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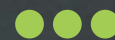
# *Electronic Business in the*
# *ICT Services Sector*

*Key issues, case studies, conclusions*

**e-business w@tch**

European Commission

*Enterprise publications*

The European *e-Business W@tch* 2003/04

e-business w@tch

Sector Impact Study No. 08-II
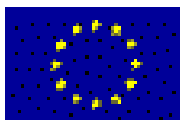
Electronic business in

## The ICT Services Sector

Key issues, case studies, conclusions

Final Report

November 2004

An initiative of the

**European Commission**
**Enterprise Directorate General**
e-Business, ICT Industries and Services

## The *e-Business W@tch*

The European Commission, Enterprise Directorate General, launched the *e-Business W@tch* to monitor the growing maturity of electronic business across different sectors of the economy in the enlarged European Union and in EEA countries. Since January 2002, the *e-Business W@tch* has analysed e-business developments and the impact of e-business in 17 manufacturing, financial and service sectors. Results are being published regularly on the Internet, and can be accessed online or ordered via the Europa server or directly at the *e-Business W@tch* website (www.europa.eu.int/comm/enterprise/ict/policy/watch/index.htm or www.ebusiness-watch.org).

This report is the second Sector Impact Study on electronic business in the chemical industries, published by the *e-Business W@tch* in the 2003/04 period. It builds on the first study from May 2004 which presented primarily the quantitative aspect, focusing on the results of the e‑Business Survey of 2003. This study provides a more detailed analysis of specific issues which were found to be particularly relevant for the sector in question.

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## Acknowledgements

This report was prepared by IDATE. It is part of a deliverable of the *e-Business W@tch*, which was conducted by a team consisting of empirica GmbH (co-ordinating partner), Berlecon Research, Databank Consulting, DIW Berlin, IDATE, RAMBØLL Management and Saatchi & Saatchi Business Communications on behalf of the European Commission, based on a service contract running from July 2003 until September 2004.

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Montpellier / Brussels, October 2004

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# Introduction to the *e-Business W@tch*

## The *e-Business W@tch* – observatory and intermediary since late 2001

The *e-Business W@tch* monitors the adoption, development and impact of electronic business practices in different sectors of the European economy. 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, confirmed and built further upon these objectives with Action 3.1.2. "A dynamic e-business environment", which defined 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".

It is against this background that the European Commission, Enterprise Directorate General, launched the *e-Business W@tch* in late 2001, with the objective of providing sectoral analysis based on sound empirical research, including annual enterprise surveys in all countries of the enlarged European Union. Special emphasis is placed on the implications for SMEs.

Since its launch, the *e-Business W@tch* has published e-Business Sector Studies on 17 sectors of the European economy, two comprehensive synthesis reports about the status of electronic business in the European Union, statistical pocketbooks and further resources (newsletters, presentations, special issue reports). These are all available on the website at www.ebusiness-watch.org.

The quantitative analysis about the diffusion of ICT and e-business is based to a large extent on annual, representative surveys among decision-makers of European enterprises. The 2002 survey included 9,264 enterprises from the former 15 EU Member States. In 2003, the regional scope of the survey was extended to the new EU Member States and EEA countries, with about 10,500 companies in total.

Survey results confirm the initial assumption and rationale of the *e-Business W@tch* that the sector in which a firm operates and the size of a company are main determinants of its e-business activity, rather than the location of a company. The large demand for the various publications and statistics provided by the *e-Business W@tch*, and their exploitation by other research institutions (for example, in the EITO Yearbook 2003 and in the OECD Information Technology Outlook 2004), documents that there has clearly been a demand for sectoral e-business analysis.

Facilitated by positive responses and the growing interest in its analysis, the *e-Business W@tch* is increasingly developing from an observatory into a think-tank and intermediary, stimulating the debate about the economic and policy implications of e-business among stakeholders at an international level.

## The wide-angle perspective: the *e-Business W@tch* provides the "big picture" as a basis for further research

The mission of the *e-Business W@tch* is to present a "wide-angle" perspective on e-business developments and practices in the sectors covered. This has important implications regarding the level of detail in which various issues can be explored, both in terms of the quantitative picture (survey) and in terms of the qualitative assessment and background research.

Over the past 10 years, "electronic business" has increased from a very specific to a very broad topic to be studied. The OECD concisely defines e-business in 2004 as "automated business processes (both intra-and inter-firm) over computer mediated networks". This definition is useful as it makes clear that e-business is more than e-commerce (which focuses on commercial transactions between

companies and their customers, be it consumers or other companies) and that e-business includes internal processes within the company as well as processes between companies. Furthermore, the OECD definition implicitly indicates that the focus and main objective of electronic business is to be found in business process automation and integration and the impacts thereof.

This implies that the potential scope for e-business analyses has also broadened. The measurement of e-commerce transactions (the volume of goods and services traded online) can and should be complemented by studies analysing the degree to which business processes, including intra-firm processes, are electronically linked to each other and have become digitally integrated.

In such a context, it becomes practically impossible to cover in depth all areas and facets of e-business in one study. The scope of such a study needs to be carefully defined and – to use the analogy of photography – it must be decided whether to "zoom in" or to use a "wide-angle" perspective. "Zoom-in" studies investigate one specific aspect of electronic business in much detail. "Wide-angle" studies adopt a broader perspective and investigate more issues at the same time, which necessarily puts limits on the level of detail in which each single issue can be explored. This must be considered when using this series of Sector Studies prepared by the *e-Business W@tch*. The second series of these Sector Studies (to be published in August 2004) will investigate and analyse specific issues in more detail, as well as taking into account feedback from a number of case studies.

## The role of economic analysis in the Sector Reports

The first chapter of each *e-Business W@tch* Sector Study provides background information on the respective sector. This overview includes the definition of the sector (on the basis of NACE Rev. 1 classification), some basic industry statistics, as well as information about the latest trends and challenges concerning the specific sector.

It appears that this practice, combined with the growing interest in the *e-Business W@tch* analysis, has caused some confusion: Some readers mistakenly consider that an *e-Business W@tch* "sector report" is a piece of economic research on the sector itself, and not a report focussing on the use of e-business in that particular sector. It is, therefore, necessary to underline that, while some background information is provided in order to better understand the context and the economic impact of e-business, the *e-Business W@tch* reports are neither intended to, nor could, be substitutes for more detailed and specific industrial analysis and statistics on each particular industry.

The same applies to the industry statistics presented in this first, introductory chapter of the *e-Business W@tch* reports. These data are mainly derived from official statistics prepared by Eurostat. However, in order to close the many gaps in the official statistics, DIW Berlin imputed missing data based on extrapolations and their own calculations. The *e-Business W@tch* cannot go beyond the presentation of this consistent set of statistics in the context of its principal assignment.

The mission of the *e-Business W@tch* is to monitor, analyse and compare the development of e-business in different sectors of the European economy – not the sectors themselves. Its objective is to provide reliable results, based on commonly accepted methodologies, which are not readily available from other sources and would trigger the interest of policy-makers, researchers, and other e-business stakeholders for more in depth analyses (or statistical surveys). The *e-Business W@tch* has adopted a "wide-angle" perspective in its approach and the necessary trade-offs are transparently depicted in all its deliverables.

## The definition of sectors and the adequate level of aggregation

Economic sectors constitute the main level of analysis for the *e-Business W@tch*. In 2003/04, the sample consists of ten sectors. Their configuration and definition are based on the NACE Rev. 1 classification of business activities. The aggregation of various NACE divisions and groups into a "sector" was guided by the aim to produce results which are relevant for the dynamics of the economy as a whole as well as with the intention of covering the most important features of e-business provision and adoption in Europe. The configuration of sectors partly followed aggregations that are also used in the "Panorama of European Businesses" published by Eurostat.

In the context of its "wide-angle" perspective, the *e-Business W@tch* analysis covers a large part of the European economy rather than focusing on very specific (sub-)sectors. Therefore, the statistics presented in these reports need to be carefully treated when making comparisons between countries and, occasionally, companies' size-classes. Against the previously described background, some generalisation and approximation has to be accepted, while the definition of sectors could be revisited during the implementation of the *e-Business W@tch*.

## The 10 sectors analysed in 2003/04

The 10 sectors which are being monitored and studied in 2003/04 include eight sectors that were already covered in 2002/03 (thus allowing the continuous monitoring of changes and progress), as well as two new ones (namely the textile, clothing and footwear industries and the craft and trade sector).

*Exhibit: Sectors covered by the e-Business W@tch in 2003/04*

| Title | NACE | Short Description |
|---|---|---|
| **Textile, clothing and footwear industries** | 17, 18, 19 | The textile, clothing and footwear industries account for about 5% of total value added in manufacturing in the former EU-15 and about 9% of employment. SMEs and co-operative SME networks play a vital role. |
| **The chemical industries** | 24,25 | ICT and the Internet in particular have fuelled the globalisation of markets for chemical products. E-business may have considerable future impact on this sector which accounts for ~15% of the production value of EU manufacturing. |
| **The electrical machinery and electronics industries** | 30, 31, 32 | The electronics industry is very suitable for e-business because of the high degree of standardisation of products, globalisation of production, and specialisation of firms along the value chain. Its dynamic development calls for continuous monitoring. |
| **The manufacture of transport equipment** | 34, 35 | The transport equipment industries are precursors for economic development in Europe. Large companies are forerunners in using e-business, with considerable implications for all stakeholders in the value chain. |
| **Craft & trade** | (17-19), 20, (30-32), (34-35), 36, 45 | The craft sector, which includes firms with less than 50 employees from a number of business activities, is vast, in terms of number of enterprises, employment and value added. E-business may become crucial for many craft firms to stay competitive with industrial production. |
| **Retail** | 52 | The retail sector represents a cornerstone of economic activity within Europe, with around 3 million retail enterprises currently in the EU, employing nearly 14 million people. As there is still untapped potential, ICT may eventually have major implications for the retail value chain. |
| **Tourism** | 55.1-5, 62.1, 63.3, 92.33, 92.52+53 | Hotels, restaurants, travel agencies and tour operators (NACE 55 and 63.3) employ about 2.2 million people in the EU. SMEs play a very important role. In some respects, the tourism sector has always been a forerunner in using ICT. E-commerce is exerting a huge impact, challenging intermediaries. |
| **ICT services** | 64.2, 72 | The ICT services sector in many respects is the leading sector and a kind of benchmark with respect to e-business application. E-business can change the nature of ICT services, which has important implications for other sectors which use them. |
| **Business services** | 74 | Business services are a huge sector, involving more than two million enterprises (99% are SMEs), and employing close to 13 million people. ICT and e-business have significant implications for those areas of the business services sector that are based on information and knowledge. |
| **Health and social work** | 85.1, 85.3 | As national health systems suffer from increasing costs and political pressures to constrain these, it is hoped that strategies for the development of an e-health and e-business infrastructure will become key drivers of change. |

# Rationale for the selection of sectors to be monitored in 2003/04

The selection of the ten sectors to be monitored in 2003/04 was guided by the aim of producing results relevant to tracking the dynamics of the economy as a whole as well as with the intention of covering the most important features of e-business provision and adoption in Europe. There are, however, additional factors that have been taken into consideration for the selection process. An important aspect to be considered is that any sector which is not going to be covered during the 2003/04 period is a candidate for analysis in 2004 onwards, provided that the *e-Business W@tch* contract will be renewed.

**Primary selection criteria**

(a) **The economic importance of the sectors for the EU economy**. For the representation of e-business impacts in the economy as a whole, "large" sectors play a major role, since changes in their production models, their purchasing and marketing behaviour as well as their productivity and dynamics of growth have a very major effect on the performance of the entire economy. The assessment of the economic importance was mainly based on two standard economic indicators: the sector's share of employment and the amount of value-added by the sector.

(b) **The relative importance of electronic business within the sector**. As the *e-Business W@tch* has demonstrated in the first phase (2002/03), the intensity and nature of ICT and e-business usage differs considerably between sectors. Some sectors, although still small in absolute terms, are growing rapidly and/or illustrate the role which ICT and electronic business may play in other sectors in the future. The statistical proxy for the relative importance of e-business in a sector is the Pilot Index which was computed for 15 sectors (cf. European E-Business Report 2003), based on the eEurope 2005 E-Business Index.

**Secondary selection criteria**

In addition to these two fundamental criteria, some other selection criteria were applied in cases where the economic and e-business relevance appeared to be equal or similar. These criteria were:

- **Balance of business activities.** There should be a balanced mix of manufacturing and service sectors. Sectors could include a public service sector for comparison.

- **The continued importance of the SME dimension.** Sectors with a higher share of SMEs could therefore be given priority over sectors where large companies dominate.

- **Policy relevance.** The selection needs to consider the policy relevance from the perspective of DG Enterprise, that is for which sectors the DG has responsibility.

- **Roll-out strategy.** Some new sectors (not covered in 2002/03) should be included in order to broaden the monitoring scope of the *e-Business W@tch*. Among sectors with a comparable economic size, new sectors (not yet covered) may be given priority.

In order to come to an initial ranking of economic importance, the *e-Business W@tch* has computed a simple Index using two component indicators: the number of people employed, and value added. The Index reflects the contribution of the sector to the total of all sectors compared.

The next step in the selection process was an attempt to make a joint consideration of the sector's contribution to employment and value added, together with the relative importance of ICT and e-business in the sector. For this purpose, the *e-Business W@tch* has computed an Index that combines the two components. In such a ranking, Business Services comes out on top, followed by Health, Retail, the Financial Services sector and ICT Services.

Based on this statistical evidence and the considerations presented above, the *e-Business W@tch* proposed a roll-out plan and a configuration of 10 sectors for the period 2003/04 that provide good coverage of relevant business activities, issues and countries, as well as being manageable in the organisation designed for the *e-Business W@tch* and the resources available.

# The Role of Electronic Business in the ICT Services Sector in 2004: Main Issues and Challenges

This report is the second Sector Impact Study on electronic business in the ICT services sector published by the *e-Business W@tch* in 2003-2004. It builds on the first study from May 2004 which focused chiefly on the quantitative aspect, presenting the results of the e-Business Survey from 2003. This second study provides a more detailed analysis of specific issues which were found to be particularly relevant for the sector in question, and supported by case studies. The conclusions summarise the central implications for firms operating in the ICT services sector, and assess the primary drivers and obstacles affecting the future development of electronic business. And, lastly, the study looks at the challenges involved in ICT policies, starting with a general view of the ways in which ICT affect corporate policies, followed by a more sector-specific examination.

# 1    Introduction

This Chapter features an updated summary of the more comprehensive introductory Chapter from the first report (May 2004). Readers wishing to obtain more detailed economic statistics on the sector should consult the first report of May 2004, which can be downloaded from the Publications section of the Business W@tch website (www.ebusiness-watch.org).

## Definition of the combined ICT services sector

The term "ICT services sector"[1] as defined for the purposes of this study, combines tele-communications services (NACE Rev. 1 64.2) and computer-related services (NACE 72).

- Telecommunications services are much more than just telephone services. This sector encompasses the distribution of data, sound, images, and other information via cable, broadcasting, relay or satellite networks. The networks' management and maintenance, and the provision of services using these networks are included in this definition. Excluded, however, is the provision of radio and television programmes (NACE 92.2).

- The computer-related services sector includes a fairly diverse range of activities which are related to ICT, as defined in section 72 of the NACE classification. The sector can be subdivided on the 3-digit-level into six further groups (cf. Exhibit 1-1). Their common link is that they are (or at least were when the classification was created) of a more or less service nature.

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[1] For the sake of clarity, for the combined NACE 64.2 and 72 sectors we will use the term "ICT services" (ICT: Information and Communication Technologies). It has to be borne in mind, however, that ICT services can also encompass a broader field, e.g. by also including wholesale of office machinery. The OECD, for instance, subsumes renting of office machinery and equipment (NACE 71.23) under ICT services. (OECD, 2000) It is, however, not always possible to distinguish between ICT and non-ICT related activities in renting and wholesale.

*Exhibit 1-1: Configuration of ICT Services under NACE Rev. 1*

| NACE Rev. 1 Division | Group | Activity |
|---|---|---|
| | 64.2 | Telecommunications |
| 72 | | Computer-related activities |
| | 72.1 | Hardware consultancy |
| | 72.2 | Software consultancy and supply |
| | 72.3 | Data processing |
| | 72.4 | Database activities |
| | 72.5 | Maintenance and repair of office, accounting and computing machinery |
| | 72.6 | Other computer-related activities |

To better reflect the particularities of value chains and business relationships, computer related services will be grouped into two sets of activities: "software services" (software consultancy and supply, NACE 72.2), and "other computer services" which include all groups of NACE Rev. 1 Division 72 except Group 72.2).

## Industry structure and employment

As shown in Exhibit 1-2, the combined ICT services sector comprises roughly 361,000 enterprises, provides jobs for about 3.2 million people, and generates added value of 255 billion euros in the EU-14[2]. Telecommunications services account for only 3% of all companies, represent about one third of employees and produce almost half of the value-added of the ICT services sector in the EU-14. These figures are a good indication of the significance of large companies operating in the telecom sector, compared to the computer industry which is largely made up of SMEs.

Exhibit 1-2 illustrates the prime differences between telecommunications and computer related services companies. In telecommunications services, about 90% of employees work in large enterprises (over 250 employees) while in computer related services, 70% work for micro, small and medium-sized enterprises.

*Exhibit 1-2: Size class distribution in ICT services*

| | | Enterprises with … employees | | | |
|---|---|---|---|---|---|
| | Total (EU-14)* | 1-9 | 10-49 | 50-249 | 250+ |
| **NACE** | **Number of enterprises** | Structure in % of total | | | |
| 64.2 | 12,929 | 84.1 | 10.6 | 3.5 | 1.7 |
| 72 | 348,326 | 93.0 | 5.7 | 1.1 | 0.2 |
| | **Number of employees** | Structure in % of total | | | |
| 64.2 | 1,061,125 | 2.6 | 3.1 | 5.1 | 89.3 |
| 72 | 2,180,610* | 30.6 | 20.2 | 19.2 | 30.1 |

* Excluding Greece (no data available)

Source: Eurostat New Cronos 2003, estimates and calculation by DIW Berlin (2003)

There are also huge gaps in the average size of companies between the two sub-sectors. The average number of employees per company in telecommunications services is 82, compared to only 6 in computer related services. Sizeable gaps are also found when

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[2] Data for EU-14, as data from Greece were not available.

comparing the size of the sectors' largest companies: 4,307 employees per company on average in telecommunications versus 943 in computer related services.

But the computer related services sector employs more people in most EU Member States than the telecommunications services sector. As shown in Exhibit 1-2, in all EU-14 countries, computer related services provided twice as many jobs as telecommunications services did in 2003.

## Market size

The total production value of the combined ICT services sector in the European Union is roughly 514 billion euros (see Exhibit 1-3). More than half of this production value (54%) stems from the telecommunications services sub-sector. In both NACE 64.2 and 72, value-added at factor cost is roughly half of the production value (about 255 billion euros in total), indicative of the massive contribution of indirect production inputs. Many of these inputs come from licenses and copyrights.

*Exhibit 1-3: Production value and value-added in European countries*
*for telecommunications services (NACE 64.2) and computer-related activities (NACE 72)*

| Country * | Telecommunications services | | | | Computer related services | | | |
|---|---|---|---|---|---|---|---|---|
| | Production value | | Value-added | | Production value | | Value-added | |
| | euros (million) | % of EU-15 | euros (million) | % of EU-15 | euros (million) | % of EU-15 | euros (million) | % of EU-15 |
| BE | 9,819.4 | 3.5 | 4,465.2 | 3.5 | 7,066.5 | 3.0 | 2,953.3 | 2.3 |
| DK | 5,492.1 | 2.0 | 2,320.4 | 1.8 | 5,149.2 | 2.2 | 2,654.6 | 2.1 |
| DE | 32,085.1 | 11.6 | 20,325.5 | 16.1 | 39,098.9 | 16.4 | 22,958.2 | 17.8 |
| ES | 21,322.1 | 7.7 | 10,857.4 | 8.6 | 9,712.9 | 4.1 | 5,430.0 | 4.2 |
| FR | 49,261.8 | 17.8 | 18,359.6 | 14.5 | 36,704.0 | 15.4 | 18,573.8 | 14.4 |
| IE | | | | | 3,784.0 | 1.6 | 2,720.1 | 2.1 |
| IT | 44,027.4 | 15.9 | 18,847.0 | 14.9 | 30,782.2 | 12.9 | 14,147.5 | 10.9 |
| LU | 945.3 | 0.3 | 660.1 | 0.5 | 494.4 | 0.2 | 237.7 | 0.2 |
| NL | | | | | 14,168.1 | 5.9 | 7,725.0 | 6.0 |
| AT | 4,585.3 | 1.7 | 2,728.6 | 2.2 | 4,118.1 | 1.7 | 2,167.2 | 1.7 |
| PT | 6,522.9 | 2.4 | 2,745.7 | 2.2 | 1,186.3 | 0.5 | 599.5 | 0.5 |
| FI | 5,763.1 | 2.1 | 2,050.0 | 1.6 | 3,705.0 | 1.6 | 1,833.8 | 1.4 |
| SE | 9,149.1 | 3.3 | 3,732.7 | 3.0 | 13,613.4 | 5.7 | 6,026.2 | 4.7 |
| UK | 71,327.7 | 25.8 | 31,134.9 | 24.6 | 69,379.1 | 29.0 | 41,262.6 | 31.9 |
| Other: EL, IE, NL | 16,344.7 | 5.9 | 8,245.8 | 6.5 | | | | |
| **EU-15** | **276,646.0** | **100.0** | **126 472.9** | **100.0** | **238 962.1** | **100.0** | **129 289.7** | **100.0** |
| * Excluding EL in computer services | | | | | | | | |

Source: Eurostat New Cronos 2003, estimates and calculation by DIW Berlin (2003).
Regional distribution 2001 for EU-15

The four largest member countries, namely Germany, the UK, Italy and France, account for almost 73% of the combined value-added (70% for telecommunications and 75% for computer related services). The ten new Member States together account for less than 2% of production value of the ICT services sector according to data from Eurostat New Cronos based on the year 2000.

These figures for value-added make the sector relatively small in comparison with the remainder of the economy. The significance of the ICT services sector derives more from its fundamental role in providing the basic infrastructure for the information economy, and from its stunning growth in the recent past.

## Productivity and labour costs

Productivity – measured as value-added per employee – differs considerably between telecommunications and computer related services. The generated value-added per person employed is considerably lower in the computer related services sector. While in telecommunications services, the value-added generated per employee in the EU-15 countries totals 119,188 euros, the same value for computer related services is only 59,291 euros. The difference is to be expected, given the high capital intensity of telecommunications, and the fact that these quantities only measure labour productivity and not total factor productivity. These differences are also reflected in investment data. Depending on the country, aggregate investment in telecommunications services sector is between 4 and 14 times higher than in the computer related services sector.

In the 10 New Member States, labour costs in the computer related services sector amount to one fourth of the labour costs in the original Member States. Such a difference may lead (and is already leading) companies from the EU-15 Member States to outsource or transfer operations to the new Member States in order to benefit from cheaper labour costs. However, the extent to which these trend will develop remains to be seen.

*Exhibit 1-4: Labour costs per employee in the computer related services sector (NACE 72) in European countries*
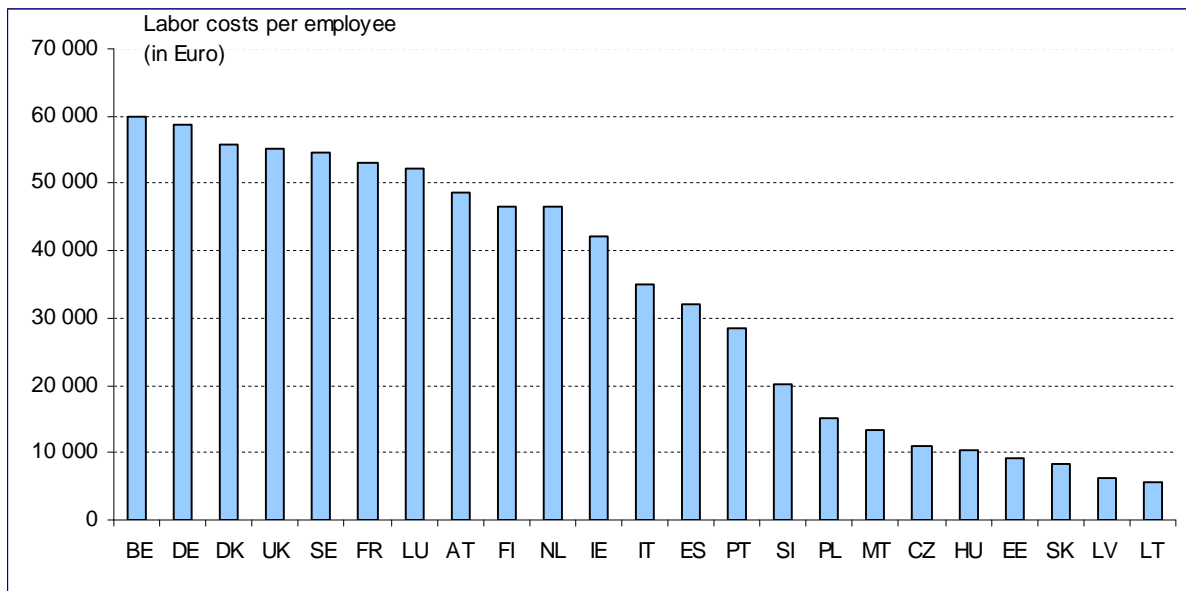


Source: Eurostat New Cronos 2003, estimates and calculation by DIW Berlin (2003).
Regional distribution 2001 for EU-15, 2000 for New Member States.

## Major trends and challenges

The ICT services industries are among the most dynamic industries in Europe's economies and belong to the core industries driving the e-business development. They have undergone substantial changes during the last decade. The ICT services sector has been particularly affected by the rise and the subsequent burst of the Internet bubble. Apart from this major impact there is also a variety of factors which have triggered trends and posed new

challenges to ICT services companies. Three factors are central to the sector's present and near future: technology, the regulatory framework and market development.

**Technology**

ICT technologies have had a considerable impact on the ICT services sector as they provide the basic infrastructure for the information economy. On the telecommunications services side, broadband Internet access – loosely defined as access rates significantly higher than those available through Integrated Digital Service Network (ISDN) or via analogue dial-up modems – has already and will continue to change the way how voice and data communications services are distributed and delivered. The total number of broadband access connections in the EU-15 reached 22.9 million at the end of 2003[3], a 70% increase in only 6 months. New services like voice calls over the Internet (VoIP), TV and video over DSL are derived from the implementation of such high speed communication technologies.

Another major technological change is the digitisation of networks and mobile communications. Telecom operators digitised large portions of their networks in the 1990s, which made the delivery of additional services possible (e.g. simple call forwarding, caller identification) and allowed an increased flexibility in billing. These so-called intelligent networks also provide the foundation for much of the customer-centric e-business in the telecommunications services industry.

In the computer services sector, the Open Source phenomenon gained popularity with operating systems such as Linux, Internet software such as Apache web server, database applications (e.g. MySQL) and content programming software (e.g. PHP – PHP Hypertext Preprocessor). Open standards are enjoying increasing prominence in the software industry, and have emerged as new potential competitors for proprietary software standards, at least for certain specific market segments. According to IDC[4], 15% of the servers shipped in 2003 run on Linux, and this percentage is expected to rise to 50% by 2006. A European public administration survey in 2003 on behalf of the European Commission found that 63 percent of the respondents already use Open Source in their software architecture[5]. In the ERP application market segment, too, Open Source software is playing a growing role. According to NewsForge – the online newspaper devoted to Linux and Open Source – in 2003, Linux and other Open Source technologies accounted for roughly 340 million of the 20 billion-euro ERP application market, thus representing about 1.6% of the overall market. That share is expected to grow rapidly over the next four years to account for 7% of the market by 2008.[6]

**Regulatory framework**

Important issues for the development of the ICT services sector are the evolution of the regulatory framework governing telecommunications services and the growing importance of intellectual property rights.

In the telecommunications services sector, the former state monopolies now have competition on their home market. The sudden increase in competition has led to a swift drop in prices, including for the incumbents' telephone services. However, the new competitors

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[3]   IDATE, Developing broadband access coverage for Directorate General Information Society, 2004

[4]   IDC, Linux and the evolution of the virtual environment, 2003

[5]   Joint Economic Commission for Europe (ECE), Eurostat, OCDE, Meeting on the Management of Statistical Information systems (MSIS°, May 2004)

[6]   J Lyman, "Open source on offense in ERP and business applications market" http://software.newsforge.com:

have been only partially successful, due to weaker than expected demand and interconnection disputes with incumbents.

The EC is currently working on the timely and effective transition to the new EU framework for electronic communications networks and services, which was adopted by the Parliament and the Council in March 2002. The new framework is designed to ensure that ex-ante regulation is applied only where the level of competition in defined markets is considered to be insufficient, on the basis of an analysis consistent with competition law methodology. Newly emerging markets too should, in principle, be free from regulation. Other key aspects of the framework are designed to support this approach to regulation and promotion of consumer interests. The new framework is an important initiative that will support the continued growth and development of the electronic communications sector in Europe.[7]

In the software industry, two related legal issues hold considerable consequences for the sector's future. The first is the issue of intellectual property rights protection, as it has become increasingly easy to exchange software over the Internet from anywhere in the world, leading to possible copyright infringement and an alleged increase in software piracy.

The second issue concerns software patents. While most forms of software were originally protected by copyright, the ICT industry now appears to be strongly opposed to patenting software, arguing that it could stifle innovation in the software development industry.

**Market development**

In the area of telecom services, the popularity and growing use of the Internet have triggered an explosion of data services traffic, especially e-mail, web browsing and professional applications. Data is expected to swiftly overtake voice as the main source of traffic on global telecommunications networks in the coming years.

Another major factor has been, and still is, digital cellular telephony. The average revenue per user (ARPU) earned by mobile operators has fallen significantly due to the growing number of subscribers who use their mobiles only occasionally, and the steady drop in mobile calling prices. At the same time, the cost of running the phone network has remained constant or even increased, thus putting significant pressure on margins.

Moreover, the new and costly UMTS (Universal Mobile Telecommunications System) licenses have clearly penalised the mobile telecom sector in recent years. So mobile operators are now banking a great deal on the future success of what is known as third generation wireless technology (or UMTS).

In the computer related services sector, a major challenge has been handling the rapidly increasing demand for e-business related consulting, software and integration services, followed by a sudden drop when the Internet bubble burst. After the dot.com inflation, customers cut back their investments due to a weakened economy, and a great many computer service companies found themselves overstaffed – having to adapt to the fall in business, while keeping their remaining staff members motivated.

The ICT services sector is, therefore, facing not only a rapid transformation of demand, but also has to adapt to new ways of distributing and delivering products like voice and data communications services over the Internet and software based on Open Source developments.

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[7]  http://europa.eu.int/information_society/topics/ecomm/all_about/implementation_enforcement/index_en.htm;
    Further information on the current initiatives of the European Commission can be found at
    http://europa.eu.int/information_society/topics/ecomm/index_en.htm

# 2 The role of electronic business in the ICT services sector analysis of selected issues

## 2.1 Key areas of e-business application in the sector

The previous Sector Study (May 2004) concluded that the combined ICT services sector is in many respects the leading sector in terms of e-business adoption. For all types of e-business applications, the two sub-sectors – telecommunications services and computer-related services – outrank other sectors studied by the *e-Business W@tch* in terms of ICT equipment and the use of e-business applications. The sector is in top position in terms of connectivity of enterprises, internal process automation, marketing and sales. It is, however, slightly behind the transport equipment sector in its use of ERP (Enterprise Resource Planning) and SCM (Supply Chain Management) applications and in using online supplier marketplaces.

The ICT services sector is more involved in e-commerce, especially telecom services and software system services which target a large number of customers online. To a certain extent, the improvement of business processes and of relationships with suppliers were found to have less priority than in manufacturing sectors.

The overall conclusion was that the current main objectives of electronic business in the ICT services industries are to develop flexible organisations capable of rapidly accessing global resources, and to provide personalised services to a larger customer base. Even if this is not exclusively related to the ICT services sector, it is particularly significant in this sector which has to contend with a rapidly changing technological environment and a subsequent evolution of customers' needs more than other sectors. The following business objectives, and related areas of application, were found to be among the most important ones in this sector.

### Developing CRM applications

The use of CRM (Customer Relationship Management) systems is becoming vital to gaining market share in a mature ICT services market, as companies in the sector need to rapidly anticipate customers' changing needs. Customers' ICT environments are becoming more complex, more distributed, more network-centric; it is more critical than ever for ICT services companies to develop close partnerships with their customers to better satisfy their needs.

The e-Business Survey 2003 revealed that 36% of employees in the ICT services sector use a CRM system in the EU-5. Although this rate is rather high compared to other sectors, CRM applications are, in fact, used mainly in large firms. Almost half of the sector's large firms have implemented a CRM system, compared to only 28% of small enterprises (with less than 50 employees), and 14% of micro enterprises (less than 10 employees). The most apparent explanation is that CRM e-business projects require large financial investments and time to implement, resources that are usually not available in smaller firms.

### Facilitating remote access and the changes of working practices

Facilitating remote access and a collaborative working environment are key to developing more flexible organisations and to enabling access to cheaper resources at the global level. The rapid technological changes and innovations require workers to share vast amounts of information and knowledge from different locations. In such a context, also influenced by the growing search to access resources at lower costs, remote access to a company's computer

system and a collaborative working environment are crucial to increasing efficiency and reducing cost structures.

Companies in the ICT services sector seem to be well endowed in this respect: 53% of enterprises from the sector, accounting for 73% of employment, state that they use remote access. These figures are significantly higher compared to other sectors. On average (among the 10 sectors studied by the *e-Business W@tch* in 2003/04), only 16% of enterprises, accounting for 37% of employment, use remote access. In terms of collaborative working practices, the ICT services sector also ranks high. Almost half of all enterprises (46%), which account for 67% of employees in the ICT services sector, use online document sharing to perform collaborative work. This is much more than on average in the 10 sectors studied, where 26% of enterprises accounting for 41% for employees use collaborative practices.

## Exploiting the delivery of ICT services through the Web

Virtually all ICT services companies showcase their offering through their corporate website. Unlike most manufacturing sectors, e-commerce related activities are predominant in this sector, and the Internet seems to constitute an important distribution and selling channel for ICT services companies.

According to the results of the e-Business Survey 2003, about 15% of all companies in the ICT services sector already sell products and/or services online (10% in the other sectors, on average). Furthermore, ICT service companies that sell online tend to have more sophisticated online order processing systems compared to companies from other sectors. For example, among the companies selling online, 23% have fully integrated their front- and back-end IT systems (sector average: only 6%), 10% have implemented online payment systems (all sectors: 4%), and 55% use online technologies other than e-mail to exchange documents with customers (all sectors: 23%).

## Implementing e-business standards

The development of open e-business standards is in many respects crucial to easing companies' adoption of e-business applications. Up until now, the lack of e-business standards for e-business applications like ERP and CRM products have constituted a major barrier, particularly to SMEs' implementation and use of these products. In general SMEs do not have the required IT resources in-house to allow them to keep up with the evolution of Open Source technology and adapt their computing systems to the latest trends.

Exhibit 2-1 summarises relevant e-business issues in the ICT services sector and indicates their relative importance in the companies' business production process.

*Exhibit 2-1: Chief areas of electronic business in the ICT services sector*

| E-business application area | Importance | Remark/example |
|---|---|---|
| Facilitate remote and mobile work (field workers, home-based telework) | ~ ~ ~ | Independent of size, all ICT services companies are well-equipped with systems that facilitate remote and mobile work. |
| Improve knowledge management by using special software | ~ ~ ™ | As a knowledge-intensive sector, KM software is being used more and more, but essentially by large companies. |
| Automate internal business processes | ~ ~ ™ | Reducing administrative costs (travel reimbursement, HR management) and improving business processes (relationships with trading partners) is a key priority in the sector. |
| Improve ERP-to-ERP connectivity | ~ ™ | The ICT services sector ranks below the all-sector average. Only large companies in the telecom services sub-sector and, to a lesser extent, in the software sub-sector use ERP systems. |
| Supply chain process integration | ~ ™ | Like an ERP system, SCM does not appear as a top priority for ICT service companies, and is used comparatively less in this sector than in the transport and chemicals sectors. |
| Decrease direct procurement costs through e-procurement | ~ ~ ™ | As in other sectors, the largest companies pursue the goal of streamlining the selection of their suppliers, mainly focussing on making processes more efficient. |
| Web based e-marketing and customer-related services | ~ ~ ™ | These applications are widely used. They are important for the ICT services sector, especially the telecom and software sub-sectors. |
| Electronic customer management (CRM) | ~ ~ ~ ~ | The ICT services sector is well ahead of other sectors in this area. The growing demand for customised and flexible services makes CRM a key component, especially in the telecom and software sub-sectors. |
| E-commerce: New ways of distributing and delivering services on the Internet | ~ ~ ~ ™ | The sector has mastered an effective approach to sales through the Internet, making it a key distribution channel. |
| B2B marketplaces on the Internet | ~ ™ | Sales through marketplaces are not a priority. Only the telecom services sub-sector and, to a lesser extent, the software services sub-sector use marketplaces, for example in auctions, to cut costs. |
| Use of e-business standards for security issues | ~ ~ ~ | E-business standards and security remain a crucial issue to increase the adoption of electronic business practices among ICT services enterprises. |
| Web services and XML-based standards | ~ ~ | Even in this sector, companies themselves do not seem yet fully convinced about XML. It could, however, become the main standard for electronic transactions in the future. |
| Extended enterprise: collaborative (online) e-product design | ~ ~ ™ | Collaborative technologies and processes are widely used in the software sub-sector, but their usage varies in other sub-sectors. |
| ~ = little relevance; ~ ~ = average relevance; ~ ~ ~ = very relevant; ~ ~ ~ ~ = highly relevant for sector ™ = mixed results, depending on the sub-sectors in the ICT services industry | | |

Source: *e-Business W@tch* (2004)

## 2.1.1 Comparison between telecommunications services and computer-related activities

Based on these findings, the following chapters (2.2 – 2.4) analyse in more detail selected ICT and e-business issues that are considered to be particularly relevant for the sector. Case studies and business references illustrate how these issues are dealt with in companies and the opportunities and challenges arising from them. To clearly understand the adoption and use of e-business in the ICT services sector, it is useful to recall the main characteristics of the ICT services sector and the differences between its two sub-sectors: telecommunications services and computer related services.

The ICT services sector has some important features that are relevant for its use of e-business:

- The sector is an early adopter and intensive user in e-business: The challenge in this analysis is both to pinpoint some specific issues that will help improve the use of e-business, while bearing in mind that the ICT services sector is in many respects the leading sector, and thus plays the role of benchmark in terms of e-business adoption.

- ICT services companies are often both suppliers and users of e-business solutions: In some ICT services, an e-business application may be used by both the application provider and by other end users, which creates de facto a collaborative process. A case in point here is the delivery of ASP services. This poses a potential problem when analysing key issues for the ICT services sector on the user side of things. However, a clear distinction will be made from the outset for issues that concern the ICT services sector directly, such as e-business services production.

- The ICT services sector has a sizeable impact on the economy as a whole: The ICT services sector's products and services have a direct impact on productivity and the economic growth. Although this sector represents a comparatively small part of the economy as a whole, it has the potential to significantly modify the structure of and influence organisational changes in companies.

Despite having a number of common features, such as those described above, the telecommunications and computer related services sub-sectors are decisively distinct. They differ in the way they produce services, as well as in the structure of their customer base. And these differences mean different e-business strategies and, consequently, different usage of e-business applications.

- Telecommunications services are largely infrastructure-based services, continuously provided to consumers and businesses. Telecommunications services require large inputs of capital and technology, typically marketed by large enterprises and sold to a large number of customers.

- Computer related services have three distinctive characteristics:

  o Consulting services are typically project-based, mainly requiring knowledge-able and skilled workers but only a limited use of capital and technology. Such services are usually produced by small enterprises and often sold to a single customer.

  o Software is often produced in the same way, especially when it is customised to the needs of the buyers. However, standard software also looks like a commodity product when sold in packaged form to a large number of customers.

  o Finally, database services are very similar to telecommunications services in terms of production, but can differ in terms of customer numbers.

In fact, both sub-sectors differ from most "traditional" service activities. Telecommunications services companies are, to a large extent, utilities that require large amounts of capital and a relatively small amount of labour for production. Computer services companies, on the other hand, are smaller and more specialised companies ("best of breed") (see Exhibit 2-2).

*Exhibit 2-2: Main characteristics of each sub-sector*

| Sub-sector | Telecom Services | Computer related services |
|---|---|---|
| Market | Large number of customers | Limited number of customers |
| Industry structure | Capital intensive | Labour intensive |
| Company size | Large | Small and medium |
| Service | Infrastructure-based services | Project based services |
| Business model | Large economies of scale | Small economies of scale* |

* Except standard software production.

Source: IDATE 2004

## 2.1.2   Key issues identified in the ICT services sector

Based on the identifying characteristics of the sector and its sub-sectors, as summarised in the previous section, a number of specific issues will be analysed in more detail and illustrated by case studies in the following Chapters. The report includes three case studies to illustrate the key issues that will be further developed in this report.

- The following section (Chapter 2.2) analyses the **importance of CRM applications** (Customer Relationship Management) for ICT services companies. Such applications are crucial for securing customer loyalty and developing innovative and personalised services, particularly for companies that manage several million customers, such as telecom service operators and software vendors. However, some firms have experienced considerable difficulties with their CRM implementations, and SMEs still lag behind in terms of adoption rate. Underlying reasons for these difficulties are explored in this section.

    Case study: CRM implementation / Vodafone (Greece)

- Chapter 2.3 discusses the **impact of broadband and remote Internet connections, and of e-business applications,** when seeking to build a **collaborative working environment**. The objective is to evaluate the impact of broadband access dissemination in companies on developing data exchanges and building new working practices.

    Case study: SynerDeal (sourcing applications)

- Chapter 2.4 evaluates **how e-business applications have contributed to the development of new service structures** such ASP (Application Service Provider) services and hosted services. The goal is to assess the degree to which this new organisation of services could modify the sector's value chain, and change the relationships between the e-business solutions provider and the end-users.

    Case study: Accelance MSP (Management Services Provider)

# 2.2    CRM: A critical issue for ICT services companies

Customer Relationship Management (CRM) systems have a clear relevance for ICT services companies, especially for telecommunications services and software vendors. However, largely due to the **high cost of implementing the solutions**, up until now only large companies have had access to these e-business applications, and even major players have experienced **difficulties in implementing them**.

## CRM usage in telecommunications and software services

CRM solutions are systems that allow ICT services companies to plan and analyse marketing campaigns, to identify patterns in sales (e.g., which customers buy what types of products and when), and to manage customer contacts and call centres. CRM applications are critical for telecommunications services operators and standard software vendors that have to manage a large customer base. In the area of telecom services, for instance, French incumbent carrier, France Telecom, manages over 100 million customers, including those of its subsidiaries.

However, some ICT services companies have experienced difficulties when implementing CRM systems and, in particular, the smaller enterprises are still dragging their feet. Of particular interest here is exploring the reasons behind these difficulties or obstacles when implementing CRM systems, and their relatively low rate of adoption by the sector's SMEs.

According the e-Business Survey 2003, telecommunications services (NACE 62.4) and software services companies (NACE 72.2) are both intensive users of CRM applications, and are well-equipped in ICT systems integration with customers (see Exhibit 2-3).

*Exhibit 2-3: Cross-sector CRM usage and online sales activities*

| | CRM usage | | Selling online | | IT system integration with customer(s) | |
|---|---|---|---|---|---|---|
| | % of firms | % of empl. | % of firms | % of empl. | % of firms | % of empl. |
| Combined ICT services | 15 | 36 | 15 | 24 | 39 | 53 |
| *Telecom* | *19* | *36* | *29* | *37* | *49* | *62* |
| *Computer* | *14* | *26* | *19* | *23* | *29* | *48* |
| *Software* | *15* | *42* | *9* | *20* | *47* | *51* |
| Business services | 4 | 13 | 3 | 11 | 32 | 38 |
| Craft & Trade | 4 | 13 | 9 | 16 | 27 | 31 |
| Health and social work | 3 | 7 | 2 | 7 | 22 | 28 |
| Retail | 3 | 7 | 8 | 17 | 21 | 22 |
| Tourism | 5 | 14 | 33 | 37 | 27 | 23 |

Note: In all graphics in the report, the words "software" and "computer" mean respectively software services (NACE 72.2) and other computer services (all NACE 72 except NACE code 72.2).

Base: all enterprises, EU-5 (DE, ES, FR, IT, UK). N = 502 (ICT services), N =74 (Telecom), N= 179 (Computer), N= 249 (Software), N ~ 500 for other sectors.. (in % of employees means that data are weighted by employment ("enterprises comprising …% of employees in the sector"). Reporting period: March-November 2003.

Source: *e-Business W@tch* (2004)

15% of all companies in the ICT services sector use CRM applications, compared to 6% on average in the sectors monitored by the *e-Business W@tch.* CRM systems are mainly implemented in large companies: 15% of companies using CRM represent more than one third of sector employees (36%). Such is particularly the case in the software sub-sector where CRM usage has been reported in 15% of the companies, accounting for more than 40% of employees of this sub-sector (see Exhibit 2-4).

*Exhibit 2-4: CRM usage in the ICT services sector*
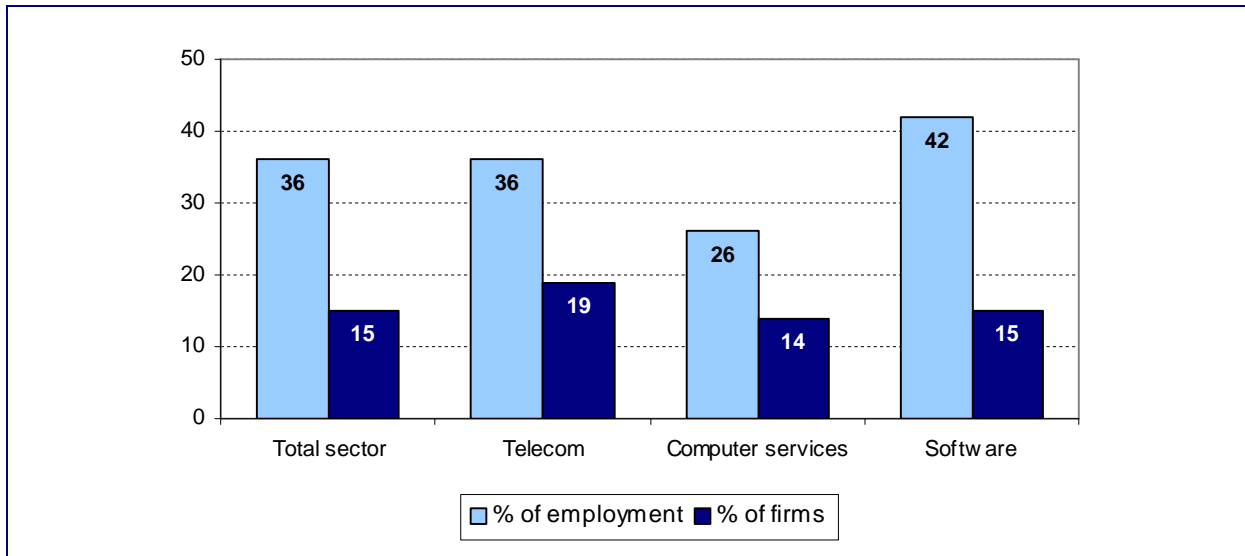


Base: all enterprises, EU-5 (DE, ES, FR, IT, UK). N = 502 (ICT services), N =74 (Telecom), N= 179 (Computer), N= 249 (Software), N ~ 500 for other sectors.. (in % of employees means that data are weighted by employment ("enterprises comprising …% of employees in the sector"). Reporting period: March/November 2003.

Source: *e-Business W@tch* (2004)

CRM applications are particularly important for large telecom operators and for standard software vendors[8], as they both have to deal with a large number of customers from different market segments (consumer market, small office/home office market, corporate market).

- In the telecommunications services sub-sector, the development of additional and sophisticated services (e.g. simple call forwarding, caller identification, rapid access to customers' profiles), and the implementation of customised billing processes require the use of CRM applications. CRM promises the opportunity to provide customised services, to improve the quality of services and to increase customers' loyalty. The use of CRM applications can also contribute to a rise in internal labour productivity (see Case study on Vodafone Greece).

- In the software services sub-sector, large software vendors regularly promote trial versions of their software, and market their products through direct downloading processes and through multiple distribution channels. CRM applications allow them to better segment their market and to offer a higher quality of customer service.

Therefore, CRM applications are gaining importance in the ICT services sector as a means of managing a large number of customers via different distribution channels, cementing customer loyalty, developing innovative and personalised services and increasing employee productivity.

## Major difficulties met in implementing CRM applications

As stated above, the implementation of CRM solutions could endow ICT services companies with some clear advantages. However, the implementation of a CRM system and its subsequent use must follow certain steps. According to market analyst Datamonitor, a third

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[8]  Standard software is defined as commercial packaged or semi-package software sold to large number of customers.

of all CRM projects implemented in various economic sectors between 2001 and 2002 had failed to meet their initial timetable and projected costs[9].

There are, in fact, several reasons which may impede CRM implementation - even in large companies. First, the companies' top management was sometimes not fully involved and did not have clear strategic objectives when implementing a CRM project. In the past, the decision to implement a CRM solution was often motivated by the need to cut internal costs. In the call centre business, for instance, the decision of implementing CRM applications was initially based on getting people off the phone as quickly as possible, rather than taking advantage of the benefits of such applications, such as collecting data on customers' needs and expectations, to then increase their satisfaction level or develop cross-selling campaigns[10]. Second, employee training was generally not sufficiently taken into account in those CRM implementations which failed. Training issues are in fact critical, since the success of a CRM system depends heavily on its users, many of whom have direct contact with customers.

France Telecom's CRM project, called e-Force, is an interesting example of the importance of the organisational and human aspects. Based on a PeopleSoft CRM solution, the main objective of the project was to develop and share a common and coherent vision of the company's customers, and to facilitate the flow of information between departments. During the three years of implementation, more than 7,000 employees received a day and a half of training on the use of e-Force applications. According to the project manager, "*one of main reasons behind the success of this implementation project stems from the solid involvement of both upper management and employees*"[11].

In the case study presented in this section (Vodafone's CRM system in Greece), employee training was also identified as key to the successful implementation of the CRM system. It is worth noting that these ICT services companies benefit internally from having among their staff highly skilled ICT people; in addition, they have the financial resources and means necessary to support training activities for a large number of employees.

It seems that only recently companies have started to realise that the human aspects are at least as critical as the technological aspect in the successful implementation and use of CRM systems. CRM in fact has a sizeable influence on a company's organisation and employees, particularly when adding a layer of business intelligence above the CRM system.

A successful implementation of a CRM system requires objectives to be clearly established from the outset to ensure optimal use of the application, and both the upper management and employees need to be involved throughout the implementation process. Most of the time, human aspects are not considered thoroughly by large companies, an oversight which bears some responsibility in cases where CRM system implementations proved troublesome.

### SMEs' low rate of CRM adoption

In the ICT services sector, micro-enterprises (with less than 10 employees) and, to a certain extent, small enterprises remain less equipped in CRM applications than companies with more than 50 employees. This finding holds true for enterprises in other sectors studied by the *e-Business W@tch,* but is particularly noticeable in the computer related services sector which is mainly populated by micro and small enterprises. As shown in Exhibit 2-5, 36% of

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[9]    Source: M2 Presswire, April 17 2002 from Datamonitor

[10]    Communications Week International (2002), Relation Therapy, 25 September 2002.

[11]    Interview with Maïtena LABARERE-GEYE, Manager of e-Force application in July 1, 2004.

employees in ICT services firms work in companies which use a CRM system. However, in micro (0-9 employees) and small enterprises (10-49 employees), only 14% and 28% of them, respectively, use CRM applications. Even though it is true that SMEs have a smaller number of customers to manage and fewer needs, the CRM adoption rate is still low by comparison to their larger counterparts.

*Exhibit 2-5: Companies from the ICT Services sector that use a CRM (customer relationship management) software solution (2003)*
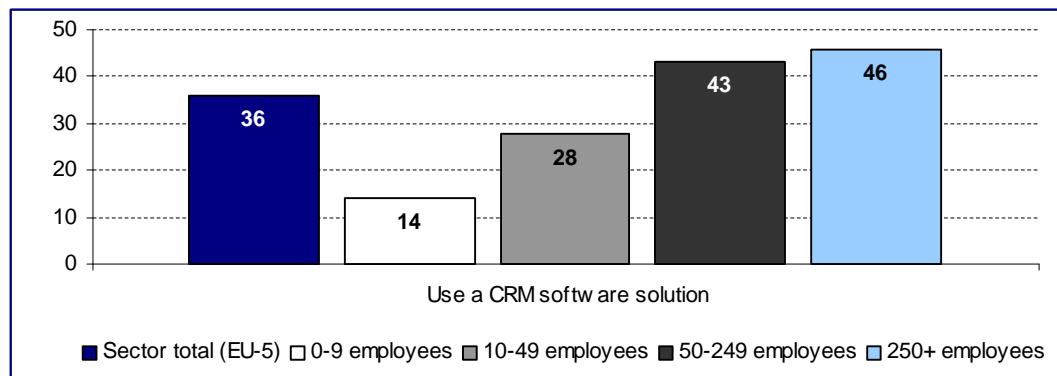


Base: all enterprises. EU-5 = DE, ES, FR, IT, UK. N=502 for EU-5 sector total.
Weighting: Figures for size-bands in % of enterprises. Figure for "Sector total" is weighted by employment ("enterprises comprising …% of employees"). Reporting period: March/November 2003.

Source: *e-Business W@tch* (2003/04)

One of the main reasons is the high cost for the acquisition and maintenance of systems. In fact, the cost of purchasing a CRM system is normally only a fraction of the total expense: implementation, training and integration outlays can be three to five times the price of the solution. All in all, a highly complex CRM installation can cost over 80 million euros and take three years to complete.

An enormous part of the cost is the training – not necessarily systems training, but teaching employees how the company wants them to interact with customers, what their priorities should be and the corporate image to project. Moreover, the implementation of CRM systems is sometimes too complex and requires internal organisational changes to fit with the business process (see Vodafone Greece case study).

## Conclusion

The rate of CRM implementation in the ICT services sector is higher than in other sectors, but remains low among micro and small companies. Nevertheless they have to address the needs of the same types of customers as large companies – but probably not the same numbers – and be able to market complex ICT services through the various available sales channels. In short, CRM systems are important e-business tools for enabling micro and small companies to compete in an increasingly competitive environment. But as they do not face the same needs as large companies, they do not require complex and expensive CRM applications. The lack of an adequate offer of CRM applications targeted to micro and small companies on the market may explain in part the low rate of CRM application adoption among this size of company.

# CASE STUDY: VODAFONE GREECE

## Abstract

*Mobile telecom operator, Vodafone Greece, has implemented a CRM solution designed by software vendor Siebel, to better understand its customers' preferences and deliver improved services. This has helped the telecom operator to reduce its annual customer churn rate by 6.7%.*

| Case characteristics | |
|---|---|
| •     Sector focus | Telecom services |
| •     Business focus | Large company |
| •     Geographical focus | Greece |
| **Case objectives** | |
| •     Mobile communications service | ä ä ä |
| •     CRM use | ä ä |
| •     Reduction of customer churn | ä ä ä |

ä = some relevance for case; ä ä ä ä = high relevance

## Background and objectives

Vodafone Greece, formerly Panafon, is a 99.4%-owned subsidiary of the world's leading mobile phone services provider, the Vodafone Group. In 2003, Vodafone Greece employed 2,500 employees and generated 1.2 billion euros in turnover. The telecom service operator had a base of 3.7 million customers at the end of June 2004, which represents 34% of all mobile telephony subscribers in Greece.

Vodafone Greece experienced growing competition from 3 competitors[12]: Stet Hellas (2.5 million subscribers), Cosmote (4.1 millions subscribers) and Q-Telecom (0.5 million subscribers). Originally there were two players on the market, Panafon and STET (now TIM), but competition intensified after the fixed telephony incumbent's subsidiary, COSMOTE, entered the market in 1998, followed by a fourth competitor, Q-Phone. To succeed in this fiercely competitive environment, Vodafone Greece strove to minimise its customer churn rate (subscription cancellation rate), to target new customers by delivering consistently high-quality service and to ensure a high level of customer satisfaction.

To achieve these objectives, the company decided to introduce a streamlined approach to call logging and trouble ticket management. The other key aim was to deploy a campaign management system that would help Vodafone Greece to increase its customer retention level. The upgrading of the CRM system started in mid-2000 and lasted 5 months.

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[12]   Number of subscribers at the end of June 2004.

## Activities

### Inputs

Initially, Vodafone Greece used the Scopus[13] CRM system as a call logging and trouble ticket system, but the company needed to upgrade this solution. To do so, Vodafone Greece chose eSiebel Communications to provide a more powerful CRM system with functionalities including:

- Customer information files
- Request handling
- Status of the requests
- Handling new connections
- Trouble tickets and complaint tickets management
- Conversion of all incoming faxes/e-mails from the customers to a service request which (depending on the type of request) is forwarded to the appropriate department.
- Computer Telephony Integration (CTI)

According to CRM Team Leader, Mr. Karantonis, "*the main reason for selecting this specific CRM application was that it incorporated all the above functionalities/modules*".

To configure the CRM system, Siebel obtained the support of a systems integration specialist from Vodafone Greece. Numerous back office applications were provided by several partners: Oracle (data warehouse), Compaq (network management system) and Genesys (Computer Telephony Integration software). With regard to the latter, Vodafone Greece has integrated the CRM solution seamlessly with the CTI software supplied by Genesys to support inbound and outbound call routing.

### Outputs

Most of the departments (Finance, Back Desk, Retail & Disconnection, New Connections, Sales) are using the current CRM solution. Vodafone Greece has also developed an internal help desk for handling the employees' training requests. According to Mr. Karantonis, "*even the Human Resources Department uses the CRM solution for handling employees' requests*".

Since the implementation of the new CRM system in late 2000, additional functionalities were added to get more real-time monitoring of corporate sales and improve the marketing campaign process, including

- Handling of corporate sales
- Marketing module for quick planning, preparation and execution of campaigns, and for measuring responses.

## Impact

The main and overall result is that the new CRM solution has helped Vodafone Greece to reduce annual customer churn by 6.7 percent. Although this significant improvement cannot exclusively be attributed to CRM use, the company management believes that

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[13]  Scopus was a call logging and trouble ticketing system developed by US company Scopus Technology. The company was acquired by Siebel in 1998.

the more sophisticated use of CRM technology has clearly contributed to the successful development.

More than 300 call centres, sales, marketing, and operations professionals at Vodafone Greece now use the new CRM solution. It has helped them to synchronise and coordinate all customer interactions across multiple channels, including telephone, e-mail, face to face, postal mail, and fax.

The CRM solution has also enabled employees to improve customer service, increase productivity and maximise revenues. The company's call centre currently receives more than 45,000 inquiries every day – equivalent to more than 14 million calls each year. The software's automated workflow and escalation procedures also enabled agents to provide accurate resolution to up to 1,000 trouble tickets per day.

The workflow automation capabilities of the CRM solution have enabled the company to manage each and every one of these calls efficiently and professionally. Sales agents are now automatically connected to customers and prospects based on product and service expertise, named account, availability and geography. They can also check the status of a calling subscribers' request or inform him/her of the status of the request.

Call scripting and profiling further improved agent productivity. A workflow-based user interface presents the appropriate questions and information as needed, guiding agents through a sequence of steps based on customers' individual requirements. Currently there is another project running which will allow Vodafone Greece to have a CRM system for billing information.

However, Mr. Karantonis stresses that it is "*difficult to come to any conclusions from the increasing number of answered calls every call. Today, the mobile services operator have a lot more services to provide which means more calls to the call centre (for activation/deactivation of services) compared with 3 years ago*". Since, the nature of mobile telecom services has significantly changed, metrics are difficult to analyse.

## Lessons learned

According Mr. Karantonis, the implementation of the new CRM system was not without difficulties. At first, the employees had trouble using the CRM solution. But thanks to employees' involvement, the CRM implementation process was ultimately successful.

During the implementation of the project, all CRM team members attended a Siebel training course for 2 weeks. The percentage of personnel involved was high and, during the first 5 months, most employees had to work overtime every day. During the subsequent years, all employees have attended a great many Siebel module presentations (such as marketing campaigns, customers loyalty, order management, e-mail response) to familiarise themselves with the CRM system. Once familiar with the product, it became their main working tool.

Mr. Karantonis also states that another key difficulty was to deal with data migration from the old to the new application. To meet the challenge, the company had first to decide and see how the Scopus Business logic (the old CRM system) could fit into the Siebel modules. For example, all of the customers requests records had to be migrated to the Siebel service requests module, and all Scopus customer information to the Siebel accounts component. Second, after matching the respective components, the company performed a data/field mapping. Once matching of the respective modules

and the data migration had been performed, it became easier to undertake further enhancements and improvements.

Notwithstanding these technical challenges, the most important experience gained was that organisational and human aspects are at least as critical as the technological ones in the implementation of CRM systems.

## Sources and references

- Siebel Customer Success Story, Siebel eBusiness, www.siebel.com
- Interview with Nikolaos Karantonis, CRM Team Leader, Vodafone Greece, (August 2004)
- "The world mobile services market," IDATE, 2003, www.idate.fr

## 2.3 The challenge for micro companies in a more network-oriented business environment

Although the ICT services sector is a leader in its adoption of e-business applications and broadband Internet connections, there is still **unexploited potential** in this area, **especially among micro enterprises**. In particular, the change of working practices (individuals and departments) and the development of innovative and collaborative working processes (based on a common technological platform) are crucial to exploiting technology's full potential. The goal of this chapter is to discuss how micro ICT services companies can take advantage of the yet untapped infrastructure potential to better integrate themselves in a networked business process and changing working practices

### High adoption rate of broadband access: a key asset for the ICT services sector

The ICT services sector has a higher level of broadband network use than the other sectors monitored by the *e-Business W@tch*. Easy broadband access is increasingly crucial for ICT services companies. The development of complex project-based organisations and processes, involving different types of ICT skills which are geographically dispersed, requires the transfer and reception of large amounts of data to manage day-to-day production processes like software development, billing processes or customer database services.

The *e-Business W@tch* Survey confirmed that the ICT services sector makes greater use of broadband networks than other sectors (see Exhibit 2-6). More than 5 in 10 sector employees work in companies that use a more than 2 Mbps Internet connection, compared to no more than 3 in 10 employees in other sectors. However, only 26% of the total enterprises in the ICT services sector (versus 15% in the other sectors) appear to be using broadband connections, revealing that it is mainly large companies which have installed them so far.

*Exhibit 2-6: Quality of Internet connection used by ICT service companies (2003)*

|  | Still use analogue dial-up modem | Are connected with <2 Mbps | Are connected with >= 2 Mbps |
|---|---|---|---|
| Sector total (EU-5) |  |  |  |
| % of employment | 15 | 38 | 52 |
| % of enterprises | 25 | 62 | 26 |
| 0-9 employees | 26 | 64 | 25 |
| 10-49 employees | 11 | 39 | 47 |
| 50-249 employees | 7 | 38 | 53 |
| 250+ employees | 13 | 27 | 66 |
| All (9) Sectors (EU-5) |  |  |  |
| % of employment | 16 | 54 | 31 |
| % of enterprises | 27 | 64 | 15 |

Base: enterprises connected to the Internet. EU-5 = DE, ES, FR, IT, UK. N=492 for EU-5 sector total and 50-100 per country. Weighting: Figures for size-bands in % of enterprises. Reporting period: March-November 2003.

Source: *e-Business W@tch* (2003/04)

The quality and the level of sophistication of e-business solutions are, among other things, dependant on the network capacity that firms can use. The more bandwidth their systems have, the more comfortable the use of the network, and the more features can be made available.

In many occasions, frustration and negative experiences with e-business applications have derived from attempts to operate complex systems on low bandwidth networks. This is still the case, for example, in e-learning applications which generally require broadband connections to provide videoconferencing and collaborative exchanges among participants.

## Development of networked business processes and working practices

The intense competition and changing working practices have made it necessary for the sector's companies to adopt a broad variety of e-business applications, a process which has pushed organisational structures well beyond their traditional boundaries (see Exhibit 2-7). This statement is confirmed by a study from the Austrian Institute of Economic Research (WIFO). It indicates clearly that the introduction of e-business applications significantly modifies the traditional organisational structure and working practices of ICT services companies[14].

*Exhibit 2-7: Network transformation of companies*

| Networking Transformation | | |
|---|---|---|
| Fixed and mobile | à | Mobile and nomadic |
| Circuit switching | à | Packed-based switching |
| Voice + Data | à | Interactive multimedia |
| Generic | à | Personalised |
| Narrowband | à | Broadband throughout |
| Connection-oriented | à | Content-oriented |
| Access-based service | à | Service ubiquity |
| Application/content specific | à | Application/content interactive |
| User managed complexity | à | Network transparency |

Source: What's Ahead for Telecom – ITU Telecom World (2003), Geneva

*Exhibit 2-8: Comparative sector adoption of broadband infrastructure and collaborative working practices*

| | Are connected with >2Mbps | | Extranet usage | | Collaborative product design | |
|---|---|---|---|---|---|---|
| | % of firms | % of empl. | % of firms | % of empl. | % of firms | % of empl. |
| Combined ICT services | 26 | 52 | 19 | 43 | 47 | 67 |
| *Telecom* | 28 | 49 | 28 | 55 | 34 | 72 |
| *Computer* | 36 | 56 | 19 | 37 | 48 | 55 |
| *Software* | 19 | 50 | 17 | 43 | 48 | 74 |
| Business services | 16 | 36 | 7 | 21 | 36 | 46 |
| Retail | 13 | 13 | 4 | 4 | 13 | 30 |
| Tourism | 16 | 16 | 6 | 10 | 18 | 35 |
| Health and social work | 10 | 21 | 5 | 11 | 16 | 27 |

Base: enterprises connected to the Internet. EU-5 = DE, ES, FR, IT, UK. N=492 for EU-5 sector total.

Weighting: Figures for size-bands in % of enterprises. Figures for "Sector total" and "All sectors" are weighted by employment ("enterprises comprising …% of employees"). Reporting period: March-November 2003.

Source: *e-Business W@tch* (2003/04)

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[14] Falk Martin (2004), ICT-linked firm reorganisation and productivity gains, Austrian Institute of Economic Research WIFO.

The combined use of broadband connections and e-business applications drove many ICT services companies to adopt a more networked production process and to re-think their working practices. As shown in Exhibit 2-8, ICT services companies have already invested largely in broadband connections, extranet usage, and collaborative production design to change their way of working, and now rank high compared to other services sectors.

Networked business structures correspond to a new way of working together, and of creating innovative services and business value. The change of working practices is already a reality for most ICT services companies, particularly the large ones.

The case is especially interesting in the US where the use of high-speed connections enable software companies to generate lower production costs via outsourcing services. According to a recent Forrester Research article, this has had direct consequences on the evolution of the US software market. Over the past 20 years, the customised software market has been declining steadily as commercially packaged and semi-packaged software has grown in sophistication and scope. But, thanks to the availability of low cost labour, offshore development resources which are being used increasingly by ICT services companies, the customised software segment in the US will grow by up to 13% in 2004. [15]

## The creation of innovative working practices

Large ICT services companies are more and more inclined to turn to outsourcing not only for managing a portion of their internal process like purchasing or logistics services, but also for parts of their business such as data centre activities or disaster recovery management.

The Synerdeal case study (following this chapter) illustrates how large companies outsource part of their internal purchasing process by using broadband connections and collaborative working processes. Based on a common technical platform, the e-sourcing service provider enables purchasing teams from remote sites to better define the purchasing demand, prepare the supplier selection process and identify the best suppliers. Broadband data communication networks and cheaper communications favour the emergence of such innovative services.

## Gap between large players and small firms

The Internet and high speed connections make it possible and easier for outsourcing to be carried out anywhere in the world. The danger here is that opportunities are not the same for large and small players. The gap between global players that use outsourcing services and develop innovative working practices, on the one hand, and a large number of small ICT services companies still doing business the traditional way, on the other, could widen in the future.

As shown in Exhibit 2-6, results by enterprise size-class confirm that micro-enterprises are less equipped in broadband connections with more than 2 Mbps. Only a quarter of micro-enterprises have access to such high speed Internet services, compared to 66% of large companies in the sector.

Use of broadband connections and e-business applications also by micro firms is vital, however, as they will be facing increasingly fierce competition. In a context of networked business process and working practices, small companies are at risk as they may loose their flexibility, responsiveness and ability to meet on-the-spot demand with no long-term commitments and, ultimately, their partnerships with larger companies. In such a context,

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[15]    Forrester Research, "The state of software spending", July 2004, www. news.com

small computer-related services subcontractors that once worked for large companies cannot eschew the transformation of their business processes and working practices.

Moreover, the lower adoption rate of broadband access among micro firms could significantly impede the development of the overall European computer related services sector which is largely composed of micro firms.

## Integration[16] of micro firms in networked business processes

As described in the previous sections, ICT and e-business applications constitute certain threats to micro and small ICT services companies, but they also offer new business opportunities, as the Synerdeal case study reveals.

In the current landscape, micro ICT services enterprises need to better equip themselves with broadband connections and e-business applications to maintain their ability to exchange data and implement collaborative practices with larger companies. Wider dissemination of basic e-business applications amongst micro firms is critical to enabling them to seize new opportunities on a changing value chain, and to deliver new innovative services such as outsourcing or ASP services to large companies.

But delivering innovative services requires flexibility, responsiveness and the ability to meet on-the-spot demand. These features could be translated into an ability to operate anytime, anywhere, under any conditions and, to be resilient to any disturbance.

## Conclusions

Micro-firms face a considerable challenge as they are less equipped in broadband access and e-business applications than SME and large companies. Therefore, it is vital that micro firms keep on providing quality services to larger companies, making efficient use of broadband connections and e-business applications. But micro firms' integration into networked production processes relies partly on their adoption of simple, high quality but trustworthy e-business solutions which allow them to take full advantage of the technologies. This is particularly relevant given that 70% of the European sector's employees work in SMEs, many of which are micro-enterprises.

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[16] By integration we mean the ability of ICT services companies to communicate information and make efficient use of their networks and e-business applications as part of their business working process.

# CASE STUDY: SYNERDEAL

## Abstract

*The case study involves the preparatory phase (e-sourcing), prior to the online purchase of calling minutes by SynerDeal on behalf of a European industrial group. The goal for this industrial group was to better integrate the different geographically dispersed purchasing teams, and to achieve a 12% savings on the purchase of its calling minutes. Both goals have been attained and, in fact, a 20% savings was achieved.*

| Case characteristics | |
| --- | --- |
| • Sector focus | ICT services |
| • Business focus | Small company |
| • Geographical focus | France, Germany, UK and USA |
| *Case objectives* | |
| • Computer services | ä ä ä |
| • E-Sourcing | ä ä |
| • Collaborative | ä ä ä ä |

ä = some relevance for case; ä ä ä ä = high relevance

## Background and objectives

The case study is about the preparatory phase (e-sourcing), prior to the online purchase of 105 million calling minutes (6 million euros). SynerDeal, the e-sourcing services provider, acts on behalf of a European industrial group operating 42 sites in three countries (FR, UK, DE).

The goal for the end user is to better coordinate the purchasing activities among different remote sites, and to save on the purchase of calling minutes.

## Activities

Created in 2000, SynerDeal both produces software and provides e-sourcing services to large and mid-size companies (with turnover of more than 80 million euros) and governments[17]. The company began developing its software in 1999, and since then has provided a new software release each month. It uses its software product (SynerTools) to structure, automate and improve end-to-end sourcing processes. The cost of using the e-sourcing solution depends on the company size, but the average price is around 60,000 euros per user.

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[17] E-Sourcing consists in consolidating purchasing requirements, finding the best qualified sources of supply around the globe, streamlining and better controlling purchasing processes to reduce the purchasing costs.

The company reported over 5 billion euros in turnover in 2003, and employs 50 specialised buying agents in Germany, the UK and the United Sates. It generates over a billion euros in product and services purchasing per year.

**Input**

The industrial group called on SynerDeal's experience to provide an e-sourcing service prior to the online purchase of calling minutes. In the preparatory phase (e-sourcing), the customer decided to set up a team with multifunctional qualifications (buyers and technicians) from the different remote purchasing departments.

SynerDeal's e-sourcing process consists of six main stages: definition of demand, sourcing, supplier selection process, analysis of suppliers' offerings, auction, contract signature (cf. Exhibit "The e-sourcing service value chain"). These are partially automated based on the use of the SynerTools solution.

*Exhibit: The e-sourcing service value chain*
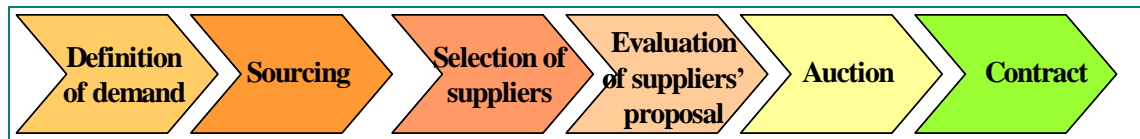


Source: IDATE from SynerDeal documents

- Definition of demand: The fist step was to clearly define the purchaser's demand. A common template was defined to collect relevant data from different purchasing departments to launch the e-sourcing process. The role of the e-sourcing solution provider was to help the remote purchasing teams to work together, to collect and aggregate data internally in order to best prepare the e-sourcing phase.

- Sourcing: Once the sourcing criteria were clearly defined, the buyer contacted 70 telecom operators, based on an initial telephone screening process drawn from specialised databases. It took one week to identify the best suppliers and new suppliers.

- Selection of suppliers: Next, the screening of suppliers was completely automated using a formal document (Request For Information ) to obtain information from suppliers. The RFI was sent to 50 telecom operators and 25 responses were received.

- Evaluation of suppliers' proposals: Prior to launching the auction, the proposals of pre-selected suppliers were evaluated to avoid that suppliers' responses would be too heterogeneous. At this stage, the purchasing team used the collected supplier responses to "equalise" the different suppliers' offers (direct connection costs, change costs, service level). In addition, a conference call was organised with each supplier to allow them to make a better bid. The interactive process enabled suppliers to have a mutual and precise understanding of the buyers' needs. After having completed this stage of the process, 19 suppliers remained on the list.

- Auction: Prior to the auction, e-learning training sessions were organised for the suppliers, and their Internet connections checked. The quality of Internet connections are crucial in the auction process, as it is important to react rapidly to any new bid. During the online auction, 12 quotations were received and 9 operators were pre-selected.

Source: SynerDeal

- Contract: Lastly, SynerDeal helped the purchaser to analyse the bids, shortlist the successful suppliers based on the auction results, and provided further assistance for finalising the deal (use of comparison and decision optimisation tools).

## Output

In this online auction for telecommunications minutes, the e-sourcing software applications have helped both parties:

- Benefit for the end-user (i.e. the European industrial group)
  - o to identify the best operators and new suppliers in record time
  - o to develop a collaborative working process between the internal purchasers located in different remote sites
  - o to extend the number and scope of sourcing projects in progress without using additional purchasing resources
  - o to generate over 20% savings. The buyer has generated 20% savings instead of the 12% targeted before the auction. But this level of savings does not reflect the average savings in using e-sourcing. Savings will in fact vary depending on the products involved, but the average is between 2% and 10%.

- Benefit for the software provider (i.e. SynerDeal)
  - o to facilitate purchasing process enhancement and gathering best practices
  - o to further automate sourcing missions and optimise time-consuming tasks
  - o to guarantee fairness and transparency to all suppliers.

## Impact

The e-sourcing software solution has enabled the end-user to select suppliers more rapidly than in a traditional purchasing process. According to Mr. De Cassan Florac, the General Director of SynerDeal, "*the e-sourcing software solution can be*

*implemented in less than three weeks, since it does not require any hardware or software investment, and requires only one day of training."*

Furthermore, it has enabled the development of collaborative and common working practices between the different remote purchasing departments since they used the same procedures to define their demands, and the same technology platform to communicate from distant sites. But it appears that some employees were reluctant to participate in this online bidding for fear of losing their status in the company. To overcome this reluctance, the company developed specific training programmes and offered incentives to employees (financial incentives, job promotion).

## Lessons learned

On the user side, the deployment of e-sourcing software requires significant changes in working practices, and above all the development of collaborative practices. These changes require careful advance planning, added to which they can up against employee resistance – as was the case within the industrial group participating in the online bidding. Some purchasers were afraid of losing their position within their department. Anticipating this problem, information, training activities and incentives should be considered as accompanying measures when implementing such an e-business application.

Another lesson learned was the fact that companies with dial-up Internet access (low speed connections) could not participate effectively, or had difficulty participating, in the auction sessions since it is critical to react rapidly to any bid from competitors. Those micro and small enterprises in the ICT services sector which are not equipped with a broadband connection are therefore largely excluded from this type of service that would allow them to broaden their market.

On the supplier side, "*some suppliers state that they have expanded their relationship with customers after having been awarded a contract via online bidding*" according to Mr. de Cassan Florac. Once confidence is established with the customers, it is easier for the supplier to develop its business through electronic process. But he also states that "*some suppliers still have concerns about this online supplier selection process which, in their view, leads to strengthened competition and forces prices down*". This new form of electronic purchasing process can strengthen competition among suppliers and de facto eliminate poorly competitive suppliers if the bid is predominantly price oriented. Therefore, the role of the service software provider as third-party is crucial to bring together all necessary information and to establish clear rules which facilitate online transactions.

## Sources and references

- Interview with Mr. Thierry de Cassan Florac, General Director, SynerDeal, August 2004
- Internal documents from SynerDeal
- www.synerdeal.com

## 2.4 New organisation of ICT services distribution and delivery: the ASP model

The Internet constitutes a key distribution and selling channel for ICT services companies. A growing number of ICT services companies use it to provide ASP (Application Service Provider) model-based services to the small and midsize enterprise market. This means of delivering and distributing ICT services could significantly **change the way in which e-business applications are used** and modify **the structure of the software market.**

### The Internet: a key distribution and selling channel for ICT services companies

Unlike in most manufacturing sectors, e-commerce related activities are very common in the ICT services sector. Virtually all ICT services companies display their offerings through their corporate website, while a significant percentage (especially in terms of employment and in comparison to most other sectors studied by the *e-Business W@tch*) actually sells over the Internet. The web can therefore be viewed as a key distribution and selling channel for ICT services companies.

As indicated in Exhibit 2-9, 15% of ICT services companies already sell products and/or services online, accounting for 24% of the sector's total employees. On the basis of these figures, the ICT services sector in general, along with the tourism sector, rank higher than any other services sector studied by the *e-Business W@tch* in this area. The telecommunications services sub-sector is an even greater practitioner of online sales, with almost one third of its companies (representing almost 40% of employees) selling online. Telecommunications services companies emerge as the leading sub-sector since they generally sell a broad range of online services (including subscriptions to fixed and mobile telecommunications services, Internet access services and wholesale services to other telecommunications operators).

Among the various online selling channels, the company website constitutes the main sales channel. Of those companies in the sector that make online sales, close to 90% practice e-commerce through their websites (see Exhibit 2-10). This sales channel is particularly popular with computer related services companies and, to a lesser extent, with telecommunications firms. In fact, 99% of other computer services companies take advantage of this channel to sell their services online. One plausible reason is that websites are easy to implement for small computer services companies and constitute a cheap selling channel for marketing computer services, particularly data processing services and database activities, and for providing online maintenance services.

The other online selling channels, in decreasing order, are electronic marketplaces (48% of the sector's companies that sell online), Extranet (42%), EDI (24%) and mobile tools (8%). It is worth noting that EDI ranks far behind in terms of online selling channels. One of the plausible reasons is that telecommunications and computing are newer industries, and more likely to be comfortable with web-based services. EDI remains more widely deployed in traditional industrial and services sectors such as automotive and retailing.

**Exhibit 2-9: Comparison of service sectors' online sales activities
and use of distribution channels in 2003**
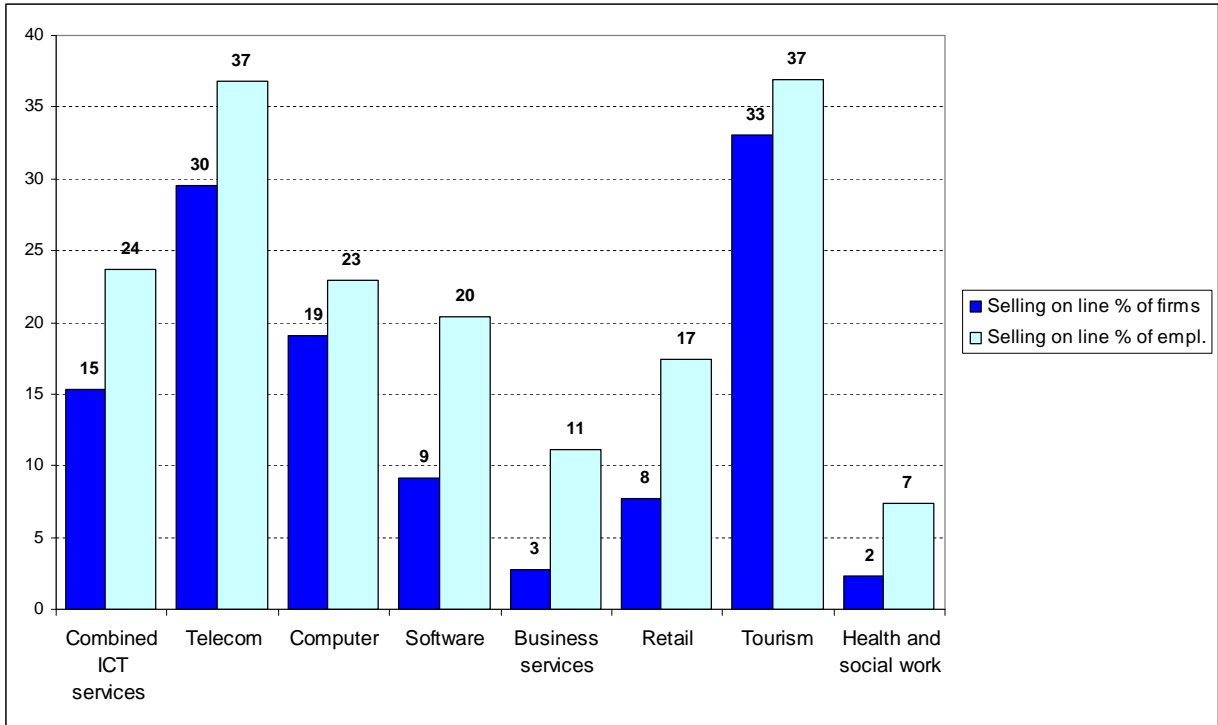


Base: all companies, EU-5 (DE, ES, FR, IT, UK). N = 502 (ICT services), N =74 (Telecom), N= 179 (Computer), N= 249 (Software), N ~ 500 for other sectors. (% of empl. means that data are weighted by employment ("enterprises comprising …% of employees in the sector"). Reporting period: March-November 2003.

Source: *e-Business W@tch* (2004)

**Exhibit 2-10: The main online selling channels used in the ICT services sector in 2003**
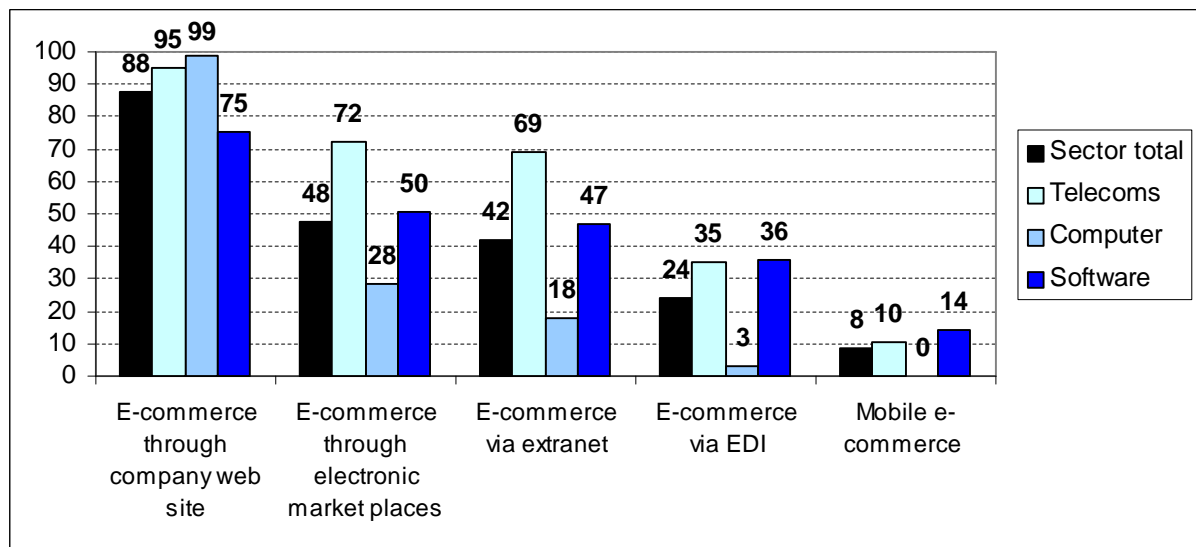


Base: selling online enterprises, EU-5 (DE, ES, FR, IT, UK). N = 502 (ICT services), N =74 (Telecom), N= 179 (Computer), N= 249 (Software), N ~ 500 for other sectors. (% of empl. means that data are weighted by employment ("enterprises comprising …% of employees in the sector"). Reporting period: March-November 2003.

Source: *e-Business W@tch* (2004)

Exhibit 2-11 indicates that the geographical distribution of online sales varies significantly, depending on the sub-sector. Overall, the majority of online sales are national. At the sub-sectors' level, telecommunications and computer services companies seem to develop online selling primarily on their national market (75% of them), while software companies (41%) use online selling channels more to reach overseas customers, in addition to clients in their local market.

Telecommunications markets (particularly consumers and SMEs) are still domestic in the main, offering a range of services in terms of prices and options on a national basis. Most telecommunications services companies operate in only one country or few countries. Many software services companies, on the other hand, sell their software with the same characteristics throughout the European Union. This applies at least to large companies from the sector, while many software companies are micro or small firms with predominantly local customers.

*Exhibit 2-11: Geographical distribution of online sales in the ICT services sector in 2003*
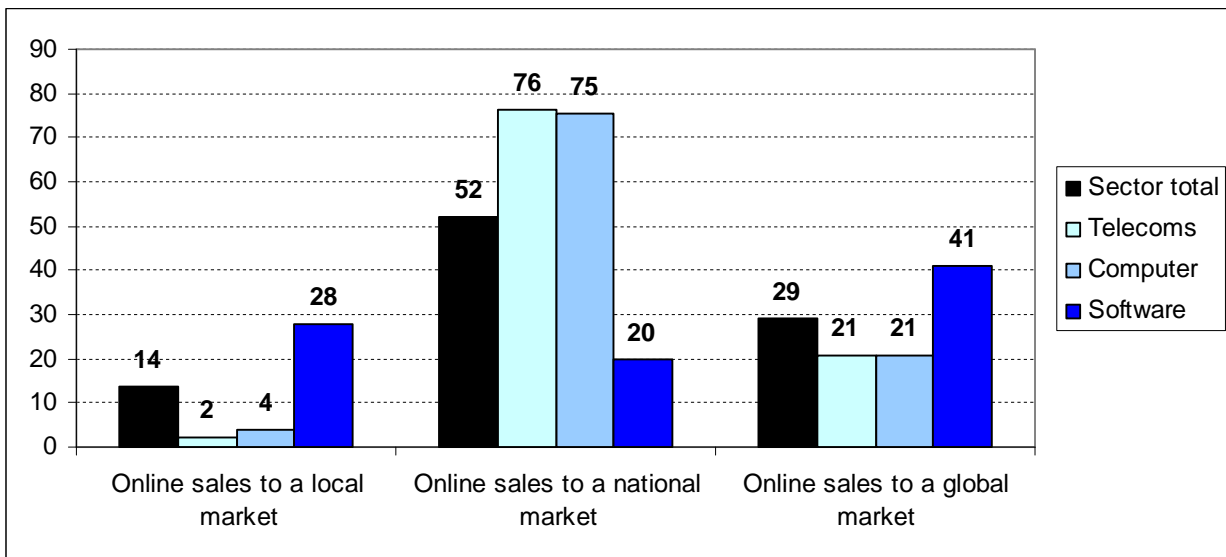


Base: selling online enterprises, EU-5 (DE, ES, FR, IT, UK). N = 502 (ICT services), N =74 (Telecom), N= 179 (Computer), N= 249 (Software), N ~ 500 for other sectors. (% of empl. means that data are weighted by employment ("enterprises comprising …% of employees in the sector"). Reporting period: March-November 2003.

Source: *e-Business W @tch* (2004)

## ASP service based model: an extension of the suppliers' role

The Application Service Provider model (ASP model) is increasingly used for distributing and delivering applications. The model enables remote distribution and delivery of software from a common platform to multiple users (see Exhibit 2-12). This manner of distributing and delivering services contributes to transforming ICT services companies' traditional business process, as well as reinforcing the suppliers' role in the sector's production process.

In fact, a growing number of companies are questioning the tactics of software vendors that make a significant portion of their recurring revenue on software maintenance and support. Such a change in the companies' needs could seriously call into question the traditional software licensing model. Under the installed software model, traditional software vendors sell their products and associated maintenance services. But, software companies have little incentive to satisfy customers under this model, generally preferring to sell them a new (high margin) licence or upgraded version two years later than to maintain the old version.

<div align="center">*Exhibit 2-12: Characteristics of ASP based model*</div>

|  | **ASP** | **Traditional models** |
|---|---|---|
| Application ownership | Owned by the supplier | Owned by the user |
| Location of the services | Remotely from a centrally controlled location via Internet | Installed locally at the user's site |
| Application scope | Limited number of applications | All applications |
| Delivery and service model | One to many, service based model | One to many, sales based or project based model |

<div align="center">Source: IDATE (2004)</div>

On the systems integrator side, it uses more in project-based services mode, whereas ASPs operate in process-based services mode. The systems integrator works with dedicated resources allocated to individual projects. It often intervenes inside the company during the project but does not necessarily ensure maintenance services. The distribution and the delivery of ASP services is different and requires different working practices and a different internal organisation. In the ASP services based model, resources are shared among several customers to ensure the proper functioning of the service at a low cost.

Exhibit 2-13 indicates how ASPs can provide various services along ICT services companies' value chain, including infrastructure services, application and integration services. In fact, the possibility of accessing and using software applications from a distance via the Internet extends users' ability to further support their production process and collaborative working practices with suppliers and/or other partners.

<div align="center">*Exhibit 2-13: Different types of ASP suppliers*</div>
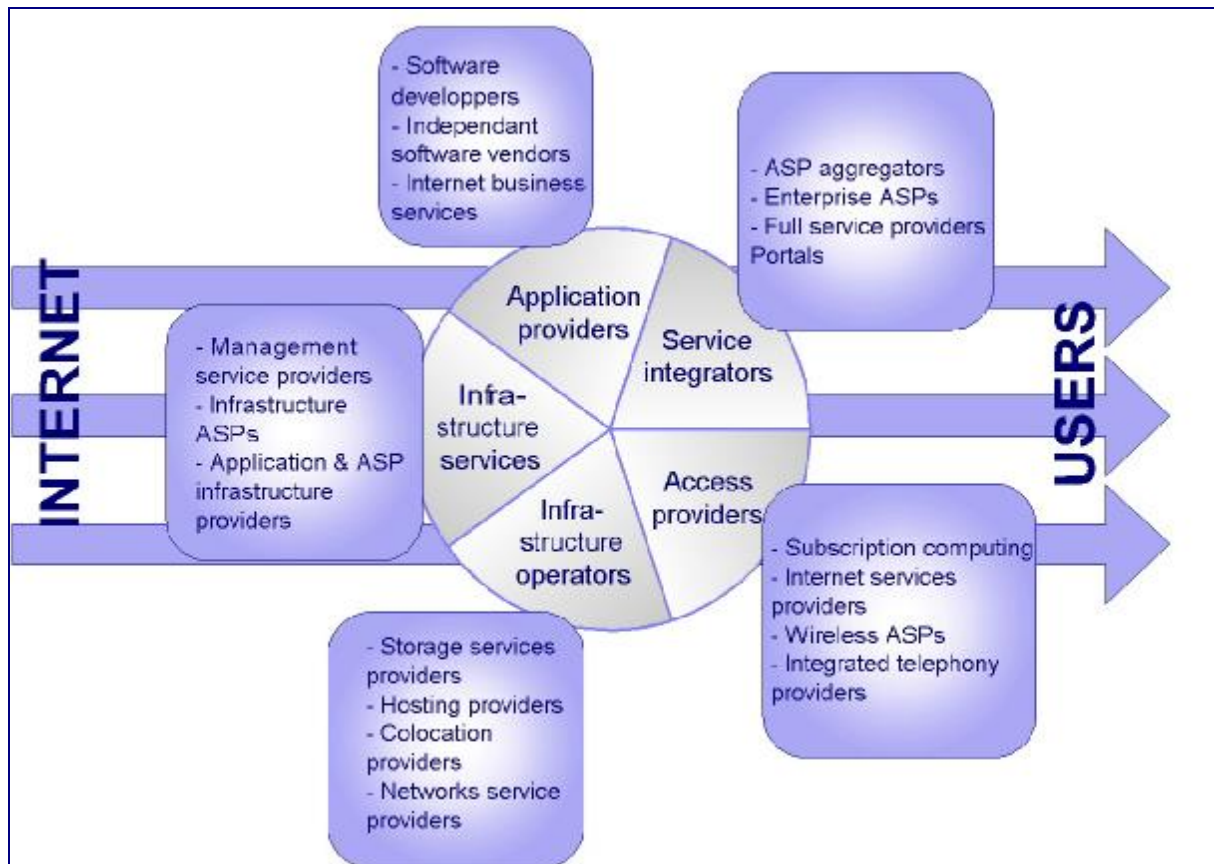


<div align="center">Source: www.aspnews.com</div>

Exhibit 2-14 indicates how ICT services firms have experienced the effect of electronic business on the relationship with their suppliers. It reveals that almost 50% of ICT services companies consider e-business to have an either significant or mild impact on relationships with their suppliers. The impact is significantly higher in the computer related services sub-sector. One explanation for this is that this sub-sector is more dependant on suppliers to run the production process. Among the other sectors studied by the *e-Business W@tch*, only the electronics sector produces comparable results.

*Exhibit 2-14: Impact of e-business on relationships to suppliers*

| | E-business impact: Relationship to suppliers (significant) | | E-business impact: Relationship to suppliers (somewhat) | |
|---|---|---|---|---|
| | % of firms | % of empl. | % of firms | % of empl. |
| Combined ICT services | 16 | 14 | 31 | 33 |
| *Telecom* | *17* | *17* | *21* | *36* |
| *Computer* | *14* | *8* | *42* | *24* |
| *Software* | *17* | *17* | *25* | *38* |
| Business services | 12 | 12 | 17 | 26 |
| Retail | 3 | 10 | 11 | 16 |
| Tourism | 10 | 8 | 20 | 22 |
| Health and social work | 3 | 3 | 15 | 21 |
| Chemical | 8 | 8 | 16 | 24 |
| Electronics | 16 | 8 | 21 | 28 |
| Textile | 1 | 7 | 5 | 14 |
| Transport | 7 | 20 | 12 | 28 |

Base: all companies, EU-5 (DE, ES, FR, IT, UK). N = 502 (ICT services), N =74 (Telecom), N= 179 (Computer), N= 249 (Software), N ~ 500 for other sectors. (% of empl. means that data are weighted by employment ("enterprises comprising …% of employees in the sector"). Reporting period: March/November 2003.

Source: *e-Business W@tch* (2004)

More significant is the fact that the development of e-business and the ASP model contribute to considerably altering the relationships between suppliers and customers, particularly in the software business. The ASP model tends to significantly reinforce the users' relationship with their suppliers. Contractually, a firm supplying an e-business solution under the ASP model is often required to provide 24/7 services. An ASP also provides other services to the user, such as monitoring and management, reporting and maintenance. This means of delivering and distributing e-business applications requires the supplier to enter in the users' information systems. Thus, ASPs have full visibility of users' operational requirements, pricing, bidding information online.

This new way of distributing and delivering ICT services requires an even greater amount of trust between the service supplier and the user, particularly since services tend to be critical for customers' basic day to day activities, and because they are delivered from a distant location (cf. Accelance case study).

## Main advantages of the ASP model for small ICT firms

When ICT companies work with Application Service Providers themselves for their own e-business needs, the role of the service supplier also becomes more important, particularly in the case of micro and small firms. These can derive sizable advantages from the ASP services based model, as they generally use standard e-business applications (such as CRM, accounting and e-purchasing applications) which are well suited for being provided by ASPs. As the service is provided over a network, the user does not have to buy the software

applications or fill the staffing requirements associated with implementing and up-dating versions of e-business applications. Nor does the firm have to install or manage its own infrastructure or the servers generally associated with the use of e-business applications.

Moreover, users can easily scale the e-business application to satisfy any volume of traffic or needs, without guess work or potentially over-spending on additional infrastructure. Consequently, micro and small ICT service firms can gain an edge in terms of responsiveness and flexibility, at a reasonable cost.

Large companies can also benefit, however, from using the ASP model. It allows them to shift certain tasks to the customer, such as personalised configuration and self-monitoring. This is particularly appealing for telecommunication services operators and standard software vendors which have to manage a large customer base.

## Impact of the ASP model on suppliers' competitive position in the ICT services market

Another aspect of the ASP model is that the balance of power between e-business software suppliers seems to have gradually shifted as different sales strategies emerged in the ICT services market. Starting in 1998, the first wave of ASPs were primarily application outsourcers, and many ASPs continue to operate successfully in that area, e.g. Corio, Appshop and Surebridge. Some of these value-added resellers (VARs) are even competing directly with software publishers.

Large software vendors such as Oracle, PeopleSoft, SAP and Siebel have attempted to implement the ASP model, with varying degrees of success. Most of these leading solutions vendors launched light versions of their software: Microsoft with Navision, Oracle, with Oracle E-Business Suite Special Edition, PeopleSoft with PeopleSoft EnterpriseOne Umbrella and SAP with SAP All-in-One product, going head to head with small "best of breed" vendors.

*Exhibit 2-15: Different delivery channel strategies used by ASPs*

| Example of ASPs | Channel Strategies | Products |
|---|---|---|
| ManagedOps | Use of existing commercial channels and Web portal | Various e-business applications |
| Rivio | Partnerships with large organisations (including telecom services operators) to sell the ASP services model | Set of services including Human Resources, time and attendance, payroll and expense, reporting. |
| Progress software (Independent software vendor) | Acquisition of a hosted delivery services provider ( pre-existing channel) | Embedded database software |
| Appshop | Close partnership with large software editors (e.g. Oracle) | Database products |
| Corio | Partnership with system integrators | Customised e-business applications management and infrastructure support services |
| Salesforce.com, NetSuite, RighNow, | Creation of ASP model applications and services | CRM, Web customer services |
| Surebridge | Combines indirect (channels) and direct (own sale force) | One–stop shopping, including own professional services and system integration |

Source: IDATE from ASPnew.com

Small and midsize ASPs have adopted different strategic channels to sell their e-business applications, sometimes forging partnerships/alliances not only with small software publishers, but also with major ICT services providers as they gained in market power.

The true leading ASPs in the present day industry are those which have shifted their ASP services-based model from simple hosting of legacy applications made available online, to developing e-business applications-based products delivered as a service (see Accelance case study). These leading ASPs include Salesforce.com, Netsuite and RightNow, all of which have built e-business applications from the ground up, delivering software and data services online. The gradual shift of the balance of power from traditional software vendors to new emerging ASPs represents a certain threat to traditional software publishers, particularly to those players who are used to providing traditional e-business services to companies.

## New business model

The change in users' needs, especially in the ICT services sector, has favoured the deployment of the ASP model and, more general, of "on demand" services. Users are now looking less for expensive all-in-one e-business solutions and more for flexible, modular systems that can be customised to their specific needs. To illustrate this point: A recent study found that as much as 30-50% of the installed base of software in the United States is not upgraded because companies overbought licences. Instead of upgrading and paying a software company for services, some firms end up establishing their own in-house expertise for the software version they possess.[18] Longstanding customers are beginning to optimise the use of their ICT infrastructure, reducing the ongoing costs of maintaining their current systems, and using the money saved to deploy new systems capable of generating tangible and short-term benefits.

In fact, a growing number of companies are questioning the tactics of software vendors that make a significant portion of their recurring revenue on software maintenance and support. Such a change in the companies' needs could seriously call into question the traditional software licensing model. Under the installed software model, traditional software vendors sell their products and associated maintenance services. But, software companies have little incentive to satisfy customers under this model, generally preferring to sell them a new (high margin) licence or upgraded version two years later than to maintain the old version.

New ASPs started implementing a subscription model typically based on one or two-year contracts. This gives ASPs a major incentive to satisfy their customers. They need to invest more in the relationship with customers to ensure that contracts are renewed. To illustrate: ASP RightNow provides its customers with 90 minutes of phone support every few months, allowing them to contact RightNow's support team to either "tune up" current applications and/or develop best practices for free. In this new landscape, the industry's leadership could shift from those who have an installed base of software, to those who are creating an ASP services model or "on-demand" products.

## Conclusions

The ASP business model is important for ICT services firms both as customers of ASPs and as service providers. As customers, the development of the ASP model could facilitate the further deployment and use of e-business applications in the ICT services sector, and particularly among micro and small enterprises that are generally less equipped than large companies yet. From this perspective, the dissemination of the ASP model should be further

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[18]  Newcomb Kevin (2004), "Why Web-based analytics work", www.aspnews.com

encouraged, as it enables micro and small firms to access e-business applications more easily. In addition, the ASP model has a noticeable impact on companies' management processes.

For software companies, the ASP model provides new ways of delivering e-business applications. ASP has the potential to lower costs and significantly shorten the time of e-business applications implementation, while also maintaining ICT services companies' flexibility and responsiveness. This increasingly common means of distributing and delivering e-business applications is gradually contributing to shifting the balance of power in favour of new suppliers, and could stimulate competition on the software market, which has hitherto been largely controlled by large software publishers.

# CASE STUDY: ACCELANCE MSP

## Abstract

*A large French systems integrator was awarded a contract by a multinational from the textile industry to provide hosting services, systems administration and data server operations monitoring, in ASP mode. To provide these services, the integrator called on the experience of a third-party, Accelance MSP, a company specialised in providing management and hosting services in ASP mode. Accelance MSP's services allowed the end client to generate a 30-60% savings on the cost of managing a base of 50 servers, while enjoying a better quality of service.*

| Case characteristics | |
|---|---|
| • Sector focus | ICT services |
| • Business focus | small/large company |
| • Geographical focus | France, Europe |
| *Case objectives* | |
| • Computer services | ä ä ä |
| • Management services | ä ä |
| • ASP services based-model, open source | ä ä ä ä |

ä = some relevance for case; ä ä ä ä = high relevance

## Background and objectives

A large French systems integration company, which we shall call "Company X"[19], was awarded a contract by a multinational in the textile industry to provide it with hosting, administration and monitoring of is data servers, in ASP (Applications Service Provider) mode. The goal for Company X was to provide its end client with a high quality service,

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[19] For reasons of confidentiality, the systems integrator requested anonymity. We shall therefore refer to it as "Company X."

without having to call on its in-house team dedicated to managing and monitoring data servers 24 hours a day, 7 days a week (24/7).

To provide these services, Company X called on the expertise of a third-party, Accelance MSP[20] (www.accelance.com), a small company with a staff of 20, specialised in providing facilities management and hosting.

## Activities

### Input

Company X chose the server management and monitoring solution marketed by Accelance MSP. The objective when implementing this solution, called X GUARD, was to manage a base of 50 servers, ensuring their level of performance and obtaining malfunction and incident detection and resolution/repair.

Periodically, the XGUARD solution (XGUARD Engine) scans all of the end users' equipment (network, systems, applications) and automatically manages the upstream flow of alert data via e-mail or SMS. In fact, each scan generates an alert message to Accelance's Network Operation Centre via a collaborative portal and managerial extranet. From a technical perspective, Accelance's XGUARD solution provides both 24/7 remote alert monitoring based on a Linux management infrastructure (Extranet), and a 24/7 alert management service that announces any incident on servers.

*Screenshot of the monitoring scoreboards*



Source: Accelance MSP

Monitoring is implemented under an ASP services-based model. The service includes a secure portal to access real-time systems status, statistics and historical information, but often requires interactive communication with the end users.

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[20]  MSP = Management Services Provider

## Output

The ASP model has benefits for all stakeholders involved in the value chain:

Benefits for the end user (i.e. the textiles multinational):

- The end user firm benefits from greater control over the operation of its server platform. It gains direct access to its account on the monitoring extranet by typing in a login and secured password. It can monitor the availability of its network, system and the applications on its platform in real time through a control panel.

- It has enjoyed a 30-40% savings on the cost of directly managing its collection of servers.

- It had a secured solution deployed within a week. The implementation phase of the service was considerably reduced (one day) compared to the purchase of server monitoring software (several weeks).

- It has a single contact with Accelance's staff which is in charge of managing the server base. Plus, the end user is kept informed through various communication platforms (SMS, e-mail) in push mode.

- It has cut the training time for the solution down to half-a-day per person

- It enjoys a higher level of service than the one generally supplied by in-house employees. In-house employees are often doing software development so they cannot intervene rapidly, and have to juggle priorities. The ASP guarantees that trouble and down time are handled within 15 to 60 minutes of receiving alerts.

- It benefits from regular upgrades of the server monitoring software.

Benefits for the service provider (i.e. Accelance MSP), both publisher and user of the X-GUARD solution:

- The ASP increases the value of its service, providing a totally transparent service to both the systems integrator and to the end-user via different scoreboards and reporting tools. It is important to note that Accelance has a direct relationship with the end-user.

- The functionalities of the solution are continually being improved, since end users can configure the solution themselves, control the network's state of operation, issue intervention requests and fill out a diagnosis when incidents occur during the trouble ticket procedure. This contributes to devising innovative ways of processing the service. The software solution can evolve through interactive and collaborative processes with ends users who have a better knowledge of their internal processes than the ASP. Every six months the ASP provides a new version of its solution as 2 employees work full time on software development.

- It guarantees a high quality of service. End users are generally aware of an incident only once it is resolved. Malfunctions and down time are handled within 15 to 60 minutes, and the ASP supplies a guarantee that a consistent level of data transfer will be maintained over the network following the alerts. Such experience gained in delivering services enables the ASP to gain end users' trust.

Benefits for the systems integrator (i.e. company X):

Several reasons can lead a systems integrator to call on a third party to provide a service to its customer:

- It avoids having to call on 2 or 3 staff members to ensure service 24/7 on this project (removal of obligations). In fact, delivering such a service in ASP mode would require a new internal organisation.

- It optimises the use of its internal resources as it does not have to hire new employees or invest in dedicated hardware and software.

- It stays focused on its core areas of expertise, namely software integration services and commercial relationships with the client. Generally, a systems integrator works more in project-based services mode, whereas ASPs operate in process-based services mode. The systems integrator works with dedicated resources allocated to individual projects. It often intervenes inside the company during the project but does not necessarily ensure maintenance services.

- It provides a better quality services to the client (via Accelance) than it could have supplied on its own.

### Impact

For the textile company, use of the ASP model has significantly increased their network availability (99.8%) at the different server sites. As a consequence, the company was able to increase its productivity and reduce the cost of maintaining its server base.

A further benefit is the significant rise in the level of trust between Accelance and the end user over the course of contract. According to Mr. Antoine Hébert, Accelance MSP's Vice President Sales & Marketing, "*this type of service provision requires a high level of trust from end customers particularly since the service is delivered from a distance*".

## Lessons learned

As the software solutions evolve, certain functions in the management and monitoring of the server base can be automated, such as account creation, but human intervention still remains central in the distribution and the delivery of the service. The collaborative process is crucial to delivering a high quality service. Mr. Antoine Hébert, Accelance's Vice President Sales & Marketing, remarked that "*the same XGUARD solution is used by both the provider and the end customer, which creates a de facto collaborative process*".

Another key point is the notion of trust between the various players along the value chain, and particularly between the ASP and the end user. It is in fact a pre-requisite to performing the task of ASP since the service provider has access to end users' key databases and data workflows. This trust is reinforced by a stipulation in the contract which guarantees that, if not satisfied, the customer can demand that its ICT system be returned to its initial state (i.e. state prior to the ASP's intervention).

One difficulty mentioned by Mr. Hébert is that "*Such services are often difficult for end users to grasp before signing a contract with us*". Under the ASP services-based model, "*the line between the delivery of the "software" product and the service itself is blurry, so the most common difficulty for end user is conceptualising and judging the quality of the service*".

## Sources and references

- Interview with Mr. Antoine Hébert, VP Sales & Marketing, Accelance MSP, August 2004
- Accelance MSP internal documents
- www.accelance.com

# 3 Conclusions: Opportunities and challenges, drivers and barriers

The ICT services sector has been going through a critical period of transition, following the burst of the Internet bubble. Driven by the need to cut costs, ICT services companies have streamlined their business production process in an effort to maximise their responsiveness, develop on-demand services and better satisfy their customers. Re-engineering business processes represents a way to benefit from cheaper resources and to develop further productivity gains.

In this context, ICT services companies, and especially the larger ones, continue to implement e-business applications to develop more networked production processes and collaborative working practices. The importance of e-business is particularly high in this sector which, more than others, has to contend with rapid technological changes and changing needs of customers (see Exhibit 3-1).

*Exhibit 3-1: Overall significance of e-business for companies in 2003 (by size)*
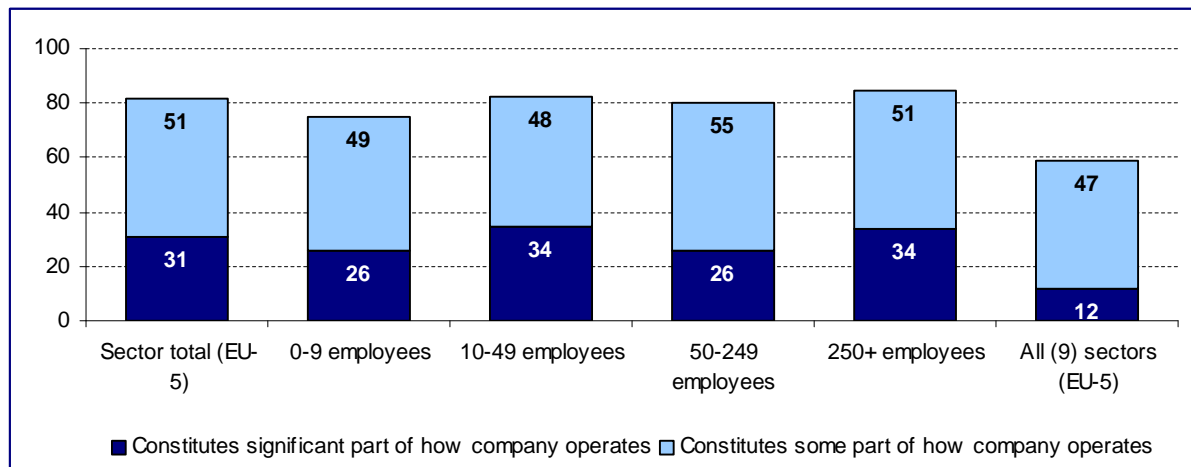


Base: all enterprises. EU-5 = DE, ES, FR, IT, UK. N=502 for EU-5 sector total and 50-100 per country.
Weighting: Figures for size-bands in % of enterprises. Figures for countries are weighted by employment ("enterprises comprising …% of employees"). Reporting period: March/November 2003.

Source: *e-Business W @tch* (2003/2004)

In many respects, the combined ICT services sector is still the leading sector in terms of e-business adoption. For all types of e-business applications, the two sub-sectors – telecommunications services and computer-related services – outrank other sectors studied by the *e-Business W @tch* in terms of ICT equipment and the use of e-business applications. The sector is in top position in terms of connectivity of enterprises, internal process automation, marketing and sales. On the whole, broadband Internet access, CRM adoption and new forms of ICT service distribution and delivery represent key developments in the ICT services sector.

The market's evolution at the global level, and the creation of innovative services are producing increasingly complex structures in the ICT services sector. CRM has therefore become especially critical, particularly in the telecom services and software sub-sectors, which are populated by large companies that have to deal with a large number of customers and anticipate their changing needs.

Broadband Internet access is also crucial, especially for micro and small enterprises which need to maintain their ability to exchange data and implement collaborative practices with larger companies. This is all the more pertinent given that the sector is now adjusting to new ways of distributing and delivering services, including ASP services which could significantly change the way in which e-business applications are used.

## 3.1 Opportunities and challenges

*Exhibit 3-2: Overview of e-business opportunities and challenges for firms in the ICT services sector*

| Opportunities | Challenges |
|---|---|
| • Decreasing price of broadband Internet access<br>• Emergence of Open Source e-business applications<br>• New ways of distributing and delivering ICT services | • Ensure fast adoption of broadband Internet connections among micro and small firms<br>• Adaptation of the sales business model to new customers' behaviour<br>• Development of CRM use among micro and small firms |

Source: *e-Business W@tch* (2004)

### Opportunities

**Decreasing price of broadband Internet access**

The steady drop in the price of broadband communications constitutes an important opportunity for stimulating the use of e-business applications, particularly among micro and small ICT services companies. The growing volume of data transfers that accompanies the implementation of networked production environments and collaborative working practices in this sector require high speed Internet connections – enabling companies to maintain their responsiveness and ability to meet on-the-spot demand. Decreasing costs for broadband access to the web could stimulate greater use of e-business applications by smaller companies, and allow them both to save money and increase productivity. The SynerDeal case study provides a good example of the extent to which broadband connections can be critical in enabling a company to exchange data quickly and react efficiently to online bids in an e-sourcing process.

**Emergence of Open Source e-business applications**

The needs of ICT service users are changing, and there is a growing demand for less expensive e-business solutions and for more flexible and easily customised systems. The development of Open Source software could provide new opportunities for ICT services companies both as users and producers of software. Open Source software will broaden the range of available products and thus allow ICT service firms to become less dependent on giant software publishers.

**New forms of ICT services distribution and delivery**

The growing development of the ASP services-based model facilitates access to e-business applications for the sectors' companies. This new way of distributing and delivering ICT services could significantly increase the access to e-business applications by micro and small companies from all sectors, and thus stimulate e-business in the broad sense. At the same time, it may also significantly reduce the cost of using related applications for ICT

services firms themselves. ASP services will undoubtedly change the ways that e-business applications are used, and alter ICT services companies' production processes.

### Challenges

**Increasing use of broadband Internet connections by micro and small firms**

Although the ICT services sector ranks high in terms of broadband Internet access in general, and in spite of decreasing costs, there are still bottlenecks in increasing smaller firms' access to high speed communication networks. The current low rate of broadband infrastructure in micro and small enterprises could seriously hamper the future development of Europe's software services industry, since small firms account for the majority of the sector's businesses.

**Adapting the sales business model to new customer behaviour**

Now that the dotcom hype (and, along with it, the e-business hype) has faded away and given room to a more realistic view of related opportunities and risks, companies are reluctant to speculatively purchase high-priced e-business software licences and to pay for maintenance costs if they perceive uncertainties regarding concrete results and return on investment. In addition, expectations in terms of support and services have increased. In this context, software vendors are considering whether to shift from the traditional business model based on selling software licences and maintenance services to a subscription-based business model. The decision where to position themselves in terms of these different models constitutes a significant challenge. Some software publishers are already considering doing away with licensing fees and, instead, charging an annual fee that would include licensing, maintenance and support. Others are offering both options to customers, and others are clinging to the existing model.

**Development of CRM use among micro and small ICT services companies**

In a more competitive and global ICT services market, CRM systems are important tools when seeking to attract new customers, and to cement existing customers' loyalty. The development of multi-channel distribution for telecom and software services requires the use of databases and CRM applications to address customers' needs. The challenge, once again, is how to enable smaller ICT service companies' to have access to CRM systems at an affordable price, i.e. how to stimulate and trigger the development of simple, low cost and easy to use CRM products.

## 3.2    E-business drivers and barriers

*Exhibit 3-3: Overview of e-business enablers and barriers in the ICT services sector*

| Enablers | Barriers |
|---|---|
| • Market pressure to increase internal efficiency <br> • Development of outsourcing/off-shoring services <br> • E-business services adoption in the public sector | • Poor adoption rate of broadband Internet access among micro and small ICT services firms <br> • Risks from increasing intellectual copyright lawsuits |

Source: *e-Business W@tch* (2004)

## Enablers: factors that could drive e-business adoption

**Market pressure to increase internal efficiency**

A great many companies are seeking to reduce production costs and streamline working practices by adopting e-business applications to stay competitive, but at a reasonable price. To a certain extent, this transition period in the services sector is propitious to the implementation of more flexible, light e-business solutions. It is interesting to note the growing adoption of Open Source products in the server market, and the development of new ways of distributing and delivering ICT services which favour the emergence of light and easy to use e-business software like Compiere, ERP5 or Fisterra.

**Development of outsourcing services**

Large ICT services companies are more and more inclined to outsource some parts of their activities to remain competitive. The development of outsourcing services in the sector constitutes an important driver to e-business applications. Outsourcing services require more intensive data exchanges, new production processes and the implementation of collaborative working practices. This trend could further increase the demand for and use of e-business applications among ICT services companies.

**E-business services adoption in the public administration**

The active use of the Internet and of e-business applications in the public sector could spur the use of these technologies in the private sector, via the creation of positive network externalities. The development of growing electronic services such as public bidding processes via the Internet pushes more and more firms to adopt e-business applications since they streamline the means of accessing calls to tender, and of submitting tenders.

## Barriers: factors that may inhibit widespread use of e-business

**Poor adoption rate of broadband Internet access among micro and small ICT services firms**

The increasing gap between large companies and micro/small firms in terms of broadband connections and the use of e-business applications constitutes a sizeable barrier to the transformation and evolution of the ICT services sector. On the whole, micro and small services enterprises report a low rate of equipment and e-business usage. Low broadband accesses and high priced e-business solutions are two prime elements preventing micro and small companies from fully exploiting the advantages that e-business technologies can provide.

**Risks of increasing intellectual copyright lawsuits**

Recent patent claims in the Open Source world raise new concerns about intellectual property rights. Copyright issues may constitute a new obstacle to the more widespread use of new Open Source software and e-business applications. The absence of central ownership for Linux and other Open Source software could lead to more lawsuits and, ultimately, impede innovation in the sector.

# 4 Policy challenges

## 4.1 General considerations on electronic business as a policy challenge

Independent from this particular sector report, there are a number of areas where electronic business developments could coincide with European or national policies. These are in particular the following areas:

1. The regulatory environment for telecommunication services
2. Innovation and technology policy
3. Education and labour market policy
4. The role model of the public sector
5. Other policy areas which have possibly some overlap with electronic business developments (e.g. patenting law, trade regulations)

This section discusses on a general level how these policy areas relate to ICT use by enterprises and for electronic business development. It points out some concrete policy challenges as well as some caveats with respect to possible policy actions, based on evidence delivered by the *e-Business W@tch.* The focus is on the first four issues mentioned above, which are the most obvious and direct ones, placed at the intersection of technological development, policy and regulatory environment.

### 4.1.1 Regulation of telecommunication services

The regulatory environment for telecommunication services and goods provides an important basis for the provision of ICT access in the European Union, both for enterprises and private households. A highly developed telecommunication infrastructure with a high quality of service, easy access for anyone and anywhere, and affordable prices are preconditions for a fast take-off of Internet usage and – at least at this stage of the development – for e-business technologies.

A good example to support this argument is the diffusion of internet access in European households. It became evident during the mid 1990s that Internet access would eventually become a standard in most households. However, it was only after the massive tariff reductions for online connections (compared to voice telephony), which were introduced mostly after the liberalisation of the EU telecommunication markets in 1998, that the Internet access boom started in most countries. The situation is now similar with regard to broadband deployment. While many households have connected to the Internet, the diffusion of broadband connections differs considerably between regions and depending on socio-economic configurations of households. While basic Internet access has become affordable for a vast majority of citizens in Europe, the costs for broadband Internet access remain rather high and constitute a main barrier for adoption.

The European Commission is currently working on the timely and effective transition to the new EU framework for electronic communications networks and services, which was adopted by the Parliament and the Council in March 2002. The new framework is designed to ensure that ex ante regulation is applied only where the level of competition in defined markets is considered to be insufficient on the basis of an analysis consistent with competition law methodology. Newly emerging markets also should in principle be free from regulation. Other

key aspects of the framework are designed to support this approach to regulation and promotion of consumers' interests. The new framework is an important initiative that will support the continued growth and development of the electronic communications sector in Europe.[21]

A favourable regulatory environment is not in itself a sufficient condition for a high usage of the Internet and associated technologies and services within a region, but it is definitely an enabler and an important requirement. Positive examples of such framework conditions within Europe are the Nordic countries, Ireland, Italy, Austria, Estonia, and the UK. Empirically, these examples show that countries with a modern, competitive telecommunication infrastructure are usually among the early adopters of ICT. This facilitates the development of internationally competitive enterprises in the provision of ICT products and services, along with competitive advantages for enterprises using these products and services.

However, not all countries in the European Union have yet realised a regulatory environment that enables them to develop a modern, competitive telecommunication infrastructure. In some of the new Member States, the regulatory environment of telecommunication markets as well as the de facto market structure is still underdeveloped in terms of competition and offer compared to the markets in the former Member States of 2003.[22] Also, six of the former Member States currently face Court action for failing to put in place the new rules on electronic communications. Thus, regulatory challenges are not unique to the new Member States.

It will certainly constitute an important challenge and objective for policy – both on the European level as well as in the concerned Member States – to ensure that the take-up process in these markets occurs as rapidly as possible and that the new regulatory framework will be fully implemented soon. This requires constant monitoring of market developments and, possibly, further improvements in the regulation of telecommunication services in the respective Member States.

## 4.1.2   Innovation and technology policy

### Technology adoption at the firm level

The adoption of e-business technologies at the firm level is essentially an investment decision which carries risk for the business owners and is subject to a multitude of relevant framework conditions. These include the sector and type of business, the market structure, endowment and resources of the firm, the behaviour of competitors, suppliers and customers, and the availability of alternative technologies to carry out a specific task. Risk means in this context that the payoff of the investment into technology adoption is uncertain at the time of the investment decision. However, it is also possible that individually optimal investment decisions lead to sub-optimal outcomes on the aggregate level (market failure).

According to normative economic theory, policy intervention would be desirable in both circumstances: in the case of market failure and in the case of sub-optimal investment decisions by firms due to unequal access to information. Such an asymmetric situation could

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[21]   http://europa.eu.int/information_society/topics/ecomm/all_about/implementation_enforcement/index_en.htm;
Further information on the current initiatives of the European Commission can be found at
http://europa.eu.int/information_society/topics/ecomm/index_en.htm

[22]   This assessment was confirmed by speakers from the new Member States at the *e-Business W@tch* Workshop on "e-Business in Acceding Countries", Brussels, 10 December 2003.

occur, for example, if a lot of complex information has to be gathered and evaluated, which is very time consuming and therefore costly. In such a case, it could be argued that large enterprises with strong economies of scale have an incentive to gather this information, while small companies do not. This could result in sub-optimal investment decisions in SMEs because of a lack of relevant information. The objective of policy action in such a case could be to improve the availability of objective and reliable information about the technologies for all market players.

Another possible source of market failure are company-external network effects of a new technology. For example, if the value of a new technology to the user strongly depends on the number of other users, the individual decision to adopt will be largely influenced by expectations about the behaviour of others. In such a situation, market failure can theoretically occur as a result of either of two equilibriums: one in which everyone adopts, or one in which nobody adopts. It could be that one of the two equilibriums dominates the other in terms of social welfare (for example, everyone could be better off with the adoption scenario), but that the less favourable one develops in the market. This would also indicate a need for policy action.

A good example of such a situation is general purpose ICT, such as Internet access (and preferably via broadband connections). In this case, there is broad agreement that every country would be better off with a high connectivity of private households and enterprises. In countries where the development of infrastructures and user access is still in its infancy, government support or subsidies to build up infrastructures could be worthwhile policy actions. On the other hand, in countries with highly developed infrastructures, such policy action to "steer the market towards the better equilibrium" will no longer be needed.

However, due to the complexity of the investment decision framework of each enterprise, it is extremely difficult (if not impossible) to identify actual over- or under-investments in many technologies. This applies in particular to technologies that are highly specific in their purpose and do not exhibit strong firm-external network effects. For example, the lower diffusion of some e-business technologies among SMEs (such as ERP or SCM systems) compared to large enterprises does not necessarily imply that SME under-invest in these tools. There can be many good reasons for these adoption patterns, as pointed out in many of the sector studies. A small company, for example, which is a supplier of specific parts to a small number of other firms, will hardly gain significant advantages from a CRM system.

Eventually, it is barely possible to determine precisely why certain firms do not adopt some of these technologies, while others do. One possible reason for non-adoption of a specific e-business technology is that firms may have a more efficient way to carry out specific tasks, or that more profitable investment opportunities exist (for instance investments into new products or services which are not based on Internet-technology, or hiring a new employee instead of investing in technology).

Consequently, there are good reasons to argue that policy should be cautious about promoting the adoption of non-general purpose technologies in enterprises, especially if there is no unambiguous indication of a market failure.

## Economic consequences of technology adoption

ICT based applications for doing business electronically, if successfully implemented and used, can be viewed as a change in the production technology of a firm. From an economic perspective, this constitutes a change in the cost-function of the firm or the creation of a new supply function, if the technology is used to create a new product or service. Hence, e-business technology adoption coincides with innovation.

Evidence from the *e-Business W@tch* suggests that Internet-based technologies are currently an important enabler of innovation in the European economy. However, many firms also improve their internal processes or create new products or services for their customers without making use of Internet-technologies, or by using online technologies only peripherally. Innovation research shows that all sorts of innovations, whether based on the Internet or not, are in the majority of cases positively associated with business success. Thus, it is not yet proven that investments in Internet-based innovations yield superior returns to other kinds of innovation.

This means that policy should focus on stimulating a climate that is generally favourable to investments in innovation, and not exclusively on Internet-based technology investments. An important aspect of such a policy is to reduce the ambiguity and risk that face potential investors. This involves the entire environment in which enterprises operate, not only the uncertainty about specific investment opportunities like the adoption of e-business technologies.

As a means of conducting innovation, technology adoption has the potential to influence other important economic measures, such as the optimal size of the firm, the optimal market structure (degree of industry concentration, large vs. small firms), the optimal degree of vertical integration, productivity, competitiveness, and changes in the demand for different types of skilled labour. The degree to which technologies actually influence these measures is hard to estimate a priori. Even empirical ex-post analysis whether and to what degree e-business has exercised an "impact" on these parameters is extremely difficult, since it is hardly possible to filter the impact of ICT and e-business from other factors and externalities.

However, it is acknowledged that the impact of electronic business implementation can be substantial. Policy-makers are therefore well advised to closely observe these technology-induced changes in order to identify areas which may require policy action. For example, if certain technologies tend to reinforce the development toward monopolistic market structures in an industry, policy should consider interventions. In this context, the sectoral analysis of the *e-Business W@tch* and the resulting empirical evidence has already revealed important insights and provides a sound basis for further analysis of specific aspects.

### 4.1.3   Education and labour market policy

Information and communication technologies need complementary inputs in the form of specialised human capital in order to function properly and to generate economic value. Consequently, an economy that lacks a high level of general education, computer and Internet literacy, and an adequate supply of highly skilled specialists will not be able to realise the full potential of ICT. In addition, the rapid technological progress in computer, network and software technologies leads to a fast depreciation of ICT skills and hence requires a constant updating of skills, which eventually leads to the "life long learning" paradigm.

Since basic schooling and higher education systems are to a large extent public responsibilities in the European Union, this could be a starting point for policy-makers to develop and induce the implementation of educational schemes that are favourable for an economy that is "tech-savvy" and innovative. In addition, the realisation of life-long learning in the Member States could probably be supported by a further deployment of public-private partnerships. A substantial involvement of the private sector will be necessary to create

sufficient opportunities for employees to participate in specific trainings and in a general continuing education, irrespective of their age and work experience.

The surveys of the *e-Business W@tch* confirm that firm-size and training offers for employees are interrelated. Large enterprises are able to provide more and better training opportunities for their employees than SMEs.[23] Economies of scale in large enterprises play an important role in this context. A company with many employees can more easily delegate responsibilities to other workers. Temporary replacement of employees participating in training by co-workers, which severely inhibits formalised training programmes in SMEs (possibly more than the mere direct costs for training programmes), is therefore less complicated in large than in small firms. Public-private partnerships might eventually help to narrow this gap between SMEs and large enterprises. Such initiatives concern, for example, training initiatives carried out in cooperation with e-business technology providers, training organisations and the public sector, or SME networks that cooperate in offering training to their members.

## 4.1.4   Role model of the public sector

The active use of ICT, the Internet, and e-business applications in the public sector can spur an active use of these technologies in the private sector, for example via the creation of positive network externalities.

An excellent example is the case of Estonia. The Estonian government played a very active role in promoting the development and usage of Internet infrastructures. For example, the Estonian Parliament approved a proposal in February 2000 to guarantee Internet access to each of its citizens[24] and immediately began to take action. The Government kick-started a high-tech drive by setting up 500 public computer centres across the country. The centres were established in cities, but also in tiny Baltic Sea islands and converted barns in desolate forests.[25] The government also makes very active use of Internet technologies itself, playing the role of an "e-champion" in Estonia. For example, public agencies use the Internet for procurement purposes and parliamentary meetings are often organized as virtual conferences, saving substantial time and travel costs. Today, Estonia is the ICT leader amongst Eastern European countries, ranking 25th out of 102 countries (ahead of Italy, Spain, Portugal, and Greece) in the Global Information Technology Report by the World Economic Forum (2002/03 edition). The active use of ICT in the public sector helped Estonia to leapfrog other countries that are still wedded to older technologies, and has also helped to make the public sector in Estonia efficient and slim.

Similarly, the public sector in the European Union and its Member States can help to support the development and usage of ICT in the private sector by making intensive use of the new technologies itself. This includes active use in providing services to its "customers" (citizens and businesses), but also the internal use for improving and optimising their own routines (Government-to-Government).

Government institutions with their experience in handling public calls can also serve as a role model by increasingly using public electronic tendering procedures, provided that the main objective of this technology can be achieved: realising cost advantages for all parties involved. For governments, cost advantages can stem from cheaper procurement prices or

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[23]   cf. CVTS2; Statistisches Bundesamt, 2002

[24]   ebusinessforum, 2001

[25]   Wired News, 21. April 2003

from more efficient procurement processes. A cost advantage for companies that participate in public tendering procedures via the Internet will mainly result from reduced efforts, both for getting access to calls and for submitting tenders.

However, a caveat in this context is that the technical development and implementation of electronic tendering procedures in the public sector could – to some extent – compete with already existing, functioning solutions and services from the private sector. This requires an assessment on a case-by-case basis, carefully weighing the gains and losses of either way from an aggregate economic perspective.

## 4.2    Policy challenges at the sectoral level

Following these considerations (and caveats) on the policy relevance of electronic business developments in general, the question is which instruments policy could use to intervene in this development, in order to counteract undesirable outcomes on the aggregate level. This chapter presents a synthesis of policy challenges which have been identified in the first series of Sector Impact Studies (published in May 2004) on 10 sectors. As this analysis bears close links to ongoing policy initiatives of the Commission's DG Enterprise, the intro-duction offers a brief summary of the current approach to e-business policies. The analysis attempts to map the challenges identified by the *e-Business W@tch* into the policy framework that was proposed in the Communication from the European Commission "Adapting e-business policies in a changing environment: The lessons of the Go Digital initiative and the challenges ahead".[26]

### 4.2.1    Taking stock of existing policies – a record of recent EU initiatives

In this context, the Enterprise Directorate General has already undertaken a substantial effort to systematize "e-business policies" with respect to their objectives, targets and contents. The "Go Digital" campaign can be regarded as the starting point and initial background of this activity, and in particular the Communication "Helping SMEs to Go Digital",[27] in which the Commission identified benchmarking as a major step to further promote the use of ICT and the Internet by SMEs.

The Communication defined a policy-oriented objective for this benchmarking activity, namely "to describe and benchmark national and regional policies and instruments for the promotion of e-business for SMEs". The objective was to help Member States and regions to assess their policies and identify best policy practices. This policy benchmarking initiative received widespread political support and attention from all relevant stakeholders.

In February 2002, the first Synthesis Report "Benchmarking National and Regional E-Business Policies" was issued. It summarised the process, which was envisaged at that time, in five steps:

1. Getting a clear picture about the adoption of ICT and e-business by SMEs
2. Benchmarking policy initiatives in favour of helping SMEs

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[26]   COM(2003) 148 final

[27]   COM(2001) 136 final

3.  Presenting the results of this benchmarking initiative, including examples of good practices in policy-making, to a broader audience of policy-makers in a high-level conference

4.  Identifying a number of quantitative targets to be achieved by national and/or European policies

5.  Monitoring the implementation of the policy targets

Since the publication of this report, the first four steps of this process have been addressed and mostly successfully accomplished. The e-Business Surveys carried out by the *e-Business W@tch* and Eurostat since 2002, and the analysis of issues in the Sector Studies of the *e-Business W@tch*, have largely contributed to a substantial improvement of the picture about the adoption of ICT and e-business by SMEs.

Step 2 has been addressed in special reports, including the above mentioned Synthesis Report and, in particular, the Final Report of the e-Business Policy Group on Benchmarking national and regional e-business policies for SMEs from June 2002. This report provides an impressive documentation of different types of policies that have been applied in the Member States of the European Union. The report structures the policies into four categories:

*Exhibit 4-1: E-business policy objectives and categories identified in the EU in 2002*

| Main policy objective / category | Examples of good practice |
|---|---|
| **Framework policies** | • UK: UK online for business<br>• Greece: the e-business forum<br>• Norway: the VeRDI programme<br>• NL: The Netherlands Go Digital Programme<br>• Spain: Catalunya on the Net |
| **E-business awareness raising and training** | • Finland: eAskel<br>• UK/Scotland: First Steps Workshop Series<br>• Austria: ECaustria ("Let's e-biz")<br>• Sweden: SVEA<br>• Germany: the B-on-line project |
| **Promoting SME support networks** | • Ireland – The PRISM II initiative<br>• Germany – Network of e-business centres<br>• The Netherlands – 'Digikringen'<br>• UK – Opportunity Wales |
| **Promotion of Internet platforms for SMEs** | • Denmark - Rakat in Roskilde<br>• Ireland – Empower<br>• Spain – The ARTEPYME II<br>• France – project Achat-ville<br>• UK - Local Shops On Line |

Source: European Commission, DG Enterprise: Final report on benchmarking national and regional e-business policies for SMEs by the e-Business Policy Group (June 2002)

The collection and case-study like description of these policies in the quoted report can be regarded as a breakthrough in systematizing European e-business policies. In parallel to this initiative of gathering evidence on e-business policies, and as a vehicle for doing so, DG Enterprise had started to develop a network of stakeholders and policy intermediaries to advance the processes of policy-making and policy co-ordination across Member States. This led to the founding of the e-BSN (e-Business Support Network), which had its first European workshop in January 2003 in Athens, in the context of the Greek EU presidency.

This e-BSN Workshop was the kick-off event for the fourth step of the master plan, as the title of the event already indicates: "Workshop on quantitative targets for e-business policies". From the beginning, it was a courageous move by DG Enterprise to promote target oriented policy-making processes, considering the substantial amount of debate and scepticism whether and to what extent policy objectives can be translated into concrete (measurable) targets or not. This debate has not yet ebbed away, but has rather increased, in particular in the context of the eEurope benchmarking which shows all the difficulties and challenges that are inevitably connected with this approach. The first challenge is that the stakeholders involved have to agree on targets and on adequate indicators to measure the achievement of a target. The second challenge is whether the required data can be collected in a comparable and reliable way, and – an important aspect with all data collection activities – with a reasonable economic effort.

In this context, it must be considered that most e-business policies are implemented on a regional or national level. Therefore, when it comes to setting targets for these policies, the European Commission can only act as a promoter and catalyst, but cannot enforce any targets for regional or national governments. To stimulate the debate in this area, and as "food for thought", the Commission issued in March 2003 the Communication "Adapting e-business policies in a changing environment: The lessons of the Go Digital initiative and the challenges ahead" (COM(2003) 148 final). This Communication, which proposed a further elaborated framework for e-business policies, attracted considerable attention and was praised for its clarity and practical applicability. The European Economic and Social Committee, for example, believes that "the European Commission has produced an excellent proposal document on the need for Member States and regions to re-orient e-business policies" and welcomed "the highly practical approach".[28]

The Communication outlines a framework for SME specific e-business policies that consists of three main challenges and nine objectives related to them (three each, see Exhibit 4.2). Continuing from this framework, the latest workshops of the e-Business Support Network at Paris (October 2003), Budapest (February 2004) and Barcelona (May 2004) have advanced the debate on appropriate targets for each of these objectives. Moreover, DG Enterprise has recently launched an evaluation study that will benchmark 10 selected e-business policies with respect to measurable targets and criteria.

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[28]  Opinion of the European Economic and Social Committee on [COM(2003) 148 final], published in the Official Journal of the European Union, 2004 / C 108 / 02, 30 April 2004, p. 23-28

**Exhibit 4-2: A framework for SME specific e-business policies**
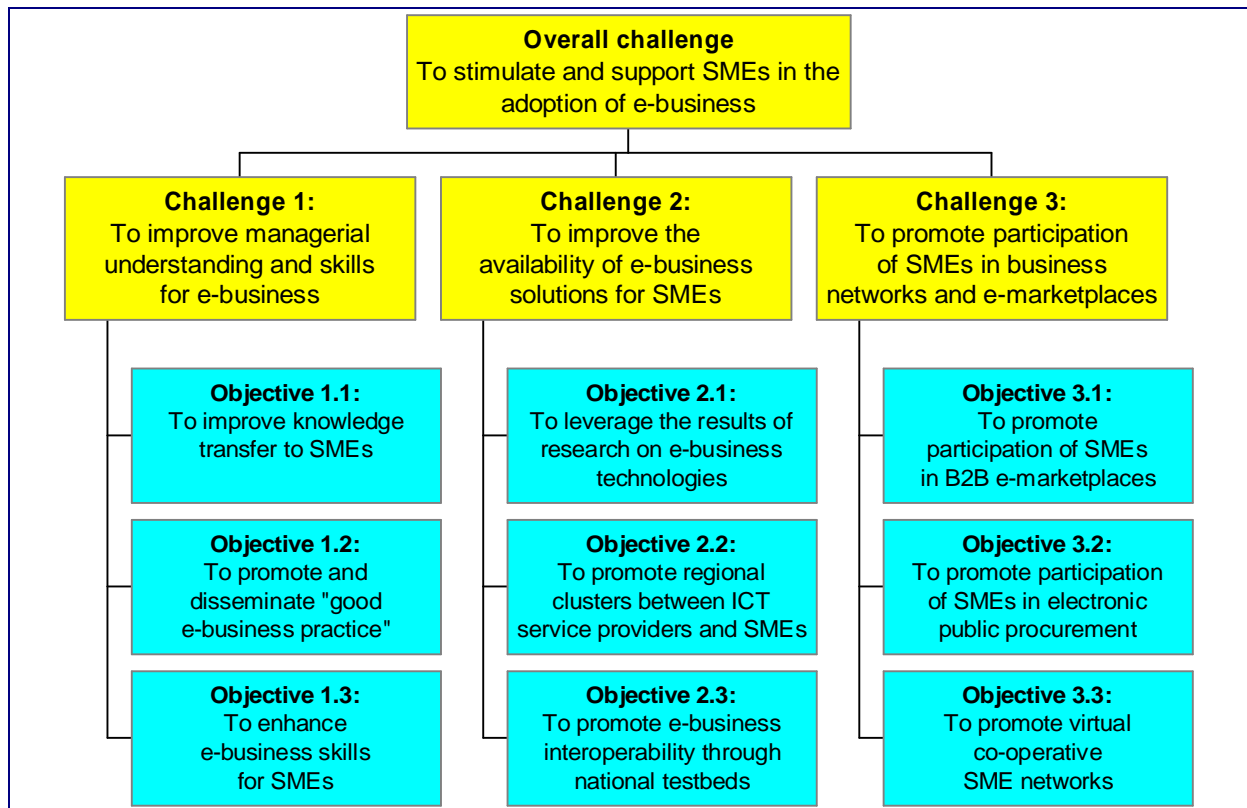


Source: European Commission [COM(2003) 148 final]

Based on these achievements, the Commission has now gradually moved to start the fifth step of the process according to the "Road Map" outlined above: monitoring the implementation of the policy targets. In this context, the recently established European e-business policies portal on the Internet (www.e-bsn.org) will play an important role. The portal already provides a valuable overview of e-business policies and best practices across the European Union, with links to related resources.

## 4.2.2   Synthesis of policy challenges identified by the *e-Business W@tch*

The policy challenges which the *e-Business W@tch* has identified and outlined in the previous series of Sector Impact Studies (May 2004) on a sector-by-sector bases can – to a large extent – be mapped into the framework developed by the EC Communication [COM(2003) 148 final] as shown above. This can be expected, as the framework covers a broad range of policies. In this chapter, an effort is undertaken to synthesize the various sectoral policy challenges by integrating similar issues under one heading, and to provide an overview of the relative importance of various policy areas by sector.

As a first overview, Exhibit 4-3 indicates the relevance of the three main e-business policy challenges identified in the EC Communication on adapting e-business policies. The mapping has been made from the perspective of small and medium-sized enterprises, and not from the large firms' point of view. This appears to be consistent as the EU framework for e-business policies has been developed specifically for SME policies, and as the conclusions on policy challenges drawn by the *e-Business W@tch* in its Sector Studies also concentrate on the SME aspect.

*Exhibit 4-3: Relevance of SME e-business policy objectives by sector*

| | To improve managerial understanding and skills for e-business among SMEs | To improve the availability of e-business solutions for SMEs | To promote participation of SMEs in business networks and e-marketplaces | Other measures (sector specific) |
|---|---|---|---|---|
| Textile industries | ~ ~ | ~ ~ ~ | ~ ~ | ~ |
| Chemical industries | ~ ~ | ~ ~ | ~ | ™ |
| Electronics | ~ ~ | ~ ~ ~ | ~ ~ | ~ |
| Transport equipment | ~ ~ ~ | ~ | ~ | ~ |
| Craft and trade | ~ ~ ~ | ~ ~ | ~ ~ ~ | ~ ~ ~ |
| Retail | ~ ~ ~ | ~ ~ | ~ ~ | ~ ~ |
| Tourism | ~ ~ ~ | ~ ~ | ~ ~ ~ | ~ |
| ICT services | ~ | ~ ~ | ~ ~ | ~ ~ |
| Business services | ~ ~ ~ | ~ ~ | ~ | ~ |
| Health services | ~ ~ ~ | ~ ~ | ~ ~ | ~ ~ ~ |
| ™ = not relevant; ~ = some relevance; ~ ~ = rather relevant; ~ ~ ~ = highly relevant | | | | |

Source: *e-Business W @tch* (2004)

In summary, the following conclusions can be drawn from this overview, backed up by the analysis and recommendations from the various Sector Studies presented by the *e-Business W @tch*:

- The policy objective "to improve the availability of e-business solutions for SMEs" has certainly some relevance for all sectors. It holds true for all sectors that the major (positive) impacts of e-business stem from rather powerful applications that are mainly adapted to the needs of large enterprises. However, the objective to stimulate the development of useful applications for small business is even more relevant for manufacturing than for service sectors, as handling the supply chain of physical materials is a major application area for systems under consideration.

- The policy objective "to improve managerial understanding and skills for e-business among SMEs", which includes awareness raising activities, appears to be most important for those sectors which are dominated by a huge number of micro (and very small) enterprises, for example the textile industries and in the craft and trade sectors. There are two main arguments in support of this position. Firstly, small enterprises cannot employ specialised staff in the way larger enterprises do. A company of five people cannot afford a (full time) "IT manager", but needs to assign related tasks to one of the five. Therefore, some public support mechanisms can be justified. Secondly, it has frequently been experienced that the adherence to traditional, established business cultures can be very strong among small firms, particularly in craft and trade sectors. This can be an impediment to introducing new, IT based processes.

- A certain reluctance among many small firms to abandon traditional business cultures and models, even if for the benefit of doing things more efficiently, can also be an obstacle to cooperation among themselves. In some sectors, however, new ways of cooperation among SMEs have already proved to be successful and necessary, for example in the furniture and in the textile industries.[29] Policy measures to stimulate the

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[29] There are many examples for ICT supported SME collaboration; see, for example, case study on Textilebusiness.it in the Sector Study on the Textile Industries, No. 01-II, August 2004.

participation of SMEs in business networks are therefore particularly relevant in sectors where such cooperation appears to have the highest potential.

The grouping of policy challenges identified in the *e-Business W@tch* Sector Studies into the three objectives of the EC framework is a useful but rather crude simplification. Furthermore, the framework does not indicate whether the challenges must or should rather be dealt with at a European, national or regional level. Some policy approaches require a co-ordination of the different governmental levels, for example RTD oriented policies, while others need to be implemented predominantly on a specific geographical level. The support of standardisation developments, for example, which has been recommended in several of the reports, can best be addressed by the European Commission or European industry groups, if at all (considering that standardisation is mostly a voluntary process). Awareness-raising targeted to SMEs, on the other hand, can only be effectively achieved through intermediaries on the regional level.

Exhibit 4-4 groups suggestions for possible policy initiatives that were raised in the Sector Studies according to the underlying objective and the policy level (from regional to European) on which the suggested action should probably be addressed, although many of the policies could of course be addressed at different levels. Thus, it can be considered as an extension of the SME e-business policy framework proposed by the EC.

It is not possible in the context of the *e-Business W@tch* to develop blueprints for how to implement these policies. Clearly, the methods and instruments used will depend on the local situation, the administrative structures, and the sectors to which activities are mainly targeted. However, such blueprints are available, as it must be assumed that most of the policy measures proposed have already been implemented in some place in the EU, whether successfully or not. It is the main objective of the e-Business Support Network (www.e-bsn.org) that these blueprints are communicated and exchanged across the EU, together with the lessons learned. Replication of successful policies, while avoiding making the same mistakes again, is the goal of this exercise.

*Exhibit 4-4: Suggestions for policy actions mapped by objectives and level*

| Objective \ Level | EU | National | Regional |
|---|---|---|---|
| **To improve managerial understanding and skills for e-business among SMEs** | Make it easier for small firms to participate in European RTD programmes<br><br>Monitor the demand for ICT skills among enterprises, possibly at sectoral level (at least on the levels of manufacturing and services), develop profiles of skills required and assess the supply situation for those skills | Public administration as a role model in using electronic procurement<br><br>Promote IT and e-business training opportunities, for instance by providing incentives for participation<br><br>Develop high-quality ICT education programmes (at university level)<br><br>Collect good e-business practice examples to overcome mental or cultural reservations among SMEs | Encourage ICT training, especially among micro and small enterprises and in the new Member States<br><br>Improve access of SMEs to information about e-business<br><br>Improve the knowledge transfer between competence centres, business development agencies and SMEs<br><br>Educate SMEs about opportunities of using simple Internet applications<br><br>Encourage links between small firms and schools & universities to give them access to young skilled people<br><br>Change the investment attitude of SMEs from saving costs by not investing to building value by investing in ICT |
| **To improve the availability of e-business solutions for SMEs** | Encourage the adoption of e-standards<br><br>In particular: promote the standardisation of computer languages used for more advanced forms of supply chain management | Provide financial incentives for innovation through e-business adoption<br><br>Develop web-based resources and interactive modules for e-business support in craft and trade<br><br>Stimulate the customisation of e-business tools as part of innovation policies | Stimulate cooperative projects involving software providers and regional SMEs |
| **To promote participation of SMEs in business networks and e-marketplaces** | Monitor the evolution of marketplaces / internet trading platforms and the related business practices | Monitor the participation of SMEs on electronic marketplaces | Support the establishment of local e-commerce platforms for SMEs, particularly in retail<br><br>Emphasis on and support for the development of network relations among SMEs and customers |
| **Other measures** | Monitor market concentration in online retail markets | Reduce legal barriers to craft business market entry (e.g. in DE, LU), particularly in ICT-related crafts<br><br>Create the regulatory environment for a competitive telecommunication market, so that companies have access to services at low prices | Educate SMEs about regulatory changes and consequences of the EU enlargement |

Source: *e-Business W@tch* (2004)

## 4.3    Sector-specific challenges

The general considerations presented in Sections 4.1 and 4.2 are relevant and apply fully to the ICT services sector. A number of e-business related issues that could be addressed by policy were introduced in the previous report (May 2004). By and large, these issues are covered by the policy challenges presented in the previous chapters.

However, some sector-specific challenges need to be addressed in detail in the ICT services sector. One of them is the widening gap between global players and the large number of small companies which have limited access to broadband. This constitutes a sector-specific challenge in that the situation could seriously impede the development of a competitive software service industry in Europe.

The implementation of a regulatory framework under the authority of the European Commission and national regulatory bodies has enabled a significant drop in the price of interconnection and telecommunications services. Consequently, the Internet and broadband market segment has enjoyed an extremely high rate of growth (+30% in 2003) in recent years[30].

But, during this period, micro and small ICT services enterprises – often the most dynamic and innovative companies – did not fully benefit from this growth. In order to replicate this dynamic development in the uptake of broadband among micro and small enterprises, specific support measures could be considered to speed up the adoption process.

- It is important that micro and small enterprises in the ICT services sector are able to access broadband Internet connections whatever their geographical location. Further investments should be made to facilitate access to broadband networks like ADSL or high speed satellite, for micro and small firms. Different levels of political and financial support from European, national and local authorities, as well as from professional organisations, would be required to provide wider coverage of the European territory with broadband Internet accesses.

- It is also important to heighten micro and small ICT services companies' awareness of the advantages of using e-business applications. Aside from those micro and small companies that see no advantages in using e-business applications, many are simply hesitant to use them. A case in point here is participating in online purchasing. Firms are often anxious that their potential profit margin will be reduced if competing with larger companies. In order to enable companies to take an informed decision based on objective information, good practices could be promoted and distributed by professional organisations to micro and small companies.

- The development of networked production processes and collaborative working practices (e.g. geographical clusters) is becoming a reality in the sector. This should provide a further incentive for micro and small enterprises to increase their e-business adoption rate in order to improve their ability to compete. A specific measure in this area would involve professional organisations providing greater communication and support for micro and small ICT services companies undergoing organisational changes.

- Supporting Open Source standards, too, is an important measure in favouring the development of software which is simpler, easier to implement and, possibly, less

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[30]    European Telecom Services Market, IDATE, December 2003

expensive. The European Commission, along with the leading software publishers involved in this area could promote the development of Open Source standards and seek to increase awareness at the European level.

Generally speaking, sector-specific measures should contribute to creating a favourable climate for ICT services companies to invest in e-business usage, while reducing the ambiguity and risks associated with such investments.

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SynerDeal (www.synerdeal.com)

# Annex I: Glossary of technical terms

| Term | Definition |
|---|---|
| **Access** | The ability to retrieve information and to communicate online through the use of digital information and communication technologies. |
| **B2B** | Business to Business. Electronic transactions between companies. |
| **B2B e-marketplace** | Electronic trading platforms on the Internet where companies can sell and/or buy goods or services to/from other companies. They can be operated by a single buyer or seller or by a third party. Many marketplaces are industry-specific. Some marketplaces require registration and membership fees from companies that want to conduct trade on them. |
| **B2C** | Business to Consumer. Electronic business processes between companies and consumers. |
| **Bandwidth** | The physical characteristic of a telecommunications system that indicates the speed at which information can be transferred. In analogue systems, it is measured in cycles per second (Hertz), and in digital systems in binary bits per second. (Bit/s). |
| **Broadband** | High bandwidth internet access. In this report, broadband is defined as the capacity to transfer data at rates of 2Mbit/s (megabits per second) or greater. |
| **Channel** | In communications, a physical or logical path allowing the transmission of information; the path connecting a data source and a receiver. |
| **CRM** | Customer Relationship Management. Software systems that promise the ability to synthesize data on customers' behaviour and needs and thus to provide a universal view of the customer. |
| **Dial-up** | The process of establishing a temporary connection (to the Internet) via the switched telephone network. |
| **DSL** | Digital Subscriber Line. A family of technologies generically referred to as DSL, or xDSL, capable of transforming ordinary phone lines (also known as "twisted copper pairs") into high-speed digital lines, capable of supporting advanced services. ADSL (Asymmetric Digital Subscriber Line), HDSL (High data rate Digital Subscriber Line) and VDSL (Very high data rate Digital Subscriber Line) are all variants of xDSL |
| **E-business** | Electronic business. The *e-Business W@tch* uses the term "e-business" in the broad sense, relating both to external and to company internal processes. This includes external communication and transaction functions, but also ICT supported flows of information within the company, for example, between departments, subsidiaries and branches. |
| **E-commerce** | Electronic commerce.  As distinct from the broader concept of e-business, e-commerce refers to external transactions in goods and services between companies (B2B), between companies and consumers (B2C), or between companies and governments (B2G) and may therefore be seen as a subgroup or component of e-business activities. |
| **EDI** | Electronic Data Interchange. A way for unaffiliated companies to use networks to link their businesses by using a common technical standard for exchanging business data. While electronic mail between companies is common, electronic data interchange passes bigger bundles that replace large paper documents such as bills and contracts. Besides saving paper, computers could save time by taking over transactions such as regular purchase orders that now require human intervention. |
| **E-readiness** | Readiness for e-business is defined as the capability to engage in electronic transactions. This comprises appropriate network access (including sufficient band-width), internal hardware and software solutions as well as the procedural and managerial readiness to deal with online transactions from simple web presence through to fulfilment of customer orders and related after sales services. |

| ERP | Enterprise Resource Planning. A software system that helps to integrate and cover all major business activities within a company, including product planning, parts purchasing, inventory management, order tracking, human resources, projects management, and finance. |
|---|---|
| **Extranet** | A network using Internet protocols that allows external organisations (for example customers or suppliers) access to selected internal data. Essentially it is an Intranet which gives external users restricted access (often password protected) to information through the firewall. |
| **ICT** | Information and communication technology. ICT includes networks, computers, other data processing and transmitting equipment, and software. The application of ICT in business processes leads to e-business, if non-proprietary networks are used. |
| **Information security** | Measures taken to protect information systems against unauthorised use and attacks |
| **Internet** | The world's largest computer communication system, with an estimated 700 million users worldwide.[31] The Internet is a loose confederation of principally academic and research computer networks. It is not a network but rather the interconnection of thousands of separate networks using a common language. |
| **Interoperability** | The technical features of a group of interconnected systems (includes equipment owned and operated by the customer which is attached to the public telecommunication network) which ensure end-to-end provision of a given service in a consistent and predictable way. |
| **Intranet** | An internal Internet, that is an internal network running using TCP/IP, which makes information available within the company. Most intranets are connected to the Internet, and use firewalls to prevent unauthorised access. |
| **ISDN** | Integrated Services Digital Network. An international telecommunications standard for transmission of voice and data over dial-up lines running at 64 Kbit/s (kilobits per second). It allows sharing of multiple devices on a single line (for example, phone, computer, fax). |
| **LAN** | Local Area Network. The most common way of connecting computers in a small area (typically inside a building or organisation) for sharing databases and communication facilities. The two most common versions are Ethernet and Token Ring. Implementation is based on coaxial cables or plain wires. Speed achieved ranges from 10 Mbps to 100 Mbps. |
| **Leased line** | A private communication channel leased from the common carrier. It is usually a dedicated fixed-route link (e.g. point-to-point frame relay). |
| **M-commerce** | Mobile commerce. E-commerce that takes place using mobile connection devices and through data transmission via technical standards for mobile communication. |
| **Micro enterprise** | A company with less than 10 employees. |
| **Modem** | Modulator/Demodulator. A device that modulates outgoing digital signals from a computer or other digital device to analogue signals suitable to be transmitted through a conventional telephone line (copper twisted pair telephone). The reverse procedure takes place for incoming signals. |
| **MRO goods** | Maintenance, repair and operating goods. Supplies which companies need to maintain their operations, for example office supplies, in contrast to "direct production goods" which are components of the goods and services the company produces. |
| **Processes** | Business processes are operations that transform the state of an object or a person. This can, for example, be an order placed via the internet. Ordering an object or a service creates a liability for the supplier to deliver, and initiates the transfer of property rights from one entity to another. The electronic handling of processes is likely to speed them up and to introduce new processes in the realisation of the same transaction. |
| **Remote access** | The ability of a company computer network's transmission points to gain access to a |

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[31] Cf. Global Internet Statistics by Global Reach, www.glreach.com

| | computer at a different location. |
|---|---|
| **SCM** | Supply Chain Management. Software that helps businesses to match supply and demand through integrated and collaborative planning tools. |
| **Sector** | Sectors of the economy with comparable business activities. These constitute the main research unit of the *e-Business W@tch*. Aggregated information at the industry level is used to document the diffusion of activities within the industries as well as the overall importance of the observed phenomena for changes in the economy as a whole. The definition of sectors follows NACE Rev.1 classifications. |
| **SME** | Small and medium-sized enterprises with 0-249 employees. To be classed as an SME, an enterprise has to satisfy the criteria for the number of employees and one of the two financial criteria, i.e. either the turnover total or the balance sheet total. In addition, it must be independent, which means less than 25% owned by one enterprise (or jointly by several enterprises) falling outside the definition of an SME or a micro-enterprise, whichever may apply. The thresholds for the turnover and the balance sheet total will be adjusted regularly, to take account of changing economic circumstances in Europe. |
| **Transaction** | Electronic transactions can be subdivided into several steps, each of which initiates a process. There are pre-sale (or -purchase) phases, sale and after-sale phases. Typically a transaction starts with information gathering, price and quality comparisons and possibly pre-sale negotiations. During the sale phase contracting and delivery are the core processes, and payment is the final stage of this phase. After-purchase transaction stages comprise customer service, the administration of credit payments and the handling of returns as well as marketing activities preparing for the next purchase. |
| **Value added** | Gross output minus intermediate inputs. It is valued at producers' prices and includes all indirect taxes but excludes VAT and subsidies. |
| **WAN** | Wide Area Network. A network allowing the interconnection and intercommunication of a group of computers over a long distance. |
| **WAP** | Wireless Application Protocol. A communication protocol for delivering data over mobile telephone systems, allowing cellular phone sets and other mobile hand-set systems to access WWW pages and other wireless services. |
| **Website** | A related collection of World Wide Web files that includes a beginning file called a home page. |
| **Wi-Fi** | Short for "wireless fidelity", popular term for a high-frequency wireless local area network (W-LAN). Wi-Fi technology is rapidly gaining acceptance as an alternative or complementary infrastructure to a wired LAN. |
| **W-LAN** | Wireless Local Area Network. An implementation of a LAN with no physical wires, using wireless transmitters and receivers. It allows a mobile user to connect to a LAN or WAN through a wireless (radio) connection. A standard, IEEE 802.11, specifies the technologies for wireless LANs. |
| **WWW** | World Wide Web. The collection of pages in html format which reside on web-servers. Although WWW and the internet are different, the terms are increasingly becoming interchangeably used. |

# Annex II: Methodological Notes on the e-Business Survey 2003

## Background

Most of the data presented in this report are results of a decision-maker survey about e-business in European enterprises in 2003. This is an annual survey carried out by the *e-Business W@tch* – the first one took place in 2002 –, constituting a cornerstones of its monitoring activities. For organisational and contractual reasons, the e-Business Survey 2003 was split into two parts. The first consisted of 3,515 telephone interviews which were conducted in March 2003 with decision-makers in enterprises from five EU countries. The second part had a scope of 4,570 interviews in the EU, 100 interviews in Norway and 2,632 interviews in the 10 new EU Member States (NMS) and was conducted in November 2003. The questionnaires used in the two parts of the survey were largely the same. A few new questions were added in the second part in order to cover issues of special topical interest for policy.

## Fieldwork

The fieldwork of the surveys in the EU-15 and in Norway was carried out by Ipsos Germany in co-operation with its partner organisations on behalf of the *e-Business W@tch*. Fieldwork in the 10 new Member States was carried out by NFO Aisa (Czech Republic) and its network.

| Country | Organisation | Country | Organisation |
|---|---|---|---|
| Belgium | INRA Belgium, Avenue de la Couronne 159-165, 1050 Brussels | UK | Continental Research, 132-140 Goswell Road, EC1V 7DY London |
| Denmark | Gallup TNS Denmark, Masnedogade 22-26, 2100 Copenhagen | Norway | Norfakta Markedsanalyse, Kjøpmannsgt. 5, 7013 Trondheim |
| Germany | INRA Deutschland GmbH, Papenkamp 2-6, 23879 Mölln | Cyprus | Synovate (member of the Aegis Group plc), Nicosia |
| Greece | Synovate, 24 Ippodamou St., 11635 Athens | Czech Republik | NFO AISA s.r.o., Slezská 113, 130 00 Praha 3, Česká republika |
| Spain | IPSOS ECO Consulting, Avda. de Burgos, 12-8a, 28036 Madrid | Estonia | Saar Poll, Veetorni 4, 10119 Tallinn, Estonia |
| France | Ipsos Insight Marketing, 99, rue de l'Abbé Groult, 75739 Paris Cedex 15 | Hungary | MEDIAN, Opinion and Market Research, POB 551, BUDAPEST, H-1539 |
| Ireland | TNS mrbi, Blackrock, Co. Dublin 2 | Lithuania | BALTIC SURVEYS, 6A Šermukšnių str., Vilnius LT-2001, Lithuania |
| Italy | Ipsos-Explorer, Via Mauro Macchi 61, 20124 Milano | Latvia | TNS – baltic data house, Kronvalda Blvd. 3 – 2, Riga LV-1010, Latvia |
| Netherlands | INRA in Belgium, Avenue de la Couronne 159-165, 1050 Brussels | Malta | MISCO – Market Intelligence Services Co. Ltd., Valetta |
| Austria | Spectra Marktforschung: Brucknerstr. 3-5/4, 4020 Linz | Poland | CASE Consumer Attitudes & Social Enquiry, ul. Nowy Świat 64, PL 00-357 Warsaw |
| Portugal | Ipsos Portugal, Rua Joaquim António de Alguiar 43-5.°, 1070-15 Lisbon | Slovenia | CATI – Marketing, Media and Social Research & Consulting, Tržaška 2, 1000 Ljubljana |
| Finland | Taloustutkimus Oy, Lemuntie 9, 00510 Helsinki | Slovakia | NFO AISA s.r.o., Slezská 113, 130 00 Praha 3, Česká republika |
| Sweden | GfK Sverige, Box 401, 221 00 Lund | | |

## Interview method

The fieldwork was carried out using mostly computer-aided telephone interview (CATI) technology. Face-to-face interviews were used in Lithuania, and a mixed approach in Malta. 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 without 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 respective countries and which have their primary business activity in one of the sectors specified by NACE Rev. 1 categories (see table). The selection and composition of sectors took into account their economic importance and the relevance of e-business activities.

The most important viewpoints used 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 focus 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 drawn was a random sample of companies from the respective sector population in each country where the respective sector was to be surveyed with the objective of fulfilling strata with respect to company size class. Strata were to include a share of at least 10% of large companies (250+ employees) per country-sector cell, 30% of medium sized enterprises (50-249 employees) and 25% of small enterprises (10-49 employees). Micro enterprises with less than 10 employees were also included in the survey. Samples were drawn locally by fieldwork organisations based on acknowledged business directories and databases (see table).

| No. | NACE Rev. 1 Section | Division/Group | Sector Name |
|---|---|---|---|
| **Population coverage of the e-Business Survey (2003)** | | |
| 01 | D | 17, 18, 19 | Manufacture of textiles and textile products, leather and leather products |
| 02 | D | 24, 25 | Manufacture of chemicals and chemical products |
| 03 | D | 30, 31 *(except 31.3 - 31.6),* 32 | Manufacture of Electrical machinery and electronics |
| 04 | D | 34, 35 | Manufacture of transport equipment |
| 05 | D | Parts of (17-19), 20, (30-32), (34-35), 36, 45 | Crafts And Trade: In addition to companies from sub-sections covered by other sectors: Manufacture of wood products; manufacture of furniture; construction and site preparation. Only enterprises with 0-49 employees. |
| 06 | G | 52.11, 52.12, 52.4 | Retail |
| 07 | H / I / O | 55.1, 55.2, 62.1, 63.3, 92.33, 92.52, 92.53 | Tourism |
| 08 | K | 74 | Business services |
| 09 | I / K | 64.2, 72 | Telecommunications and computer-related services |
| 10 | N | 85.11, 85.12, 85.3 | Health and social services |

| Country | Directory / Database | Country | Directory / Database |
|---|---|---|---|
| Austria | Herold BUSINESS MARKETING database | UK | Dun & Bradstreet |
| Belgium | Dun & Bradstreet | Norway | Dun & Bradstreet |
| Denmark | KOB (Købmandsstandens Oplysnings Bureau) | Cyprus | Census of economic activity |
| Germany | Heins und Partner Business Pool | Czech Republic | Merit – CDF, Meritum Software, Enterprises database 2003 |
| Finland | Blue Book - TDC Hakernistot OY | Estonia | Estonian statistical bureau + Krediinfo (register of taxpayers) |
| France | IDATA, based on INSEE Siren file (the National Institute of Statistics) and other directories | Hungary | Company Information Data Store, provided by Hungarian Central Statistical office |
| Greece | ICAP directory (the major database for Greece) | Lithuania | Department of Statistics and National Register at Ministry of Economics |
| Ireland | Bill Moss | Latvia | Business Register of Republic of Latvia |
| Italy | Dun & Bradstreet | Malta | National Statistics Office, Employment and training corporation |
| Netherlands | Dun & Bradstreet | Poland | REGON (GUS) data (National register of business) |
| Portugal | MOPE database | Slovenia | IPIS directory, published by Noviforum (list of active Slovenian enterprises) |
| Spain | Dun & Bradstreet | Slovakia | Albertina, Albertina Data, Enterprises database 2003 |
| Sweden | Swedish Post Address Register (PAR) | | |

**Scope of the e-Business Survey 2003: No. of interviews per country and sector**

| Scope | Part I (March 2003) | Part II (Nov/Dec 2003) |
|---|---|---|
| No. of sectors covered | 7 sectors | 10 sectors |
| No. of EU Member States involved | 5 countries | 25 countries |
| No. of sector-country-cells | 35 | 98 |
| No. of interviews | 3515 | 4670 (EU+NO) + 2632 (NMS) = 7302 |

| | Food, beverages and tobacco | Textile industries | Chemical industries | Electronics | Transport equipment | Crafts & trade (Construction ; Wood & furniture) | Retail | Tourism | ICT services | Health & social services | Business services | Total int. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Belgium | | | 101 | | | | 100 | | | | 100 | 301 |
| Denmark | | | | | | | 67 | 67 | | 66 | | 200 |
| Germany | 100* | 100 | 100* | 100* | 100* | 100 | 100* | 101* | 100* | 100 | 100 | 1101 |
| Greece | | 84 | | 76 | 89 | 75 | | 75 | | | | 399 |
| Spain | 100* | 101 | 100* | 100* | 100* | 108 | 100* | 100* | 100* | 101 | 100 | 1110 |
| France | 100* | 100 | 100* | 100* | 101* | 101 | 101* | 99* | 100* | 100 | 100 | 1102 |
| Ireland | | | 70 | | | | | 70 | 71 | | | 211 |
| Italy | 102* | 100 | 101* | 101* | 100* | 100 | 102* | 102* | 101* | 100 | 101 | 1110 |
| Luxembourg ** | | | | | | | | | | | | 0 |
| Netherlands | | 100 | | | | | | | 101 | 102 | | 303 |
| Austria | | | | | 68 | | | 132 | | 100 | | 300 |
| Portugal | | | | | 104 | | 100 | | | | 100 | 304 |
| Finland | | 75 | | 75 | | | | | 76 | | | 226 |
| Sweden | | | 80 | 75 | 79 | | | | | | 80 | 314 |
| United Kingdom | 100* | 100 | 101* | 101* | 100* | 100 | 101* | 100* | 101* | 100 | 100 | 1104 |
| Cyprus | | | | | | | | 64 | | | | 64 |
| Czech Republic | | | 60 | | 60 | | | 60 | 60 | 60 | | 300 |
| Estonia | | 50 | 50 | 50 | 21 | 65 | 50 | 50 | 50 | 50 | 50 | 486 |
| Hungary | | | | 80 | 80 | | | | | | 80 | 240 |
| Lithuania | | | | | | | 57 | | | | | 57 |
| Latvia | | 51 | 49 | | | | 51 | | | | | 151 |
| Malta | | | | | | | | 51 | | | | 51 |
| Poland | | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 800 |
| Slovenia | | | | 56 | | | | 51 | 53 | 55 | 58 | 273 |
| Slovakia | | 50 | | 50 | | | 50 | | | | 60 | 210 |
| Norway | | 30 | | | | | 70 | | | | | 100 |
| **TOTAL** | **502** | **1021** | **992** | **1044** | **1082** | **729** | **1193** | **1138** | **993** | **1014** | **1109** | **10817** |

\* interviews carried out in March 2003   \*\* was covered in the e-Business Survey 2002

## Problems encountered

No major problems were reported by the fieldwork organisations with respect to interviewing (e.g. comprehensibility of the questionnaire, logical structure). The overall feed-back from the survey organisations was that fieldwork ran smoothly and that they had the impression that the questionnaire was well understood by most respondents. Some difficulties occurred, though, mainly with respect to the following issues:

- The main challenge was the fulfilment of quotas regarding company size-bands. In many countries, it was not possible to accomplish the objective of including a minimum share of large or even medium-sized enterprises in specific sectors. In such a case, these were replaced by interviews with smaller companies or from other sectors.

- Another well known issue in this type of survey stems from the difficulties of conducting research projects among ICT decision-makers in general. 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 difficult to carry out interviews within businesses and retailers not using or with a very basic use of computers, because of the number of questions on related issues. The French fieldwork

organisation, for instance, reported that the questionnaire was too specific for some organisations, for example for small companies in the health & social services sector. These are mostly doctor's surgeries, where it was felt that the e-business related questions were not applicable to them. Also, small companies from the crafts' & trade sector, which often have just a computer but no network at all felt that the questionnaire was not sufficiently adapted to their activities.

- A related issue is that there are some compromises to be made if the same questionnaire should be used for micro-enterprises as well as for large companies. Some of the questions, while only scratching the surface of e-business activities in large companies, are hardly relevant for micro-enterprises with less than 10 employees. The Hungarian survey company, for instance, reported that some questions seemed to have little relevance for companies with only one or a few employees.

- Finally, an issue which was known in advance but is unavoidable in telephone interviews is that there is no "ideal target person" to be interviewed. Fieldwork organisations 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 technical implementation status. The Irish fieldwork organisation, for instance, reported that some of the smaller companies were not familiar with technical terms such as used for standards ("EDI" or "EDIFACT").

## 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 should be read as "enterprises comprising x% of employees". To give an example: The indicator "percentage of companies selling online" – if weighted by employment – is 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. It also allows 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 four 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 was organised into the following modules:

- Background information (basic company data, innovation activities)

- ICT infrastructure and e-skills development in the company

- E-commerce and e-business activities (internal business process automation, procurement and supply chain integration, exchange of standardised data between trading partners, marketing and sales activities, use of e-business software)

- Impact of e-business (impact of selling and procuring online, perceived effects on work processes, satisfaction with outcome)

- Assessment of future importance of various e-business technologies

The choice of indicators considers relevant statistical work by the OECD and Eurostat and includes a basic set of widely accepted measures for e-commerce and e-business, but also tries to introduce 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 questionnaires can be downloaded (as a spreadsheet) from the *e-Business W@tch* website (http://www.ebusiness-watch.org).

# Annex III: Sector Impact Studies
# of the *e-Business W@tch* in 2003/04

| No. | Sector | Date |
|---|---|---|
| 1 | Textile, clothing and footwear industries | |
| | • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe | May 2004 |
| | • Report II: Key Issues, Case Studies, Conclusions | August 2004 |
| 2 | Chemical industries | |
| | • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe | May 2004 |
| | • Report II: Key Issues, Case Studies, Conclusions | August 2004 |
| 3 | Electrical machinery and electronics | |
| | • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe | May 2004 |
| | • Report II: Key Issues, Case Studies, Conclusions | August 2004 |
| 4 | Transport equipment manufacturing | |
| | • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe | May 2004 |
| | • Report II: Key Issues, Case Studies, Conclusions | August 2004 |
| 5 | Crafts' and trade sectors | |
| | • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe | May 2004 |
| | • Report II: Key Issues, Case Studies, Conclusions | August 2004 |
| 6 | Retail | |
| | • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe | May 2004 |
| | • Report II: Key Issues, Case Studies, Conclusions | August 2004 |
| 7 | Tourism | |
| | • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe | May 2004 |
| | • Report II: Key Issues, Case Studies, Conclusions | August 2004 |
| 8 | ICT services | |
| | • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe | May 2004 |
| | • Report II: Key Issues, Case Studies, Conclusions | August 2004 |
| 9 | Business services | |
| | • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe | May 2004 |
| | • Report II: Key Issues, Case Studies, Conclusions | August 2004 |
| 10 | Health and social services | |
| | • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe | May 2004 |
| | • Report II: Key Issues, Case Studies, Conclusions | August 2004 |