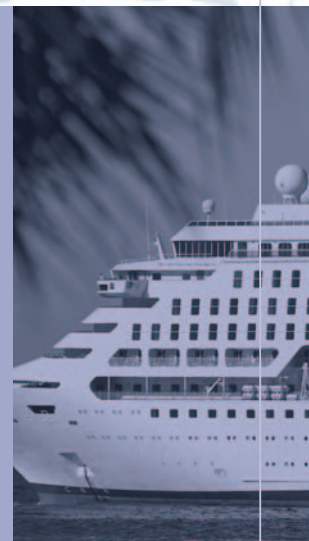


The European e-Business Report

2006/07 edition

*A portrait of e-business
in 10 sectors of the EU economy
5th Synthesis Report of the e-Business W@tch*

e-business
w@tch



January 2007



European
Commission



The European e-Business Report

2006/07 edition

**A portrait of e-business
in 10 sectors of the EU economy**
5th Synthesis Report of the e-Business W@tch

January 2007

e-business
w@tch

The e-Business W@tch

The European Commission's Directorate General for Enterprise and Industry 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 late 2001 the *e-Business W@tch* has analysed e-business developments and impacts in 20 manufacturing, financial and service sectors. All publications of the *e-Business W@tch* – including this report – are available in electronic format on the internet either via the Europa server or directly at the *e-Business W@tch* website: (<http://ec.europa.eu/comm/enterprise/ict/policy/watch/index.htm>, www.ebusiness-watch.org).

Acknowledgements

This report was prepared by empirica GmbH on behalf of the European Commission's Directorate General for Enterprise and Industry, in co-operation with Berlecon Research, Databank Consulting, DIW Berlin, Lios Geal Consultants, Rambøll Management and Salzburg Research, based on a service contract with the European Commission running from November 2005 to February 2007.

Editors: Hannes Selhofer, Stefan Lilischkis (empirica GmbH); Georgios Karageorgos (DG Enterprise and Industry); Peter O'Donnell.

Cover design, layout of the colour section and production: mediadesign-bonn.de

Disclaimer

Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use which might be made of the following information. The views expressed in this report are those of the authors and do not necessarily reflect those of the European Commission. Nothing in this report implies or expresses a warranty of any kind. Results from this report should be used only as guidelines as part of an overall strategy. For detailed advice on corporate planning, business processes and management, technology integration and legal or tax issues, the services of a professional should be obtained.

For further information, contact:



e-Business W@tch
c/o empirica GmbH
Oxfordstr. 2, 53111 Bonn
Germany
Fax: (49-228) 98530-12
e-Mail: info@ebusiness-watch.org



European Commission
Enterprise Directorate-General
e-Business, ICT Industries and Services
Fax: (32-2) 2967019
e-Mail: entr-innov-ict-ebiz@ec.europa.eu

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

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

Luxembourg: Office for Official Publications of the European Communities, 2006

ISBN 92-79-02038-2

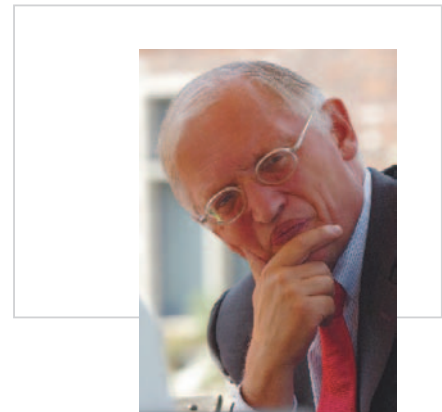
© European Communities, 2006. Reproduction is authorised provided the source is acknowledged.

Printed in Germany

Table of contents

Foreword	5	Part 3: e-Business Statements by Experts from Policy, Industry and Research	197
by Günter Verheugen, Vice-President, European Commission			
Introduction to the e-Business W@tch	7		
Executive Summary	9		
Benchmarking Report: ICT Adoption and e-Business in 10 Sectors	17		
Part 1: Synthesis of Main Study Findings 2006/07	37		
1.1 Use of and Access to ICT Networks	39	3.1 Policy perspectives, statements from business intermediaries and standardisation organisations	199
1.2 ICT Skills, Outsourcing and ICT Budgets	42	<i>José António Feu</i> , Ministry for Economy and Innovation, Portugal	
1.3 e-Standards and Interoperability	47	<i>Barbara Gatti</i> , CEN	
1.4 Internal Process Integration	53	<i>Roald Magne Johannessen</i> , BIT Programme – Innovation Norway	
1.5 e-Procurement and Supply Chain Integration	58	<i>Gerhard Laga</i> , Austrian Federal Economic Chamber	
1.6 Improving Customer Service: e-Marketing	62	<i>Gilles Morin</i> , Export Development Canada	
1.7 ICT and Innovation	66	<i>Freek Posthumus</i> , UEAPME/ NORMAPME	
1.8 Drivers and Barriers for the Uptake of e-Business	68	<i>Graham Vickery</i> , OECD	
1.9 e-Business Impact on Corporate Performance, Productivity and Employment	71	3.2 Company and industry perspectives	213
1.10 The Role of New Companies in e-Business Innovation and Diffusion	77	<i>Peter G.L. Potgieser</i> , Equens	
1.11 Case Studies in e-Business: Conclusions and Lessons Learned	82	<i>Brigitte Preissl</i> , Deutsche Telekom	
1.12 Five Years of Monitoring e-Business in Retrospect	89	<i>Joseph Reger</i> , Fujitsu Siemens Computers	
		<i>Marcel Swennenhuis</i> , Agfa Healthcare	
		<i>Rachel Tym</i> , European Tour Operators Association	
Part 2: Sector Perspectives on e-Business in 2006/07	99	3.3 Research and consulting perspectives	223
2.1 The Food & Beverages Industry	99	<i>Georgios Doukidis</i> , Athens University of Economics and Business	
2.2 The Footwear Industry	110	<i>Jesús Galván Ruiz</i> , INGEFOR S.L.	
2.3 The Pulp & Paper Industry	119	<i>Joze Gricar</i> , University of Maribor	
2.4 The ICT Manufacturing Industry	129	<i>Arturas Kaklauskas</i> , Vilnius Gediminas Technical University	
2.5 The Consumer Electronics Industry	139	<i>Giuliano Noci</i> , Politecnico di Milano	
2.6 The Shipbuilding and Repair Industry	146	<i>Ilias Vlachos</i> , Agricultural University of Athens	
2.7 The Construction Industry	157		
2.8 The Tourism Industry	167	Annexes	
2.9 The Telecommunications Industry	178	Annex I: Glossary of Technical Terms	235
2.10 The Hospital Activities Industry	187	Annex II: e-Business W@tch Activities in 2006/07	239
		Annex III: Methodological Notes: The e-Business Survey 2006	245
		Annex IV: e-Business – The Conceptual Framework	255





Foreword

The European Commission has long recognised and emphasised the importance of information and communication technologies (ICT) for the European economy to thrive. First, the ICT producing industry itself is a major contributor to growth, with an annual average growth rate of about 6% until 2008. Second, as this report clearly demonstrates, companies from all sectors are increasingly using ICT for doing business. "e-Business" has become a critical factor for competitiveness and productivity growth.

However, we need to make a focused effort in Europe in order to allow the positive effects of ICT to fully unfold. The agenda is challenging. It requires close cooperation between policy makers and the private sector to accomplish the many-sided tasks that have to be tackled.

On the policy side, we need to create a favourable framework for our companies as they compete in a global business environment. This includes cutting "red tape", fostering innovation and – more specifically with regard to ICT – counteracting shortages in e-skills and promoting systems inter-operability.

Above all, companies need to demonstrate a positive attitude toward innovation and toward the broad use of ICT as a tool. I am glad to see that this has been confirmed by the *e-Business W@tch* special study on ICT impact, which finds that "positive effects of ICT on productivity are more likely to occur in firms that conduct innovations and that are advanced users of ICT."

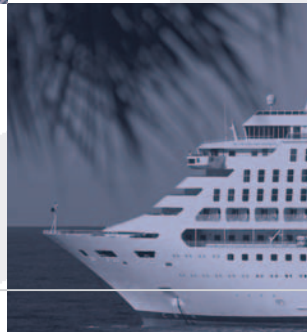
The European Commission is fully committed to support the wide adoption of ICT among enterprises, in particular in small and medium sized enterprises (SMEs). A high-level ICT Task Force was commissioned in 2006 to look in detail at ICT uptake and skills requirements, and to make policy recommendations. We are determined to take these recommendations seriously. All actions will be embedded in the renewed Lisbon Strategy for Growth and Jobs in Europe. We also know that sector-specific requirements have to be taken into account, as stated in the "new industrial policy" communication.

With its focus on sectors, SMEs and the study of ICT use and impact in business, *e-Business W@tch* has taken a central position in this policy context. It has become an influential source of unbiased information. This is why the initiative will be renewed until at least 2008. I place great expectations in the "new" *e-Business W@tch* as a vehicle to stimulate debate and to inform policymakers and industry about relevant developments.

Günter Verheugen
Vice-President of the European Commission



e-business
w@tch



1. "eEurope 2005: An information society for all". Communication from the Commission, COM(2002) 263 final, 28 May 2002, chapter 3.1.2
2. "Implementing the Community Lisbon Programme: A Policy Framework to Strengthen EU Manufacturing - towards a more integrated approach for Industrial Policy." Communication from the Commission, COM(2005) 474 final, 5.10.2005
3. The Final Report is available at http://ec.europa.eu/enterprise/ict/policy/doc/icttf_report.pdf (download: Dec. 2006).

Introduction to the e-Business W@tch

Policy background

The European Commission launched *e-Business W@tch* in late 2001 to monitor the adoption, development and impact of electronic business practices in different sectors of the economy in the European Union and beyond.

The initiative is rooted in the eEurope Action Plans of 2002 and 2005. The 2005 Action Plan set the goal "to promote take-up of e-business with the aim of increasing the competitiveness of European enterprises and raising productivity and growth through investment in information and communication technologies, human resources (notably e-skills) and new business models".¹ *e-Business W@tch* has been an important instrument for the European Commission to assess the developments and progress in this field.

In 2005, as a response to globalisation and intense international competition, the European Commission launched a new industrial policy² to create better framework conditions for manufacturing industries in the coming years. Some of the policy strands described have direct links to ICT and e-business developments. One of the initiatives covered by the policy was the assignment of a Taskforce on information and communication technologies (ICT) competitiveness in 2006. The taskforce, with stakeholder representatives, focused on identifying and proposing measures to remove obstacles that inhibit ICT take-up among enterprises. It issued its final report with recommendations in November 2006, many of which reflect arguments and conclusions drawn from *e-Business W@tch* studies.³

Focus and scope

Within this broader policy context, two further important facets regarding the mission of the initiative are relevant. First, the focus of *e-Business W@tch* studies is sectors (and not countries). Second, special emphasis is placed on developments and implications for small and medium-sized enterprises (SMEs).

Since its launch, *e-Business W@tch* has published studies on more than 20 sectors of the European economy, five comprehensive synthesis reports about the state-of-play in e-business in the European Union, statistical pocketbooks, and various other resources such as newsletters and special issue reports. All publications are available at www.ebusiness-watch.org ('resources').

e-Business W@tch presents a 'wide-angle' perspective on the adoption and use of ICT in the sectors studied. The topic is not restricted to the measurement of

e-commerce transactions (the volume of goods and services traded online), but also includes an assessment of the degree to which business processes, including intra-firm processes, are electronically linked to each other and have become digitally integrated.

However, it becomes practically impossible to cover in detail all areas and facets of e-business in a single sector study. Each study therefore focuses on a few specific issues, allowing the reader to zoom into these topics in more detail.

The *mission* of *e-Business W@tch* is to monitor, analyse and compare the development and impact 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 will trigger the interest of policy-makers, researchers, and other e-business stakeholders for more in depth analyses or statistical surveys.

e-Business W@tch has adopted a "wide-angle" perspective in its *approach*. The necessary trade-offs are transparently depicted in each of its deliverables.

Methodology

e-Business W@tch combines quantitative and qualitative research elements. The quantitative analysis of ICT and e-business adoption by firms is based to a large extent on representative surveys among decision-makers in European enterprises ("e-Business Survey"). Interviews are conducted by telephone, based on a standardised and computer supported questionnaire (CATI⁴ method). The most recent survey (conducted in April/May 2006) covered more than 14,000 enterprises from 10 sectors in all EU Member States and most EEA and Acceding and Candidate Countries.⁵

The *e-Business W@tch* Surveys have won recognition from the international research community as a useful instrument for piloting new e-business metrics. The experience gained from this piloting is used, for example, by Eurostat for planning and developing its own survey of ICT use by businesses.

4. Computer Assisted Telephone Interviews, a widely used method in representative household or decision-maker surveys.

5. The EEA (European Economic Area) includes, in addition to EU Member States, Iceland, Liechtenstein and Norway. Candidate Countries for accession into the EU include (as of December 2006) Croatia and Turkey. Bulgaria and Romania were Acceding Countries in 2006. See Annex III for more detailed information about the survey methodology.

e-Business W@tch complements the statistical picture with a more detailed presentation of concrete e-business activity in individual enterprises from the sectors covered, mainly in the form of brief case studies. About 75 case studies were conducted in 2006, adding to more than 100 case studies conducted in previous years. Evidence from the survey and case studies is backed up by desk research and interviews with industry representatives and e-business experts.

The importance of networking and debate

e-Business W@tch has increasingly developed from a market observatory into a think-tank and intermediary, stimulating debate among stakeholders at international level about the economic and policy implications of e-business. The positive feed-back and wide uptake for the various publications and statistics provided by the *e-Business W@tch*, for example their exploitation by various research institutions, reflects the demand for sectoral e-business analysis and discussion on related issues.



e-Business W@tch uses several mechanisms for debate and networking with stakeholders. An important platform for this is the website (www.ebusiness-watch.org), where all reports and survey data are published. Furthermore, results are presented and discussed with industry at workshops, within and via the Advisory Board, and, lastly, through the participation of study team members in other events, such as conferences, workshops and working groups organised by third parties.

The definition of sectors and the adequate level of aggregation

Economic sectors constitute the main level of analysis for *e-Business W@tch*. The 2006 studies cover sub-sets of ten different sectors whose configuration and definition are based on the NACE Rev. 1.1 classification of business activities.⁶ Over the years since its initial implementation in late 2001, *e-Business W@tch* followed a roll-out plan in the coverage of different sectors.⁷ In each new period, some new sectors (not covered in previous years) were added.

The aggregation of various business activities into sectors in earlier implementation periods (2002-2004) made it possible to cover a broad spectrum of the economy, but also posed challenges for the analysis of e-business developments. In cases where heterogeneous sub-sectors were aggregated, it was sometimes difficult to make general observations or draw conclusions for "the sector" at stake. It also turned out that industry has a clear preference for narrower sector definitions.

The approach for selecting and defining sectors which was used in 2005 and 2006 reflects these concerns. Many of the sectors studied since 2005 are sub-sectors that had been part of larger aggregations in 2002-2004. A further argument for "zooming in" on former sub-sectors is that the broad picture for whole sectors is already available from earlier *e-Business W@tch* studies. The selection of sectors in 2006 has been made on the basis of the following considerations:

- The roll-out plan of 2003.
- Policy relevance of the sector from the Commission's perspective.
- Interest articulated by the industry in previous years on studies of this type.
- The current dynamics of e-business in the sector and the impact of ICT and electronic business, as derived from earlier *e-Business W@tch* sector studies.

6. NACE Rev. 1.1 is a 4-digit classification of business activities. It is a revision of the 'General Industrial Classification of Economic Activities within the European Communities', known by the acronym NACE and originally published by Eurostat in 1970.

7. See website: "selection of sectors" (www.ebusiness-watch.org/about/sector_selection.htm)

Executive Summary

The overly pessimistic and hesitant attitude towards ICT that the burst of the new economy bubble provoked in many companies is now a thing of the past. e-Business has gained new momentum in the EU and in other advanced economies of the world. The cost-saving potential of ICT has been broadly recognised by companies. Efficiency and productivity

gains have been a key driver for growth in ICT investments. Large firms, and increasingly the public sector, are spearheading this development. However, in parallel to the continued search for cost-cutting potential, companies are becoming more creative in using ICT for new forms of customer service.

Key e-Business trends observed in 2006

>> *Supply chain integration is key:*

Increasingly, competition occurs not only within a company's value system, but between entire networks. Optimising the supply chain by means of ICT, e.g. by integrating with distribution networks, is a key factor in achieving competitive advantage.

>> *Better solutions for SMEs:*

Until recently, the ICT industry was often criticised for failing to provide adequate e-business solutions for small and medium-sized firms. This is changing. Driven by market requirements, and enabled by technological advances, ICT companies are increasingly addressing the SME market. They are developing affordable, smaller-sized solutions (e.g. ERP and CRM suites) that can be connected with the more powerful systems of large firms.

>> *ICT for customer service:*

e-Business is not just about cutting costs: service companies have always used ICT for marketing purposes and customer service. Now, manufacturing companies are increasingly devoting attention to using e-business for better service to their customers, with the strategic goal of creating sustained relationships with them.

>> *Growing maturity of new technologies:*

Applications based on RFID technology, the use of Voice-over-IP, and mobile e-business applications using wireless technology have gained maturity. Although still not widely diffused, these emerging technologies have started to influence e-business.

W@tch out: new trends & issues ahead

>> *The "missing link":*

e-Business activities of large companies are maturing. They understand the benefits, and are steadily improving ICT tools to their own advantage. They have connected their systems to many of their major tier-1 suppliers for e-business. But supply chain integration often comes to a halt at that point: many of the small supply firms still cannot cope with system requirements, and they risk exclusion from the value network. Policy and industry initiatives are increasingly addressing this issue.

>> *ICT outsourcing, out-tasking etc:*

Spectacular, large-scale ICT outsourcing projects will be the exception in the future. New and more flexible arrangements with external service providers (e.g. for specific tasks, or for maintenance services) will often be preferred.

>> *Open source and software as a service:*

Business models for software service provision could change in the future. Rather than just selling a product, the service component is becoming increasingly important. Growth in the use of open source (OS) software components is reinforcing this trend. These changes can be a challenge for business advisors; the range of products and service models from which companies can choose has increased.

>> *Information management:*

The role of information management (IM) in companies may further increase in importance. IM will take on the role of intermediaries between the traditional ICT department, the management and the operational departments of a company (i.e. the internal ICT users).

Sectoral e-business differences – manufacturing, construction, services

The intensity, focus and impact of electronic business depend on the business activity of companies, and on the configuration of the value system in which these companies operate. In manufacturing sectors, companies focus on procurement processes, optimising supply chain management, and integrating with retail and distribution. In a project-oriented business such as construction, applications supporting project management have a high potential. In tourism, online informa-

tion and reservation services have become a commonplace. In telecommunications, it is hardly possible to make a clear distinction between the use of e-business by telecom firms themselves and the provision of related services to (business) customers. Hospitals aim at improving the efficiency of their internal processes as well as document exchanges within the health system by means of ICT, thus cutting costs.

Exhibit E-1: The relevance of ICT and e-business in 10 sectors in 2006

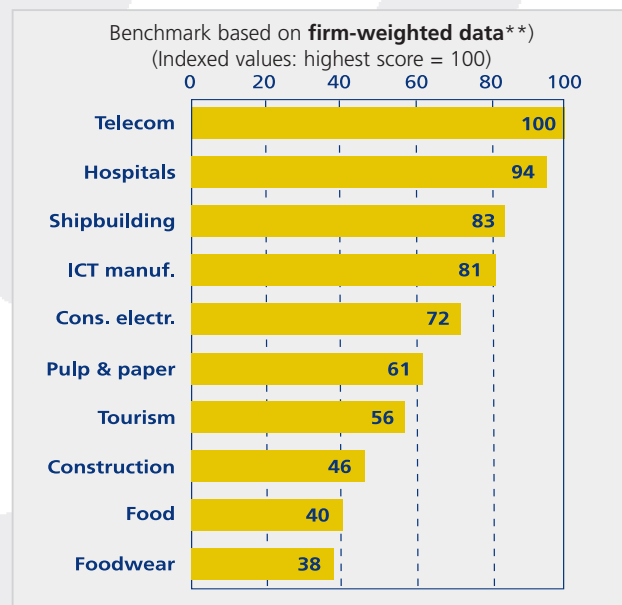
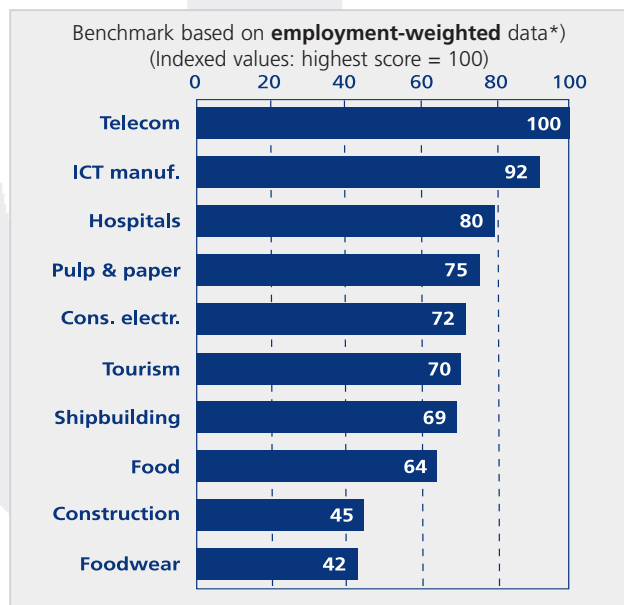
(overall assessment based on survey results, desk research and case studies)

Sector	Application	e-Sourcing & procurement	e-Logistics/ SCM	e-Design & planning	e-Marketing & sales	ICT use for innovation	Perceived ICT significance
Food & beverage		●●	●●●●●	●●	●●	●●	●●
Footwear		●	●	●	●●	●●	●
Pulp & paper		●●●	●●●	●●	●●●	●●	●●
ICT manufacturing		●●●●	●●●	●●●	●●●	●●●●	●●●
Cons. electronics		●●●●	●●●	●●●	●●●	●●●●	●●●
Shipbuilding		●●	●●	●●●●	●	●●	●●
Construction		●●	●●	●●●	●	●●●	●●
Tourism		●●●	●●●	●●	●●●●	●●	●●●
Telecoms		●●●●	●●	●●●	●●●●	●●●●	●●●●
Hospital activities		●●●	●●	●●	●	●●●	●●●

● = below average relevance / diffusion; ●● = average relevance / diffusion; ●●● = above average relevance / diffusion; ●●●● = high relevance / diffusion; ● = applies only for some sub-sectors / types of firms

Source: e-Business W@tch (2006) – based on analysis from the respective Sector Studies

Exhibit E-2: e-Business Index 2006 for 10 sectors (EU-10 data) ⁹



*) Employment-weighted data express e-business adoption as "activity in firms comprising ...% of employment in a sector", thus emphasizing the situation in larger firms.

**) Firm-weighted data express e-business adoption as "% of firms in a sector with a certain activity", irrespective of the size of the firms (i.e. small companies and large ones count equally). Results are mainly determined by the situation in smaller firms, as there are many more small companies than large ones

9. The e-Business Index is based on 16 component indicators. It can be used for benchmarking the intensity of ICT use in companies from different industries or countries. However, it is a simplified, aggregated view; results depend on the choice of indicators and the weighting of underlying data (for more information, see Annex III - Methodology).

Manufacturing

In general, large companies drive e-business development in manufacturing industries. Supply-chain integration is a key objective for many e-business initiatives. In parallel, innovative ICT-based forms of customer service are rapidly gaining momentum, even in B2B oriented sectors. However, the 'digital divide' between large and small companies is still very pronounced, for example in the food & beverage, pulp & paper and shipbuilding & repair industries.

Among the six manufacturing sectors surveyed in 2006, electronic business activity has reached the highest level of intensity in the ICT-related industries, i.e. in **ICT manufacturing** and **consumer electronics**. In these industries, the prevalence of large companies, intense competition, frequent product changes and production dispersion drive e-business adoption. More than in other industries, companies feel a major impact from ICT on relations with business partners and on the entire value chain.

By contrast, in the **footwear** industry, ICT usage appears to be much lower than in other manufacturing industries. This applies even to larger firms from the sector. To some extent, the delayed ICT adoption in this industry could be a case of a 'chicken-and-egg' dilemma: on the one hand, the crisis of the footwear (and textile) industries in Europe makes companies feel that e-business is a secondary goal, as there are more pressing issues to be dealt with. On the other hand, a low level of investment in new technology creates opportunity costs, e.g. in form of lower productivity growth. This means it will be even more difficult for firms in Europe to compete with low-wage countries.

In the **pulp and paper** industry, the main impact of ICT is as a driver and enabler of process innovation in supply chain management and B2B trading processes. Large companies from the sector use ICT quite intensively in all application areas along the value chain: for procurement processes, in production, inbound and outbound logistics, and in marketing and customer service.

In the **food and beverages** industry, supply chain management is likely to remain a key point of focus for the leading players in the future. The objective is not only to reduce costs. The globalisation of supply chain sourcing and intensified safety concerns have added important new links to the supply chain: the issues of food supply safety and traceability.

A key application area for ICT in the **shipbuilding and repair** industry is the integration of engineering and production processes along the value chain. This integration has effects on the competitiveness of individual shipyards, as well as on the industry as a whole.

Construction

At first sight, e-business activity in the **construction** industry appears not to have the same intensity as in advanced manufacturing sectors. However, as the questionnaire of the *e-Business W@tch* survey is geared principally toward ICT use in manufacturing, statistical results may not fully reflect some of the emerging trends in construction. For example, project-oriented technologies such as project web and 3D visualisation tools carry significant economic potential for this industry. Although they are not yet widely deployed in the sector, there are examples demonstrating that companies can benefit from using these technologies.

Service sectors

e-Tourism is one of the most dynamic areas of e-business, with a major impact for nearly all players involved. ICT usage enables service providers to interact directly with customers, which puts severe pressure on traditional intermediaries such as travel agencies and tour operators.



Telecommunications companies have a forerunner position as intensive users of ICT and e-business in almost all application areas. Moreover, the wide diffusion of e-business technologies among smaller enterprises too distinguishes this sector from most other industries studied by *e-Business W@tch*.

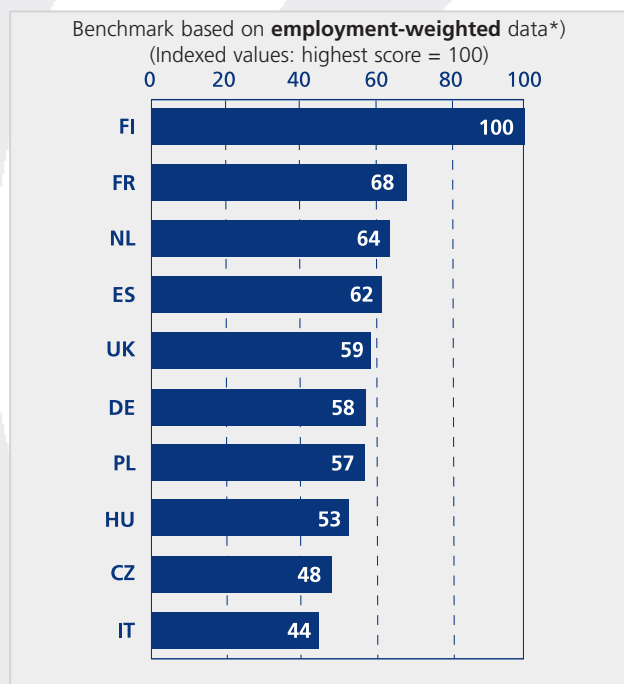
Almost all European **hospitals** have at least an electronic system for patient data and financial administration. However, few of them use more sophisticated systems, and departmental information systems are often not integrated with each other. Core drivers of e-business in hospitals include cost containment, improvement of quality of care, and state regulations, for example the implementation of Diagnosis-Related Groups.

Geographic disparities in ICT use for business

In international comparisons, EU enterprises are – on average – level with their counterparts in other advanced economies in their use of ICT. There are differences within the EU, however, particularly with regard to the average ICT maturity of smaller companies. In general, firms in Northern European countries are more advanced than companies in Southern European countries and from most of the new Member States in linking their business processes internally and with business partners.

The e-Business Index 2006, composed of 16 indicators, shows Finland as the e-business benchmark in a comparison of eight EU countries (see Exhibits). Companies from France, the Netherlands, the UK and Germany are very similar in their use of ICT, particularly if emphasis is laid on the larger companies (see employment-weighted Scoreboard). Firms from the new Member States (Czech Republic and Hungary), although taking the lower ranks in this benchmarking exercise, are not far behind in their use of ICT.

Exhibit E-3: e-Business Index 2006 for 10 EU countries

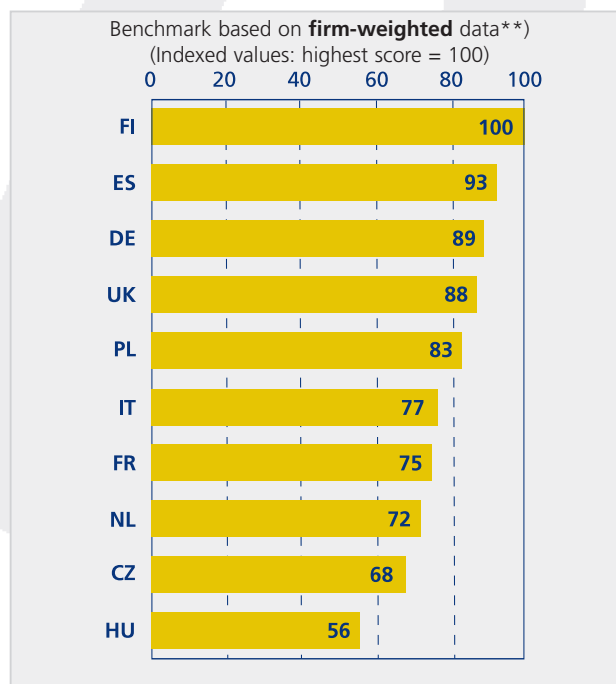


*) Employment-weighted data express e-business adoption as "activity in firms comprising ...% of employment in a sector", thus emphasizing the situation in larger firms.

Impact of industry structure – challenges for comparisons by country

With the possible exception of the Nordic countries, the location of a company is by no means a reliable predictor of its level of e-business activity. This may be due to structural characteristics. In Italy, for example, sectors dominated by small firms are much more prevalent than in other countries. Since large firms are more advanced in electronic business, aggregated data may point at a lower level of e-business activity in Italy. This reflects, at least to some extent, the structure of the economy rather than the overall e-maturity of firms.

In contrast to Italy, the relative performance of French and Dutch companies is significantly better if the emphasis is on larger firms. These benchmarking results suggest a pronounced digital divide between small and large firms in these countries.



**) Firm-weighted data express e-business adoption as "% of firms in a sector with a certain activity", irrespective of the size (i.e. small companies and large ones count equally). Results are mainly determined by the situation in smaller firms, as there are many more small companies than large ones.

Source: e-Business W@tch (2006)

Opportunities and challenges for small companies

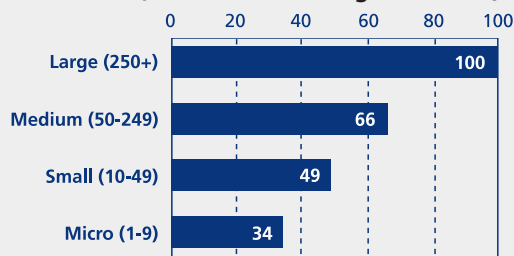
e-Business activities of large companies are rapidly maturing. These companies have powerful ICT systems for linking business processes, understand their benefits and possess the necessary know-how to steadily improve these systems to their advantage. Many smaller companies, by contrast, still struggle with the requirements of getting digitally connected with their suppliers and customers. If they cannot cope with requirements of the digital economy, they risk being eliminated from the value systems that tend to be orchestrated by large firms.

Exhibit E-4: The e-Business Index 2006 by firm size

	A	B	C	D
Micro (0-9)	41	23	34	40
Small (10-49)	60	39	43	54
Medium (50-249)	84	56	56	67
Large (250+)	100	100	100	100

A = Sub-Index "ICT networks"
 B = Sub-Index "e-Integration of internal processes"
 C = Sub-Index "e-Procurement and supply chain integration"
 D = Sub-Index "e-Marketing and sales"

Overall Index (based on firm-weighted data*)



* Firm-weighted data express e-business adoption as "% of firms within a size-band with a certain activity".

Source: e-Business W@tch (2006)

ICT implications for SMEs are ambivalent. On the one hand, ICT may offer increased economies of scale. Large enterprises can afford powerful ICT systems at proportionally lower cost than SMEs have to meet for their comparatively simple infrastructure. The e-Business Index 2006 confirms that the diffusion of ICT systems for internal and external process integration increases in a linear fashion according to firm size.

On the other hand, it is debatable whether small companies really need the same powerful solutions as large firms in order to achieve the same benefits. In a small company, information management and e-business can possibly also be effectively and efficiently achieved by the use of less sophisticated and less expensive systems.

e-Business Opportunities for Small Firms

- >> **ICT usage facilitates cooperation:**
SMEs need to cooperate, for example by building networks. ICT usage facilitates cooperation in many ways (e.g. through project management tools, or online collaboration tools for design).
- >> **The SME potential of new technologies:**
Current technological developments hold some promise for small companies, for example Voice-over-IP telephony and mobile e-business solutions. Moreover, ICT companies are increasingly addressing the SME market by developing affordable, smaller-sized solutions (e.g. ERP and CRM suits).
- >> **Metcalfe's Law:**
The value of any communication technology is proportional to the square of the number of users of the system. Large companies have recognised that they need to get their small business partners "on board" in order to reap the full benefits of e-business. Policy is also focusing on the integration of small firms in their "digital eco-systems".
- >> **Going international:**
Many SMEs are forced to expand their market area. e-Commerce can be an opportunity (if not the only way) for them to achieve this goal.

e-Business Challenges for Small Firms

- >> **Complying with ICT requirements of large firms:**
Large companies use their power to impose ICT standards and systems upon small supply companies. Small firms risk being forced to comply with different systems in parallel.
- >> **Lack of ICT strategy and skills:**
Smaller firms often lack a coherent ICT investment strategy or the related skills - partly because most SMEs cannot afford to employ ICT practitioners: According to the e-Business Survey 2006, only about 15% of small firms and 30% of medium-sized firms employ ICT practitioners, i.e. have their own ICT department. Thus, ICT strategy and implementation critically depends on respective skills of the management.
- >> **Shift of power:**
Large companies' e-procurement schemes tend mainly to benefit the buyer, due to increased price transparency. Effects are similar to those of price finders and auction platforms in the consumer market. This development can lead to erosion of profit margins for SME suppliers.

ICT impact on firms

A special study conducted by e-Business W@tch in 2006 (see also Section 1.9) found that advanced users of ICT are more likely to exhibit increases in employment. Furthermore, firms that conduct product innovations are more likely to increase employment. Only 22% of non-innovative firms report an increase in employment, compared to 34% of firms that carried out non-ICT-enabled product innovations and even 43% of firms that had ICT-enabled product innovations. The data suggest a similarly positive pattern for process innovations.

ICT matters for employment and productivity growth

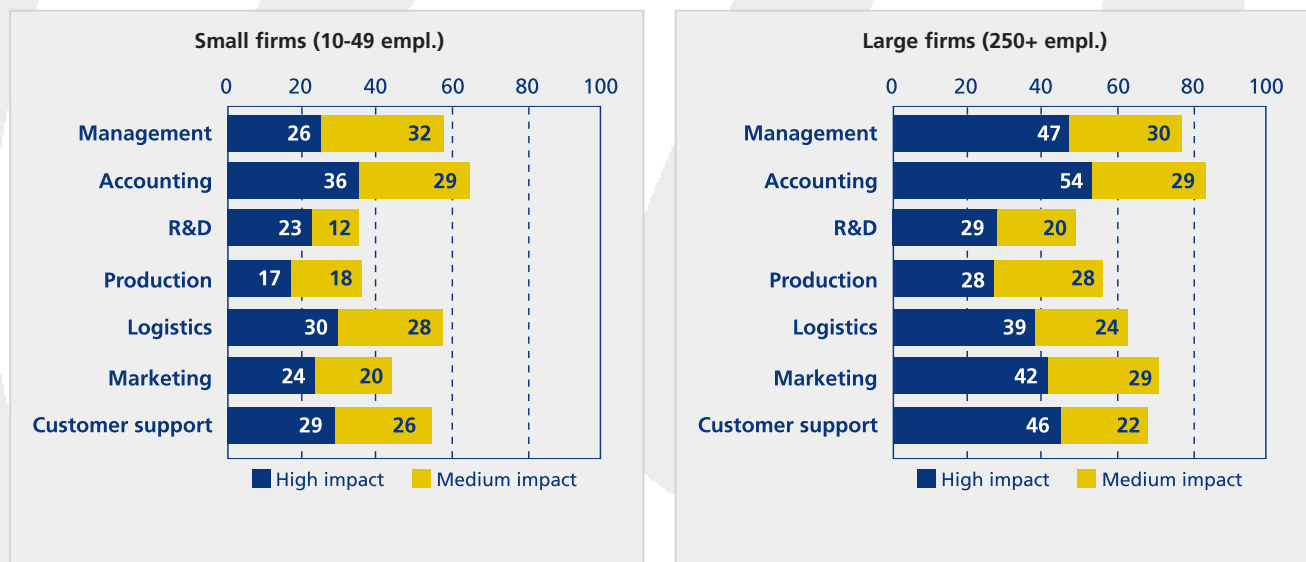
More advanced users of ICT and innovative firms were also found to be more likely to exhibit productivity increases than non-innovative firms at all stages of ICT development. Moreover, the share of firms with increased turnover was significantly higher among the innovators. 70% of firms that conducted ICT-enabled innovations report turnover growth, compared to 44% of non-innovators.

Anticipated future impact of ICT

Firms expect that ICT will continue to have a significant impact on how they do their business in the future. In particular, they believe that ICT will become even more important as a tool to support planning, decision making and controlling. Without doubt, management and controlling functions in an enterprise depend critically on ICT systems. They provide information faster, more flexibly and more concisely than would otherwise be possible. In larger enterprises, many of the regular management reports (e.g. from controlling) are automatically generated from ICT based information systems.

It is interesting that marketing and customer support have overtaken production and logistics as primary application areas for ICT in the scenario of large firms (see Exhibit E-5). This applies not only to service sectors such as tourism and telecommunications (obvious for these industries), but increasingly also to manufacturing sectors.

Exhibit E-5: Percentage of companies expecting that ICT will have a high / medium impact on ... in the future



Base (100%): Companies with computers, EU-10, 10 sectors. N = 2159 (small firms) / 670 (large firms).

In % of firms. Survey question: Do you expect that ICT will have a high / medium / low impact or no impact on <business function> in your company in the future?*

Source: e-Business W@tch (2006)

Policy implications of e-business

e-Business developments can have implications for several policy areas. Relevant considerations in this context can be grouped around two main objectives: promoting ICT adoption and counteracting ICT-induced flaws or market failure.

Promote ICT adoption:

Policies aiming at accelerating the adoption of ICT and e-business practices among companies, particularly among SMEs. This is based on the assumption that ICT is a key driver of productivity and competitiveness. This includes, for example, the following policy areas and types of initiatives:

- **Innovation and technology policy:** creating incentives and a favourable environment for enterprises to innovate; stimulating the development of ICT tools (e.g. for SMEs); promoting interoperability and standardisation processes (and advocating attention to the requirements of SMEs in this context);
- **Education and labour market policies:** ensuring an adequate supply of e-skills in the market, enhancing the managerial understanding of e-business issues in SMEs, supporting employee training and train-the-trainer measures;
- **Role model of the public sector:** recognising the role model of the public sector in ICT adoption, e.g. by using public e-procurement;
- **Awareness raising policies:** initiatives directly promoting ICT uptake, e.g. the organisation of SME workshops, the collection and dissemination of best practice examples, and the facilitation of working with business advisors;
- **Industrial policy:** initiatives to encourage cooperation among SMEs, the formation of networks and clusters;

Counteract ICT-induced 'flaws' or market failure:

Policy interventions to counteract undesirable effects on the aggregate level from deployment of ICT in business. This includes a broad range of policy areas, for example competition policy (with the objective of counteracting market concentration).

The following table summarises policy implications from e-business developments that have been identified in *e-Business W@tch* sector studies in 2006. While some of the goals and types of initiatives proposed are relevant for specific sectors only, others are valid for most sectors (e.g. promoting interoperability).



In the e-Business Report of 2005, two objectives were seen as particularly important: the improvement of **e-skills** among smaller companies, and the advancement of **interoperability** and standards. This assessment remains valid for 2006, in full recognition of the many efforts that have been started at regional, national and European levels to address these goals.