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Electronic Business in Craft & Trade

Key issues, case studies, conclusions

**e-business
w@tch**



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Enterprise publications

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 impacts in 17 manufacturing, financial and service sectors. Results are continuously being published on the internet and can be accessed 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 craft and trade sectors published by the *e-Business W@tch* in the 2003/04 period. It builds on the first study from May 2004 which presented mainly the quantitative picture, focusing on the results of the e-Business Survey 2003. This study analyses in more detail specific issues which were found to be particularly relevant for the sector at stake.

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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 the Sector Studies prepared by the *e-Business W@tch*.

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 and, in particular, sectors for which 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 Craft and Trade Industries in 2004: Main Issues and Challenges

This report is the second Sector Impact Study on electronic business in craft and trade industries published by the *e-Business W@tch* in the 2003/04 period. It builds on the first study from May 2004 which mainly presented the quantitative picture, focusing on the results of the e-Business Survey 2003. This study analyses in more detail specific issues which were found to be particularly relevant for the sector at stake. The analysis is supported by case studies and interviews with experts. The conclusions summarise the main business implications for firms in the sector stemming from ICT and e-business, and assess the main drivers and impediments for the future development of electronic business in the sector. Finally, the study points at ICT related policy challenges, starting with considerations about the overall implications of ICT for policy and leading to more sector specific aspects.

1 Introduction

1.1 Definition

An operational definition of crafts

“Craft and trade” is considered here as a group of professions in which “workers apply their specific knowledge and skills to produce or process goods” and in which “the tasks call for an understanding of all stages of the production process, the materials and tools used and the nature and purpose of the final product”.¹ However, there is no European definition for craft enterprises, and crafts cover a very wide range of activities that do not constitute a marked-off sector in the General Industrial Classification of Economic Activities within the European Communities (NACE). The *e-Business W@tch* applies an operational definition of craft enterprises as “firms with less than 50 employees in craft-related NACE Rev. 1 business activities”. These business activities comprise manufacturing activities in fields such as food, wood, metals and ceramics (NACE 15 – 37, excluding 23 – 25), construction (NACE 45), repairs (NACE 50), transport (NACE 60), and several “other services” (NACE 90 and 93). The definition of “small” and “micro” enterprises – in this context, as well as in other sectors studied – has been derived from and is in full conformity with the European SME definition.²

Analysing a composite craft and trade sector

The heterogeneity of the craft and trade sector implies that e-business application differs largely across sub-sectors. Since the *e-Business W@tch* analysis needs to allow a comparison between sub-sectors, the following crafts have been selected:³

¹ See the European equivalent to the International Standard Classification of Occupations in Elias/Birch (1994).

² http://europa.eu.int/comm/enterprise/enterprise_policy/sme_definition/index_en.htm

³ See Annex (Methodological considerations for the craft and trade sector) for an elaboration of related methodological issues

NACE Rev.1	Business activity	Craft section
17	Manufacture of textiles and textile products	Textiles, clothing and footwear
17.1	Preparation and spinning of textile fibres	
17.2	Textile weaving	
17.3	Finishing of textile	
17.4	Manufacture of made-up textile articles except apparel	
17.6	Manufacture of knitted and crocheted fabrics	
17.7	Manufacture of knitted and crocheted articles	
18	Manufacture of wearing apparel, dressing and dyeing of fur	
18.1	Manufacture of leather clothes	
18.2	Manufacture of other wearing apparel and accessories	
19	Manufacture of leather and leather products	Textiles, clothing and footwear
19.3	Manufacture of footwear	
30	Manufacture of office machinery and computers	Electrical Machinery and Electronics
30.01	Manufacture of office machinery	
30.02	Manufacture of computers and other information processing equipment	
31	Manufacture of electrical machinery and apparatus n.e.c.	
31.1	Manufacture of electric motors, generators and transformers	
31.2	Manufacture of electricity distribution and control apparatus	
32	Manufacture of radio, television and communication equipment and apparatus	
32.1	Manufacture of electronic valves, tubes and other electronic components	
32.2	Manufacture of television and radio transmitters and apparatus for line telephony	
32.3	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	
34	Manufacture of motor vehicles, trailers and semi-trailers	Transport Equipment
34.1	Manufacture of motor vehicles	
34.2	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	
34.3	Manufacture of parts, accessories for motor vehicles	
35	Manufacture of other transport equipment	
35.1	Building and repairing of ships and boats	
35.2	Manufacture of railway, tramway locomotives, rolling stock	
35.3	Manufacture of aircraft and spacecraft	
35.4	Manufacture of motorcycles and bicycles	
35.5	Manufacture of other transport equipment	
20	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	Wood and Furniture
20.1	Sawmilling and planing of wood; impregnation of wood	
20.2	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other panels and boards	
20.3	Manufacture of builders' carpentry and joinery	
20.4	Manufacture of wooden containers	
20.5	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials	
36	Manufacture of furniture; manufacturing n.e.c.	Wood and Furniture
36.1	Manufacture of furniture	
45	Construction	Construction
45.2	Building of complete constructions or parts thereof; civil engineering	
45.3	Building installation	
45.4	Building completion	

Note: Only enterprises with less than 50 employees in these sectors are considered as craft firms

The composite craft and trade sector comprises firms with less than 50 employees in three sectors which are also dealt with in separate sector reports of the *e-Business W@tch*, namely the manufacture of textile, clothing and footwear (NACE 17-19), electrical machinery and electronics manufacturing (NACE 30-32) and transport equipment manufacturing (NACE 34-35).

In addition, the composite craft and trade sector includes two sectors which are only dealt with in the craft and trade sector reports of the *e-Business W@tch*: wood and wood products manufacturing (NACE 20) and furniture manufacturing (NACE 36.1),⁴ construction (NACE 45). These two sectors were selected because they have a particularly high share of small companies, because they are, for construction, of particularly high economic importance, and because they provide, for furniture manufacturing, exemplary e-business practices. Activities covered in the composite craft and trade sector are listed in Exhibit 1-1.

1.2 Economic profile

This section gives a brief overview of the size and structure of selected craft industries, using key economic indicators from the New Cronos database of Eurostat. A more detailed overview with data tables and methodological considerations as well as information on the sub-sector and the survey countries has been presented in the first sector report on the craft and trade sector (May 2004).

Economic importance of the craft and trade sector

Craft and trade is a huge sector in terms of number of enterprises, employment and value added. While it is impossible to quantify craft-trade in Europe owing to the shortcomings of surveying methods and time-lags in updating, 99% of European non-primary enterprises are small and micro firms with less than 50 employees, accounting for more than 50% of employment and half of Europe's total turnover. A large part of these small firms can be considered as crafts.

Small businesses and crafts were the motor of employment in the past decade. Most crafts are rooted in the local economy and only a small percentage is engaged in international trade. Thus, crafts are also important drivers of local and regional structural change. Small businesses in the new Member States play a role as significant as they do in Western Europe. In Europe, small businesses play a more important role than in the US. In the European Economic Area (EEA – EU and Iceland, Liechtenstein and Norway) and Switzerland, firms of up to 50 employees account for 53% of total employment and only 30% in the US. This difference can be explained by the fact that the US has a larger domestic market without linguistic barriers, a more heterogeneous capital market and fewer barriers against mergers and acquisitions.

⁴ Wood and furniture manufacturing is in itself a composed sector. Wood manufacturing (NACE 20) is intertwined with furniture manufacturing (NACE 36.1) as – besides construction – the main user of wood. From the perspective of the furniture industry, the wood-transforming industry is the most important supplier. On EU level, around 40% of furniture is made from wood, and the furniture industry annually buys 90% of medium-density fibreboard and 55% of particleboard production. It should be considered, however, that many other materials such as metal, textiles and plastic are also used for furniture manufacturing.

Characteristics of the craft and trade sector

Number of craft enterprises: Craft firms account for the vast majority, commonly more than 90%, of enterprises in any country and any sector under consideration. In construction, the EU average share is as much as 99%. In the new EU Member States, crafts also make up the largest share of enterprises, but the percentages tend to be lower than in the EU. This can be attributed to the former economic order with its large-scale enterprises.

Employment: The significance of employment in craft firms differs largely by country and sub-sector, implying differing industry structures and market situations. Construction is the sub-sector with the highest share of craft employment in total employment, with an EU average of 73%. Data availability for craft employment in the new Member States is limited except for the construction sector where, with the exception of the Czech Republic, the share of craft employment tends to be much lower than in the former EU-15.

Value added: The share of crafts' value added in total manufacturing value added tends to be lower than the share of enterprises and people employed for most sectors. Again, the EU average percentages vary largely between the sub-sectors considered, showing the different levels of concentration in the sub-sector. The share of crafts value added tends to be lower in the new Member States compared with the former EU-15 Member States.

Productivity: Productivity, measured as value added at factor cost per person employed, is much lower in crafts than in medium-sized and large enterprises (MLEs). In EU average, crafts only reach 71% of MLE productivity in the construction sector, 68% in the textiles sector, 63% in wood and furniture manufacturing, 61% in transport equipment manufacturing and 58% in electrical machinery and electronics.

1.3 Trends and challenges

E-business, the core subject of this report, is one of the major challenges to craft firms. However, there are many further current issues in craft enterprises – as well as in small enterprises in general – including the following:

- **Single market.** Improving the single market for enterprises will be important for craft firms to tap into the opportunities of free trade in Europe. The European Commission issued an action plan for “Improving the Single Market for Enterprises and Citizens” for 2002 and beyond, aiming to ensure that rules are properly enforced and simplified. Simplification is of particular importance to crafts.
- **Enlargement and external relations.** The enlargement of the European Union opens up new trade opportunities for craft enterprises in the formerly 15 and currently 25 Member States – but also challenges their competitiveness. The same applies to the free trade zone between European Union and Mediterranean countries that is planned to be established by 2010, to open the European market to further suppliers from low-wage countries.
- **Environment.** Sustainable development is of increasing importance in the EU. Related policy measures often directly affect craft enterprises. For example, UEAPME expects the Directive on environmental liability⁵ to have major repercussions on small firms.⁶

⁵ proposed by DG Environment in January 2002, COM(2002) 17 final

⁶ See UEAPME (2003), p. 13.

- **Limited resources.** Crafts and small businesses suffer from having limited human and financial resources, as well as from being more locally bound than their larger counterparts. Several issues are related to this disadvantage, the most important among them being administrative burdens, as well as technical and administrative standards. For example, the ISO 9000 system is firmly established today in the European economy. Many crafts, in particular those working as subcontractors for big companies, were obliged to become certified. Certification costs for them turned out to be relatively higher than for large companies.

Trends and challenges differ largely between sub-sectors. In the sub-sectors considered here, core challenges include the following:

- **Textiles, clothing and footwear manufacturing.** Five “mega trends” affecting the textiles industry have been identified: globalisation, business acceleration, concentration (for example chemicals on the supply side and big textile retail on the demand side), quality imperative as well as customisation and personalisation. These trends could lead to a transformation process in the textiles industry.⁷
- **Electrical machinery and electronics.** The business climate in electronics and electrical machinery remains volatile, maintaining pressure to innovate and increase efficiency. The electronics sector (NACE 30 and 32) was the fastest growing business sector in many European countries during the 1990s, but in the past two years the industry was confronted with a recessive demand scenario. Positive developments include that the proportion of electrical and electronic systems in vehicles’ value is likely to increase in a few years.
- **Transport equipment manufacturing.** The current business environment in the transport equipment sector is difficult for many producers in the whole value chain, including crafts. The global economic environment continues to be uncertain, and general economic growth is slow in most EU countries. As regards automobile sales, domestic European markets are almost saturated and demand is typically replacement demand.
- **Wood and furniture manufacturing:** The cost of raw materials is one of the most important issues in the wood manufacturing industry. In international comparison, stumpage costs in the EU are relatively high because of fragmented and private ownership of forests. Demand for furniture is very cyclical, depending on the general economic situation, disposable income, interest rates as well as on demographic aspects such as age class composition and frequency of household formation. European companies face serious competition in furniture manufacturing and have, in the past, not always been successful in adapting to market challenges. This is shown by the fact that the EU was a net exporter of furniture in the 1990s but has experienced trade deficits since 2000.
- **Construction:** The construction industry is currently facing stagnation. According to the European Construction Industry Federation (FIEC), construction activity in the EU grew by a moderate 0.6% in 2002 and is not likely to grow by more than 0.5% in 2003. According to FIEC, the enlargement of the Union constitutes “a huge potential for construction activity in terms of both major infrastructure as well as building projects (new housing, renovation of existing buildings)”.⁸

⁷ Cf. Sector Report on the Textile, Clothing and Footwear Industries, No. 1-II, August 2004.

⁸ FIEC, European Construction Industry Federation (2003), p. 5.

2 The role of electronic business in the craft and trade sector – analysis of selected issues

2.1 Key application areas of electronic business in the craft and trade sector

Main findings from the first craft and trade sector report

The first craft and trade sector report (May 2004) offered a detailed analysis of findings from the *e-Business W@tch* survey in 2003 as well as an analysis of literature in the field. Several issues turned out to be of particular importance for the craft and trade sector – e-business benefits, e-procurement, standardisation, employment and skills, and country results:

- **E-business benefits.** Craft enterprises, which are by definition small or micro firms, in general lag behind medium-sized and large firms in e-business use. Besides limited availability of investment funds and limited usefulness of various e-business applications, there appears to be a lack of knowledge about the benefits of e-business.
- **E-procurement.** Relative to other sectors, online procurement of goods appears to be the most important e-business function for crafts. System integration with suppliers in the construction industry as well as relatively high use of Enterprise Resource Planning in wood and furniture manufacturing are remarkable sub-issues.
- **Standardisation.** Several reasons can explain why e-business does not play a role in many craft firms, including high technology costs, complicated technology and security concerns. All these issues however seem to be related to interoperability problems and standardisation of IT hardware, software and networks.
- **Employment and skills.** Considering the importance of small enterprises for employment creation and retention as well as for professional training, it is worth having a closer look at issues related to employment and IT skills in the craft and trade sector.
- **Country differences.** The use of e-business differed widely between the countries included in the survey. Thus it is worthwhile presenting a benchmarking overview of survey findings by country. Furthermore, a high level of e-business application in Greece which is not in line with other surveys calls for a follow-up.

The *e-Business W@tch* survey offers a wealth of data that were not analysed in the first report. Selected further empirical findings will therefore be presented in the following chapters. The five selected issues will also be illustrated by case studies, interviews and other kinds of investigations.

There are some areas that are of relatively little importance for e-business in the craft and trade sector, such as Knowledge Management for which many small and even micro firms are too small, or Customer Relationship Management software, which do not make much sense for a number of customers that is, in craft firms, typically relatively small. Consequently, these issues will not be discussed in the following, or only in passing.

Overview of importance of e-business application areas

Exhibit 2-1 presents an overview of e-business objectives and an assessment of how important (or unimportant) they are for the craft and trade sector. In many indicators, differences between the sub-sectors are important due to the heterogeneity of the craft and trade sector (indicated by an empty circle in the “importance” column).

Exhibit 2-1: Summary overview: Importance of e-business areas in craft and trade industries

E-business application area	Importance	Remark / example
Internal processes		
Automate internal business processes	●●	As the number of employees in craft firms is small, automation of internal business processes is not a key issue but still relevant, e.g., for document sharing
Electronic customer management	●	Customer relationships are very important for craft firms but are preferably being realised in personal contact. Thus the use of CRM systems in order to, for example, analyse mass data to target marketing activities, is not an issue.
Improve knowledge management by using special software	●	Due to the small size of craft firms, KM software is not widely used. No clear benefit perceived.
E-commerce		
Supply chain process integration	●●○	Particularly important for the furniture industry which has a variety of different inputs, requiring efficient Enterprise Resource Planning.
Decrease direct procurement costs through e-procurement	●●●	As in other sectors, the potential of reducing costs is the most important benefit of online procurement. Improving process efficiency is almost equally important.
IT system integration with suppliers	●●●○	Key e-business application area in the construction industry. Small firms often need to download procurement catalogues from large suppliers and harmonise their IT system with that of the large supplier
Web based e-marketing and customer related services	●●	Improving customer service is the most important benefit stated by craft firms that sell online. However, the share of online sellers is small.
Increase sales volume / area through selling on the internet	●○	Selling online through the company website is not a priority for craft companies. However, an increased sales volume is the second most important effect stated by online sellers. Sector differences apply.
Extended enterprise		
Communication with business partners	●●●○	Improving the efficiency and quality of business processes between trading partners is a priority in the construction sector that needs to establish communication between a large number of stakeholders taking part in a construction project
E-business standards for exchanging structured data	●●○	Electronic procurement is an important application for craft companies. In this context, standards for electronic document exchange are important.
Collaborative (online) e-product design	●●○	Quite important for the electronics, transport equipment and textiles industries, not so much in construction.
What will be important		
Facilitate remote and mobile work (fieldworkers, homebased telework)	●●○	Particularly important for the construction sector and its building site activities.
Web services and XML based standards	●○	There does not appear to be a considerable need for XML among craft firms. Web services could become fairly important in the construction sector.
● = little relevance; ●● = average relevance; ●●● = very relevant; ●●●● = high relevance for sector ○ = mixed results, depending on the sub-sector within the composite craft and trade industries		

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

2.2 Potential e-business benefits for craft enterprises

State of e-business application: far from integrating e-business processes

The *e-Business W@tch*, together with research from other sources⁹, confirm that small firms in general and crafts in particular have taken their first step to go digital. However, they are still far from digitally integrating their business processes: the “e” part of their business processes tends to be a front-end activity, facing the customer or supplier. A core reason for this lagging behind appears to be that craft firms do not see a necessity to invest in e-business. More than two thirds of craft firm representatives believe that “the company is too small to benefit”. This attitude may be caused by the fact that crafts business often relies on personal relationships that require face-to-face contact. It may also be the case that many craft firms are run by relatively old entrepreneurs who do not see good reasons to change processes just before their retirement. However, e-business may offer many benefits to craft enterprises. The *e-Business W@tch* survey included several questions on the impacts of e-business and Internet use. These data were not analysed in the first report but, in the light of considerable e-business reservation in craft firms, are worthwhile investigating. Furthermore, a case study of a small Danish cabinetmaker at the end of this chapter will illustrate how craft firms can benefit from company-specific, simple e-business practices. The case study also shows how industry associations can support craft firms in benefiting from e-business.

Major benefits of e-business are seen in improved information for management and planning

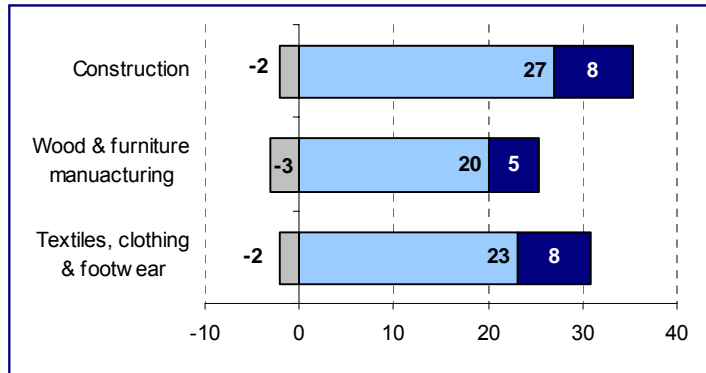
Overall. Companies with Internet access were asked what impacts the Internet and e-business had on their company in the following areas: collaboration among employees, information for management and planning, internal processing of transactions, and product innovation. Overall, around one third of the companies stated positive impacts of e-business and the Internet (see Exhibit 2-2). Most respondents stated that the effects were neither positive nor negative (not shown in the diagrams). The percentage of interviewees reporting negative effects was negligible and did not exceed 3% in any indicator.

Industries. The level of positive impacts was highest in construction in all indicators except product innovation. This corresponds with the fact that, among the three sub-sectors considered here, the level of interviewees stating that e-business is of some importance or very important is highest in the construction industry (40%, as opposed to 37% and 21% for wood and textiles respectively). Positive effects in the construction industry appear to be highest for “information for management and planning” (37% fairly positive and 14% very positive). In product innovation, the textiles industry reported the highest level of positive impacts (30% fairly positive, 6% very positive). This corresponds to the relatively high importance of online product design with business in this industry – 11% of the firms state that they use online technologies for collaborative product design, compared with 9% and 5% respectively in the case of the wood and construction industries. The wood and furniture industries reported some of the lowest impacts. However, in information for management and planning, wood and furniture manufacturing comes second to construction with 30% of respondents stating a very positive impact of e-business and the Internet and 12% fairly positive impacts.

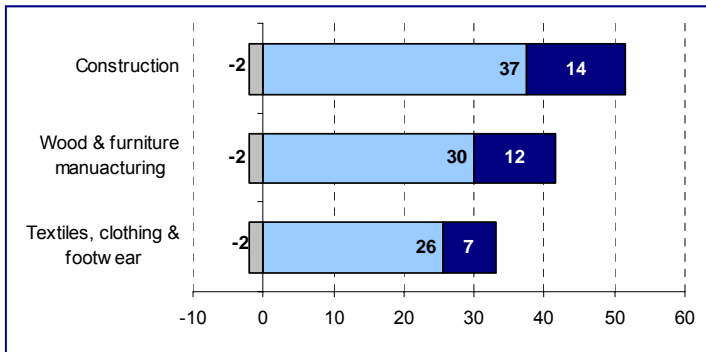
⁹ Cf. study on Internet use by the German Crafts Association (Zentralverband des deutschen Handwerks, 2000).

Exhibit 2-2: Impacts of Internet and e-business in craft industries

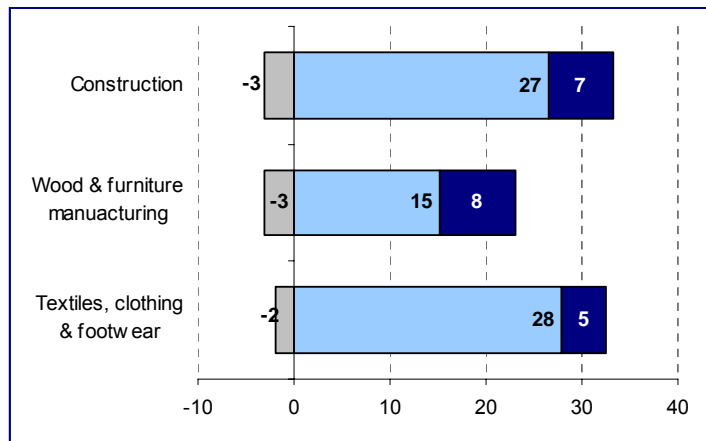
Impacts of Internet and e-business on collaboration among employees



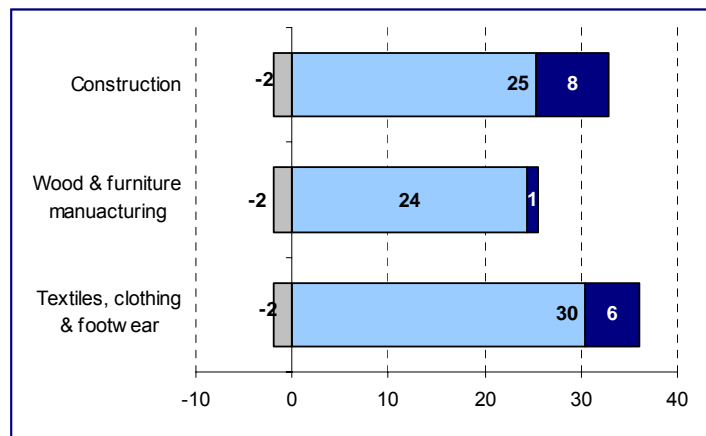
Impacts of Internet and e-business on information for management and planning



Impacts of Internet and e-business on internal processing of transactions



Impacts of Internet and e-business on product innovation



Key: negative >> fairly positive >> very positive

Base: EU-5 (DE, ES, FR, IT, UK), enterprises with Internet access (n = 95 – 295 per industry). Figures in % of employment (“enterprises comprising ...% of employees in the country/industry”). Reporting period: March/November 2003.

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

High satisfaction with e-business among craft firms

Overall. Respondents who indicated that they practise e-business were asked how much they are satisfied with it. The results show that the vast majority of craft companies practising e-business is satisfied with it – see Exhibit 2-3. On average, companies representing 76% of craft firms said that they are “fairly satisfied”, and 13% stated that they are “very satisfied”. A minority of 11% stated they were fairly disappointed, and the level of statements of “very disappointed” was negligible, with less than 1%. These general findings also apply across countries and industries, with some peculiarities as listed below.

Cross-sector comparison. Craft firms do not fall behind the other nine sectors studied by the *e-Business W@tch* in satisfaction with their e-business practice. The levels of high and moderate satisfaction are very similar, no matter if weighted by employment or by enterprise.

Exhibit 2-3: Satisfaction with e-business in craft industries (2003)

	Very satisfied	Fairly satisfied	Fairly disappointed	Very disappointed
Sector total (EU-5)				
% of employment	13	76	11	<1
% of enterprises	12	74	13	1.2
0-9 employees	12	74	13	1.4
10-49 employees	12	77	11	<1
Other 9 Sectors (EU-5)				
% of employment	16	75	8.6	<1
% of enterprises	18	73	7.9	<1
Countries				
DE Germany	11	76	11	2.2
EL Greece	16	78	6.3	<1
ES Spain	17	82	<1	<1
FR France	1	74	25	<1
IT Italy	8	73	19	<1
UK United Kingdom	27	68	4.7	<1
EE Estonia	<1	98	1.4	<1
PL Poland	17	82	1.4	<1
Industries				
Textiles, clothing & footwear	12	82	5.4	<1
El. machinery & electronics	15	72	11	2
Transport equipment	9.3	82	7.4	1
Wood & furniture	13	80	6.4	<1
Construction	12	74	12	1

Base: EU-5 (DE, ES, FR, IT, UK), enterprises practising e-business (n = 468 for EU-5 sector total, 55 – 199 per country and 39 – 167 per industry). Figures for size-bands in % of enterprises. Figures for countries and industries are weighted by employment (“enterprises comprising ...% of employees in the country/industry”). Reporting period: March/November 2003.

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

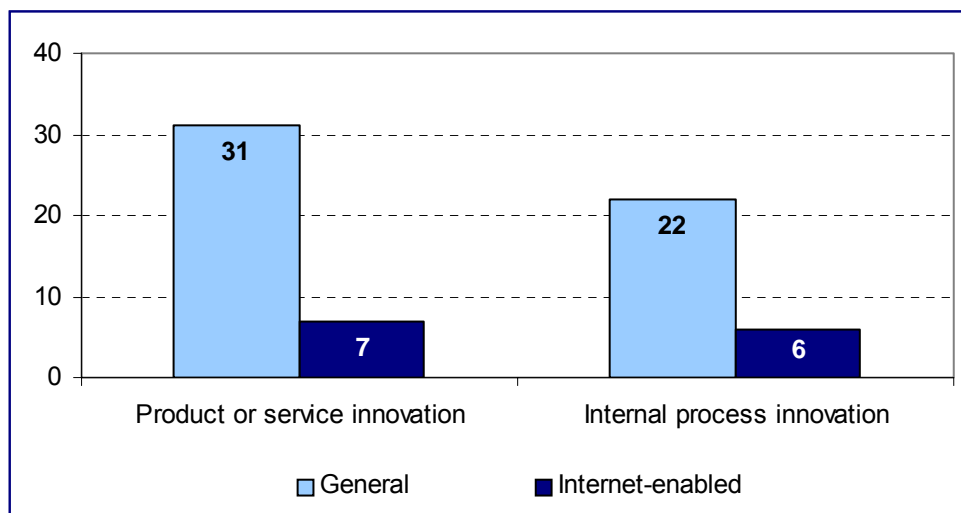
Countries. Companies from France stated the highest level of disappointment (25% fairly disappointed), followed by those in Italy (19%) and Germany (11%). In all other countries, the level of disappointment was well below 10%. The level of answers of “very satisfied” was highest in the UK (27%). Estonian firms showed an extreme answering behaviour: 98% said they are fairly satisfied, and the rest stated they were very satisfied, fairly disappointed or very disappointed.

Industries. In the industries covered by this analysis, the levels of satisfaction are fairly similar, whereby respondents from the electrical machinery and construction sectors were slightly less satisfied than those from the textiles, transport equipment and wood/furniture industries.

E-business use and business success – a correlation analysis

The purchase of a new technology alone does not immediately lead to efficiency gains or other positive impacts. The implementation and application of these tools often requires re-engineering business processes. E-business technologies might also be used for offering new services or products to customers. It is not information technology as such that determines the economic impact of e-business, but what companies decide to do with it. Exhibit 2-4 shows that, in 2003, 31% of craft firms stated that they had introduced product or service innovations in the 12 months before the interview, while in 7% this innovation was Internet-enabled. Innovation of internal processes took place in 22% of the craft enterprises; in 6% this internal process innovation was Internet-enabled. It appears that a considerable share of craft firms have innovated products, services or internal processes, but only a small share of this was related to the use of the Internet.

Exhibit 2-4: Innovation in craft industries 2003



Base: EU-8 (DE, EL, ES, FR, IT, UK, EE, PL), all enterprises (n = 1,412). Figures in % of enterprises. Reporting period: November 2003.

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

The benefits of e-business for craft enterprises can be further examined with a statistical analysis of correlations between innovation and company performance. The hypothesis is that Internet-enabled innovation is positively correlated with turnover increase and profitability. Exhibit 2-5 shows that any kind of innovation is positively correlated with turnover increase. There are no very large correlation values – the largest being 1.88 for internal process innovation and turnover increase – but the correlations are significant on the 99% level. With regard to companies' profitability in the 12 months prior to the interview, the correlation values are quite small, but one can cautiously interpret that there is a statistically significant positive relationship between innovation and profitability. General innovation appears to be slightly more positively correlated with turnover increase and profitability than Internet-related innovation. Nevertheless, the hypothesis about the positive effects of Internet-enabled innovation is confirmed.

Exhibit 2-5: Correlation of innovative activities and financial performance

	Turnover increased last year	Turnover same last year	Turnover decreased last year	Profit in last 12 months
Product or service innovation – general	0.164**	0.102**	-0.046	0.090**
Product or service innovation – Internet-related	0.112**	-0.077**	-0.048	0.054*
Internal process innovation – general	0.188**	-0.108**	-0.099**	0.079**
Internal process innovation – Internet-related	0.116**	-0.064*	-0.097**	0.039

Kendall-Tau-b correlation coefficients ; * significant at 95%, ** significant at 99%
Base: all enterprises (unweighted, n = 1,412). Reporting period: November 2003

Source: e-Business W@tch (2004)

CASE STUDY: E-BUSINESS IN SMALL DANISH FURNITURE MANUFACTURERS

Abstract

The case study of Danish Furniture On-line and the Aksel Kjersgaard cabinetmaker factory is a good example of how to use the Internet for information and marketing purposes. It shows that the Internet can be an important medium of furniture presentation as well as for initiating contacts to customers and suppliers.

Case characteristics	
• Sector focus	Furniture Manufacturing
• Business focus	Small companies
• Geographical focus	Denmark
Case objectives	
• Online product presentation	*****
• Preferential ways of using the Internet in craft companies	*****
• Exemplary industry association initiative	***

* = some relevance for case; ***** = high relevance

Background and objectives

Core data on the Danish furniture industry

The Danish furniture industry is very competitive. When related to the small population of Denmark, Danish furniture production and exports are quite significant on the global

market, as the Association of Danish Furniture Industries (ADFI) claims.¹⁰ More than four fifths of the production is exported, making the furniture sector Denmark's sixth-largest export industry. According to Eurostat data, the furniture manufacturing industry in Denmark comprises around 1,300 companies, 92% of them with less than 50 employees. The Danish furniture industry employs around 26,000 people, about 8,800 of those in firms with less than 50 employees. Danish furniture manufacture can be divided into three main segments: furniture for the home (accounting for the bulk of Denmark's furniture manufacture), commercial and contract furniture, and designer furniture.¹¹

Danish Furniture On-Line

The combination of advanced technology and an elevated level of technical competence makes productivity in the industry very high. Companies with less than 50 employees reach 84% of the productivity level of medium-sized and large enterprises. This, together with the UK, is the highest level of all European countries for which data are available.¹² Danish furniture is sold through a wide variety of channels, including Internet sales. The most important furniture portal is "Danish Furniture On-Line", which is claimed to be "*one of Europe's most important furniture gateways with links to more than 200 manufacturers*".¹³

Activities

Manufacturers' Index – online portal for the Danish furniture industry

The ADFI represents more than 90% of Danish furniture production, including almost 350 members in June 2004. As early as 1996, when the Internet was just taking off, the ADFI introduced "Danish Furniture On-Line" (<http://www.danishfurniture.dk>). The driving force behind creating this online portal was to give the ADFI's members opportunities to present their companies in a new electronic medium. The link to this portal is free of charge. In order to market the portal, the ADFI sent direct mails to some thousands of buyers of Danish furniture all over the world in 1999. In its current state, the portal is a pleasantly designed website with five rubrics:

- Manufacturers' Index, the internet portal of the furniture trade;
- Dansk Mobler Trade Magazine, providing information about advertising in this specialised press magazine;
- facts about Danish furniture industries, such as statistics on industry and market size and structure;
- consumers' tips, such as how to clean and maintain furniture adequately;
- press information.

Manufacturers' Index provides access to more than 230 Danish manufacturers and exporters of furniture and related furniture products. Each company has at least an

¹⁰ See "facts about Danish furniture" at www.danishfurniture.dk/index.asp?pg=3.

¹¹ The information in this paragraph is, unless otherwise stated, taken from "Facts about Danish Furniture" at <http://www.danishfurniture.dk>.

¹² See *e-Business W@tch* Sector Impact Study 05-I, May 2004, p. 15.

¹³ Information on the Association of Danish Furniture Industries at <http://www.danishfurniture.dk>.

information site with the company's name, products and e-mail address. Most firms also have a link to their website. The websites generally have a very high presentation quality. The Index lists firms of all size classes, but most of them are small firms, some of them proudly referring to a long tradition of family owned craft business. In 2002, the search facilities of the Index were extended to encompass suppliers in 13 different product categories, from dining room chairs to carpets and textiles, or to provide an alphabetical list of all companies (see Exhibit 2-6). The international orientation of the Index is shown by the fact that it is available in Danish and English. According to ADFI representative Jørgen Andersen there are no current plans to further develop it except by trying to ensure that every Danish furniture manufacturer is represented in the index.

The ADFI believes that one of the main benefits of the portal is that the companies get a lot of additional contacts. However, the ADFI does not follow up business results and is not informed to what extent the contacts actually lead to sales. The goods that best lend themselves to be sold online are probably cheap furniture and soft furnishings – for which the risk of not actually seeing them before purchasing is low – and brand furniture for which the customers know what they receive.

Exhibit 2-6: Manufacturers' Index at Danish Furniture On-Line

Source: <http://www.danishfurniture.dk>

E-business at Aksel Kjersgaard furniture manufacturing

The Aksel Kjersgaard factory, a cabinet-making enterprise based in Odder at the Danish east coast, specialises in manufacturing very high quality tables, hall furniture

and home office furniture.¹⁴ The firm was founded in 1952, has currently 25 employees and exports to most parts of the world.

The factory established its website (see Exhibit 2-7) in 2001. This website includes a company profile, pictures of furniture products, and a contact page with a standard form for electronic inquiries. The website has developed into an important communication platform for customers to make inquiries, many of which are questions on where to buy certain products. “We didn’t know how well-known we are”, says company owner Jørgen Kjersgaard. Currently, the company receives around 10 to 15 inquiries a week. Increased communication with final customers is one of the most important changes the Internet has brought to the company. The firm’s website is linked to the Manufacturers’ Index in Danish Furniture On-line. Kjersgaard could not say how many contacts are triggered through the Manufacturers’ Index, but as long as it does not cost anything to be listed, he finds it is worthwhile. His suggestion on how to improve the Index would be to include a search function for furniture styles because many customers are looking for certain specific ones.

Exhibit 2-7: Danish furniture manufacturer Aksel Kjersgaard’s homepage



Source: www.ak.dk

Aksel Kjersgaard does not sell online because the high-quality furniture they produce does not lend itself to be sold through the Internet. “Our customers want to see and

¹⁴ In order to identify small Danish furniture manufacturers with e-business practice, companies listed in the Manufacturers’ Index at Danish Furniture On-line were asked if they were interested in a case study about them. All companies except some obviously large firms that are not craft firms as defined by the *e-Business W@tch* (altogether more than 200) received an e-mail on 6th June 2004. Two companies that appeared to be similarly suited expressed their interest and the one that replied first, Aksel Kjersgaard, was chosen.

touch our furniture”, says Jørgen Kjersgaard. “If anything goes wrong, it is expensive to send furniture back and forth”. For this reason Kjersgaard prefers to sell through selected small brick-and-mortar vendors who also offer customer service.

Online procurement practice at Aksel Kjersgaard is limited to goods such as machine parts and software. Direct production goods, particularly wood, as well as metal fittings, are bought offline because, as Jørgen Kjersgaard says, “there is no fixed price; you need to talk and negotiate”. However, the Internet has been a valuable source of information about suppliers and their products in the past six years. Kjersgaard found several suppliers through the Internet. Most of the direct production goods come from Europe, but there are also suppliers from other parts of the world like India, for example.

Three people dealing with administrative tasks work with computers in a local area network with ADSL Internet access. The computers are used for common office purposes such as document exchange. Computer skills are acquired informally, for example by consulting friends and colleagues. In early 2004, the company introduced a small CRM (Customer Relationship Management) software, a standard solution from a large software company, for accountancy and storage planning in order to improve customer tracing. The current number of customers is 400, mainly furniture vendors. Since most of these companies are small, they are not very advanced in e-business and improve their e-business practice slowly. Most of the orders come in by fax, only around 2% by e-mail, but the share is increasing.

Jørgen Kjersgaard does not see notable security problems related to the Internet, nor does he complain about complicated or expensive technology. His greatest concern is that competitors can look at his products online and copy them. In the future, he plans to search for customers more comprehensively through the Internet. Currently he uses the Internet mainly for verifying potential new vendors of his products. Their websites are an excellent source for judging if a vendor is right for selling his high-quality furniture. Before the Internet age, an agent had to look at the potential vendors personally – in this respect, “the Internet saves a great deal of money”.

Lessons learned

The case study of Danish Furniture On-line and the Aksel Kjersgaard cabinetmaker factory presents a good example of how small firms can use the Internet for customer service and marketing. While comprehensive e-business use may not be useful for many small furniture manufacturers, the Web offers opportunities for increasing the number of end customers and intermediate vendors, selecting more and better suppliers as well as improving customer service and reducing costs related to all these functions. With regard to the Manufacturers’ Index, the Association of Danish Furniture Industries may want to collect evidence on the e-business practices and needs of firms listed, in order to make the portal even more valuable for customers and furniture firms.

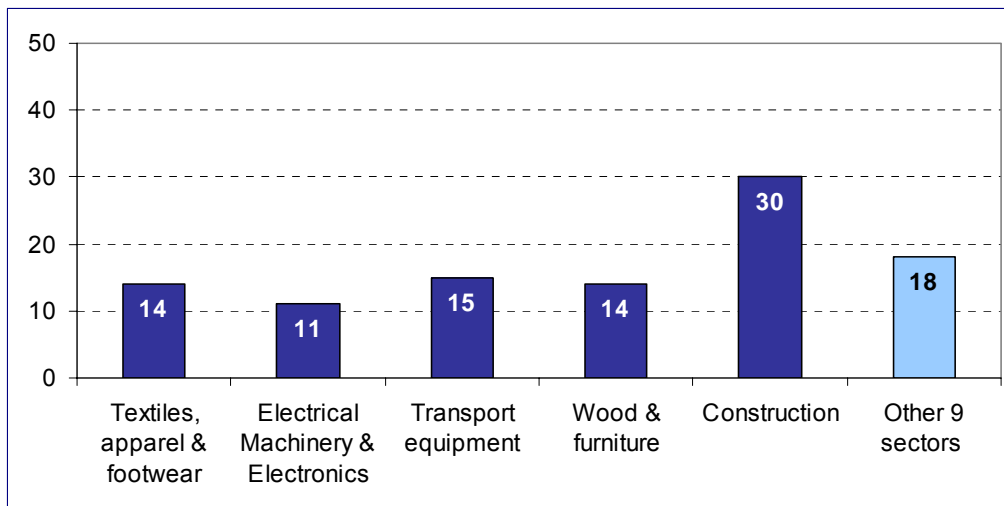
Sources and references

- Danish Furniture On-line, <http://www.danishfurniture.dk>
- Contact and interviews with Jørgen Gravgaard Andersen, Association of Danish Furniture Industries (exchanges by e-mail, interview, May/June 2004), Jørgen Kjersgaard, owner of Aksel Kjersgaard furniture factory, Odder, Denmark (<http://www.ak.dk>) (May 2004)

System integration with suppliers in construction

The high level of system integration with a supplier in the composite craft sector is mainly due to the construction sub-sector. In the construction industry, the level of system integration with that of a supplier is 30% (employment-weighted) which is more than twice as high as in the other industries – see Exhibit 2-8. The most apparent reason is that construction products are commonly bought from large enterprises with online catalogues.

Exhibit 2-8: IT system integration with suppliers for placing orders in craft industries

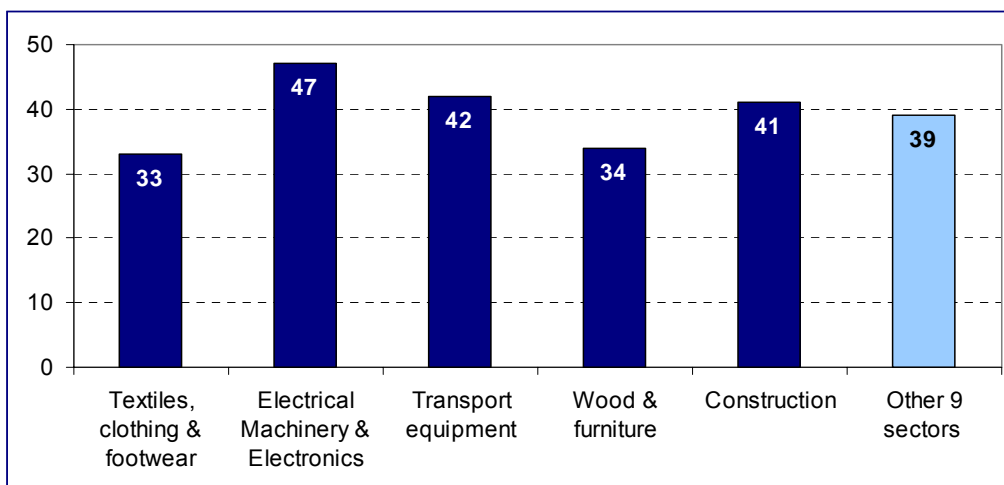


Base: EU-5 (DE, ES, FR, IT, UK), enterprises procuring online (n = 29 - 159). Figures in % of employment ("enterprises comprising ...% of employees in the country/industry"). Reporting period: March/November 2003.

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

As regards electronic exchange of documents with suppliers, there is no strong bias towards one sub-sector – see Exhibit 2-9. Instead, the percentages are distributed as in most other e-business indicators, with electrical machinery and electronics leading and the textiles, clothing and footwear industry at the bottom of the scale.

Exhibit 2-9: Use of online technologies to exchange documents with suppliers in craft industries



Base: EU-5 (DE, ES, FR, IT, UK), enterprises procuring online (n = 29 - 159). Figures in % of employment ("enterprises comprising ...% of employees in the country/industry"). Reporting period: March/November 2003.

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

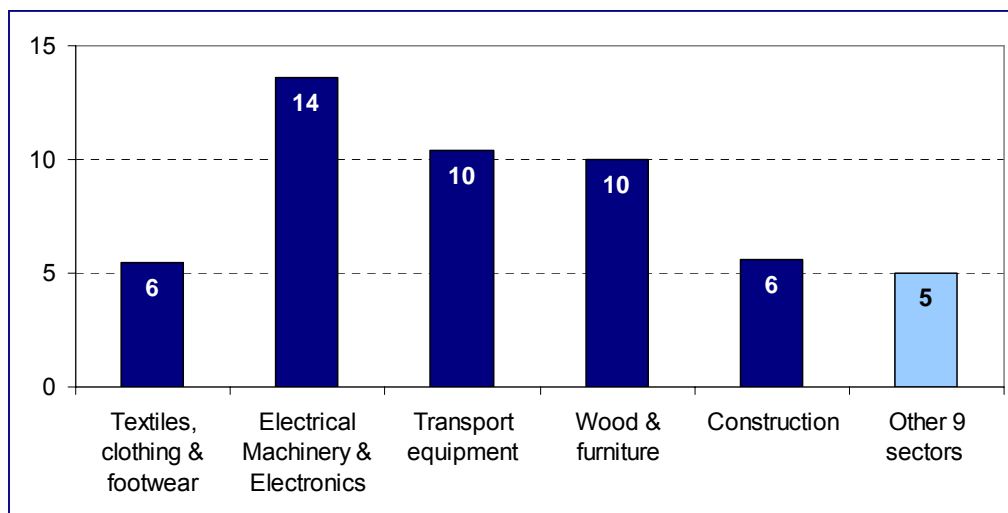
Among construction craft firms, the share of firms with a Supply Chain Management (SCM) system is relatively high (3.1%) for small firms, equal for instance to the diffusion among small companies from the technologically advanced electronics industry. The systematic electronic ordering of construction material appears to be quite advanced in craft firms.

Enterprise Resource Planning in wood and furniture manufacturing

The wood and furniture manufacturing industries exhibit a relatively high level of ERP (Enterprise Resource Planning) use in small companies (see Exhibit 2-10). 10% of firms with less than 50 employees from this sector use ERP, which is about the same level as among small transport equipment manufacturers and more than in the construction and textiles sub-sectors (6%). The figure for small firms from the other nine sectors is 12%.

A main reason for the importance of ERP use in small wood and furniture manufacturing firms is competitive pressure in the furniture industry, making it necessary to reduce lead times.¹⁵ Since there are long lead times for raw materials and short lead times for finished products, access to business information for forecasting and material planning is crucial. Moreover, increased product complexity and changing market conditions call for increased product line options and fabric styles. Customers expect furniture manufacturers to allow them to customise the products they are going to buy, to offer different pricing and payment options and to present different product configurations on the Internet with attractive visualisation tools.

Exhibit 2-10: ERP use in firms with 10 – 49 employees in craft industries



Base: EU-5 (DE, ES, FR, IT, UK), all enterprises (n = 61 - 141). Figures in % of enterprises.

Reporting period: March/November 2003.

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

Contribution of online procurement and sales to financial performance

E-business can be considered as a set of related technological tools based on one unifying paradigm – the Internet. Each of these tools serves the purpose to support specific activities within an enterprise or between the enterprise and its environment. Not all e-business tools

¹⁵ See, for example, the presentation of ERP solutions at http://www.seradex.com/office_furniture_erp.shtml and http://www.friedmancorp.com/industrysolutions/furniture/furniture_overview.html.

must necessarily have the same potential for creating economic value for an enterprise. This section takes a more detailed look at several specific technologies, and how their adoption is associated with financial performance. Exhibit 2-11 shows the results of a statistical correlation analysis between turnover and profitability on the one hand and various types of e-business applications on the other hand. The analysis only considers e-business applications that the companies practised for more than one year because otherwise it would not make sense to correlate their practice with turnover and profit in the past year.

The result is that e-procurement as well as e-sales in craft enterprises is significantly positively correlated with turnover increase and profitability, while there are no statistically significant correlations for the other types of applications, namely Supply Chain Management, Customer Relationship Management, Knowledge Management and Enterprise Resource Planning. There is also a significant positive correlation between e-learning applications and turnover increase. The correlation values are not large, all below 0.1. The fact that there are no significant correlations for many e-business applications may be due to the low number of firms using them.

The finding that e-procurement is positively correlated with business success should not come as a surprise, if the general importance of this practice for craft enterprises is taken into account. The positive correlations for online sales are rather more unexpected, as online selling does not appear as a favourite electronic practice in craft firms.

Exhibit 2-11: Correlation of innovative e-business applications and financial performance¹⁶

	Turnover increased last year	Turnover same last year	Turnover decreased last year	Profit in last 12 months
Online sales	0.077**	-0.049	-0.003	0.062*
Online purchases	0.095**	-0.023	-0.016	0.058*
Supply Chain Management	0.030	0.007	-0.019	-0.012
Customer Relationship Management	0.031	-0.012	0.013	-0.007
Knowledge Management	0.040	-0.004	-0.022	0.001
Enterprise Resource Planning	0,037	0.006	-0.037	-0.025
E-learning	0.055*	-0.029	-0.041	0.018

Kendall-Tau-b correlation coefficients; * significant at 95%, ** significant at 99%
Base: all enterprises (unweighted, n = 1,412). Reporting period: November 2003

Source: e-Business W@tch (2004)

¹⁶ Kendall's Tau is a (nonparametric) measure of correlation between two variables. It can take values between -1 and 1. If two variables are totally independent from each other, Kendall's Tau takes a value of 0. If two variables are identical (always occur together), Kendall's Tau takes a value of 1 or a value of -1, if they always occur together but with reversed signs. Cf. Sheskin, D.J. (2004).

CASE STUDY: AIR-CRAFT – E-PROCUREMENT AT AIRBUS INVOLVING CRAFT COMPANIES

Abstract

AIR-CRAFT was a project supporting e-business relationships between Airbus Hamburg and small local construction enterprises. It was funded by the German Federal Ministry of Education and Research from 2001 to 2004. AIR-CRAFT successfully extended e-business competence in craft firms in order to make them more competitive and to sustain business with large enterprises. The lessons learned could be relevant for many other craft firms regarding supplier relationships with large enterprises.

Case characteristics	
• Sector focus	Construction
• Business focus	e-Procurement
• Geographical focus	Hamburg, Germany
Case objectives	
• Sustained business relationships between large enterprises and small craft suppliers	*****
• Integration of craft firms' IT systems with large customers	*****
• Developing e-business skills in craft firms	***
• Standardisation of online service catalogues	***

* = some relevance for case; ***** = high relevance

Background and objectives

Project partners

AIR-CRAFT was a project supporting e-procurement relationships between Airbus Hamburg as the ordering party and small local construction enterprises as suppliers. The craft firms were in charge of maintenance and reconstruction work at Airbus buildings; they were not involved in the construction of airplanes. The project, with a budget of around 950,000 Euro, was funded by the German Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung, BMBF) from August 2001 to July 2004. The project included five partners:

- Airbus Deutschland GmbH, Hamburg,
- the German Standards Institute (Deutsches Institut für Normung e.V. – DIN),
- the Cooperation Centre Hamburg, a department of the research section of the Department of Science of the Free, Hanseatic City of Hamburg (Freie und Hansestadt Hamburg, Behörde für Wissenschaft und Forschung, Kooperationsstelle),
- the Hamburg Chamber of Crafts,

- the Chamber's Future Workshop Association (Zukunftswerkstatt e.V. der Handwerkskammer Hamburg).

Project funds were allocated to the Future Workshop, the City of Hamburg and the German Standards Institute, but not to Airbus and the participating craft firms nor to the Chamber of Crafts.

Starting point: procurement of craft services increasingly online

The starting point of the project was the fact that professional buyers in large firms are increasingly replacing traditional paper-and-telephone forms of procuring craft services by catalogue- and network-based platforms. In the case of recurring services, catalogue-based online procurement is beneficial for large firms due to economies of scale. Recurring services include, for example, painting offices, renewing carpets or building walls in large office spaces. By creating an e-commerce system, the large firms often introduce new company-specific "service books",¹⁷ that is electronic catalogues describing services required by the company. Craft firms delivering services to several such large companies have to deal with various electronic service books. This may put considerable strain on them with regard to IT compatibility and skills, because they may have to update or extend their IT hard- and software and deal with numerous different standards.

Targets and rationale: linking craft firms to e-procurement platforms

Airbus Hamburg implemented a catalogue-based online platform for acquiring craft services in 2003, offering craft firms the opportunity to connect to this catalogue. The craft firms knew that they needed to respond to this offer in order to stay in business with Airbus, particularly because Airbus is seeking to buy craft services exclusively through its electronic system in the future. That is why representatives from the Hamburg Chamber of Crafts and Airbus initiated AIR-CRAFT. Altogether 23 craft firms from six construction and construction-related industries were linked to the Airbus platform.

AIR-CRAFT's core objective was to make craft employees familiar with handling e-business applications in order to, as mentioned in the project's mission statement,¹⁸ increase craft firms' strategic competence in e-business and develop new markets for them. Furthermore, it was sought to prove the feasibility of linking craft firms to e-business platforms and to prove the economic viability of e-commerce. The rationale behind setting up the project was that small enterprises, due to cost barriers and lack of information about e-commerce usage, fall behind medium-sized and large ones in e-business use.

Special issues: standardisation, qualification, cooperative supply

AIR-CRAFT included the development of standardised e-procurement systems and qualification modules as well as the formation of cooperative craft service supply:

- The development of standards for e-procurement was sought because craft firms may easily be swamped with having to deal with many the different e-procurement

¹⁷ In German: Leistungsbücher.

¹⁸ The mission statement in English language can be downloaded at <http://www.projekt-air-craft.de>, "Das Projekt".

platforms of large firms. An e-catalogue management system for craft firms that can be applied with many different clients was sought to be developed.

- Qualification concepts were developed, comprising mainly three modules: seminars teaching craft firms' decision-makers about e-business, creating electronic catalogues for construction services, and developing a training programme for certified e-business specialists in crafts and trade. The qualification concept included e-learning components that were meant to enable craft employees to learn to be self-sustained and to increase the pleasure of training.
- Cooperative supply of craft services requires the joint use of service books from different companies. This calls for elements of personnel management that increase employees' competencies.

Activities

Integrating craft firms' service profiles into the Airbus platform

In the framework of AIR-CRAFT, standard service descriptions developed by the Common Council for Electronics in Construction (Gemeinsamer Ausschuss für Elektronik im Bauwesen, GAEB) in Germany named STL-BauZ were used. These standards comprise a comprehensive collection of descriptions of building repair and maintenance services, allowing craft firms to supply various clients with the same descriptions. In the framework of AIR-CRAFT, craft firms created their company-specific service profiles. At Airbus, these service profiles were reviewed, released by the procurement unit and integrated in the electronic procurement system. In this way, electronic orders became possible. The craft firm was enabled to offer its services on electronic market places and gain new customers.

Processing time in craft companies was reduced by using such electronic processes. A specific data exchange format on an XML-basis is used, named GAEB according to the abovementioned Council. E-mails sent with this format can be read by numerous software programmes for craft and construction firms available on the market. In the AIR-CRAFT project, a converting tool named WinGAEB was used, allowing craft firms to read orders from any e-mail programme and convert them into the GAEB format DA86.

Business processes without media breaks

Common business processes between Airbus and craft firms take the form presented in Exhibit 2-12. The fact that the craft firm issues an invoice with a value equalling the order is different from traditional procurement processes. Commonly, final service costs differ from initial cost calculations. For both sides the value of the service is agreed in advance. After completing the service the craft firm may claim a higher value, but this requires a new electronic process.

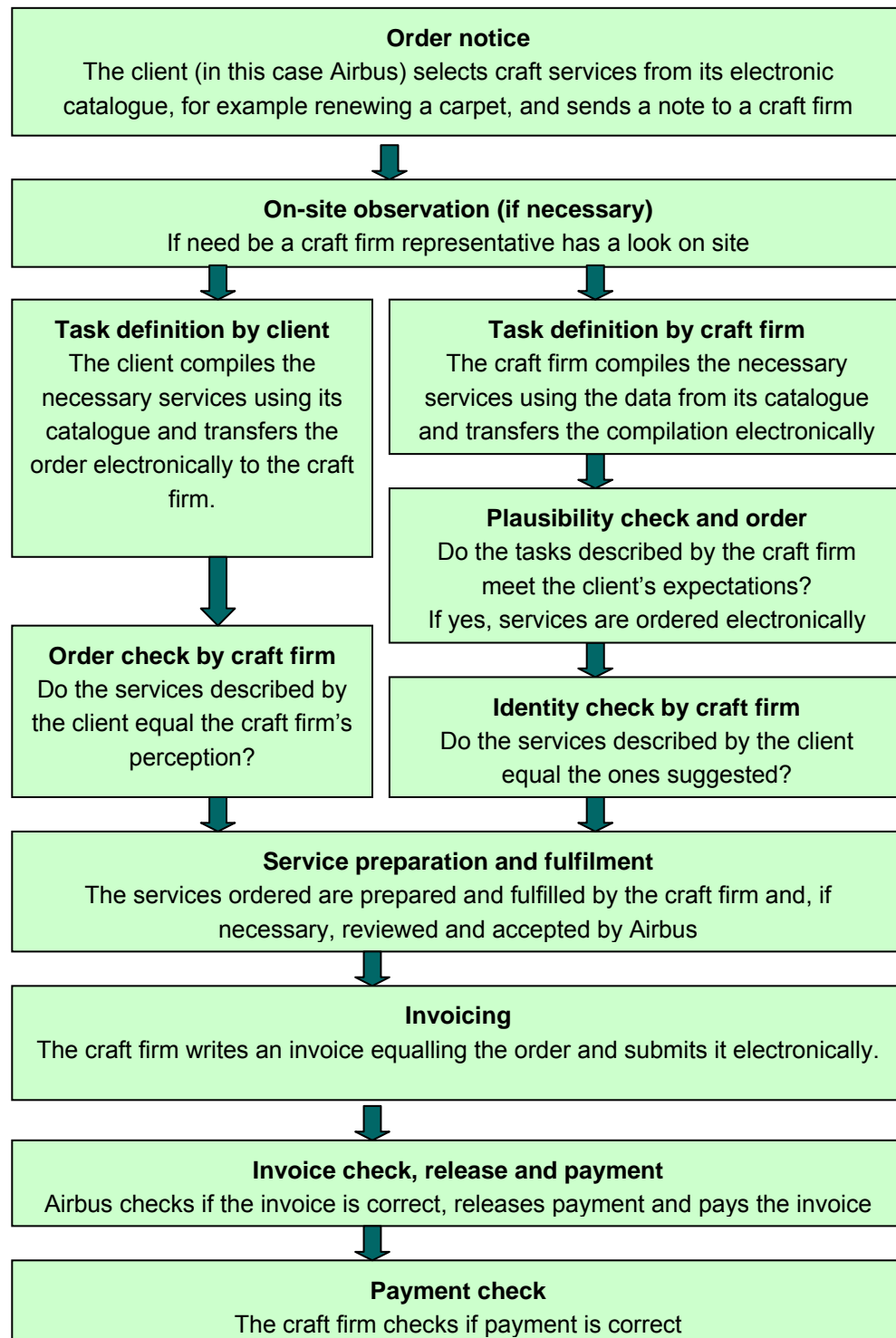
The whole process may take place electronically, but telephone communication can become necessary. For example, the colour of a carpet to be renewed may not be defined in the electronic order, requiring a phone call to clarify this question.

Project outcomes – a craft firm's perspective

At the AIR-CRAFT final conference on 30 March 2004, one of the craft firms that participated in the project, the Otto Wagner GmbH, presented its experiences. The Otto Wagner GmbH is a traditional craft firm with 20 employees, in existence since 1966. Its

main field of activity include gas and water supply, disposal of dirt and rain water and the construction of plumbing and flat roof insulation.

Exhibit 2-12: Pattern of AIR-CRAFT e-procurement processes



Source: AIR-CRAFT project final conference, presentation Sabine Wendt, own modifications

The representative, Jens Wagner, named four basic preconditions a craft company had to fulfil in AIR-CRAFT: a new generation IT system, an expedient software tailored to the own industry (expedient meaning that “the producer still exists five years after

purchase and is able to deliver maintenance services”), Internet with a powerful provider, and, last but not least, no fear of engaging into something new.

Already prior to the AIR-CRAFT project, the Otto Wagner GmbH took part in calls for tender with the GAEB standard service descriptions (see above). The company was also used to receiving orders on a data file or per e-mail. All common formats could be converted with special software. However, AIR-CRAFT included new features: standard service texts had to be used; ordering and accounting had to be done via data networks, and a service catalogue with fixed prices had to be applied. Jens Wagner stated four advantages of the AIR-CRAFT processes:

- shorter fulfilment time of tasks,
- quicker invoicing,
- improved liquidity,
- potential applicability to other customers.

However, he also mentioned problems. Firstly, the service book developed for Airbus cannot simply be applied with other firms because of different standards. Secondly, only a small part of the services in his industry can be described in detail and assessed honestly in a standardised service catalogue – stressing both “in detail” and “honestly”. Describing services in advance is not trivial. There appears to be a trade-off between describing services, on the one hand, in as complex a way as possible in order to adequately determine what is to be done and, on the other hand, as simply as possible in order to streamline procurement and reduce costs.

In conclusion, Wagner saw AIR-CRAFT as an opportunity to take part in important new developments right from the beginning. He said that much time and patience is required from all participants, so that “we should begin cautiously and improve slowly but steadily”.

Project outcomes – Airbus perspective

At the AIR-CRAFT final conference, the Airbus Deutschland Senior Vice President General Procurement, Capital Goods and Services, Holger Malzahn, presented his balance of the project. In 2002, services procured by Airbus Deutschland GmbH, including craft services, accounted for 45% of all goods procured. These services had a value of 450 million Euro, comprising some 6,000 orders. He stressed peculiarities of service procurement: it is more complex and more difficult to standardise than product procurement, and in the predominant part of service orders the exact contents of the service and amounts of goods used can be determined only after the service is fulfilled. 40% of services cannot be determined in a catalogue at all.

The introduction of e-procurement tools is considered a very important Airbus project. The procurement system, called BuySide, offers a unified procurement process in the whole company, from order till payment. At the time of the conference, BuySide comprised 15 product catalogues, two service catalogues, 1,000 appliers in Airbus departments as well as 40,000 products and services catalogued. 50% of all orders were conducted through BuySide.

After the conclusion of AIR-CRAFT, Airbus intends to expand the usage of service catalogues. By 2006, the application of more complex service catalogues is planned. For Airbus, AIR-CRAFT was cited as being a successful project. AIR-CRAFT...

- strengthened existing supplier relationships through joint development and usage of e-procurement tools,
- reduced process costs through more efficient internal and external processes,
- largely automated the procurement process, thus giving the buyers more time for strategic tasks,
- introduced unambiguous specifications that allow the comparison of services of different suppliers at different locations.

Lessons learned

AIR-CRAFT is about making craft firms familiar with electronic service catalogues used by large companies' procurement departments. One objective was to put craft firms in a position to deal with service catalogues of various large enterprises. However, while AIR-CRAFT made craft firms familiar with particular standards developed by the Common Council for Electronics in Construction, it remains a considerable problem that each large enterprise has its own catalogue, swamping craft firms with different standards. All participants agreed that standardisation of service catalogues would be required in order to allow craft firms to service various large enterprises efficiently. As one Airbus representative said: *"There is a dramatic lack of industry standards on service processes."*

Furthermore, many craftsmen are still not convinced that their services can be adequately described in standard catalogues. Qualification and information about electronic catalogues may reduce such reservations, as a craftsman stated at the AIR-CRAFT final conference. Such promotion of e-business may be provided by craft chambers. In conclusion, e-procurement of services through electronic catalogues offers a number of benefits such as craft firms' ability to send invoices more quickly and procurers' ability to reduce process costs. However, as a representative from the Hamburg Chamber of Crafts stated, the question of whether electronic standard service catalogues will determine procurement in the future is still open. Industry standards for e-procurement need to be defined, and craftsmen's reservations against standard service descriptions need to be overcome.

Sources and references

- AIR-CRAFT website: <http://www.projekt-air-craft.de>.
 - Project AIR-CRAFT. Final conference, Hamburg Chamber of Crafts, 30 March 2004. Core presentations are available in Power Point format at the AIR-CRAFT website.
 - Participants' websites: www.airbus.com (Airbus), www.kooperationsstelle-hh.com (City of Hamburg, Cooperation unit), www.hwk-hamburg.de (Hamburg Chamber of Crafts), www.din.de (German Standards Institute).
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2.4 The role of IT standards for craft firms

Standardisation issues in the craft and trade sector

The previous Sector Study (May 2004) showed that interoperability and standardisation issues are of particular importance to the craft and trade sector.¹⁹ A lack of standards and interoperability problems with systems from other companies or even within one firm may put high cost strains on small firms. In the e-Business Survey 2003, the enterprises were asked if they exchange standardised data with their buyers or sellers electronically. "Standardised data" referred to "electronic product catalogues, orders, invoices, delivery notes and similar business documents". Plain e-mails were excluded in the question. Enterprises representing 24% (construction), 21% (wood and furniture) and 19% (textiles) of employees reported exchanging standardised data electronically. Thus, standardisation issues are important for a considerable share of craft firms.

Obstacles to e-business stemming from lack of technical standards

In the e-Business Survey 2003, companies were also asked if they observe obstacles to e-business stemming from lack of technical standards. 11% in the textile, clothing and footwear industries, 18% in the wood and furniture manufacturing industries and 17% in the construction industry agreed with this statement. These figures may appear quite low. However, asked about particular standardisation issues, the figures become much higher.

*Exhibit 2-13: Assessment by craft companies:
standardisation issues regarded as critical for e-business success*

	Security	Data protection and privacy	Cataloguing and classification	Business messaging and transaction processing
Industries				
Textiles, clothing & footwear	48	59	13	22
Wood & furniture	53	53	20	22
Construction	62	74	25	35

Base: EU-5 (DE, ES, FR, IT, UK), enterprises using computers (n = 112-355 per industry). Figures are weighted by employment ("enterprises comprising ...% of employees in the industry"). Reporting period: March/November 2003.

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

Data protection and privacy was assessed as being a critical standardisation issue by 59% of the textile firms, 53% of the wood and furniture firms and 74% of the construction firms. The figures for "security" were 48%, 53% and 62%, thus slightly lower. The explanation for these high figures may be that security and standardisation issues are very important to craft and trade firms. Business messaging and transaction processing were assessed as being a critical obstacle by much fewer firms: 22% in textiles, clothing and footwear as well as in wood and furniture manufacturing, and 35% in construction. Cataloguing and classification was assessed as being a critical standardisation issue by a minority of enterprises (13-25%). The construction industry attributes the highest importance to standardisation for all items asked.

¹⁹ This issue was discussed, for example, in a workshop of the UEAPME construction forum on 22 March 2004.

IT STANDARDISATION IN CRAFT INDUSTRIES – EXPERT INTERVIEW WITH F. POSTHUMUS

Abstract

The interview highlights some particular issues of IT standardisation related to the craft and trade sector, including the domination of large firms in setting standards. Concerted efforts of the European Commission and the Member States in order to develop IT standards are recommended, stressing that much effort is required to inform and motivate small firms to participate in the processes.

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What is the general situation of e-business standards in the craft and trade industries in the EU?

The craft and trade enterprises have several handicaps that prevent them from using e-business solutions on a wide scale. Firstly, they are not very good at following the standardisation process. Their interests are very much focussed on the day-to-day business situation, rather than on the long-term issues on which standardmakers usually work. They generally know too little about new standards and often use old ones. In e-business, they usually ignore the existence of standards altogether. Secondly, small enterprises still consider that e-business is too much oriented towards the needs of large enterprises. They find that the e-business solutions offered to them today are not specific enough. Software companies and solution providers do not yet sufficiently take into account the diversity of the 20 million SMEs in Europe. Thirdly, the small enterprises have to work with these large company programmes as their suppliers force the use on them. However this leads to widespread interoperability problems, computer overload and the related negative implications.

As a result, most small enterprises remain sidelined. On the positive side, there is a revival of interest in good IT solutions, as Internet diffusion among consumers further increases.

What role does standardisation of e-business applications play for small craft enterprises? Are there differences to large firms?

There are indeed several issues. Large firms dictate user standards that small firms have to adopt. Small firms need to handle all the large-company-specific standards of many different IT vendors, which increases costs. These IT standards are not compatible with the small firm's computer capacity and they do not allow proper data exchange, leading to double entries of data. Such interoperability problems lead to heavy administrative efforts on behalf of small firms. Re-entry of data in small firms amounts to 20 to 40% additional administrative time! While the large company system usually aims to be of general purpose, the SME needs focussed solutions, tailored to its specific needs. Finally, large firms have the means to finance standardisation efforts and are organised to adapt in a fast moving world. The small firm has to have support in doing so and that is one of the essential roles of NORMAPME and our sister organisation UEAPME.

Are there types of e-business applications with a particularly strong need for standardisation?

The development of good, safe and secure standards, allowing easy-to-use e-business applications is very important for the small companies. Small companies depend much more than large enterprises on off-the-shelf solutions. They cannot afford to develop software in-house, which makes them much more dependent on the authorities and the software providers. Unfortunately, software applications that are specifically tailored to craft firms are the exception, and – if available – the potential users are not aware of their existence. There is thus a lot to be done in that area.

In which craft industries are standardisation issues of particular importance and why?

E-business is going to be important to all small enterprises, but understandably we need to prioritise. Therefore, we will choose some over others. In the food production sector - which includes a number of craft industries such as bakeries, wineries and breweries - again most craft firms do not yet realise the scope of what is awaiting them in terms of administrative efforts of fulfilling the new legislation and standards for traceability, hygiene maintenance, labelling, and the like. But the amount of work will only be handled in a cost effective way by using computers. We have proposed concrete projects in this direction and we think the Commission should seriously consider them as they will enable solutions tailored to craft firms in this sector.

The construction industry is a very “hands on” sector and is usually less computerised, even in the bigger, 100-employees type of firms. But the supply chain of the small construction company usually includes large firms, is very intensive and imposes the use of e-procurement solutions. At present, there is a multitude of solutions from suppliers which is impossible for small firms to maintain. Suppliers have to realise that the small firm wants more uniform product lists for e-catalogues. Only then can we expect a major shift to e-business. A similar structure exists in the wood and furniture industries.

Are there particular challenges related to e-business standards in the new Member States?

The new Member States face the same problems as the old ones. Their major opportunity, however, is that the small company owner is sometimes more easily motivated to participate in innovative, new projects, as this could be an opportunity to close the gap to competitors from the former EU-15. This requires a concerted effort from all players involved and we sincerely hope that the proposal we made on that subject earlier will find a willing ear with Europe's decision-makers.

Is there a need to define European e-business standards as opposed to adopt standards developed elsewhere in the world?

Good e-business standards made in time are one of the vehicles for craft and trade firms to modernise their business methods. It is part of an overall change in the management process which, up to now, has only been accomplished by a minority of craft firms. Defining standards with active involvement of the craft firm representatives improves the competitive position of the European craft companies. It is part of preserving the strong network of small enterprises and making it the engine of growth in Europe. The list of top 500 companies in the world includes – according to the Financial Times – mostly American firms, and their combined turnover illustrates that further: 9,000 billion dollars in the USA and 5,000 billion dollars in Europe. In the US, economic growth is largely attributed to the large enterprises, in contrast to Europe. 50% of the Gross National Product in Europe is generated by SMEs, against only 30% in the US. It is therefore obvious that unless the European SMEs prosper, they cannot provide the needed push to economic growth.

How should standardisation in craft industries evolve? Should it be left to market forces or is state intervention necessary?

It is necessary to have a concerted effort between the various actors in this field. That involves standardisation bodies, the European Commission and national institutions, regional development agencies, enterprises and the industry associations such as UEAPME and NORMAPME whose role should not be underestimated.

What political measures do you suggest for tackling EU standardisation challenges in the craft and trade sector?

Political support should be given to the SME associations, as this is the most efficient way to reach small enterprises. Several actions are relevant. The European Commission activities, notably eBIF on interoperability, eInvoicing, eLegal aspects and others are very relevant as they help to develop structured frameworks for consultation processes with stakeholders. We actively support these initiatives. A very important effort in this context is to inform and motivate SMEs to actively participate in these initiatives. This requires support programmes at all levels: education programmes, innovation support programmes, development of SME-tailored e-business software solutions, and knowledge exchange programmes. UEAPME proposes several programmes for this to happen.

Member States should complement these efforts, as it is clearly in their interest to have a strong SME national base for a healthy economic and employment growth. We support the strengthening of European standardisation organisations, as this is the

most efficient way to develop good interoperable standards. We are ready to get the SME voice heard. A strong Europe in this area will make European SMEs a strong economic player.

Sources and references

- European Committee for Standardisation (CEN, www.cenorm.be), having set up an e-Business Interoperability Forum
 - European Telecommunications Standards Institute (ETSI, www.etsi.org)
 - European Office of Crafts, Trades and Small and Medium-sized Enterprises for Standardisation (NORMAPME, www.normapme.com)
 - European e-Business Support Network (eBSN, www.e-bsn.org),
 - eLegal, Specifying Legal Terms of Contract in ICT Environment. European project IST-1999-20570, 2000/11-2002/11 (<http://cic.vtt.fi/projects/elegal/public.html>).
 - Proceedings of a workshop on standards for e-business (www.ebusiness-watch.org, publications, workshop proceedings)
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2.5 Employment creation and skills development in craft and trade firms

The role of the craft and trade sector in IT employment and skills development

It is often stated that the craft and trade sector is very important for employment and skills development. Research for the first sector report partly confirmed this assumption:

- With regard to employment, small businesses including crafts were the motor of employment in recent years. According to the Observatory of European SMEs, between 1988 and 2001 employment grew with a rate of 0.5 in firms with less than 10 employees and of 0.2 in firms with between 10 and 49 employees. In contrast, employment development shows negative growth in medium-sized and large firms (-0.1 each), while growth of value added was positive in all size classes.
- With regard to skills development, the e-Business Survey 2003 revealed that in craft firms with 10–49 employees, the percentage offering any kind of support for skills development (60%) is slightly higher than the all-size class figure (56%) of the other sectors studied by *e-Business W@tch*.

In the following, issues of employment and skills development are analysed in more detail. Some more findings from the *e-Business W@tch* 2003 survey are presented and discussed.

Size of IT department

Overall: The share of employees mainly occupied with maintenance of Information Technology and networks is used as a proxy to indicate the level of e-business skills. On average, 0.9 in 10 employees in craft enterprises are IT and network specialists (see Exhibit 2-14).

Sector comparison: The share of IT and networking specialists in craft and trade firms is slightly lower than in the other nine sectors (1.1 in 10) studied by *e-Business W@tch*.

Size classes: Micro firms tend to have a higher share of IT and networking specialists than larger companies. This is true for craft and trade firms as well as for the other nine sectors. The reason is that larger companies can benefit from specialisation effects among their employees. However, the level of IT specialists in craft firms is smaller than in the other sectors: 1 versus 1.7 in 10 in micro enterprises with 0-9 employees, and 0.6 versus 1 in 10 in firms with 10-49 employees. This indicates a lag behind in IT skills in craft firms. While craft firms can be attributed high importance for employment and skills in general, their importance for IT skills appears to be relatively low.

Countries: There are large differences between countries. The share of IT specialists in craft firms appears to be largest in Greece (2 in 10), Spain (1.4 in 10) and the UK (1.3 in 10) and smallest in Estonia (0.1 in 10) and France (0.4 in 10).

Industries: Probably due to its proximity to information technology issues, the share of IT specialists is highest in the electrical machinery and electronics sub-sector (1.7 in 10). In transport equipment manufacturing, wood and furniture manufacturing as well as construction, the share is quite similar with 0.8 or 0.9 in 10. Textiles, clothing and footwear are behind with 0.5 in 10.

Forms of IT training in craft firms

Overall: Craft firms representing 51% of employment support any kind of IT skills development (see Exhibit 2-15). The most widespread form of supporting such development is the usage of working time for learning activities (38%), followed by participation in IT training offered by third parties (26%) and in-house IT or computer training.

Sector comparison: The level of IT skills development support is much higher in the other nine sectors (77%, employment-weighted) studied by the *e-Business W@tch*. This applies for all types of support. The differences are less pronounced in enterprise-weighted figures.

Exhibit 2-14: Size of IT department in craft industries (2003)

	Number of employees per ten employees mainly occupied with maintenance of IT and networks
Sector total (EU-5)	
% of enterprises	0.9
0-9 employees	1
10-49 employees	0.6
Other 9 Sectors (EU-5)	
% of enterprises	1.1
0-9 employees	1.7
10-49 employees	1
50-249 employees	0.4
>250 employees	0.2
Countries	
DE Germany	0.9
EL Greece	2
ES Spain	1.4
FR France	0.4
IT Italy	0.6
UK United Kingdom	1.3
EE Estonia	0.1
PL Poland	1
Industries	
Textiles, clothing & footwear	0.5
El. machinery & electronics	1.7
Transport equipment	0.9
Wood & furniture	0.8
Construction	0.9

Base: EU-5 (DE, ES, FR, IT, UK), all enterprises excl. "Don't know" / "no answer" (n = 1,399 for EU-5 sector total, 138 – 281 per country and 125 – 383 per industry). Figures in % of enterprises. Reporting period: March/November 2003.

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

Size classes: The level of IT skills development support in craft firms with 10-49 employees (60% of enterprises) is larger than the overall level in the other nine sectors (56%). This may be interpreted as an indication of the importance of IT skills development in craft firms. However, comparing size classes only, the craft sector is less advanced than the other sectors studied by the *e-Business W@tch* in all forms of IT skills development support; this applies to both micro and small enterprises.

Exhibit 2-15: ICT skills development in craft firms

	Supporting any kind of IT skills development	Offering in-house IT or computer training	Participation in IT training offered by third parties	Usage of working time for learning activities
Sector total (EU-5)				
% of employment	51	17	26	38
% of enterprises	41	12	20	33
0-9 employees	39	10	19	32
10-49 employees	60	24	32	42
Other (9) Sectors (EU-5)				
% of employment	77	44	51	62
% of enterprises	56	23	29	47
0-9 employees	54	23	27	46
10-49 employees	77	38	45	62
Countries				
DE Germany	58	14	37	36
EL Greece	59	40	37	43
ES Spain	59	24	35	43
FR France	61	23	24	51
IT Italy	31	6.2	12	25
UK United Kingdom	53	29	28	42
EE Estonia	63	15	34	33
PL Poland	28	9.1	5.3	21
Industries				
Textiles, clothing & footwear	37	13	21	25
El. machinery & electronics	75	35	35	63
Transport equipment	55	22	34	45
Wood & furniture	42	19	26	33
Construction	53	17	26	39

Base: EU-5 (DE, ES, FR, IT, UK), all enterprises excl. DN/NA (n = 1,399 for EU-5 sector total, 138 – 281 per country and 125 – 383 per industry). Figures for size-bands in % of enterprises. Figures for countries and industries are weighted by employment (“enterprises comprising ...% of employees in the country/industry”). Reporting period: March/November 2003.

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

Countries: The differences of IT skills development between companies from different countries are considerable. Considering any kind of IT skills development support, the levels are highest in companies from Estonia (63%) and France (61%), with those in Germany, Greece and Spain not much behind, and lowest among firms in Poland (28%) and Italy (31%).

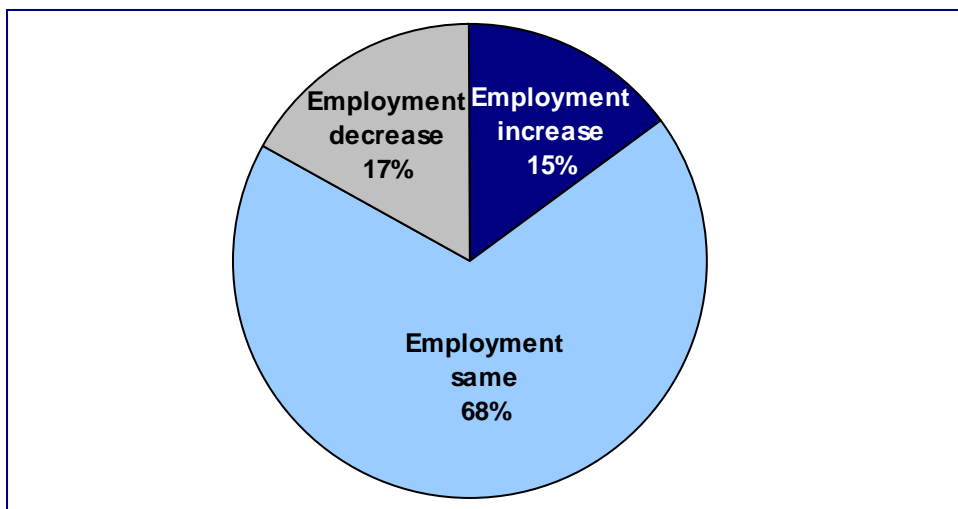
Sectors: The levels of IT skills development in the five sub-sectors show the common ranking. Companies from the electrical machinery and electronics industry come highest in any kind of such development (75%), followed by transport equipment (55%), construction (52%), wood and furniture manufacturing (42%) and textiles, clothing and footwear (37%). This ranking generally also applies to the various forms of IT training.

Employment effects of product and process innovation

The adoption of e-business has impacts on labour demand. Firstly, new job opportunities become available for individuals with e-business specific skills throughout all sectors that make use of the technology. Secondly, process innovation can eventually lead to a substitution of labour by capital. When enterprises adopt new technologies in order to optimise their internal work routines – effectively a technology-induced process innovation – the efficiency gains often stem from automating work routines that formerly required a higher amount of labour. On the other hand, the enterprise might be required to hire additional staff with the competence to run and maintain the new technology. Finally, if the technology is successfully implemented and eventually leads to productivity gains, this could result in an overall growth of the enterprise via the market feedback mechanism. Thus, the net employment effect of a technology-induced process innovation is hard to evaluate in advance.

New technologies can also be adopted to conduct technology-induced product or service innovations. An example would be a small craft firm supplying car parts which decides to implement an online shop as an additional sales channel. This would be a technology-induced service innovation that could allow customers to get real-time quotes of prices and availability, and eventually to speed up ordering processes and delivery time, possibly leading to higher customer loyalty or a competitive advantage vis-à-vis competitors. Such types of product or service innovations either improve existing offers significantly or create entirely new markets. In summary, positive employment effects stemming from product or service innovations can be expected, whereas employment effects of internal process innovations could be either positive or negative. These hypotheses can be tested for the craft and trade sector using data from the November 2003 survey of the *e-Business W@tch*.

Exhibit 2-16: Employment development in craft industries 2002 – 2003



Base: EU-7 (DE, EL, ES, FR, IT, UK, EE, PL), all enterprises (n = 1,412). Figures in % of enterprises.
Reporting period: November 2003.

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

Craft and trade firms were asked if the number of their employees increased, decreased, or roughly stayed the same during the past 12 months prior to the survey. Exhibit 2-16 shows that 15% of enterprises in the sample recorded an employment increase, while 17% stated a decrease. In the majority of firms (68%), employment roughly stayed the same.

A correlation analysis shows that employment increase is significantly positively related to all types of innovation (see Exhibit 2-17). This suggests that innovation in general and e-business innovation in particular is an important means to increase employment in the craft and trade sector. The value is highest for general internal process innovation (0.148**). Thus, although one could have expected that internal process innovation leads to job reduction, the opposite appears to be true. It may be that in many craft enterprises the introduction of process innovations improved their competitiveness, leading to an increased demand for labour.

Exhibit 2-17: Correlation of innovative activities and employment in craft firms

	Employment increase	Employment decrease	Employment stayed the same
Product or service innovations – general	0.062*	-0.007	-0.037
Product or service innovations – Internet-enabled	0.103**	-0.096**	-0.006
Internal process innovation – general	0.148**	0.013	-0.123**
Internal process innovation – Internet-enabled	0.114**	-0.067*	-0.049
Kendall-Tau-b correlation coefficients; * significant at 95%, ** significant at 99%			
Base: all enterprises (unweighted, n = 1,412). Reporting period: November 2003			

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

2.6 Country differences in e-business application

E-business areas of particular strength and weakness by country

The previous Sector Study (May 2004) revealed many differences between companies from the eight countries included in the survey in the craft and trade sectors. The summary from this study report is supplemented here by a performance overview which may be of particular value to international and national decision-makers. Exhibit 2-18 shows an overview of all 27 indicators presented in the previous sector report (May 2004) for which data by country are available. The value for EU-5 is attributed 100%, the countries' percentages indicate if their values are below or above the EU-5 average. This presentation facilitates a country benchmarking. For example, a percentage of 110 for computer use in Germany means that computer use in the German craft and trade sector is 10% above EU-5. The analysis reveals the following results:

Germany: German craft firms are above the EU-5 average in most indicators. With regard to infrastructure and skills they are below average only in broadband Internet connection (defined here as connections with more than 2Mbit/s). German craft firms' e-business performance appears to be particularly low in business processes between companies.

Greece: Greece is well above EU-5 average in almost all indicators except online procurement and broadband Internet connection. The high figures for Greece are followed up in a detailed investigation at the end of this chapter.

Spain: Spanish craft and trade firms are above average in most cases across all groups of indicators. However, despite their generally good e-business performance, their levels in the core indicators of WWW use, purchasing online and having a website are quite low.

France: French craft enterprises are below average in most cases. They have particularly low levels in IT infrastructure, online procurement and online marketing and sales. Their particular strength appears to be in business processes between companies.

Exhibit 2-18: Craft and trade industries: overview of country performance in core indicators

	EU-5		DE	EL	ES	FR	IT	UK	EE	PL
	value	%	% of EU-5	% of EU-5	% of EU-5	% of EU-5	% of EU-5	% of EU-5	% of EU-5	% of EU-5
Infrastructure & skills										
Computer use (1)	91	100	110	110	107	96	93	98	107	73
Have access to the Internet (1)	77	100	121	125	105	77	90	109	122	74
WWW use (1)	60	100	140	100	78	85	83	127	155	85
e-mail use (1)	69	100	125	133	106	74	87	112	130	65
Local Area Network (1)	30	100	130	157	117	50	87	107	123	67
Remote access to computer system (2)	11	100	109	236	136	36	55	164	209	164
Connected with >=2Mbit/s (3)	10	100	80	50	180	50	60	80	140	90
Support of IT skills development (1)	50	100	115	117	116	121	62	105	125	55
Internal business processes										
Intranet use (1)	16	100	90	192	131	81	95	97	95	86
Knowledge management (1)	2.9	100	45	117	203	1	155	3	4	52
e-learning application use (1)	1.6	100	231	306	17	69	113	75	538	188
Online collaborative work (1)	16	100	75	244	169	113	56	94	31	94
Automate travel reimbursement (1)	1.3	100	19	146	123	17	108	269	18	146
Track working hours/production time (1)	8	100	150	125	100	100	38	150	213	25
Human resources management (1)	5	100	160	200	100	80	40	180	100	40
Online procurement										
Online purchases (1)	24	100	196	42	71	46	54	158	63	46
e-purchase of MRO goods (4)	60	100	128	43	83	67	93	73	52	95
e-purchase of direct prod. goods (4)	59	100	92	25	114	98	73	125	132	129
Document exchange with suppliers (3)	39	100	87	97	121	121	77	121	92	85
IT system integration with supplier (4)	25	100	136	60	108	20	100	48	152	72
Supply Chain Management (1)	2.7	100	34	0	326	0	59	13	0	17
Marketing and sales										
Have a website (1)	32	100	172	109	78	66	75	131	134	88
Sell online (1)	3.2	100	181	216	122	88	30	106	163	72
Processes between companies										
Collaborative product design (3)	7	100	57	143	43	186	100	171	71	186
Collaborative demand forecast (3)	5	100	100	140	60	260	100	80	140	140
Capacity / inventory management (3)	5	100	60	120	120	160	80	120	180	80
Contract negotiation (3)	9	100	33	122	133	167	56	178	378	178

Bases: EU-5 (DE, ES, FR, IT, UK); (1) all enterprises (n = 1,414 for EU-5 sector total, 138-288 per country); (2) enterprises using computers; (3) enterprises with Internet access (n = 1,130 for EU-5 sector total, 188-257 per country); (4) enterprises procuring online (n = 440 for EU-5 sector total, 37-137 per country). Figures are weighted by employment ("enterprises comprising ...% of employees in the country/industry"). Reporting period: March/November 2003.

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

Italy: Italian craft firms are hardly ever above EU-5 average. Their relatively best e-business performance is in internal business processes, with high levels in knowledge management and e-learning.

United Kingdom: British craft firms are above average in around two thirds of the indicators, including the core indicators of WWW use, online purchases, having a website and selling online. There appear to be weaknesses in some internal business processes.

Estonia: Estonian firms in the craft and trade sector have some of the highest levels of e-business application. They are particularly strong in IT infrastructure and skills with no indicator below the EU average. However, there are also several low levels in internal e-business processes and online procurement.

Poland: Polish craft firms are generally far below the EU-5 average. Their strength appears to be in online processes between companies, an area with above-average performance except online capacity and inventory management.

HIDDEN CHAMPION OR METHODOLOGY TRAPS? INVESTIGATING E-BUSINESS IN GREECE

Abstract

The case of an unexpectedly high level of e-business use reported by Greek craft enterprises in the e-Business W@tch survey is investigated. It turns out that the high levels may partly be due to “soft” factors such as a low reference point for e-business use in Greece, some misinterpretations of questions, and cultural peculiarities. On interpreting the Greek data, one should also consider some very low figures of e-business use in Greek craft firms.

Investigation characteristics	
• Sector focus	Craft and trade
• Business focus	e-business in general
• Geographical focus	Greece
Investigation objectives	
• Explanation of high figures of e-business use in Greek craft firms	****
• Methodological follow-up of the survey	***

* = some relevance for case; **** = high relevance

Background and objectives

Extraordinarily high figures for e-business in Greek craft firms

The analysis of data from the e-Business Survey 2003 had an unexpected result: Greek craft firms reported some of the highest levels of ICT use and e-business application. Figures were particularly high in many infrastructure and basic Internet

indicators. In computer usage, Local Area Network, Intranet, remote access to the company's computer system, Internet access, and use of e-mail, companies in Greece performed the highest level of all countries surveyed (see Exhibit 2-19). In e-business applications, there were also some indicators with very high levels in Greece. Greek craft firms reported the highest levels of online internal collaborative work, online support of human resources management, selling online and overall significance of e-business.

Exhibit 2-19: Selected indicators with particularly high figures for Greek craft firms

	Use computers	Use e-mail	Remote Access	Online internal collaborative work	Selling online	e-business very important
Sector total (EU-5)						
% of employment	91	69	11	16	3.2	6.3
Other (9) Sectors (EU-5)						
% of employment	96	84	39	40	16	12
Countries						
DE Germany	100	86	12	12	5.8	5
EL Greece	100	92	26	39	6.9	26
ES Spain	97	73	15	27	3.9	4
FR France	87	51	4	18	2.8	3
IT Italy	85	60	6	9	<1	12
UK United Kingdom	89	77	18	15	3.4	5
EE Estonia	97	90	23	5	5.2	2
PL Poland	66	45	18	15	2.3	13

Base: EU-5 (DE, ES, FR, IT, UK), all enterprises (n = 1,414 for EU-5 sector total, 138-288 per country); except "remote access": enterprises using computers. Figures for countries and industries are weighted by employment ("enterprises comprising ...% of employees in the country/industry"). Reporting period: March/November 2003.

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

Comparison with other surveys

These findings are not in line with the common perception that Southern European countries in general and Greece in particular lag behind in Information Society developments. They do also not appear to be in line with findings for other sectors studied by the *e-Business W@tch* as well as with several other surveys about e-business in European countries:

- *e-Business W@tch*. Considering all sectors, the e-Business Survey 2003 presented a differentiated picture of e-business in Greece. The level of Internet connection and online sales was higher than the EU average, but this was partly due to the composition of the Greek sector sample. The level of e-procurement, as well as of business process integration, as indicated by the use of Supply Chain Management and by IT system integration with suppliers, was below average.
- *Eurostat*. In Eurostat data on "e-commerce and the Internet in European businesses",²⁰ Greek enterprises show some of the lowest values compared to other countries. The level of companies using computers was second lowest, which is

²⁰ Eurostat (2003), p. 52 – 55.

mainly due to a weak equipment rate among small enterprises; the take-up rate of broadband Internet access was lowest; and the recourse of e-procurement was third lowest. However, in online sales Greek enterprises were above EU average.

- *SIBIS*: An enterprise survey in the framework of the EU project Statistical Indicators Benchmarking the Information Society (SIBIS) showed that among the seven countries considered (DE, ES, FR, EL, IT, FI, UK), Greece presented the highest level of businesses without Internet access and the lowest level of “e-commerce allrounders” who market and sell goods online and have their business integrated with partners in the value chain.
- *e-businessforum*: A research on SMEs in Greece designed by GRNET and carried out by CENTRUM²¹ concluded that: "As a whole, levels for 2002 as regards the introduction of ITC infrastructures by Greek SMEs show that they are not that ready to promote and develop a dynamic e-business environment compared to European and international enterprises". Furthermore, the survey found that the "level of electronic operations is also relatively low". Part of the explanation (as in Eurostat) was the increase in the "digital gap" between very small enterprises (with 1-5 employees) and enterprises with 11 and more employees.

Usefulness of a methodological investigation

At first glance, the *e-Business W@tch* team identified no obvious explanation for the high survey figures in Greek craft firms. Thus a more detailed investigation on this issue was conducted, which may provide useful insight not only to the European Commission, but also to researchers and all others interested in identifying traps of cross-country survey data interpretation.

Investigation

There are a number of possible reasons for the high figures of e-business use in Greek craft firms, some related to methodology, some to the interviewees. In the following, the most important reasons are discussed in detail.

Perception effects on the part of the reader

There may be an over-interpretation of high Greek data on the part of the reader. One may be impressed by some particularly high figures of e-business use in Greece, but neglect to observe that the performance of companies from Greece is quite average and even low in many other e-business indicators.

In infrastructure and basic application indicators, Greece has particularly low levels in WWW use, high-bandwidth connection and Wide Area Networks (see Exhibit 2-20). With regard to online procurement and online practices of the extended enterprise, Greek craft firms have the lowest levels of online purchasing and Supply Chain Management systems and they are quite low in system integration with suppliers. It should also be considered that the craft and trade sector sample does not include countries from Scandinavia which are generally the European e-business leaders.

²¹ ebusinessforum (2003) - <http://www.ebusinessforum.gr/>

Exhibit 2-20: Indicators with particularly low figures for Greek craft firms

	Use the WWW (1)	Connected with >= 2 Mbit/s (2)	Wide Area Network (1)	Purchase online (2)	IT system integration with a supplier (3)	Supply Chain Management (1)
Sector total (EU-5)						
	60	10	5	24	25	2.7
Other (9) Sectors (EU-5)						
	77	31	29	46	18	6.3
Countries						
DE Germany	84	8	3	47	34	<1
EL Greece	60	5	5	10	15	0
ES Spain	47	18	10	17	27	8.8
FR France	51	5	3	11	5	0
IT Italy	50	6	1	13	25	1.6
UK United Kingdom	76	8	9	38	12	<1
EE Estonia	93	14	9	15	38	0
PL Poland	51	9	2	11	18	<1

Base: EU-5 (DE, ES, FR, IT, UK), (1) all enterprises (n = 1,414 for EU-5 sector total, 138-288 per country); (2) enterprises with Internet access; (3) enterprises procuring online. Figures are weighted by employment ("enterprises comprising ...% of employees in the country/industry"). Reporting period: March/November 2003.

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

Database effects

The database from which the contact details for the sample are drawn may include relatively many firms which practise e-business, as the directory could possibly have a relatively low coverage of firms with less than ten employees. The average size of firms in the Greek craft and trade sample was 12.9 employees (unweighted). This is higher than in the other sample countries (Germany: 12.4, France: 9.8, Italy: 11.2, Spain: 10.3, UK: 9.3) except Estonia (14.2) but still points to a dominance of micro enterprises in the Greek sample. The sampling source was the database from ICAP, a member of the European Association of Directory and Database Publishers, which is updated every 18 months. While it was out of scope to follow up the characteristics of this database in the framework of this investigation, there are no obvious signs of a flawed database that could distort survey findings.

Characteristics of the data collection method

Every data collection method has particular characteristics. For the *e-Business W@tch* survey, a Computer-Aided Telephone Interview (CATI) method was chosen because this is the best method to reach a high number of interviewees in a short period of time, with a high response rate and at relatively low cost. This method was applied in all countries, and it can be assumed that the level of telephone penetration is similarly high in all countries so that all relevant companies could be reached by phone. Consequently, the high figures for Greek craft firms cannot meaningfully be attributed to the data collection method in the survey²².

²² Further details on the survey methodology are provided in Annex I

Data weighting

The raw data produced by the *e-Business W@tch* survey needed to be weighted according to the number of enterprises and employment. This is necessary in order to adequately reflect the composition of the company population in reality, as opposed to the composition of the sample, but it may lead to a distorted picture if the number of cases in the sample is quite small. However, a comparison of weighted and unweighted data shows that in the case of Greek craft firms, weighting changed the country's rank in comparison with other survey countries to a limited extent only.

Considering unweighted data, Greek craft firms are also ranked highest in computer use, LAN use, online collaborative work, online human resources management and assessment of e-business significance. The Greek position in unweighted data is significantly worse only in remote access. In enterprise-weighted figures, Greece has also some of the highest level of e-business use. Thus, data weighting does not significantly influence the Greek craft firms' ranking in e-business use.

Exhibit 2-21: Indicators with particularly high figures for Greek craft firms in different weighting schemes

Data for Greece only	Use computers	Use e-mail	Remote Access to computer system	Online internal collaborative work	Selling online	e-business very important
Employment-weighted						
% of employment	100	92	26	39	6.9	26
Rank of Greek craft firms	1	1	1	1	1	1
Enterprise-weighted						
% of enterprises	99	91	22	30	3.3	26
Rank of Greek craft firms	1	2	2	1	4	1
Unweighted						
% in sample companies	98	84	18	34	7.1	21
Rank of Greek craft firms	1	2	5	1	2	1

Base: EU-5 (DE, ES, FR, IT, UK), all enterprises (n = 238); except "remote access": enterprises using computers (n = 234). Greek rank in a sample with eight countries. Reporting period: March/November 2003.

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

Sub-sector weighting

It could also be the case that the high Greek figures are related to the sub-sector weighting. Since construction firms represent 75% of the firms in the weighted sample and the other four sub-sectors together only 25%, high values for e-business use in construction result in high figures for e-business use overall. Thus, as the overall level of e-business in Greek crafts is very high, this must be due to the fact that Greek construction firms reported very high levels of e-business use. It may be that the other four sub-sectors fall behind, which would put Greek's high levels in a different light.

In an exemplary exercise, Exhibit 2-22 shows e-business use in the textile, clothing and footwear sub-sector – which is the sub-sector with the overall lowest e-business use and which offers a reasonably high number of cases by country. It turns out that Greece is also in the top group of countries, except for remote access to the company's computer system. Thus, the high values of e-business use in Greek craft firms cannot be attributed to the dominance of the construction sub-sector in the overall craft figures.

Exhibit 2-22: Indicators with particularly high figures for Greek craft firms in the textile, clothing and footwear sector

Textile, clothing and footwear sector only	Use computers	Local Area Network	Intranet	Remote Access	Internet access	Use e-mail
Countries						
DE Germany	95	50	8	21	84	78
EL Greece	97	44	25	7.4	83	79
ES Spain	88	28	12	11	65	57
FR France	85	28	15	16	73	65
IT Italy	78	13	19	4.5	66	52
UK United Kingdom	89	49	26	36	80	77
EE Estonia	86	12	10	2.3	80	79
PL Poland	59	12	7	2.5	46	38

Base: EU-5 (DE, ES, FR, IT, UK), all enterprises (n = 30 - 60); except "remote access": enterprises using computers (n = 26 - 57). Greek rank in a sample with eight countries. Figures are weighted by employment ("enterprises comprising ...% of employees in the country/industry"). Reporting period: March/November 2003.

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

Self-selection of people with advanced e-business practice

Firms with no notable e-business practice may refuse to participate in the survey, resulting in an over-representation of firms with advanced practice. The response willingness can be traced in the interview minutes submitted to the *e-Business W@tch* co-ordinator (empirica) by the survey organisation Ipsos. These minutes show that Greek respondents were "eager to participate". The refusal rate in all sectors surveyed in Greece (350 in 1,457 contacts, which is 24%) was much lower than, for example, in the UK (1,930 in 2,566, 65%) and in Spain (1,210 in 1,984, 61%). A certain share of the 24% of Greek contact people may have refused because their company does not apply much e-business, but the high response rate suggests that there does not appear to be a considerable self-selection effect of Greek craft enterprises with high e-business use.

Misinterpretation of questions

Interviewees from Greek craft firms could have misinterpreted the questions and tended to say "yes" when they were uncertain about the answer. In fact, the field report states that "some IT terminology was difficult to understand by people who are not IT specialists but take decisions regarding technology (mostly owners of small companies)". This may be the case for indicators such as online collaborative work, online human resources management, and also online sales when, for example, simply having a website is judged as selling online. However, indicators such as use of computers and e-mail, intranet availability, and Internet access should be rather clear to all respondents. Thus, misinterpretation effects can explain high e-business levels in Greek craft firms only to a limited extent.

Low reference point of e-business use

Interviewees whose company operates in a business environment with little ICT penetration or who previously had a low level of e-business use may overestimate their practice. This may be the case in Greece, Italy and Poland where the level of answers of "very important" for e-business use is highest of all eight countries (see Exhibit 2-19) although these countries are generally not among the e-business leaders. Thus, some Greek craft firm representatives may have judged their practice as advanced from an

individual perspective even if it does not appear to be that advanced with more objective benchmarks.

Cultural influences

Cross-national survey research faces the challenge of differences in language and culture which may hinder achieving measurement equivalency.²³ For cultural reasons, Greek interviewees could have presented their e-business practices more positively than was appropriate. There may be a tendency towards overestimating own experiences in Southern countries: with regard to e-business being “very important” for the company, not only Greece but Italy as well stands out (see Exhibit 2-19). The tendency to answer “yes” in surveys is a well-known issue in social science, called acquiescence, but no documents dealing with this issue in Greece were identified in the framework of this investigation.

Conclusions

In conclusion, there remains uncertainty about some very high figures of e-business in Greek craft firms. There do not appear to be “hard” methodological reasons such as weighting effects, effects of the survey method, a distorted database, or self-selection effects. To some extent, the reasons may rather be found in “soft” factors such as a low reference point for e-business use in Greece, some misinterpretations of questions leading to inappropriate answers of “yes”, and cultural peculiarities leading to an over-assessment of e-business importance. Different explanations may apply to different indicators. Furthermore, one should not only consider the very high figures for some indicators but also some very low figures for others. A differentiated picture of e-business use in Greek craft firms should be drawn, stressing strengths in basic IT equipment and online sales as well as weaknesses in broadband access, WWW use and online procurement.

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²³ See for example Smith (2004).

3 Conclusions: Opportunities and challenges, drivers and barriers

3.1 Opportunities and challenges

Conclusions from survey data and further investigations

The previous analysis leads to a number of conclusions with regard to e-business opportunities and challenges for the craft and trade sector (see Exhibit 3-1). As far as opportunities are concerned, the fact that the vast majority of craft firms that use the Internet and apply e-business solutions are satisfied with their practice can encourage those firms that have not yet entered the Internet age to introduce online practices. E-business may improve or maintain competitiveness by introducing a new marketing and sales channel, by reducing procurement costs and by making business processes more efficient. However, a number of challenges are related to tapping these opportunities: craft enterprises need to gain e-business expertise; an issue that is particularly important in the new Member States.

Exhibit 3-1: Overview of e-business opportunities and challenges in the craft and trade sector

Opportunities: improving business	Challenges: gaining e-business expertise
<ul style="list-style-type: none"> • Introducing a new marketing and sales channel • Reducing procurement costs • Making business processes more efficient 	<ul style="list-style-type: none"> • IT skills development • Catching up of new Member States

Opportunities: adopting e-business to improve business

E-business can improve the whole business process of craft enterprises, including functions such as procurement, marketing, sales, personnel management, communication within and outside the company, and decision-making:

- **Product presentation.** Own websites offer the opportunity to present products and services, attracting the increasing number of customers who are used to selecting suppliers by comparing their websites.
- **New sales channel.** The Internet can offer a new sales channel and a larger sales area for crafts with specialised products, particularly if they can be shipped easily.
- **Pre-sales and after-sales consulting.** Better customer information about products and services reduces the need for time-consuming explanations.
- **Marketing portals.** Those craft firms that do not want to go online or do not want to sell on the Internet can participate in online portals for marketing their products (see for example the case study of Danish Furniture On-line presented in this report).
- **Sector-specific information.** Craft portals can arrange contacts between craft firms and potential customers, suggest standard contracts, and offer up-to date industry information.
- **Reduced procurement costs** through procuring online can be realised, also on e-marketplaces – particularly in consortia with other firms.
- **Management information:** *e-Business W@tch* data show that e-business can significantly improve the availability of data for management and planning, particularly in the construction industry.

- **Internal and external communication** can become more efficient, for example by sharing documents electronically between employees or by exchanging electronic documents with customers and suppliers.
- **Employee attraction.** Active use of electronic business practice can imply increased attractiveness of a craft firm for apprentices and trained employees. It could be an instrument to counteract the negative trend that craft firms have become less attractive for young people looking for an apprenticeship.
- **Product innovation.** e-Business can positively influence product innovation; the *e-Business W@tch* analysis shows particularly high impacts in the textile crafts.
- **Business efficiency.** In general, business processes can become more efficient by streamlining them with ICTs. According to the *e-Business W@tch* data, around 90% of craft firms using the Internet or applying e-business are satisfied with their practice, in all five sub-sectors considered.

Challenges: gaining e-business expertise

On introducing Internet use and e-business practices, craft firms need to develop IT skills. This may be a considerable challenge because in firms with only a small number of employees, it does not pay to employ IT specialists. Consequently, owners and staff need to be knowledgeable about e-business themselves, or buy IT services from outside the company. However, data from the *e-Business W@tch* show that craft firms do not develop IT skills as much as other sectors do, not even by learning during working time. It may be advisable to invest more time in IT skills training, for example in courses offered by IT institutes and craft chambers or, if available, by e-business training modules offered by using the chambers.

The development of IT skills will be of particular importance in the craft and trade sector in the new Member States. Data from the *e-Business W@tch* also shows that there is still a gap between companies from the new Member States and the former EU-15 in the craft and trade sector. Companies from Estonia, being the exception, have reached a high level of e-business application, surpassing many former EU-15 Member States. In the short term, the development of e-skills will be important for those craft firms that offer their products and services internationally or to larger local enterprises. As the use of information technologies will become more widespread in the new Member States, adoption of e-business will also become important for craft firms operating in local markets.

3.2 E-business drivers and barriers

Conclusions from survey data and further investigations

The above mentioned opportunities of e-business may not be obvious to craft firms of different size and industry. However, even if craft entrepreneurs are reluctant to introduce e-business, there are a number of drivers forcing them to do so – above all the need to stay competitive in an economic and social environment that is increasingly marked by information technology use (see exhibit 3-2). The small size of craft firms implies limited investment capacity and ICT skills compared to larger firms. This could remain a critical barrier to e-business adoption, although small firms do not need the same configurations of ICT and e-business architectures as large firms.

Exhibit 3-2: Overview of e-business drivers and barriers in the craft and trade sector

Drivers: need to stay competitive	Barriers: difficulties related to small size
<ul style="list-style-type: none"> • Diffusion of IT in society and economy • Standards set by large suppliers and customers • Generational change of craft firm owners 	<ul style="list-style-type: none"> • Lack of investment funds • Lack of specialised IT knowledge in-house

Drivers: IT diffusion in society and economy

One of the core drivers to introduce and extend e-business practices is the necessity to stay competitive. Craft firms that are part of value chains with large enterprises can be expected to feel knock-on effects of e-business initiatives of the sector's "giants". In many cases small firms which supply to larger customers will be forced to adapt to the latter's standards or get out of business. The case study on e-procurement of construction services by Airbus showed that large firms may switch to completely procuring craft services online in the future, leaving aside those firms not applying e-business practices. As one participant at the AIR-CRAFT final conference said, "If you do not move with time, you will be gone in time." (German: „Wer nicht mit der Zeit geht, geht mit der Zeit.“).

Most of the more advanced e-business technologies, however, may not be of much use to the shoemaker round the corner in his daily business, nor for the average small craft company. But this does not mean that craft firms should not carefully consider possible opportunities stemming from simple e-business applications which they should seek to realise. Non-application of e-business even in rudimentary forms of website presentation and electronic correspondence with customers and suppliers may put the craft and trade sector at a serious disadvantage in the medium term. Modern marketing and sales channels meeting customers' expectations as well as opportunities of cheaper procurement and more efficient business processes remain unused. As more and more young people who grew up with Internet technology become prosperous consumers, the Internet will be a common medium for selecting suppliers. Craft firms without a website may have a hard time. Young craftsmen founding companies or taking over established ones will be much more competent IT users than older craft entrepreneurs. Furthermore, the attractiveness of craft firms for young people seeking an apprenticeship has declined. This is alarming, as the craft and trade sectors are of great importance for vocational training.

Barriers: small size may inhibit e-business diffusion

Comprehensive use of ICTs and e-business may not be economic in many craft firms. Findings presented in this report and in other *e-Business W@tch* reports indicate that e-business solutions seem to benefit large firms to a greater extent than their smaller counterparts because many e-business projects imply increasing returns to scale. The more advanced e-solutions in particular, require substantial investments in software, customisation, and user training. Large firms therefore appear to be in a more advantageous position to realise efficiency gains, cost reduction, and improved competitiveness. Consequently, large firms currently take the lead-role in changing the supply chain and industry structure with e-business solutions. This applies particularly to the transport equipment sub-sector with its dominance of large manufacturers at the top of the supply chain.

However, slower adoption of e-business by small businesses does not suggest a market failure or irrationality. Small firms do not have the strategic position or financial capabilities to take a leading role in e-business application. High costs of implementation together with

increased pressure on product margins in e-marketplace environments and the difficulties in keeping confidential information are likely to prohibit the adoption of e-business in quite a number of small firms, even in the medium term. Therefore, the migration to doing business electronically will rather be a gradual and modular one for craft firms, taking one step after the other. The first step is frequently to use e-mail for communication with customers and suppliers. Once this has become common practice, more advanced systems can be considered to further improve the information flow. A rush into complex systems, involving high implementation and maintenance costs, may rather have negative effects and will certainly not solve general problems.

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 named 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 as early as 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.²⁴

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 2003.²⁵ 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.

²⁴ http://europa.eu.int/information_society/topics/ecommm/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/ecommm/index_en.htm

²⁵ This assessment was confirmed by speakers from the new Member States at the e-Business W@rch Workshop on "e-Business in Acceding Countries", Brussels, 10 December 2003.

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 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, 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 for 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 in 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 into 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 potential investors face. This involves the entire environment in which enterprises operate, not only the uncertainty about specific investment opportunities such as 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 ICTs 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 ICTs. 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 training and in a general continuing education, irrespectively 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.²⁶ 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 of 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 citizens²⁷ 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.²⁸ The government also makes very active use of Internet technologies itself, playing

²⁶ cf. CVTS2; Statistisches Bundesamt, 2002

²⁷ ebusinessforum, 2001

²⁸ Wired News, 21. April 2003

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 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 introduction 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”.²⁹

²⁹ COM(2003) 148 final

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",³⁰ 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
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 (see Exhibit 4-1).

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 so doing 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.

³⁰ COM(2001) 136 final

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	<ul style="list-style-type: none"> • UK: UK online for business • Greece: the e-business forum • Norway: the VeRDI programme • NL: The Netherlands Go Digital Programme • Spain: Catalunya on the Net
E-business awareness raising and training	<ul style="list-style-type: none"> • Finland: eAskel • UK/Scotland: First Steps Workshop Series • Austria: ECAustria ("Let's e-biz") • Sweden: SVEA • Germany: the B-on-line project
Promoting SME support networks	<ul style="list-style-type: none"> • Ireland – The PRISM II initiative • Germany – Network of e-business centres • The Netherlands – 'Digikringen' • UK – Opportunity Wales
Promotion of Internet platforms for SMEs	<ul style="list-style-type: none"> • Denmark - Rakat in Roskilde • Ireland – Empower • Spain – The ARTEPYME II • France – project Achat-ville • 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)

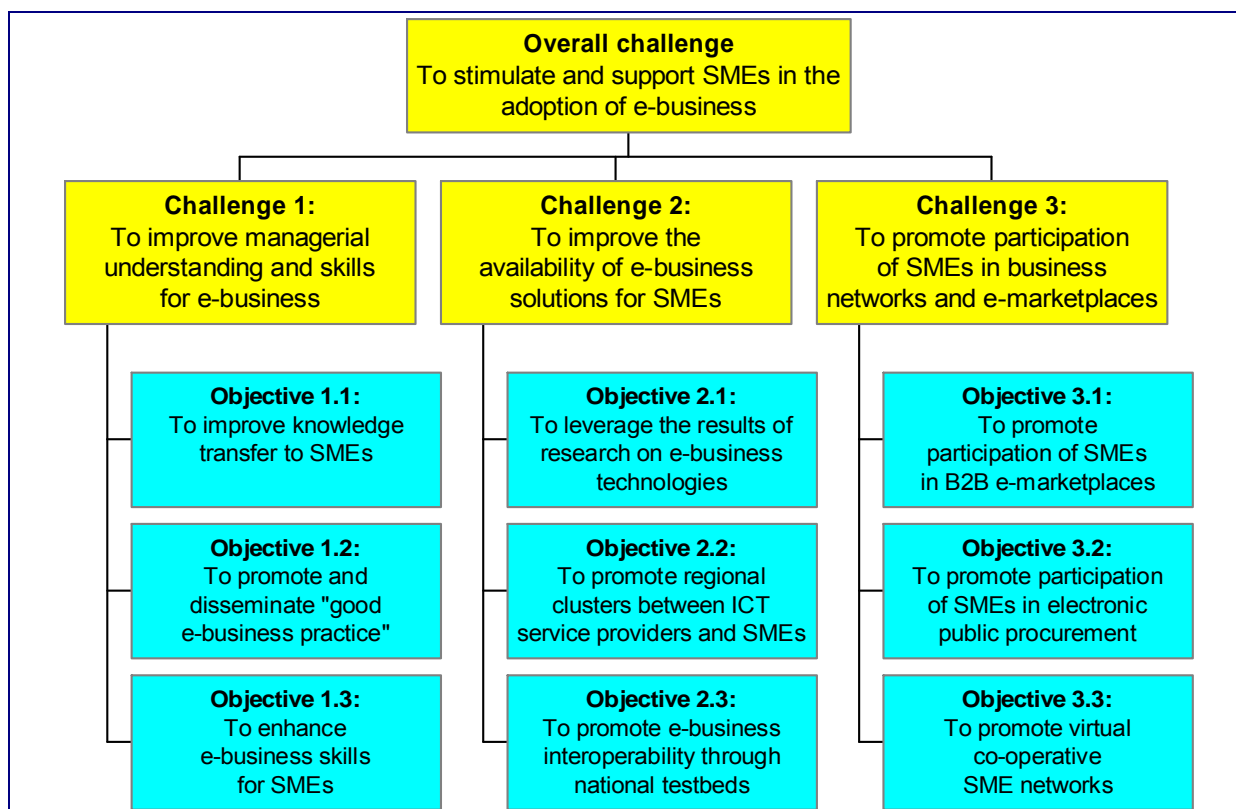
This e-BSN Workshop was the kick-off event for the fourth step of the master plan, as the title of the event already indicates: "Workshop on quantitative targets for e-business policies". From the beginning, it was a courageous move by DG Enterprise to promote target oriented policy-making processes, 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".³¹

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.

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.

³¹ 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

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 SMEs 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.³² Policy measures to stimulate the 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.

³² 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.

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

Source: e-Business W@tch (2004)

4.3 Sector specific challenges

The chapter summarises the main policy challenges that were described in detail in the previous Sector Study on the craft and trade sector (May 2004), and points at new issues that emerged during the analysis carried out in the context of this report.

General issues of e-business promotion in the craft and trade sector

General policy issues include the promotion of e-business in craft firms on a regional level, the creation of interactive website modules for e-business support in the craft and trade sector, and the recommendation to move stepwise into the information society:

- **Promoting e-business on a regional level:** Since crafts are generally rooted in the local and regional economy, support to e-business should predominantly take place at the local and regional level. Craft chambers or chambers of commerce should take a leading role in promoting the introduction and extension of e-business practices in crafts. Due to the constraints in public spending, privately funded initiatives by business organisations could be an alternative. Regional activities can be supplemented by national and EU initiatives, like the European e-Business Support Network (eBSN, <http://www.e-bsn.org/content/en/index.html>), the eSkills Forum (<http://europa.eu.int/comm/enterprise/ict/policy/ict-skills.htm>), the European e-Business Legal Portal (www.ebusinesslex.net), and the European B2B marketplaces portal (<http://www.emarketservices.com/>) which are currently implemented by the Commission's DG Enterprise.
- **Websites and interactive modules:** Websites can be a valuable source of news and information about e-business. In order to make best use of the Internet opportunities and in order to provide good examples of helpful Internet applications, such websites should also include interactive modules such as forums for enterprises looking for business partners and self-assessment software tools.
- **Stepwise moving into the Information Society:** While there are good reasons for craft firms to apply e-business, it does not appear to be recommendable to move into the Information Society in one big leap and without a well-defined strategy. A stepwise approach, consciously monitoring costs and benefits, may be more reasonable. In a workshop of the UEAPME Construction Forum in March 2004, a seven-step approach was recommended by Freek Posthumus, *e-Business W@tch* expert for the craft and trade sector. The approach comprises the following steps:³³ 1) buy a computer and use it as a calculator and word processor, 2) use e-mail, 3) create a website copy of the company's brochure, 4) make your website interactive for marketing and sales, 5) use internal processes as well, purchase online, 6) sell online, apply Enterprise Resource Planning and e-invoicing tools, 7) introduce e-payment and full integration of e-business.

Knowledge society issues

The introduction of ICT infrastructure and e-business applications requires the development of related skills. Policy initiatives can support this process, for example through targeted research, education and knowledge transfer programmes. It would be helpful if the participation of craft firms in European RTD programmes could be improved, as well as the

³³ With slight modifications by the author. The minutes of the Forum are available at www.ebusiness-watch.org.

dissemination of results to craft firms. Furthermore, links between craft firms and schools could be strengthened.

- **Promoting research, education and knowledge transfer:** Networks of excellence involving public research institutions, craft associations and craft firms could be established and promoted to facilitate a transfer of knowledge about ICT and e-business practice.
- **Improving craft participation in European research:** By introducing large-scale instruments such as "Integrated Projects", the European Union's 6th Framework Programme for Research and Development offers relatively unfavourable conditions for the participation of SMEs in general, including craft firms. The 7th Framework Programme could consider different types of instruments that are more favourable for SMEs, particularly with regard to e-business related R&D projects.
- **Links between craft firms and schools:** As craft firms are usually rooted in the local and regional business, they tend to seek personnel in the local and regional labour market. Links between craft firms with e-business practices and schools may help to create a favourable image among young people interested in computer issues. Local and regional bodies for education on the one hand and crafts on the other hand may set up initiatives and programmes linking schools and craft firms.

Sector-related issues

As the craft and trade sector has a very wide scope of business activity, there is also a need for industry-specific measures to promote e-business. This applies in particular to the construction sector as the largest employer in Europe. A voluntary e-Construction Working Group, comprising representatives from construction industry organisations and EU Member States, was formed to support the development of a European Commission Action Plan for increasing the construction sector's competitiveness. In 2003 the Group proposed that future initiatives should address a number of measures, including the following, which are in line with *e-Business W@tch* findings.³⁴

- promoting the further development of user-friendly, cost-effective ICT solutions for the construction industry;
- driving the development of shared standards for design, materials and business exchanges in the construction industry;
- setting up an effective e-learning programme for the sector in order to overcome the ICT skills gap;
- working closely with governments and administrations in setting up innovative e-government applications for businesses all over Europe, including electronic public procurement;
- addressing legal, transactional and authentication aspects on information sharing and copyrights.

³⁴ See Information and Communication Technologies Working Group (2003) and related activities by the European Commission at <http://europa.eu.int/comm/enterprise/construction/it/inftech.htm>.

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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 <i>e-Business W@tch</i> 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 bandwidth), 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. ³⁵ 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 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.

³⁵ Cf. Global Internet Statistics by Global Reach, www.glreach.com

Remote access	The ability of a company computer network's transmission points to gain access to a 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 <i>e-Business W@tch</i> . 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.º, 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).

Population coverage of the e-Business Survey (2003)			
No.	NACE Rev. 1		Sector Name
	Section	Division/Group	
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 Watch* in 2003/04

No.	Sector	Date
1	Textile, clothing and footwear industries <ul style="list-style-type: none"> • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe • Report II: Key Issues, Case Studies, Conclusions 	May 2004 August 2004
2	Chemical industries <ul style="list-style-type: none"> • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe • Report II: Key Issues, Case Studies, Conclusions 	May 2004 August 2004
3	Electrical machinery and electronics <ul style="list-style-type: none"> • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe • Report II: Key Issues, Case Studies, Conclusions 	May 2004 August 2004
4	Transport equipment manufacturing <ul style="list-style-type: none"> • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe • Report II: Key Issues, Case Studies, Conclusions 	May 2004 August 2004
5	Crafts' and trade sectors <ul style="list-style-type: none"> • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe • Report II: Key Issues, Case Studies, Conclusions 	May 2004 August 2004
6	Retail <ul style="list-style-type: none"> • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe • Report II: Key Issues, Case Studies, Conclusions 	May 2004 August 2004
7	Tourism <ul style="list-style-type: none"> • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe • Report II: Key Issues, Case Studies, Conclusions 	May 2004 August 2004
8	ICT services <ul style="list-style-type: none"> • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe • Report II: Key Issues, Case Studies, Conclusions 	May 2004 August 2004
9	Business services <ul style="list-style-type: none"> • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe • Report II: Key Issues, Case Studies, Conclusions 	May 2004 August 2004
10	Health and social services <ul style="list-style-type: none"> • Report I: The Quantitative Picture: Diffusion of ICT and e-business in Europe • Report II: Key Issues, Case Studies, Conclusions 	May 2004 August 2004

Annex IV: Methodological considerations for the craft and trade sector

Methodology challenges: crafts as a cross-industry sector with no clear definition

Crafts and trades play an important role in the European economy and therefore suggest themselves for analysis within the *e-Business W@tch*. However, such an analysis faces methodological difficulties. Firstly, there is no agreed definition of crafts in the EU Member States, let alone in the Accession States. As summarised by DG Enterprise: "There is no European definition for craft enterprises. (...) It is difficult to compare the available information, due either to the lack of a legal definition of craft-trade enterprise in many countries or to the lack of uniformity."³⁶ A study conducted to establish operational definitions of the craft and trade sector revealed four characteristics of the craft and trade sector that are applied in EU Member State statistical practice: legal nature (e.g., one-man companies, partnerships), profession, economic activities, and dimension of enterprise in number of workers (less than 50).³⁷

Secondly, as a consequence, crafts is not a marked-off sector in official statistics. The European classification of economic activities (NACE Rev. 1) does not contain a section on "crafts". Rather, crafts is a cross-industry sector. Considering the economic activities criterion that is applied in nine Member States, various categories include craft firms: manufacturing activities in fields such as food, wood, metals and ceramics (NACE 15 – 37, excluding 23), construction (NACE 45), repairs (NACE 50), transport (NACE 60), and several "other services" (NACE 90 and 93).

ISCO 88 crafts as a reference classification

An important reference classification for a crafts analysis is the European variant of the International Standard Classification of Occupations, referred to as ISCO 88 (COM), which helps to identify crafts in the NACE classification. ISCO 88, major group 7, defines "crafts and related trades" as a group of professions in which "workers apply their specific knowledge and skills to produce or process goods" and in which "the tasks call for an understanding of all stages of the production process, the materials and tools used and the nature and purpose of the final product". ISCO 88 distinguishes four broad categories of crafts:

- Extraction and building trades workers.
- Metal, machinery and related trades workers.
- Precision, handicraft, craft printing and related trades workers.
- Other craft and related trades workers (including food processing, wood treaters and textile workers).

This ISCO 88 major group 7 list has large intersections with the crafts-related NACE categories but is not congruent with them. Extraction workers are not part of the NACE list, while transport and "other services" are not included in ISCO 88 major group 7.

Survey of a limited number of crafts with an operational definition

For the *e-Business W@tch* the methodological difficulties mentioned above imply that it would be difficult to analyse an all-inclusive crafts sector. However, a pragmatic approach allows a meaningful analysis of crafts in Europe. Such a pragmatic approach requires an operational definition of crafts and a selection of crafts that is included in the survey. The operational definition in the framework of the *e-Business W@tch* is "firms with less than 50 employees in crafts-related NACE categories". The selection of craft trades for the *e-Business W@tch* analysis includes NACE categories with a significant amount of enterprises with less than 50 employees that constitute a large share of employees and value added in these NACE categories and that are assumed to be fairly advanced in e-business application.

Crafts make up a large share in three of the survey sectors

Referring to ISCO 88, three of the ten sectors selected for the *e-Business W@tch* survey largely comprise craft professions: textile, clothing and footwear manufacturing, manufacture of electrical machinery and electronics, and manufacture of transport equipment. Firms with less than 50 employees in these sectors form one group of

³⁶ See <http://europa.eu.int/comm/enterprise/entrepreneurship/craft/definition.htm>.

³⁷ See Istituto Guglielmo Tagliacarne (2001).

firms of the *e-Business W@tch* craft and trade sector. In order to make optimal use of the available sample, these firms are included in two different analyses: firstly in the analysis of the whole sector including all size classes and NACE sub-categories, secondly in the analysis of the craft sector.

Two other sectors were selected for the craft and trade analysis in order to widen the spectrum for sub-sector comparison: construction as well as wood manufacturing and furniture manufacturing. These sectors have a particularly high share of small companies, and they are, for construction, of particularly high economic importance. For furniture manufacturing, they provide exemplary e-business practices.

For a craft and trade analysis a few NACE sub-categories needed to be excluded because they are not considered as crafts in ISCO 88, for example "site preparation" in the construction industry which includes demolition and wrecking of buildings and test drilling. Tables 1 – 5 present an overview of crafts included in the *e-Business W@tch* craft analysis.

Crafts are of little or no importance in the other e-Business W@tch sectors

A minor group of crafts is included in the retail, ICT services and business services industries that were also included in the *e-Business W@tch* survey. Due to a small number of cases in the survey, an analysis by country or size class would not be appropriate. Thus it was not meaningful to include them in the crafts sector of the *e-Business W@tch*:

- Retail: ISCO 88 category 7231 "motor vehicles mechanics and fitters" has intersections with NACE 50.2 "maintenance and repair of motor vehicles". However, motor vehicle maintenance and repair is not really a retail activity but only related to it. The first *e-Business W@tch* survey included no cases of NACE 50.2.
- ICT services: ISCO 88 category 7242 "Electrical mechanics, fitters and servicers" and NACE 72.5 "Maintenance and repair of office, accounting and computing machinery" activities have intersections. The first *e-Business W@tch* survey included only 41 cases of NACE 72.5.
- Business services: NACE 74.7 "Industrial cleaning" includes crafts in terms of the German Crafts Act. The first *e-Business W@tch* survey included only 36 cases. NACE 74.8 "Miscellaneous business activities" include photographic activities which are included in ISCO 88 crafts unit group 7344 "photographic and related workers". This craft is too specific to be identified in the sample.

No crafts in terms of ISCO 88 are included in tourism and chemical industries.

Further craft and trade sectors not included in the survey

The following ISCO 88 categories are not included in the *e-Business Watch* survey at all:

- 711 Miners, shotfirers, stone cutters and carvers
- 721 Metal moulders, welders, sheet-metal workers, structural-metal preparers
- 722 Blacksmiths, tool-makers and related trade workers
- 73 Precision workers in metal and related materials
- 741 Food processing and related trades workers

Several of the categories did not lend themselves to be included in the survey, for various reasons:

- Some sectors are dominated by large enterprises. This applies to energy products mining (NACE 10–12) and manufacture of basic metals (NACE 27).³⁸
- Some sectors are too specific to identify a sufficient number of firms in the sample countries or to compare them against the other quite broad sectors that are supposed to be included. This applies to "cutting, shaping and finishing of stone" (NACE 26.7), "manufacture of musical instruments" (36.3), "manufacture of jewellery and related articles" (NACE 36.2).
- Some sectors are not significant in terms of employment, value added and e-business application. This applies to "forestry, logging and related service activities" (NACE 2).

Several industries were included in the first and second *e-Business W@tch* surveys so that detailed information is already available in previous reports:

- Manufacture of food products, beverages and tobacco (NACE 15 and 16).
- Printing and service activities related to printing (NACE 22.2).
- Manufacture of machinery and equipment (NACE 29).

³⁸ See European Commission (2002), *European Business Facts and Figures*, p. 188 for NACE 27.

Table 6 presents an overview of craft-related professions and NACE categories that are not included in the e-Business W@tch.

Table 1: Textile, clothing and footwear industry crafts

Crafts in ISCO 88		Corresponding NACE categories	
743	Textile, garment and related trade workers	17	Manufacture of textiles
7431	Fibre preparers	17.1	Preparation and spinning of textile fibres
7432	Weavers, knitters and related workers	17.2	Textile weaving
7433	Tailors, dressmakers and hatters	17.3	Finishing of textiles
7434	Furriers and related workers	17.4	Manufacture of made-up textile articles, except apparel
7435	Textile, leather and related pattern-makers and cutters	17.5	Manufacture of other textiles
7436	Sewers, embroiderers and related workers	17.6	Manufacture of knitted and crocheted fabrics
7437	Upholsterers and related workers	17.7	Manufacture of knitted and crocheted articles
733	Handicraft workers in wood, textile, leather and related materials	18	Manufacture of leather clothes
7332	Handicraft workers in textile, leather and related materials	18.1	Manufacture of leather clothes
		18.2	Manufacture of wearing apparel and accessories Dressing and dyeing of fur, manufacture of
		18.3	articles of fur
744	Pelt, leather and shoemaking trades workers	19	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear
7441	Pelt dressers, tanners and fellmongers	19.1	Tanning and dressing of leather
7442	Shoe-makers and related workers	19.2	Manufacture of luggage, handbags and the like, saddlery and harness
		19.3	Manufacture of footwear

NACE sections included in the survey: 17 excluding 17.5, 18 excluding 18.3, and 19.3.

Table 2: Manufacture of electrical machinery and electronics industry crafts

Crafts in ISCO 88		Corresponding NACE categories	
724	Electrical and electronic equipment mechanics and fitters	30	Manufacture of office machinery and computers
7241	Electrical mechanics fitters and services	30.1	Manufacture of office machinery and computers
7242	Electronics mechanics, fitters and servicers	30.2	Manufacture of computers and other information processing equipment
7244	Telegraph and telephone installers and servicers	31	Manufacture of electrical machinery and apparatus n.e.c.
7245	Electrical line installers, repairers and cable jointers	31.1	Manufacture of electric motors, generators and transformers
		31.2	Manufacture of electrical distribution and control apparatus
		31.3	Manufacture of insulated wire and cable
		31.4	Manufacture of accumulators, primary cells and primary batteries
		31.5	Manufacture of lighting equipment and electric lamps
		31.6	Manufacture of electrical equipment n.e.c.
		32	Manufacture of radio, television and communication equipment and apparatus
		32.1	Manufacture of electrical valves and tubes and other electronic components
		32.2	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy
		32.3	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods

NACE sections included in the survey: 30, 31.1 – 31.2, 32.1 – 32.3.

Table 3: Manufacture of transport equipment industry crafts

Crafts in ISCO 88		Corresponding NACE categories	
723	Machinery mechanics and fitters	34	Manufacture of motor vehicles, trailers and semi-trailers
7231	Motor vehicle mechanics and fitters	34.1	Manufacture of motor vehicles
7232	Aircraft engine mechanics and fitters	34.2	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers
7233	Agricultural- or industrial-machinery mechanics and fitters	34.3	Manufacture of parts and accessories for motor vehicles and their engines
		35	Manufacture of other transport equipment
		35.1	Building and repairing of ships and boats
		35.2	Manufacture of railway and tramway locomotives and rolling stock
		35.3	Manufacture of aircraft and spacecraft
		35.4	Manufacture of motorcycles and bicycles
		35.5	Manufacture of other transport equipment n.e.c.

NACE sections included in the survey: all.

Table 4: Manufacture of wood and furniture industry crafts

Crafts in ISCO 88		Corresponding NACE categories	
742	Wood treaters, cabinetmakers and related trades workers	20	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
		20.1	Sawmilling and planing of wood; impregnation of wood
		20.2	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other panels and boards
		20.3	Manufacture of builders' carpentry and joinery
		20.4	Manufacture of wooden containers
		20.5	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials
		36	Manufacture of furniture; manufacturing n.e.c.
		36.1	Manufacture of furniture

NACE sections included in the survey: all.

Table 5: Construction industry crafts

Crafts in ISCO 88		Corresponding NACE categories	
712	Building frame and related trade workers	45	Construction
7121	Builders	45.2	Building of complete constructions or parts thereof; civil engineering
7122	Bricklayers and stonemasons	45.3	Building installation
7123	Concrete placers, concrete finishers and related workers	45.4	Building completion
7124	Carpenters and joiners	45.5	Renting of construction or demolition equipment with operator
7129	Building frame and related trades workers not elsewhere classified		
713	Building finishers and related trades workers		
7131	Roofers		
7132	Floor layers and tile setters		
7133	Plasterers		
7134	Insulation workers		
7135	Glaziers		
7136	Plumbers and pipe fitters		
7137	Building and related electricians		
7139	Building finishers and related trade workers not elsewhere classified		
714	Painters, building structure cleaners and related trade workers		
7141	Painters and related workers		
7143	Building structure cleaners		

NACE sections included in the survey: 45.2 – 25.4. (Note that 45.1 “site preparation” is not included in ISCO 88 crafts.)

Table 6: Crafts in ISCO 88 and NACE not included in the e-Business W@tch

Crafts in ISCO 88 not included in the e-Business W@tch survey		Corresponding NACE categories	
7111	Shotfires and blasters	10	Mining of coal and lignite; extraction of peat
7112	Miners and quarry workers	11	Extraction of crude petroleum and natural gas; service activities
		12	Mining of uranium and thorium ores
		13	Mining of metal ores
		14	Other Mining and quarrying
7113	Stone splitters, cutters and carvers	26.7	Cutting, shaping and finishing of stone
721	Metal moulders, welders, sheet-metal workers, structural-metal preparers	27	Manufacture of basic metals
722	Blacksmiths, tool-makers and related trade workers	28	Manufacture of fabricated metal products, except machinery and equipment
		29	Manufacture of machinery and equipment n.e.c.
7311	Precision-instrument makers and repairers	33	Manufacture of medical, precision and optical instruments, watches and clocks
7312	Musical-instrument makers and tuners	36.3	Manufacture of musical instruments
7313	Jewellery and precious-metal workers	36.2	Manufacture of jewellery and related articles
732	Potters, glass-makers and related trades workers	26.1	Manufacture of glass and glass products
		26.2	Manufacture of non-refractory ceramic goods other than for construction purposes; manufacture of refractory ceramic products
		26.3	Manufacture of ceramic tiles and flags
7331	Handicraft workers in wood and related materials	2	Forestry, logging and related service activities
734	Craft printing and related trades workers	22.2	Printing and service activities related to printing
741	Food processing and related trades workers	15	Manufacture of food products and beverages
		16	Manufacture of tobacco products