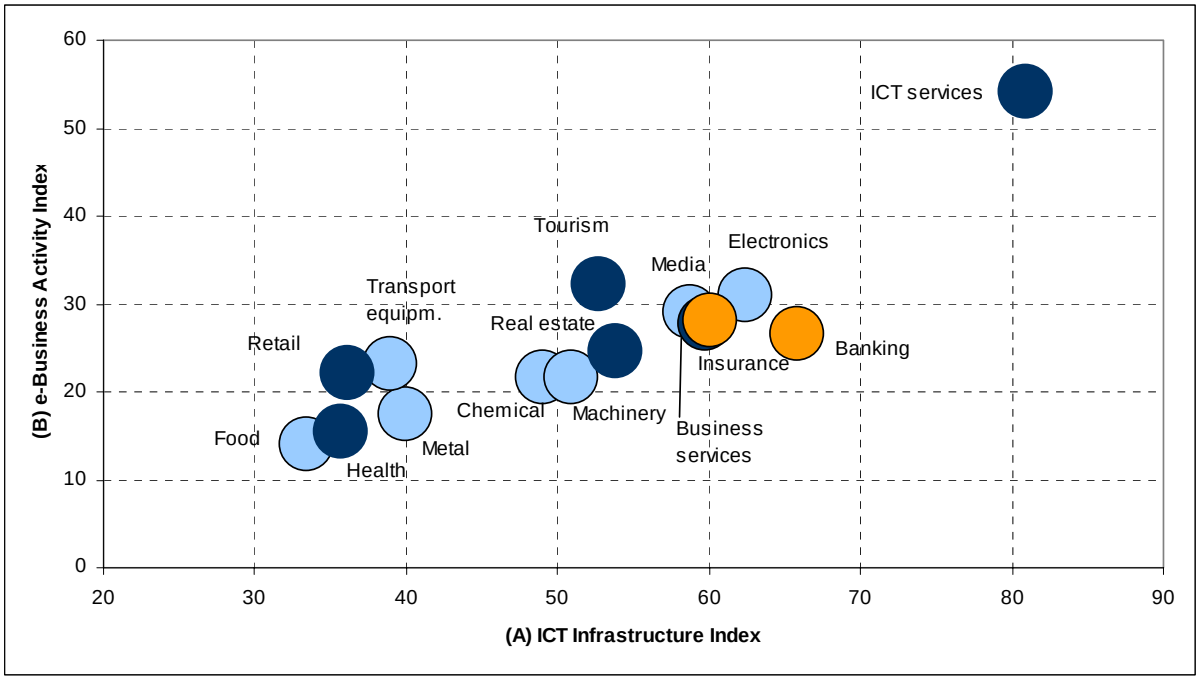
Source: *e-Business W@tch* (2002/03)

1.2 E-champions and late e-adopters: the eEurope E-Business Index for sectors

The eEurope 2005 Action Plan endorsed by the Seville European Council in June 2002 calls for the benchmarking of its main targets. One of these targets is that, "by 2005, Europe should have (…) a dynamic e-business environment". In order to track the progress achieved, a plan for benchmarking the targets of the eEurope 2005 Action Plan was adopted. As a contribution to these benchmarking plans, the Enterprise Directorate General proposed the inclusion of the "E-Business Index", to adequately capture the complexity of the dynamic e-business environment. Eurostat will deliver the data to perform the benchmarking of e-readiness in the EU Member States and of the EU as a whole.

Based on the methodology proposed by DG Enterprise, the *e-Business W@tch* has calculated in a pilot the E-Business Index from a sectoral perspective for the 15 sectors monitored in 2002 and 2003, using the survey results of the 2002 e-Business Survey. The Index is composed of two subindices, namely the ICT Infrastructure Index and the e-Business Activity Index.[7]

Exhibit 1-12: The E-Readiness of 15 sectors of the EU economy (based on the eEurope 2005 E-Business Index)



light circles: manufacturing sectors; dark circles: service sectors / financial services (orange)

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

It is clear that this kind of statistical aggregation necessarily conceals a more differentiated picture of e-business within a sector. In transport equipment manufacturing and in the food and beverages sector, for example, large companies and multinationals in particular are among the leaders in exploiting advanced e-business applications, while smaller companies are much less advanced. As a result, if component indicators are defined as "…% of enterprises (having adopted … or engaging in a specific e-business activity)", the indicator is biased towards the situation in smaller companies which are larger in number. With this caveat in mind, results of the pilot are still useful to demonstrate the different role and importance of ICT across various sectors of the economy. We have grouped sectors into four categories according to their "e-proximity" in 2002/03:

[7] Some of the component indicators had to be adapted in order to comply with the availability of data sources. For a detailed description of the approach and a discussion of methodological issues see the contribution by Simon Robinson in part D of the report.

Exhibit 1-13: Tentative typology of sectors according to their "e-proximity"

The e-champion(s)	The e-intensive sectors	The e-specific sectors	The late e-adopters
• ICT services	• Electrical machinery & electronics • Banking / leasing • Insurance & pension funding • Media & printing • Business services	• Tourism • Real estate • Machinery and equipment • The chemical industries	• Transport equipment • Metal products • Food, beverages & tobacco • Retail • Health and social services

The e-champion(s)

- *ICT services* ***(Index: 68)***

The sector which makes the most intensive use of information and communication technologies and e-business applications is the **ICT sector** itself. This was to be expected, as the sector is predestined for e-business in many ways (cf. Sector Reports). In this regard, the ICT sector is a special case with respect to e-business and should not be used as a benchmark for other business activities of a totally different nature. However, notwithstanding these differences, there may be some lessons to be learned from telecommunications and computer services companies. One such lesson is how to exploit ICT for managing business processes, for example when dealing with a large number or customers by making customer service more efficient through using online as a key sales and communication channel.

Although ICT services companies had to manage falling demand for their products in 2001 and 2002 rather than concentrating on the implementation of new e-business strategies, they are still the e-leaders in many respects. In fact, they focused on areas where ICT and e-business investments promised to help cushion the impact of the demand downturn. It certainly helped them that they are familiar with concept and technology, as they are suppliers of the most essential elements for conducting e-business themselves.

The e-intensive sectors

- *Electrical machinery & electronics* ***(Index: 47)***
- *Banking / leasing* ***(Index: 46)***
- *Insurance & pension funding* ***(Index: 44)***
- *Media & printing* ***(Index: 44)***
- *Business services* ***(Index: 44)***

This group includes the two **financial services** sectors (banking, insurance and pension funding), which are intensive users of ICT networks in general and of specific applications, for example – as they are dealing with a large number of customers – CRM software. Optimising customer relationship is a major focus of e-business in both sectors, and – as can be expected – in fact they report far above average impacts of e-business on customer relationship. Internal processes (such as handling claims in insurance companies) are another important ICT application area for financial service companies promising massive cost savings.

Two sectors which belong to the "converging industries" – the media and the electronics industry (including consumer electronics) – are also among the e-intensive sectors, but with a different focus and profile. The **electrical machinery and electronics** industry is a fast and advanced adopter of sophisticated electronic business applications for improving supply chain and production processes. For example, the sector is the leader – even ahead of ICT services – in using IT supported ERP, and is one of the forerunners in implementing advanced e-procurement systems.

In a very different way, **media and printing** companies also use e-business for their supply chain processes. Here, many of the goods and services traded between companies or between companies and consumers can be digitised and are therefore predestined for being delivered, sold or bought electronically. A good ICT infrastructure is therefore an important requirement for companies in this sector.

Finally the **business services** sector is among the e-intensive sectors, albeit not in all respects. This sector is in itself quite heterogeneous, and different e-business applications are not equally suitable for all sub-sectors. A special characteristics of this sector – which partly explains its comparatively high Index value – is that even small businesses are quite advanced in using ICT, in contrast to other sectors, where the digital divide between small and big firms is much larger.

The e-specific sectors

- *Tourism* ***(Index: 43)***
- *Real estate* ***(Index: 39)***
- *Machinery and equipment* ***(Index: 36)***
- *Media & printing* ***(Index: 44)***
- *Chemical industries* ***(Index: 35)***

This group is constituted by sectors which are very different by nature and consequently focus on specific aspects of electronic business each. The **tourism** sector, for example, shows a high e-Business Activity Index – mainly because it is a leader in online selling. The large players and tourism networks have been pioneers in adopting and developing new ICTs since the 1970s (Computer Reservation Systems). After Global Distribution System in the 1980s, the Internet has now become the new channel for interactions. It is impacting on the role of traditional intermediaries and has favoured the entry of new e-intermediaries.

The other service sector in this group is the **real estate sector**. Although the nature of business activities and the structure of the sector value chain are quite different from tourism, there are some similarities as well. For both sectors, the Internet is an increasingly important marketing channel to inform potential customers about the offer, be it destinations in tourism or property in real estate. The difference is that reservations are easily made online in tourism while property is not typically "sold" online (in the sense of performing the act of buying), which is the reason why real estate scores (statistically) low in the category "companies making online sales".

There are also two manufacturing sectors in the group of "e-specific" sectors. The e-business profile of the **chemical industries** differs very much between the large players and the smaller companies of the sector. Several companies in the chemical industries use e-business extensively. These companies – large and established household names – make up the largest share of media coverage about e-business in the sector. As they do not constitute the majority of enterprises, however, their dominance in the media may bias the perception of the state of e-business in the chemical industries. On the aggregate level, the chemical industries are still below expectations and also below their e-business potential. The current e-business focus in the sector is on improving the efficiency of business processes.

The **machinery and equipment** manufacturing sector is very much shaped by small and medium sized companies, operating in highly competitive domestic markets with increasing competition from overseas producers. Efficient management of supply chains constitutes the fabric of the sector. Against this background, many within the industry predicted a fertile ground for e-business investment and a widespread e-transformation of the sector. Scenarios illustrated the rise of Internet based sales, procurement and information exchanges, with production in the middle being linked to both. In fact, e-procurement is by far the most widely used application, while the adoption of e-sales was significantly lower. All in all, the sector has still untapped e-potential. This is an important challenge for EU companies to stay competitive in the context of a fierce global competition in this sector.

The late e-adopters

- *Transport equipment* ***(Index: 31)***
- *Metal products* ***(Index: 29)***
- *Retail* ***(Index: 29)***
- *Health and social services* ***(Index: 26)***
- *Food, beverages & tobacco* ***(Index: 24)***

Finally, there is a group of sectors where the diffusion of ICT and e-business applications is significantly lower compared to the other sectors. Quite unexpectedly, the **transport equipment manufacturing** sector is among them. Although large automotive companies and OEMs (original equipment manufacturers) act as e-business pioneers not only in the sector itself, SMEs are still rather reluctant. This can partly be explained by the fact that production in transport equipment subsectors other than the automotive industry is characterised by the domination of small production lots, often individually ordered products. The use of tools designed to address large customer groups, such as the Internet, does not play a significant role for these manufacturers on the sales side.

The potentials of e-business suggest that there should be a strong interest in the **metal products** industry to engage in new ways of doing business, but e-business is not yet a big issue in this sector. Opportunities were mainly discussed during the Internet boom time around 2000, but the topic seems to have lost its appeal for many enterprises from the sector. One of the reasons is that business in this sector is frequently conducted on the basis of personal and long-standing relationships with suppliers and customers. Firms are often specialised in a number of niche products and serve rather small market segments. The number of suppliers and customers for each individual firm is limited, leaving little room for efficiency gains from e-business tools such as CRM or e-procurement.

The **retail sector** is also characterised by a considerable gap between the actual and potential deployment of e-business, since the network organisation of the sector should constitute the ideal application area for e-business applications. The sector is characterised by rather low sales margins, and competition is therefore based on the reduction of purchase prices and on the optimisation of stock of products (and capital). In fact, the main areas in which retailers are investing in applications are supply chain configurations, management of store operations and interaction with customers. The low index value is partly a result of many micro enterprises in the sector which cause diffusion of ICT to be low if expressed in "% of enterprises".

The same applies to the **food and beverages** industry, where large multinational companies (usually leaders in their sectors) are the most technologically advanced companies, while smaller companies lag behind in adopting ICT, particularly upstream of the various product lines. In this sector, e-business mainly involves in-house company processes and procedures. Sophisticated technologies and applications, however, are less pervasive than in other manufacturing sectors.

In recent years the **health and social services** sector has made considerable progress towards accessing more advanced, digital telecommunications networks via ISDN, DSL or fixed connections, and access to Internet services has equally improved. A variety of issues, however, hamper the wider application of e-business solutions, and the sector as a whole, in spite of its economic significance, is trailing behind almost all other economic sectors. Key hurdles for advanced applications in the health sector are technical infrastructure issues: legacy medical and task-specific information systems, stand-alone systems for various administrative tasks, or investments in EDI, and mainframe computers rather than client-server platforms.

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