Annex I: The e-Business Survey 2005

The *e-Business W@tch* collects data on the use of ICT and e-business in European enterprises by means of representative surveys. The e-Business Survey 2005, which was the third survey after those of 2002 and 2003, had a scope of 5,218 telephone interviews with decision-makers in enterprises from seven EU countries (Czech Republic, France, Germany, Italy, Poland, Spain and the UK). Interviews were carried out in January and February 2005. The field work of the survey was coordinated and conducted by Ipsos GmbH using computer-aided telephone interview (CATI) technology.

Questionnaire

The general design of the questionnaire builds on the ones used in the previous surveys of 2002 and 2003 in order to ensure a basic continuity of the research approach. However, new modules on security and interoperability have been added, while other modules have been reduced (mostly the ones on perceived impacts of e-business, where little new evidence was to be expected compared to the findings of 2003).

New questions were also introduced in the e-commerce related modules, reflecting the developments in electronic business and changing perspectives in research, in particular the emphasis on electronic business processes. An important focus of the 2005 survey was on the use of ICT systems to support e-procurement and online sales processes. These questions complement the previously used questions on online purchasing and selling activity.

The questionnaires of all three surveys (2002, 2003, 2005) can be downloaded from the *e-Business W@tch* website at www.ebusiness-watch.org/about/methodology.htm.

Population

In contrast to the surveys of 2002 and 2003, the 2005 survey considered only **companies that used computers**. Thus, the highest level of the population was the set of all computer-using enterprises which were active within the national territory of one of the 7 countries covered, and which had their primary business activity in one of the 10 sectors specified on the basis of NACE Rev. 1.1 categories.

Evidence from previous surveys shows that this does not make a noticeable difference for medium-sized and large firms, as the share of firms that use computers can be expected to be 99% or more in all sectors and countries covered. Differences are relevant, however, for micro and small enterprises, in particular in the food and beverages industry, the textile industry, construction and tourism. In these four sectors, 10-30% of micro enterprises and 4-15% of small firms (depending on the country and sector) do not use a computer.[1] Therefore it makes a difference if a figure represents a percentage of "all companies" (as in 2003) or a percentage of "companies using computers" (as in 2005). Differences are much less pronounced, though, when figures have been weighted by employment.

The 10 sectors that have been selected for the 2005 survey are extremely heterogeneous in terms of their size. Construction is by far the largest with about 2.3 million enterprises in the EU-25. At the other end of the range are the aerospace and pharmaceutical industries with only about 2,200 and 3,900 firms respectively in the EU-25. This is a factor of about 100 between the largest and smallest sector. This imbalance has clearly implications for the achievement of survey quota and the impact of weighting on sector data and on aggregate results.

[1] Non-computer users include typically small craft firms (textile, construction), bars, restaurants or pensions (in tourism), and small food producing companies.

Table 1: Population coverage of the e-Business Survey (2005)

No.	NACE Rev. 1.1		Sector name (as used by *e-Business W@tch*)
	Section	Division / Group	
01	DA	15	Manufacture of food products and beverages
02	DB	17, 18	Manufacture of textiles (17), wearing apparel; dressing & dyeing of fur (18)
03	DE	22	Publishing, printing and reproduction of recorded media
04	DG	24.4, 24.5	Manufacture of pharmaceuticals (24.4), soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations (24.5)
05	DK	29.1 – 29.5	Manufacture of machinery and equipment (not included: Manufacture of weapons and ammunition, domestic appliances)
06	DM	34	Manufacture of motor vehicles, trailers and semi-trailers
07	DM	35.3	Manufacture of aircraft and spacecraft
08	F	45	Construction
09	H, I, O	55, 62.1, 63.3, 92.3+5	Tourism, including hotels and restaurants (55), parts of air transport (62), travel agencies and tour operators (63.3), and parts of recreational, cultural and sporting activities (92)
10	K	72	Computer and related activities

Sampling frame and method

No cut-off was made in terms of minimum size of firms. The sample drawn was a random sample of companies from the respective sector population in each of the seven countries, with the objective of fulfilling minimum strata with respect to company size class per country-sector cell. Strata were to include a 10% share of large companies (250+ employees), 30% of medium sized enterprises (50-249 employees), 25% of small enterprises (10-49 employees) and up to 35% of micro enterprises with less than 10 employees. Samples were drawn locally by fieldwork organisations based on widely recognized business directories and databases (see Table 2).

Table 2: Directories from which samples were drawn (2005)

Country		Directory / database
CZ	Czech Republic	Albertina Business Database (database of economic subjects with >1m entries)
DE	Germany	Heins und Partner Business Pool
ES	Spain	Dun & Bradstreet
FR	France	SIREN file from INSEE (the French National Statistics Institute)
IT	Italy	Dun & Bradstreet
PL	Poland	Kompass Polska
UK	United Kingdom	Dun & Bradstreet

The survey was carried out as an enterprise survey: data collection and reporting focus on the enterprise, defined as a business organisation (legal unit) with one or more establishments. In some of the sectors, target quota in the larger enterprise size-bands could not be accomplished in each of the countries. In these cases, interviews were shifted to the next largest size-band (from large to medium-sized, from medium-sized to small).

Fieldwork

Fieldwork was coordinated by the German branch of Ipsos GmbH (www.ipsos.de) and conducted in cooperation with local partner organisations (see Table 3) on behalf of *e-Business W@tch*. Pilot interviews prior to the regular fieldwork were conducted with 12 companies in Germany in December 2004, in order to test the questionnaire (structure, comprehensibility of questions). The survey had a scope of 5,218 interviews, evenly spread across the seven countries covered. About 565 interviews per sector were conducted (see Table 4), except for the aeronautics and the pharmaceutical industry. Due to the small population of firms in these sectors, it was not possible to achieve the target quota. In the aerospace industry, only 163 company interviews could be realised in the seven countries covered. In this sector, practically the entire population of companies was contacted.

Table 3: Market research companies having conducted the fieldwork in the e-Business Survey 2005

Country		Fieldwork organisation
CZ	Czech Republic	Ipsos Czech Republic, Skolska 32/694, 110 00 Praha 1
DE	Germany	Ipsos GmbH, Papenkamp 2-6, 23879 Mölln
ES	Spain	Ipsos ECO Consulting, Avda. de Burgos, 12.-8[a], 28036 Madrid
FR	France	Ipsos Insight Marketing, 99, rue de l'Abbé Groult, 75739 Paris Cedex 15
IT	Italy	Demoskopea S.p.A., Via Salaria 290/ Via Rubicone 41, 00199 Rome
PL	Poland	Ipsos, ul. Pulawska 39, 02-508 Warsaw
UK	United Kingdom	Continental Research, 132-140 Goswell Road, EC1V 7DY London

Table 4: Number of interviews conducted by sector and country (2005)

Sector	CZ	DE	ES	FR	IT	PL	UK	TOTAL
Food and beverages	85	80	82	80	86	83	75	**571**
Textiles and clothing	85	76	81	80	81	83	75	**561**
Publishing and printing	84	80	82	80	79	83	75	**563**
Pharmaceutical industry	54	83	81	76	81	82	75	**532**
Machinery and equipment	85	80	81	77	84	83	75	**565**
Automotive industry	85	80	81	80	81	83	75	**565**
Aerospace industry	20	38	15	39	23	3	25	**163**
Construction	84	81	83	80	80	83	75	**566**
Tourism	84	80	82	80	82	83	76	**567**
Computer related services	84	80	82	78	82	84	75	**565**
TOTAL	**750**	**758**	**750**	**750**	**759**	**750**	**701**	**5218**

Table 5: Interview contact protocol: completion rates and non-response reasons (2005)

		CZ	DE	ES	FR	IT	PL	UK	Total
1	**Sample (gross)**	**2632**	**7247**	**8796**	**10123**	**5082**	**7825**	**13104**	**54809**
1.1	Telephone number does not exist	126	880	680	373	340	959	870	4228
1.2	Not a company (e.g. private household)	42	130	220	200	44	214	115	965
1.3	Fax machine / modem	40	56	10	0	359	248	116	829
1.4	Quota completed > address not used	191	361	3357	1623	351	1161	3856	10900
1.5	No target person in company	57	344	186	98	72	109	691	1557
1.6	Language problems	2	16	14	14	1	0	0	47
1.7	No answer on no. of employees	10	8	3	1	0	0	8	30
1.8	Company does not use computers	11	80	194	332	41	30	567	1255
	Sum 1.1 – 1.8	479	1875	4664	2641	1208	2721	6223	19811
2	**Sample (net)**	**2153**	**5372**	**4132**	**7482**	**3874**	**5104**	**6881**	**34998**
2.1	Nobody picks up phone (and max. contacts not yet exhausted)	212	366	335	892	1080	1333	6	4224
2.2	Line busy, engaged	60	52	6	68	60	438	0	684
2.3	Answering machine	42	133	20	1208	79	137	463	2082
2.4	Contact person refuses (refusal at reception, switchboard)	472	931	2010	2024	755	1613	1695	9500
2.5	Target person refuses	388	2125	184	693	142	122	2591	6245
2.6	No appointment during fieldwork period	42	13	395	202	0	261	298	1211
2.7	Open appointment	77	935	363	1584	968	371	1008	5306
2.8	Target person is ill / not available	10	3	47	0	2	0	0	62
2.9	Interview abandoned	91	56	22	57	28	79	119	452
2.10	Interview error, cannot be used	9	0	0	4	1	0	0	14
	Sum 2.1 – 2.10	1403	4614	3382	6732	3115	4354	6180	29780
3	**Successful interviews**	**750**	**758**	**750**	**750**	**759**	**750**	**701**	**5218**
	Completion rate (= [3] / [2])	**34.8%**	**14.1%**	**18.2%**	**10.0%**	**19.6%**	**14.7%**	**10.2%**	**14.9%**
	Average interview time (min : sec)	**17:07**	**19:06**	**17:29**	**17:15**	**20:51**	**21:15**	**19:53**	**19:00**

Non response: In a voluntary telephone survey, in order to achieve the targeted interview totals, it is always necessary to contact more companies than just the number equal to the target. In addition to refusals, or eligible respondents being unavailable, any sample contains a proportion of "wrong" businesses (e.g., from another sector), and wrong and/or unobtainable telephone numbers. Table 5 shows the completion rate by country (completed interviews as percentage of contacts made) and reasons for non-completion of interviews. Higher refusal rates in some countries, sectors or size bands (especially among large businesses) inevitably raises questions about a possible refusal bias. That is, the possibility that respondents differ in their characteristics from those that refuse to participate. However, this effect cannot be avoided in any voluntary survey (be it telephone- or paper-based).

Feedback on the fieldwork

No major problems were reported from the fieldwork with respect to interviewing (comprehensibility of the questionnaire, logical structure). The overall feedback from the survey organisations was that fieldwork ran smoothly and that the questionnaire was well understood by most respondents. The main challenge was the fulfilment of the quotas, which was difficult or impossible in some of the sectors, in particular among the larger size-bands. Specific remarks from fieldwork organisations, however, point at some differences in the local situation (see Table 6).

Table 6: Comments by national fieldwork companies on their experience (2005)

Country		Comments
CZ	Czech Republic	• It was more difficult to complete interviews with very small companies. They were less willing to participate in an interview. • Respondents often felt that questions about a firm's profit or turnover are not adequate. The interviewers mentioned that these questions were several times a cause of abandoning the interview.
DE	Germany	• In total fieldwork ran smoothly and the questionnaire was easy to understand and interesting for most of respondents. • Answering the question about turnover as well as the investment on ICT was often problematic for the respondents and yielded a high proportion of non-replies. • Respondents of small companies often had difficulty in answering questions related to specific technical terms and application. In cases where they used only one or few computers, some questions (e.g. regarding networks) were not relevant for them. • Positive resonance comes from the respondents when they know that the survey is being done on behalf of the European Commission. The reference to the website at the end of the interview was welcome and helpful.
ES	Spain	• Interviews in very small companies were more difficult to complete due to the lack of knowledge about ICT. On the other hand, the participation of respondents in big companies was difficult to achieve. • Generally the questionnaire was easy to understand. • About a quarter of the firms contacted have subcontracted most of their ICT tasks, which made it difficult for the respondents to answer specific technical questions. • Questions regarding the turnover and investments were difficult to answer for the respondents and yielded a high proportion of don't know responses. This is also often experienced in other B2B surveys.
FR	France	• Small companies often do not have much ICT equipment. Respondents therefore sometimes had difficulty in answering some of the questions, since the questionnaire was not adapted to these companies. Small companies often answered "don't know" to more detailed questions. • Respondents from larger companies had difficulty answering questions concerning turnover, benefits and other financial issues. These questions would be better put to somebody from the financial department. • As more and more companies outsource their IT department, it is difficult to identify a responsible person within the company to answer the questions.

IT	Italy	• The questionnaire was considered long, but quite easy to answer. • However, a few sections (mainly D and E) were considered more complicated than others. In particular technical terms that referred to security and to online services were difficult to understand. • Interviews were carried out without any problems in medium-sized enterprises where it is easier to identify and contact an IT manager. Those respondents had the best grasp of what was being talked about in the interview. • The financial questions were difficult to answer for most of the respondents, especially the question on ICT investments.
PL	Poland	• Respondents from small companies often had difficulties in answering questions related to specific technical applications. • Companies are quite reluctant to provide financial information, so respondents often answer DK to the financial questions. • In many companies, IT people are not allowed to say anything about internal matters of the company. • Many companies outsource their IT department and its activities.
UK	United Kingdom	• As with previous surveys carried out in the context of the *e-Business W@tch* programme, fieldwork ran relatively smoothly. • However, the anticipated strike-rate was severely affected by the substantial length of the interview (20 minutes). • Gathering turnover and investment details again yielded a high proportion of don't know responses. • As a final point, it is becoming increasingly difficult to secure interviews with IT/DP professionals, and we suspect that this situation will only worsen in the future.

Weighting schemes

Due to stratified sampling, the sample size in each size-band is not proportional to the population numbers. If proportional allocation had been used, the sample sizes in the 250+ size-band would have been extremely small, not allowing any reasonable presentation of results. Thus, weighting is required so that results adequately reflect the structure and distribution of enterprises in the population of the respective sector or geographic area. *e-Business W@tch* applies two different weighting schemes: weighting by employment and by the number of enterprises.[2]

- Weighting by employment: Values that are reported as employment-weighted figures should be read as "enterprises comprising x% of employees" (in the respective sector or country). The reason for using employment weighting is that there are many more micro-enterprises than any other firms. If the weights did not take into account the economic importance of businesses of different sizes in some way, the results would be dominated by the percentages observed in the micro size-band.
- Weighting by the number of enterprises: Values that are reported as "x% of enterprises" show the share of firms irrespective of their size, i.e. a micro-company with a few employees and a large company with thousands of employees both count equally.

[2] In the tables of this report, data are presented in both ways.

Statistical accuracy of the survey: confidence intervals

Statistics vary in their accuracy, depending on the kind of data and sources. A "confidence interval" is a measure that helps to assess the accuracy that can be expected from data. The confidence interval is the estimated range of values on a certain level of significance. Confidence intervals for estimates of a population fraction (percentages) depend on the sample size, the probability of error, and the survey result (value of the percentage) itself. Further to this, variance of the weighting factors has negative effects on confidence intervals.

Table 7 gives some indication about the level of accuracy that can be expected for industry totals (EU7 totals based on all respondents) depending on the weighting scheme applied. For totals of all-sectors, an accuracy of +/- 2 percentage points can be expected for most values that are expressed as "% of firms", and of +/- 3 percentage points for values that are weighted by employment. The confidence interval for industry totals (EU-7) is about +/- 5 percentage points (in both weighting schemes). Employment-weighted results for the pharmaceutical, the automotive and the aeronautics industry have higher confidence intervals, because these sectors are more sensitive to weights due to their structure (i.e. the dominance of large firms in a comparatively small population). In the aeronautics industry, employment-weighted figures should not be used.

Please note that the calculation of confidence intervals is based on the assumption of (quasi-) infinite population universes. In practice, however, in some industries and in some countries the complete population of businesses consists of only several hundred or even a few dozen of enterprises. In some cases, literally each and every enterprise within a country-industry and size-band cell was contacted and asked to participate in the survey. This means that it is practically impossible to achieve a higher confidence interval through representative enterprise surveys in which participation is not obligatory. This should be borne in mind when comparing the confidence intervals of *e-Business W@tch* surveys to those commonly found in general population surveys.

Table 7: Confidence intervals for all-sector and sector totals (EU-7)

		Confidence interval		
	Survey result	Weighted by employment	Weighted as "% of firms"	Unweighted
All sectors (aggregate), EU-7	**10%**	**8.1% - 12.2%**	**8.7% - 11.5%**	**9.3% - 10.7%**
Food and beverages	10%	7.2% - 13.8%	6.9% - 14.3%	8.1% - 12.3%
Textile industries	10%	7.4% - 13.3%	6.9% - 14.3%	8.1% - 12.3%
Publishing and printing	10%	7.2% - 13.7%	7.2% - 13.8%	8.1% - 12.3%
Manufacture of pharmaceuticals	10%	5.3% - 18.0%	7.5% - 13.1%	8.1% - 12.4%
Manufacture of machinery and equipment	10%	6.5% - 15.1%	7.1% - 13.9%	8.1% - 12.3%
Automotive industry	10%	4.6% - 20.2%	7.7% - 12.8%	8.1% - 12.3%
Aerospace industry	10%	1.7% - 41.3%	5.7% - 16.9%	6.8% - 14.6%
Construction	10%	7.7% - 12.8%	7.0% - 14.1%	8.1% - 12.3%
Tourism	10%	7.2% - 13.8%	6.9% - 14.3%	8.1% - 12.3%
IT services	10%	7.3% - 13.6%	6.5% - 15.2%	8.1% - 12.3%
All sectors (aggregate), EU-7	**30%**	**27.0% - 33.2%**	**27.9% - 32.2%**	**29.0% - 31.1%**
Food and beverages	30%	25.2% - 35.2%	24.7% - 35.9%	26.9% - 33.3%
Textile industries	30%	25.7% - 34.6%	24.7% - 35.8%	26.9% - 33.3%
Publishing and printing	30%	25.3% - 35.1%	25.3% - 35.2%	26.9% - 33.3%
Manufacture of pharmaceuticals	30%	21.5% - 40.2%	25.9% - 34.4%	26.8% - 33.4%
Manufacture of machinery and equipment	30%	23.9% - 36.9%	25.1% - 35.4%	26.9% - 33.3%
Automotive industry	30%	19.9% - 42.6%	26.3% - 34.0%	26.9% - 33.3%
Aerospace industry	30%	10.5% - 61.0%	22.3% - 39.0%	24.4% - 36.2%
Construction	30%	26.3% - 34.0%	24.9% - 35.7%	26.9% - 33.3%
Tourism	30%	25.2% - 35.2%	24.7% - 35.9%	26.9% - 33.3%
IT services	30%	25.5% - 35.0%	23.9% - 36.9%	26.9% - 33.3%
All sectors (aggregate), EU-7	**50%**	**46.6% - 53.4%**	**47.7% - 52.3%**	**48.9% - 51.1%**
Food and beverages	50%	44.6% - 55.4%	43.9% - 56.1%	46.6% - 53.4%
Textile industries	50%	45.2% - 54.8%	44.0% - 56.0%	46.5% - 53.5%
Publishing and printing	50%	44.7% - 55.3%	44.6% - 55.4%	46.5% - 53.5%
Manufacture of pharmaceuticals	50%	39.8% - 60.2%	45.4% - 54.6%	46.4% - 53.6%
Manufacture of machinery and equipment	50%	42.9% - 57.1%	44.4% - 55.6%	46.5% - 53.5%
Automotive industry	50%	37.7% - 62.3%	45.8% - 54.2%	46.5% - 53.5%
Aerospace industry	50%	23.2% - 76.8%	40.9% - 59.1%	43.6% - 56.4%
Construction	50%	45.8% - 54.2%	44.1% - 55.9%	46.5% - 53.5%
Tourism	50%	44.5% - 55.5%	43.9% - 56.1%	46.5% - 53.5%
IT services	50%	44.8% - 55.2%	42.9% - 57.1%	46.5% - 53.5%
All sectors (aggregate), EU-7	**70%**	**66.8% - 73.0%**	**67.8% - 72.1%**	**68.9% - 71.0%**
Food and beverages	70%	64.8% - 74.8%	64.1% - 75.3%	66.7% - 73.1%
Textile industries	70%	65.4% - 74.3%	64.2% - 75.3%	66.7% - 73.1%
Publishing and printing	70%	64.9% - 74.7%	64.8% - 74.7%	66.7% - 73.1%
Manufacture of pharmaceuticals	70%	59.8% - 78.5%	65.6% - 74.1%	66.6% - 73.2%
Manufacture of machinery and equipment	70%	63.1% - 76.1%	64.6% - 74.9%	66.7% - 73.1%
Automotive industry	70%	57.4% - 80.1%	66.0% - 73.7%	66.7% - 73.1%
Aerospace industry	70%	39.0% - 89.5%	61.0% - 77.7%	63.8% - 75.6%
Construction	70%	66.0% - 73.7%	64.3% - 75.1%	66.7% - 73.1%
Tourism	70%	64.8% - 74.8%	64.1% - 75.3%	66.7% - 73.1%
IT services	70%	65.0% - 74.5%	63.1% - 76.1%	66.7% - 73.1%
All sectors (aggregate), EU-7	**90%**	**87.8% - 91.9%**	**88.5% - 91.3%**	**89.3% - 90.7%**
Food and beverages	90%	86.2% - 92.8%	85.7% - 93.1%	87.7% - 91.9%
Textile industries	90%	86.7% - 92.6%	85.7% - 93.1%	87.7% - 91.9%
Publishing and printing	90%	86.3% - 92.8%	86.2% - 92.8%	87.7% - 91.9%
Manufacture of pharmaceuticals	90%	82.0% - 94.7%	86.9% - 92.5%	87.6% - 91.9%
Manufacture of machinery and equipment	90%	84.9% - 93.5%	86.1% - 92.9%	87.7% - 91.9%
Automotive industry	90%	79.8% - 95.4%	87.2% - 92.3%	87.7% - 91.9%
Aerospace industry	90%	58.7% - 98.3%	83.1% - 94.3%	85.4% - 93.2%
Construction	90%	87.2% - 92.3%	85.9% - 93.0%	87.7% - 91.9%
Tourism	90%	86.2% - 92.8%	85.7% - 93.1%	87.7% - 91.9%
IT services	90%	86.4% - 92.7%	84.8% - 93.5%	87.7% - 91.9%

confidence intervals at α=.90