Key Figures on Information Society Denmark 2004

Ministry of Science
Technology and Innovation

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Explanation of symbols

0 0.0	Less than 0.5 of the unit applied
.	Category not applicable
. .	Data too uncertain
. . .	Data not available
-	Nil

New knowledge of ICT development in Denmark and abroad

Information and communication technology is becoming increasingly important to citizens, the public sector and the business community. Therefore, the implementation and use of ICT is an important element of the Government's strategy to place Denmark among the world's leading high technology nations.

To achieve this we need to be able to document and describe the developments taking place in the field of information and communication technology. As this field is strongly internationalised, it is also important that we keep an eye on the development in other countries.

I therefore welcome the efforts of Statistics Denmark and the Ministry of Science, Technology and Innovation, who have selected and compiled a number of key figures that may contribute to illustrating recent trends in Denmark and abroad. These key figures are a valuable tool in the evaluation of the Government's IT and telecommunications policy.

In the Danish Government's IT and Telecommunications Policy Action Plan, *"Using IT Wisely"*, which was published in October 2003, it was announced that I would present a report to the Danish Parliament in the spring of 2004 on the status of the ICT development in Denmark. This publication forms the basis of the status report on IT and telecommunications.

Enjoy your reading of
Key Figures on Information Society Denmark 2004

Helge Sander, Minister of Science, Technology and Innovation

April 2004

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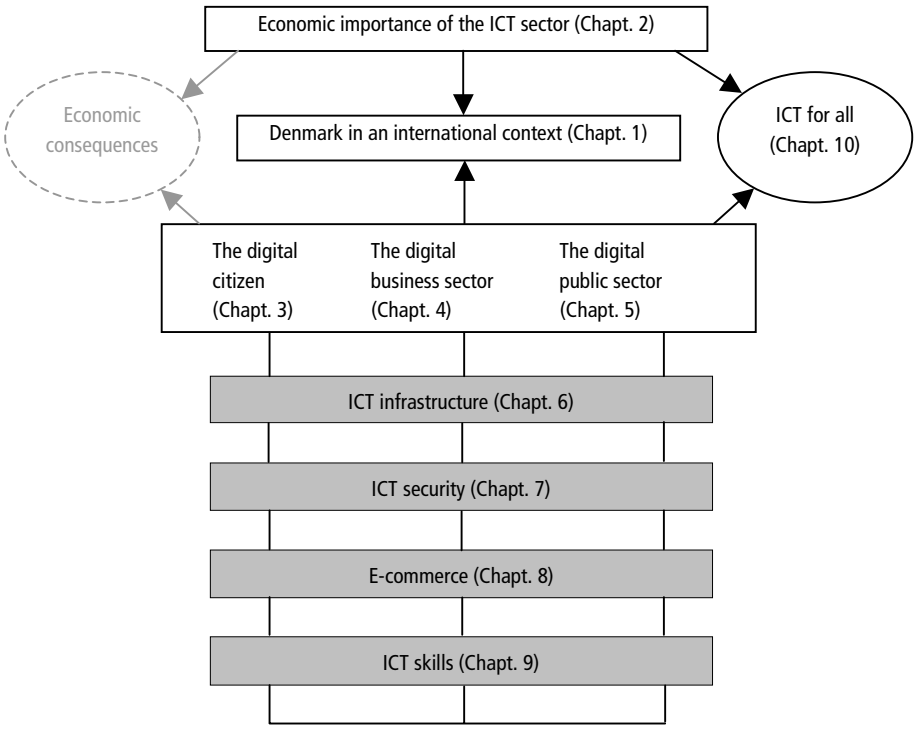
Introduction

New publication on the information society

Key Figures on Information Society Denmark 2004 presents a selection of key figures on the supply and use of information and communication technology (ICT) in Denmark. The publication is based on statistics on ICT usage by the population, the business sector and the public sector. Furthermore, register data are applied to illustrate the Danish ICT sector, and international figures serve to illustrate Denmark's position in an international context.



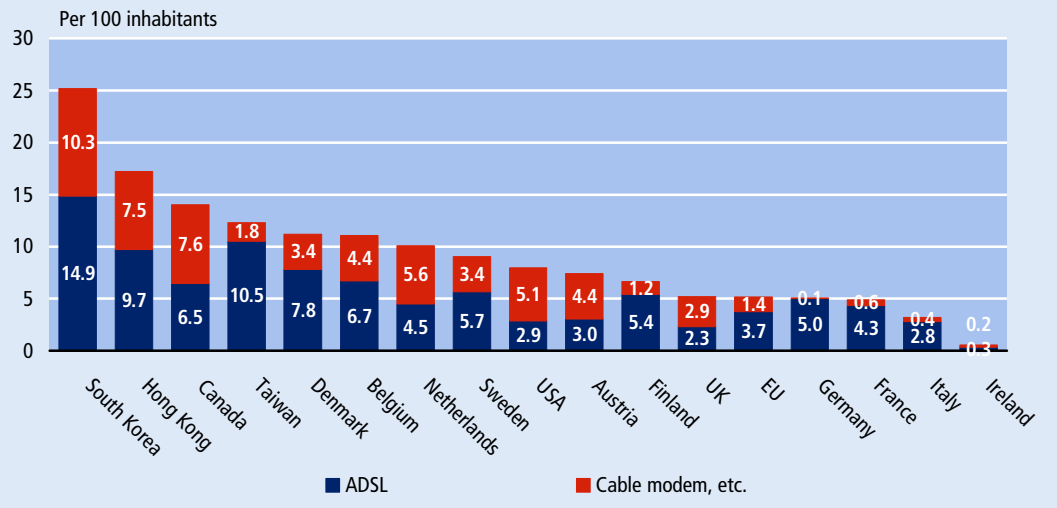
Structure of the publication

The figure illustrates the structure of the publication. First, an account is given of *Denmark in an international context*, and subsequently the current situation in Denmark is described. A distinction is made between supply and demand. *Economic importance of the ICT sector* describes the supply side, i.e. the production of ICT products and services. The demand is the use of ICT as described in *The digital citizen, The digital business sector* and *The digital public sector*.

Cross-sectoral areas

The publication also presents four cross-sectoral areas that are important to all three user groups. *ICT infrastructure* is the basis of ICT diffusion and adoption, and *ICT security* is central to further integration. *E-commerce* has created new relations between citizens, enterprises and the public sector. Citizens' *ICT skills* are a prerequisite for effective utilisation of ICT in society. The last chapter – *ICT for all* – illustrates the development in the access to and use of ICT among the Danish population.

Figure 1.1 **Penetration of fast access connections, October 2003**



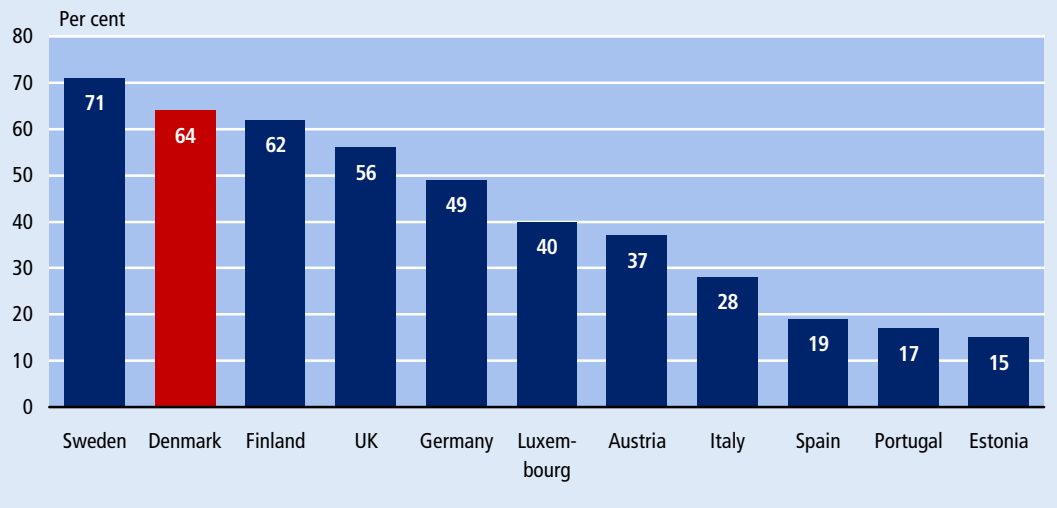
Source: European Commission, February 2004.

Denmark has highest penetration in Europe

Asian countries are among the leading in terms of penetration rates of fast Internet access. In October 2003 Denmark had the highest penetration of ADSL and cable modem services per 100 inhabitants among the European countries included in the survey.

The development in Denmark is mainly attributable to the increase in ADSL subscriptions in recent years. See also Table 6.2 in Chapter 6.

Figure 1.2 **Internet use by the population within the last three months, 2002**



Source: Eurostat, Statistics in focus, Theme 4 – 38/2003.

Danes among the most frequent users

In 2002, 64 per cent of the Danish population used the Internet. Hence, Denmark comes in second among the countries in the survey, topped only by Sweden (71 per cent).

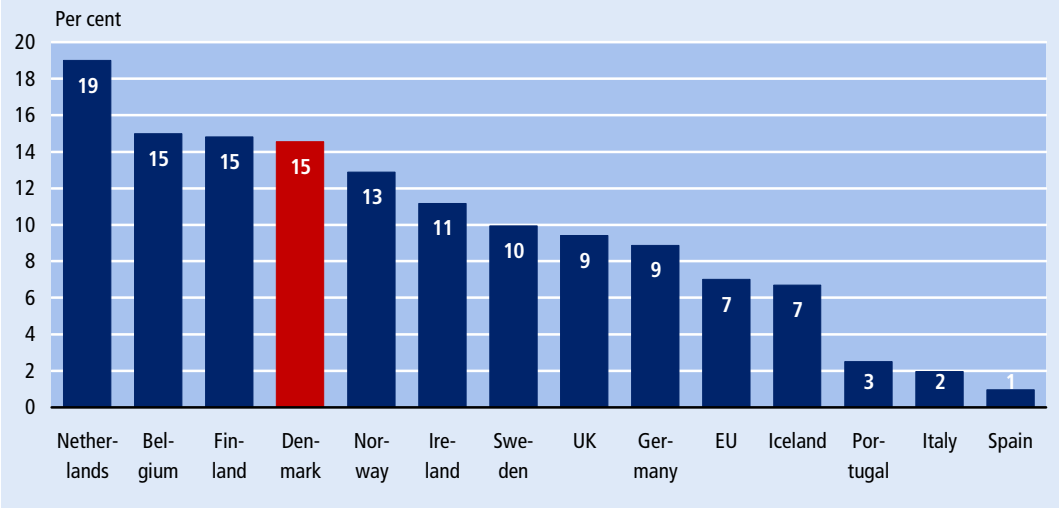
Large variations within the EU

Internet use varies considerably within the European Union. In the Nordic countries more than 60 per cent of the population had used the Internet within the last three months as compared to less than 20 per cent of the Spanish and Portuguese.

The population is defined as individuals aged 16 to 74 years.

Chapter 3 provides a more detailed description of Internet access and use among the Danish population.

Figure 1.3 **Share of enterprises having received orders via the Internet, 2002**



Note: Comprises enterprises with 10 or more employees. Internet sales cover at least 1 per cent of total turnover. Danish figures have been harmonised to EU definitions. 2002 refers to the whole year concerning e-commerce.

Source: Eurostat, Statistics on the information society in Europe, 2004.

Denmark ranks high regarding Internet access and e-commerce

Denmark ranks among the highest in terms of the share of enterprises receiving orders via the Internet (at least 1 per cent of total turnover), outranked only by the Netherlands, Belgium and Finland. Largely all Danish enterprises with 10 or more employees have Internet access. The same applies in countries such as Finland and Iceland.

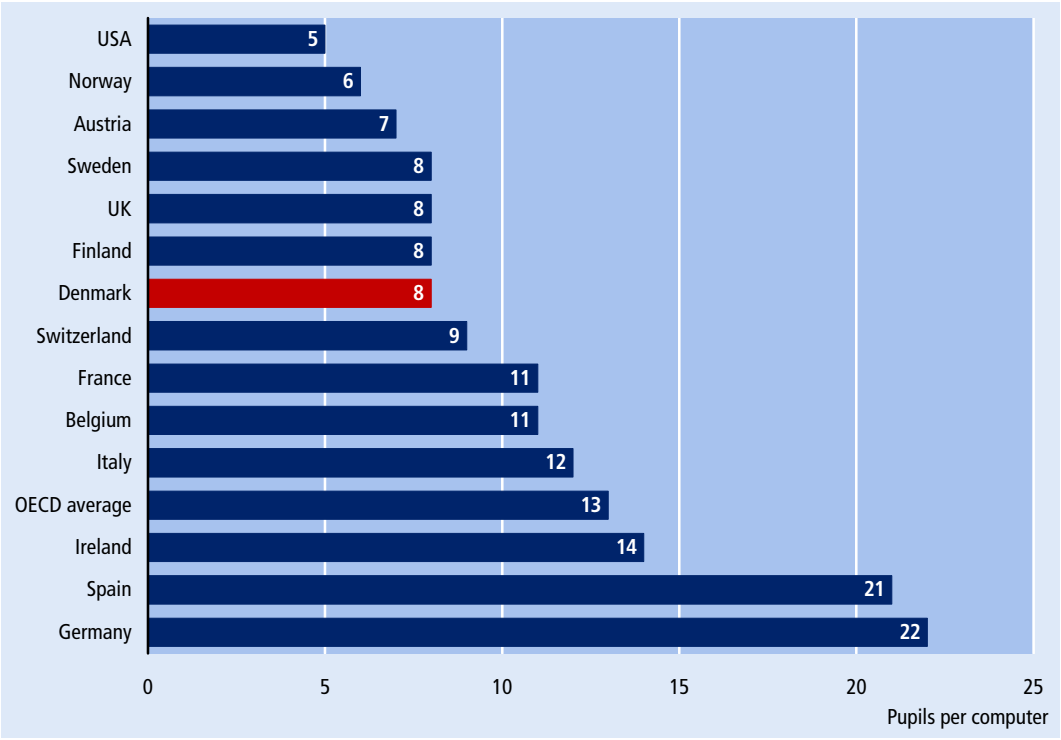
Table 1.3 **Internet use by enterprises, 2002**

	Has Internet access	Has received orders via the Internet	Has purchased via the Internet
	per cent of enterprises with 10 or more employees		
Netherlands	86	19	21
Belgium	92	15	20
Finland	98	15	15
Denmark	98	15	21
Norway	88	13	…
Ireland	86	11	22
Sweden	95	10	23
UK	81	9	19
Germany	95	9	11
EU	87	7	12
Iceland	97	7	12
Portugal	71	3	8
Italy	83	2	3
Spain	84	1	3

Note: Comprises enterprises with 10 or more employees. Internet sales/purchases cover at least 1 per cent of total turnover/purchases. The proportion of Internet users was measured in November 2002 in Denmark and 1st quarter 2003 in the other countries.

Source: Eurostat, Statistics on the information society in Europe, 2004.

Figure 1.4 **Number of pupils per computer in primary and lower secondary schools, 2000**



Note: Statistics based on the type of school in the individual countries where 15-year-olds are enrolled.
Source: OECD PISA 2000.

8 pupils per computer in Denmark in 2000

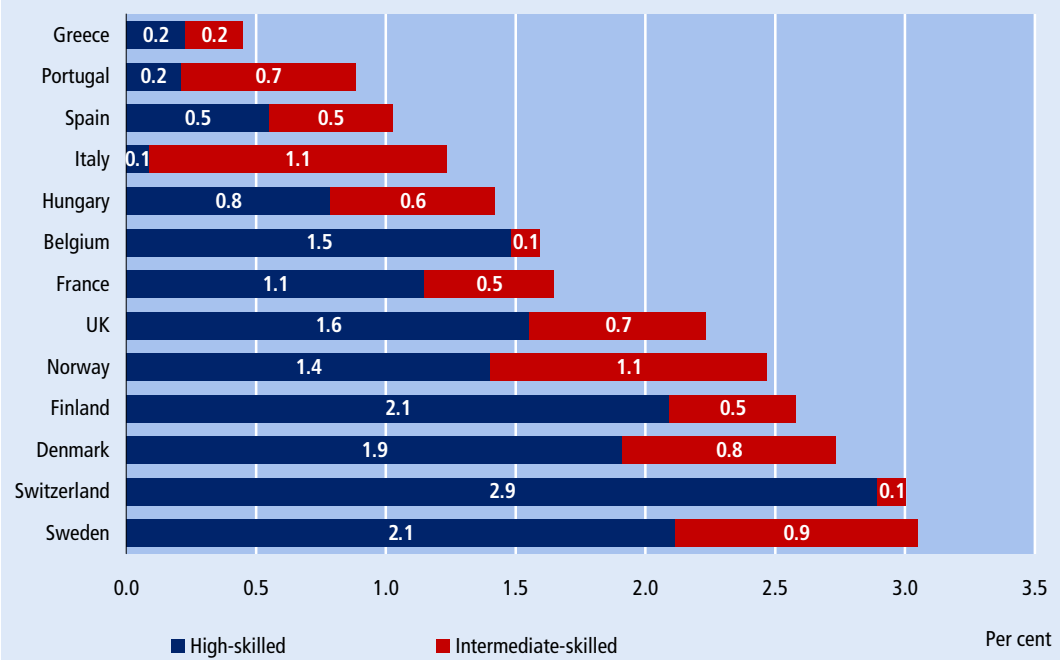
Denmark ranks among the best internationally in terms of the number of pupils per computer used for learning purposes at school. With eight pupils per computer Denmark is topped only by the USA, Norway and Austria, while Sweden, the UK and Finland are at the same level.

13 pupils per computer in the OECD in 2000

Countries such as Spain and Germany have considerably more pupils per computer and the OECD average is 13 pupils per computer.

Chapter 9 describes the trend in the number of pupils per new computer in Denmark.

Figure 1.5 **Share of high-skilled ICT workers in total occupations, Q2 2003**



Note: The definition of high-skilled ICT workers is based on occupational categories and includes ISCO-88, minor group 213. 213 comprises computing professionals, including computer system designers, analysts and programmers. Intermediate-skilled ICT workers include ISCO-88, minor group 312, who are computer associate professionals, including computer assistants, computer equipment operators and industrial robot controllers.

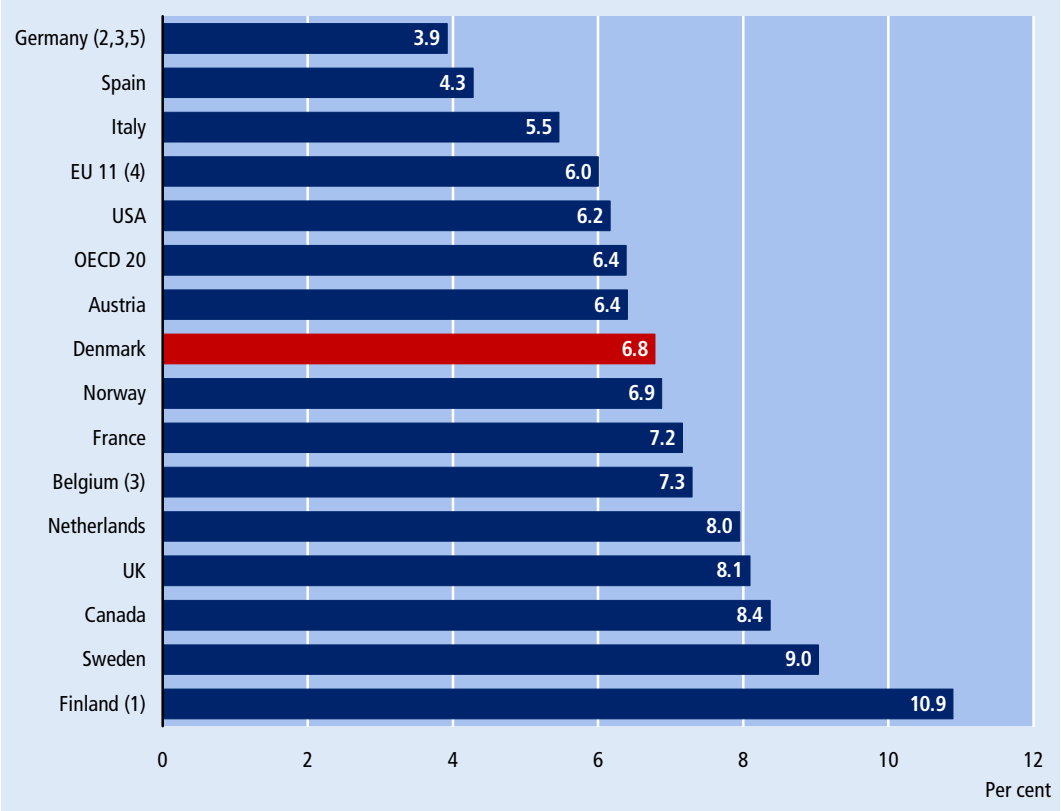
Source: Special extract from Eurostat: Labour Force Survey Database 2003.

Largest share of ICT workers in Nordic region

ICT workers account for 2.7 per cent of total occupations in Denmark. Together with the other Nordic countries and Switzerland, Denmark is at the front in Europe. Greece and Portugal are at the other end of the scale with ICT workers accounting for less than 1 per cent of total occupations.

See Chapter 9 for further information on Danes with formal ICT education.

Figure 1.6 **Share of ICT employment in business sector employment, 2000**



Note: German figures are for 1999. [1]Based on number of employees. [2]Excluding ICT wholesale (5184). [3]Rental of ICT products (7133) is not available. [4]Excluding Greece, Austria, Ireland and Luxembourg. [5]Excluding Telecommunication services (6420).

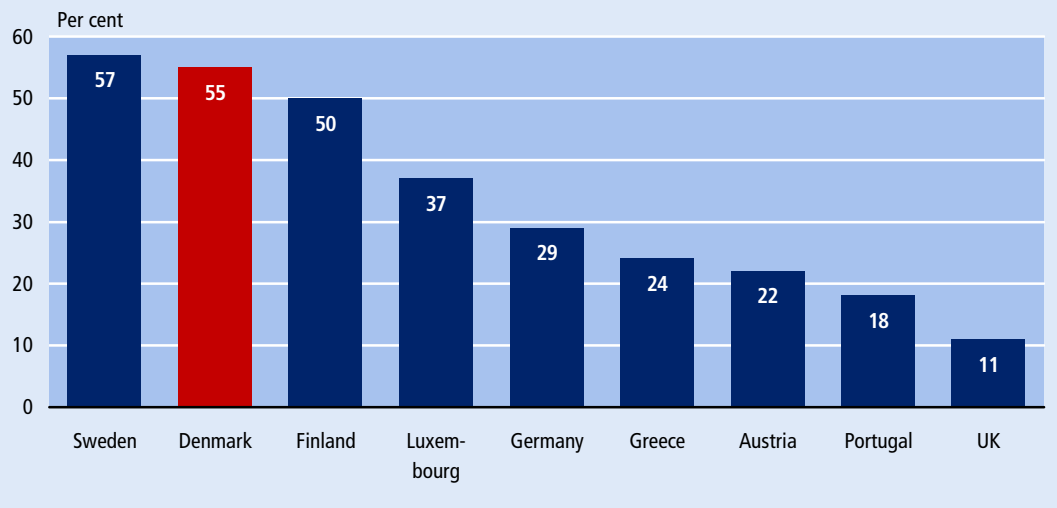
Source: OECD estimates based on national sources; STAN and national accounts databases, August 2002.

Share of ICT employment is in the midfield

Measured by employment in the ICT sector in relation to the business sector as a whole, Denmark is in the middle of the field together with Norway, Austria and the USA, all very close to the OECD average.

In Finland and Sweden, ICT employment has a much larger share as compared to the OECD average, and countries such as Spain and Germany are at the other end of the scale.

Figure 1.7 **Share of population who had communicated with public authorities via the Internet within the last three months, 2002**



Note: For Denmark the reference period is the last month prior to the survey.
Source: Eurostat, Statistics in focus, Theme 4 – 38/2003.

Denmark in leading position with the other Nordic countries

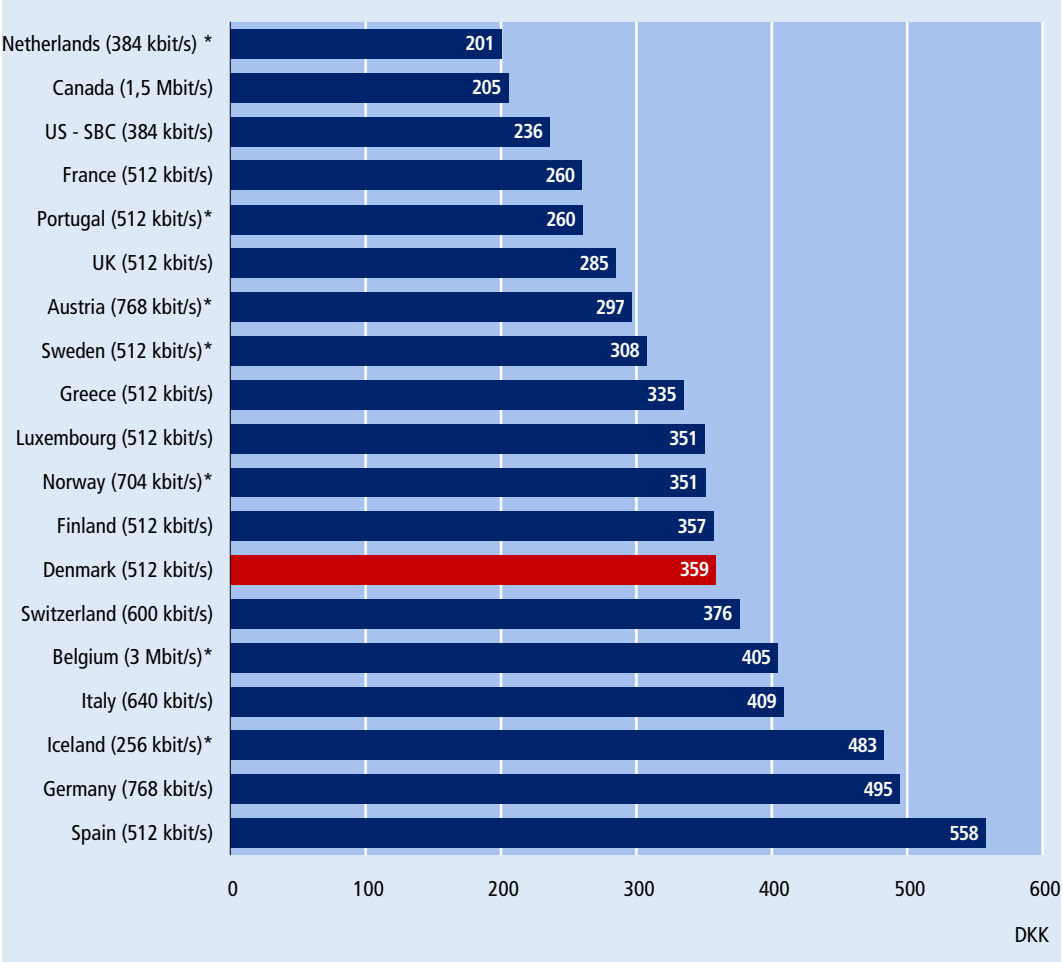
In a European context, communication between the populations and public authorities via the Internet is most common in the Nordic countries. Sweden is in the lead with 57 per cent of its population in 2002 having communicated with public authorities within the last three months. In Denmark the figure was 55 per cent.

Use of the Internet for communication with public authorities is somewhat less common in Portugal and the UK, with 18 and 11 per cent, respectively.

The most frequent use is for finding information on official web sites. Communication with public authorities also includes downloading forms and submitting completed forms.

The Danish population's communication with public authorities via the Internet is further described in Figure 5.1 and Figure 10.3.

Figure 1.8 **Comparison of ADSL prices, January 2004**



Note: Represented by the cheapest of the major providers in each country. Prices are not adjusted for differences in purchasing power. A comparison of ADSL prices is difficult due to different speeds in different countries. Furthermore, in the countries marked with *, a variable traffic charge is payable if the subscriber exceeds a specified monthly volume of traffic.

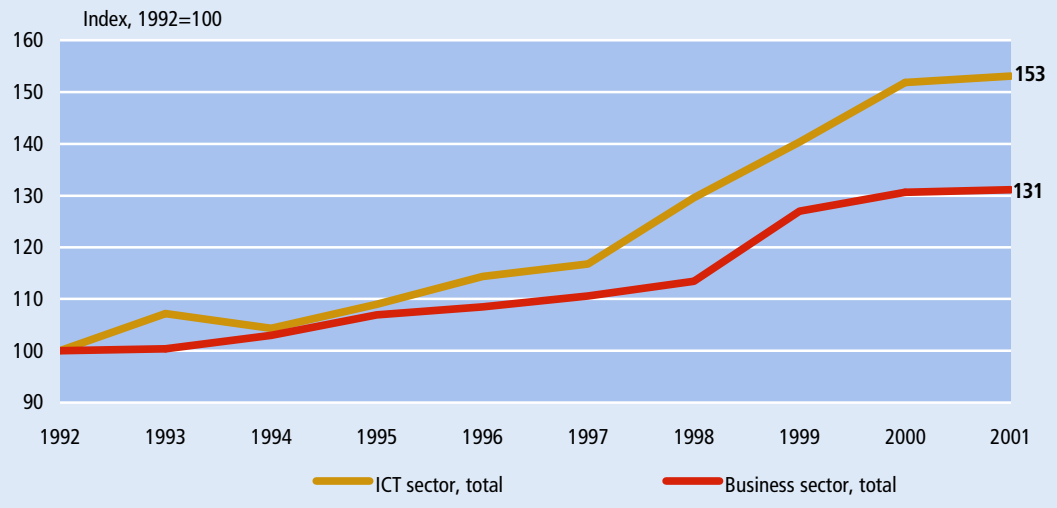
Source: Broadband Market Tariffwatch, www.baskerville.telecoms.com, January 2004.

Denmark has relatively high ADSL prices

With DKK 359 per month, the price of ADSL in Denmark is among the most expensive. Compared with countries where the available speed is the same as in Denmark, only Spain has a higher price.

See also Figure 6.1 on the development in Danish ADSL prices.

Figure 2.1 **Full-time employees in the ICT sector**



Source: Statistics Denmark, Enterprise statistics (1992-1999) and General enterprise statistics (1999-2001).

ICT sector employment up by 53 per cent from 1992 to 2001

The number of full-time employees in the ICT sector has risen substantially since the early 1990s, and faster than the number of full-time employees in the business sector in general. In 2001, the ICT sector had 104,800 full-time employees, corresponding to 8.3 per cent of total employment in the business sector. This equates to an increase of 1.2 percentage points since 1992, when the corresponding share was 7.1 per cent.

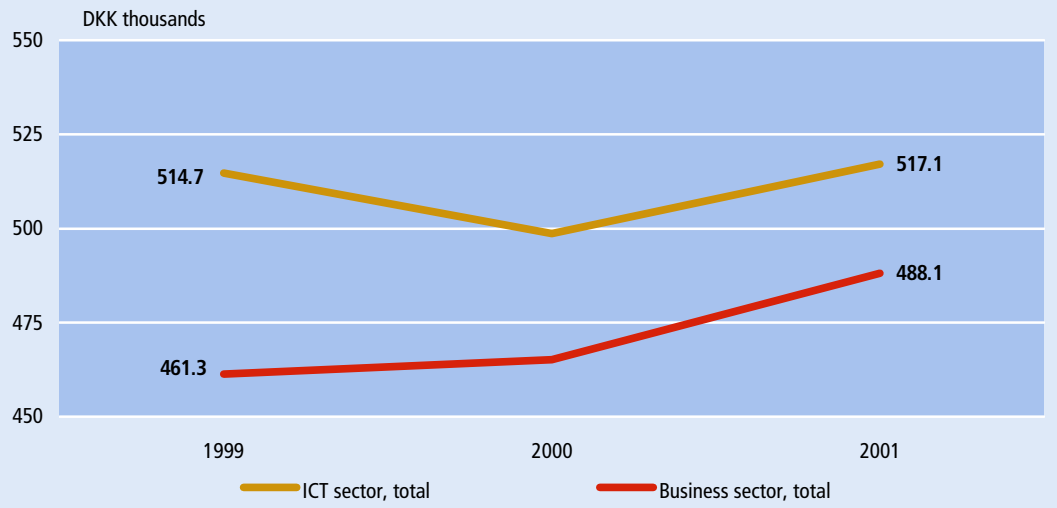
Table 2.1 **Full-time employees in the ICT sector**

	1992	1993	1994	1995	1996	1997	1998	1999	1999	2000	2001
	1,000 full-time employees										
ICT sector, total	68	73	71	75	78	80	89	96	96	104	105
Business sector, total	962	966	991	1 029	1 044	1 064	1 092	1 111	1 223	1 257	1 262
	per cent										
ICT sector's share of business sector	7.1	7.6	7.2	7.3	7.5	7.5	8.1	8.7	7.9	8.3	8.3

Note: The number of full-time employees is a measure of the total employment and is calculated on the basis of the contributions of each enterprise to the Danish Labour Market Supplementary Pension (ATP). The statistics do not include owners of personally owned enterprises.

Source: Statistics Denmark, Enterprise statistics (1992-1999) and General enterprise statistics (1999-2001).

Figure 2.2 **Value added per full-time employee**



Note: Excluding telecommunications.
Source: Statistics Denmark, General enterprise statistics, 2001.

High earnings capacity in ICT sector in general ...

The earnings capacity of the ICT sector, measured as the average value added per full-time employee, is higher than the average for the business sector as a whole. In 2001, the ICT sector had an average value added per full-time employee of DKK 517,000, or 6 per cent above the level of the business sector, which was DKK 488,000.

..but considerable variation within the ICT sector

There are major mutual differences in the level of the individual industries within the ICT sector. The value added in ICT manufacturing in 2001 was DKK 445,000 per full-time employee, which is the lowest among the ICT industries.

The value added for telecommunications was not calculated until 2001, which is why this industry is not included in the aggregate statistics. In 2001 the value added in telecommunications was DKK 854,000.

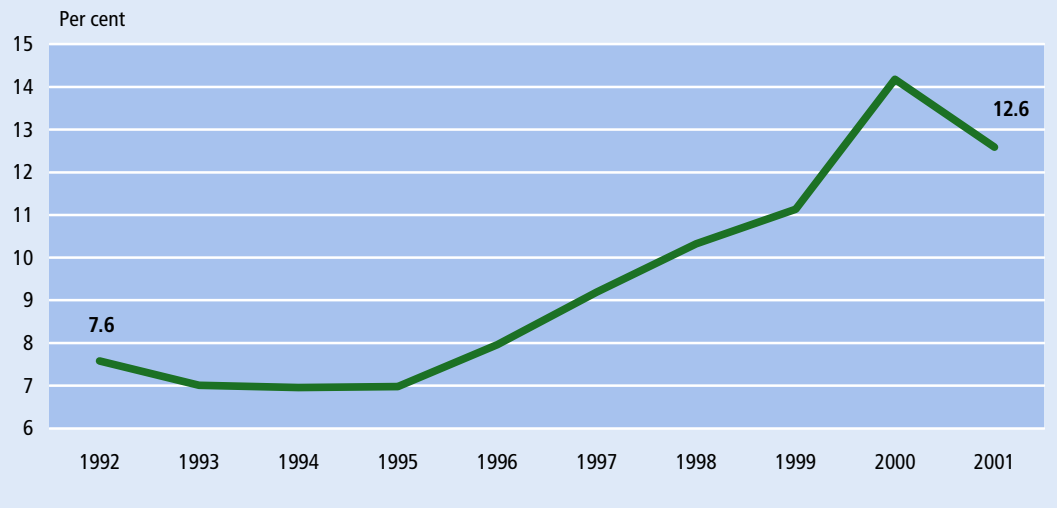
Table 2.2 **Value added per full-time employee**

	1999	2000	2001
	DKK thousands		
ICT sector, total	**514.7**	**498.7**	**517.1**
ICT manufacturing	428.4	393.0	445.3
ICT wholesale	521.0	548.4	533.2
ICT consulting services	575.3	525.0	544.3
Business sector, total	**461.3**	**465.2**	**488.1**

Note: The value added per full-time employee is only calculated for enterprises and activities comprised by the Accounting Statistics, from which the value added is derived.

Source: Statistics Denmark, General enterprise statistics, 1999.

Figure 2.3 **The ICT sector's share of new enterprises**



Source: Statistics Denmark, Statistics on new enterprises.

15,000 new ICT enterprises since early 1990s ...

Since the early 1990s, more than 15,000 new enterprises have been established within the ICT sector, corresponding to 10 per cent of all new enterprises in the period. The new ICT enterprises have accounted for an ever increasing share of new enterprises since the mid-1990s.

..and 2,640 new ICT enterprises in 2000 alone

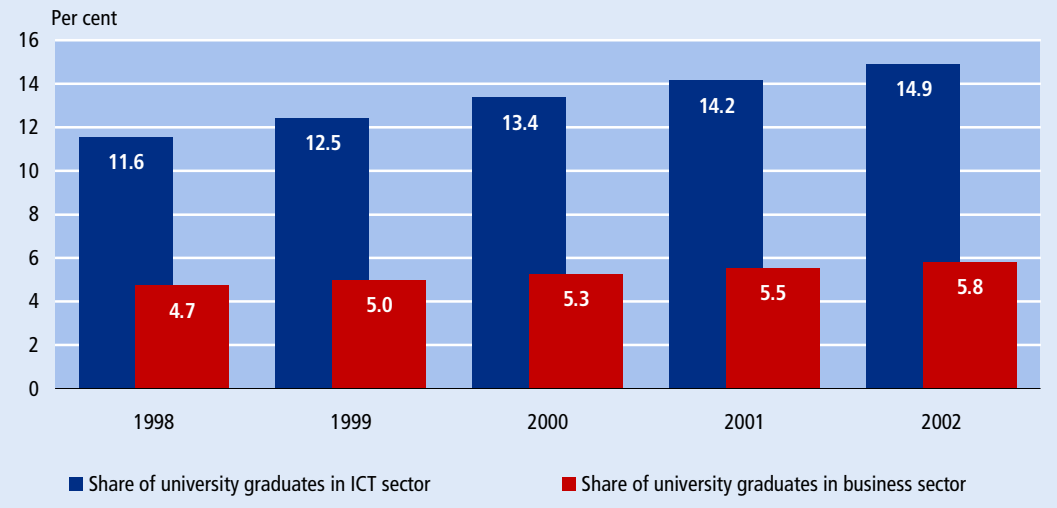
In the period 1993 to 1995, about 1,000 new ICT enterprises were established each year, but from 1996 to 2000 the annual number of new enterprises increased. This trend peaked in 2000 with a total of 2,640 new ICT enterprises. 2001 saw the establishment of 2,068 new ICT enterprises, a decline of 22 per cent compared to 2000. The decline in new enterprises in 2001 was not limited to the ICT sector as the total number of new enterprises decreased by 12 per cent from 2000 to 2001.

Table 2.3 **New enterprises**

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	number									
ICT sector	1 203	1 027	1 077	996	1 163	1 483	1 658	1 973	2 640	2 068
Business sector	15 865	14 642	15 476	14 261	14 613	16 143	16 050	17 715	18 625	16 429
	per cent									
ICT sector's share of business sector	7.6	7.0	7.0	7.0	8.0	9.2	10.3	11.1	14.2	12.6

Source: Statistics Denmark, Statistics on new enterprises. 1992-2001.

Figure 2.4 **Share of employed university graduates**



Source: Statistics Denmark, Education and employment of the population. 1998-2002.

High educational level in ICT sector

The workforce of the ICT sector generally has a high, and increasing, educational level. Of the employees in the ICT sector 15 per cent, or more than one in seven employees, had a university degree in 2002, that is either a bachelor's, master's or PhD degree. Only one in 17 employees in the business sector have a university degree.

Over one in seven have university degree

The share of university graduates in the ICT sector has increased from just under 12 per cent in 1998 to 15 per cent in 2002, which is an increase of 3 percentage points, while the corresponding share in the business sector during the same period has increased from just under 5 per cent to 6 per cent, or 1 percentage point. The growing share of university graduates in the ICT sector equates to an increase from 13 per cent of all university graduates in 1998 to 16 per cent in 2002. The figures further show that one in six university graduates were employed in the ICT sector in 2002 compared to one in eight in 1998.

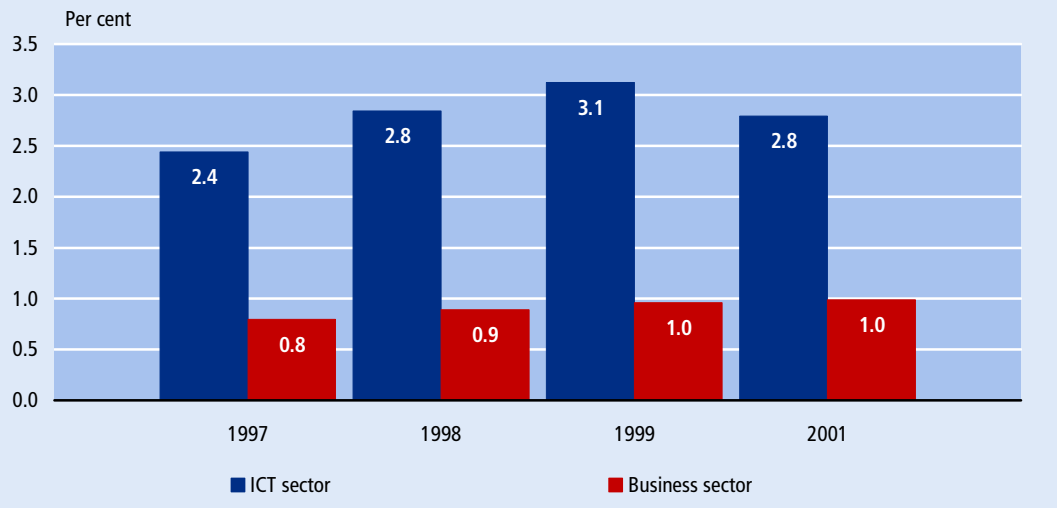
Table 2.4 **Number of university graduates in the ICT sector and the business sector**

	1998	1999	2000	2001	2002
	number				
Employees in ICT sector, total	89 010	95 868	102 196	109 603	108 335
University graduates in ICT sector, total	10 306	11 936	13 675	15 529	16 174
Employees in business sector, total	1 660 642	1 696 835	1 715 988	1 736 715	1 733 814
University graduates in business sector, total	78 644	84 706	90 423	96 064	100 648
ICT sector's share of total university graduates (%)	13.1	14.1	15.1	16.2	16.1

Note: Employment is based on the actual number of persons in the population statistics with a given degree. The figure is therefore higher than the calculated number of full-time employees stated in Table 2.1, in which a part-time employee, for example, is included as a half full-time employee.

Source: Statistics Denmark, Education and employment of the population. 1998-2002.

Figure 2.5 **Research and development (R&D) as share of turnover**



Source: The Danish Institute for Studies in Research and Research Policy, Erhvervslivets forskningsarbejde (Research by trade and industry) 1997-2001, and Statistics Denmark, Enterprise statistics 1997-1999 and General enterprise statistics 2001.

ICT sector invested DKK 5.7bn in R&D in 2001 ...

In the period 1997 to 2001, the ICT sector invested an annually increasing amount in research and development. From 1997 to 2001 the amount increased by 62 per cent from DKK 3.5bn to DKK 5.7bn.

... corresponding to 2.8 per cent of turnover ...

In relation to turnover, R&D investments accounted for 2.8 per cent in 2001 compared to 2.4 per cent in 1997, while total R&D investments in the business sector in 2001 accounted for 1 per cent of turnover.

... and 26 per cent of R&D investments by the business sector

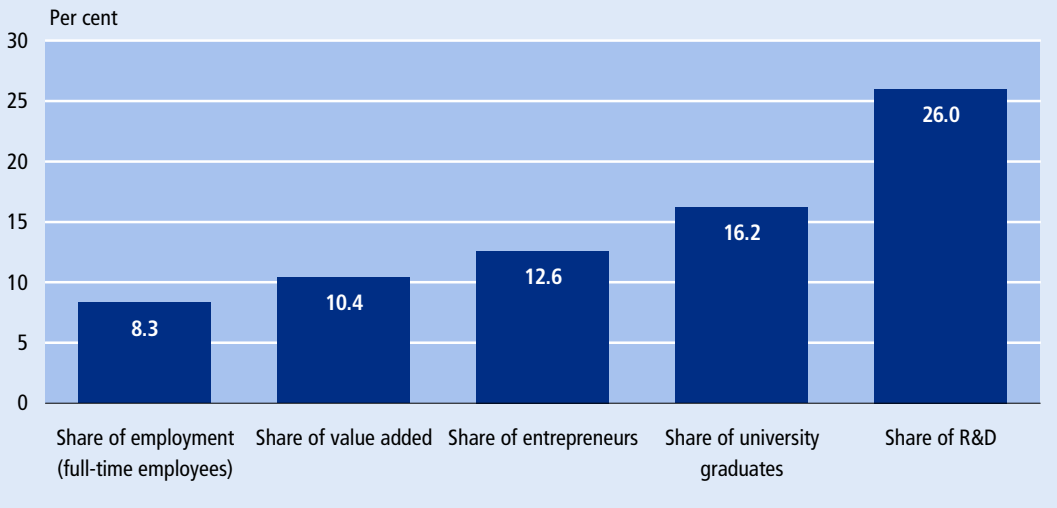
The ICT sector accounts for a substantial share of total R&D investments by the business sector. In 2001, the ICT sector's share constituted 26 per cent of total R&D investments by the business sector in the amount of DKK 21.7bn, which was a decrease of 5.3 percentage points from 31.3 per cent in 1999.

Table 2.5 **Research and development as per cent of turnover**

	1998		1999		2001	
	R&D	Turnover	R&D	Turnover	R&D	Turnover
	DKK million					
ICT sector	4 646	163 459	5 369	171 926	5 695	203 869
Business sector, total	15 395	1 728 485	17 151	1 789 636	21 660	2 215 436
	per cent					
ICT sector's share of business sector	30.2	9.5	31.3	9.6	26.3	9.2

Source: The Danish Institute for Studies in Research and Research Policy, Erhvervslivets forskningsarbejde (Research by trade and industry). 2001, and Statistics Denmark, General enterprise statistics 2001.

Figure 2.6 **Size, value creation and knowledge intensity of the ICT sector, 2001**



Note: The ICT sector's share of the value added for 2001 includes the value added in telecommunications.

Source: Statistics Denmark, General enterprise statistics 2001, and The Danish Institute for Studies in Research and Research Policy, Erhvervslivets forskning og udviklingsarbejde (Research and development by trade and industry). 2001.

ICT sector characterised by high knowledge intensity ...

In terms of size, the ICT sector accounts for 8.3 per cent of employment. The ICT sector is considerably more knowledge-intensive than the business sector as a whole, particularly by virtue of its substantial R&D investments and a large share of its employees being university graduates. This knowledge intensity may be one of the reasons why the value creation in the ICT sector accounts for 10.4 per cent.

... substantial R&D investments

The most distinctive figure is the ICT sector's contribution to total R&D investments, which corresponds to 26 per cent of total R&D investments by the business sector.

... high educational level

Employees in the ICT sector generally have considerably higher degrees than employees in the business sector as a whole. In 2001, employment in the ICT sector accounted for 8.3 per cent of total employment in the business sector, while its share of university graduates was nearly twice as high, namely over 16 per cent.

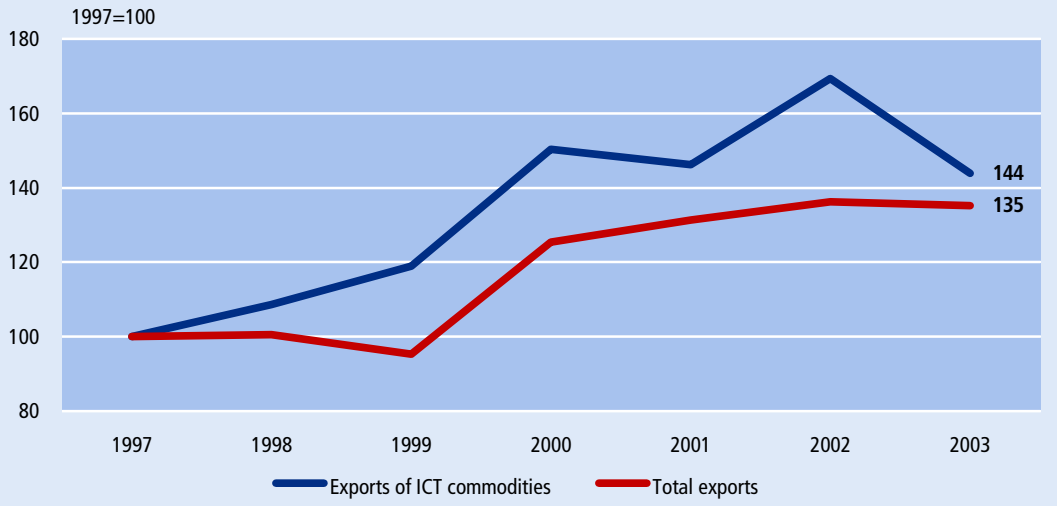
... many new enterprises

A measure of the dynamics of the ICT sector is the share of new enterprises, which in 2001 accounted for 12.6 per cent of all new enterprises in the business sector.

... and high earnings capacity

Similarly, the earnings capacity of the ICT sector, measured as value added, was higher than the share of employees; thus, in 2001 the value added in the ICT sector constituted 10.4 per cent of the total value added in the business sector.

Figure 2.7 **ICT exports**



Source: Statistics Denmark, Foreign trade statistics (special extract).

Exports of ICT commodities came to DKK 38bn in 2003 ...

Danish exports of ICT commodities totalled DKK 38bn in 2003, which is a 44 per cent increase since 1997. In the same period, total exports rose by 35 per cent from DKK 321bn in 1997 to DKK 434bn in 2003. This means that the share of ICT commodities of total exports increased from 8.1 per cent in 1997 to 8.7 per cent in 2003.

... while exports of ICT services came to DKK 6.7bn

Exports of services by ICT consulting firms were first calculated for the year 2002, when they amounted to DKK 6,718bn, or 16 per cent of the total turnover of that activity. Total exports of ICT commodities and services thus exceeded DKK 51bn in 2002.

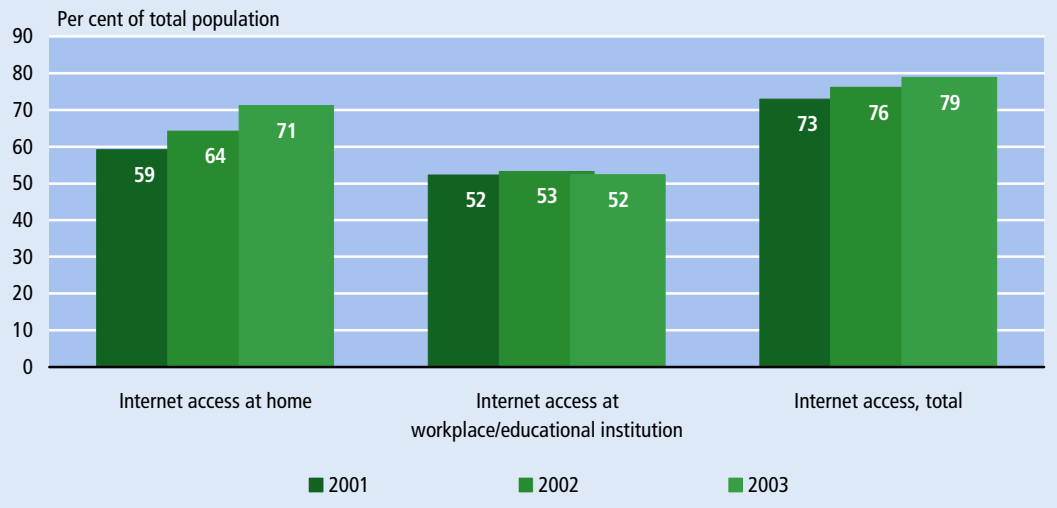
Table 2.7 **Share of ICT exports of total exports**

	1997	1998	1999	2000	2001	2002	2003
	DKK million						
Exports of ICT commodities	26 187	27 437	31 142	39 384	38 302	44 350	37 682
Exports of medicinal and pharmaceutical commodities[1]	15 615	16 869	21 155	24 097	28 246	30 359	34 641
Exports of agricultural goods[1]	47 132	42 436	42 673	47 687	52 439	49 347	47 163
Total exports	321 185	322 797	306 136	403 044	421 830	437 779	434 243
	per cent						
ICT commodities' share of exports	8.1	8.6	10.1	9.7	9.0	10.1	8.7

[1] Based on Exports by commodity groups. Regarding Agricultural goods, this group comprises Agricultural goods of animal origin, Agricultural goods of vegetable origin, and Canned meat and milk.

Source: Statistics Denmark, Foreign trade statistics (special extract).

Figure 3.1 **Internet access at home and at workplace/educational institution**



Source: Statistics Denmark, Internet use by the population.

Eight in ten have access at home and/or at work

An increasing number of the Danes get access to the Internet. In 2003, 79 per cent of the population had Internet access at home and/or at their workplace/educational institution; this compares to 76 per cent in 2002 and 73 per cent in 2001.

More have Internet access at home

The increase derives from the share of persons with Internet access at home. The last three years have seen a steady increase in the share of the population with Internet access at home. In 2003, 71 per cent of the population had Internet access at home against 59 per cent in 2001. The increase was largest from 2002 to 2003 when the share of the population with Internet access at home rose by 11 per cent.

Unchanged share with access at work

Contrary to this, the number of people with Internet access at their workplace or educational institution has remained largely unchanged. 52 per cent of the population have Internet access at their workplace.

In 2003, 71 per cent of the population had an Internet connection at home through their PC. In addition, 4 per cent had access from their mobile phone, and 2 per cent from a handheld computer.

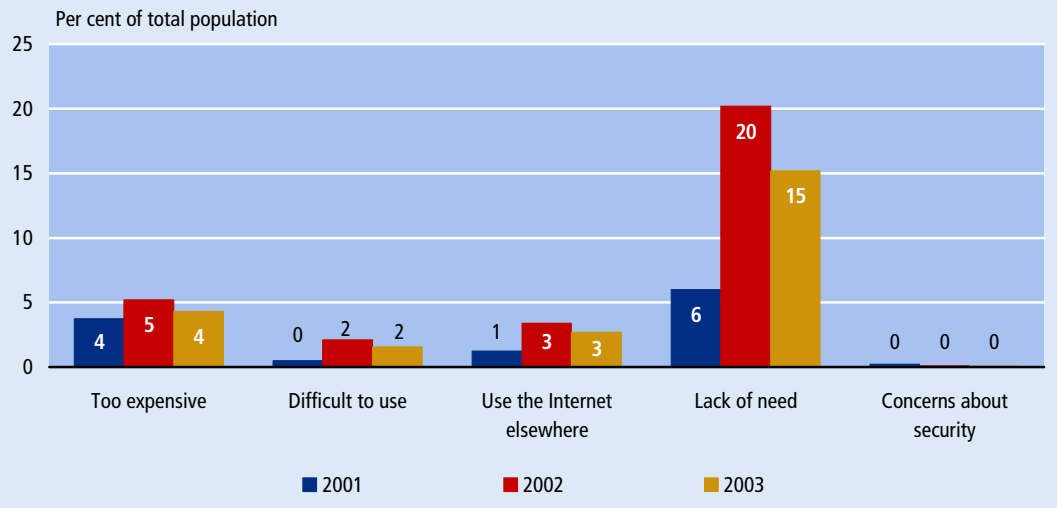
Chapter 10 shows Internet access by various population groups/types of household.

Table 3.1 **Devices for home Internet access, 2003**

	PC	Handheld computer	Mobile phone
	per cent of total population		
Access at home	71	2	4

Source: Statistics Denmark, Internet use by the population.

Figure 3.2 **Most significant barriers to home Internet access**



Note: Respondents have had more reply options during the three years; the figure shows five selected barriers.
Source: Statistics Denmark, Internet use by the population.

There has been no noticeable development in the most significant barriers to having Internet access at home.

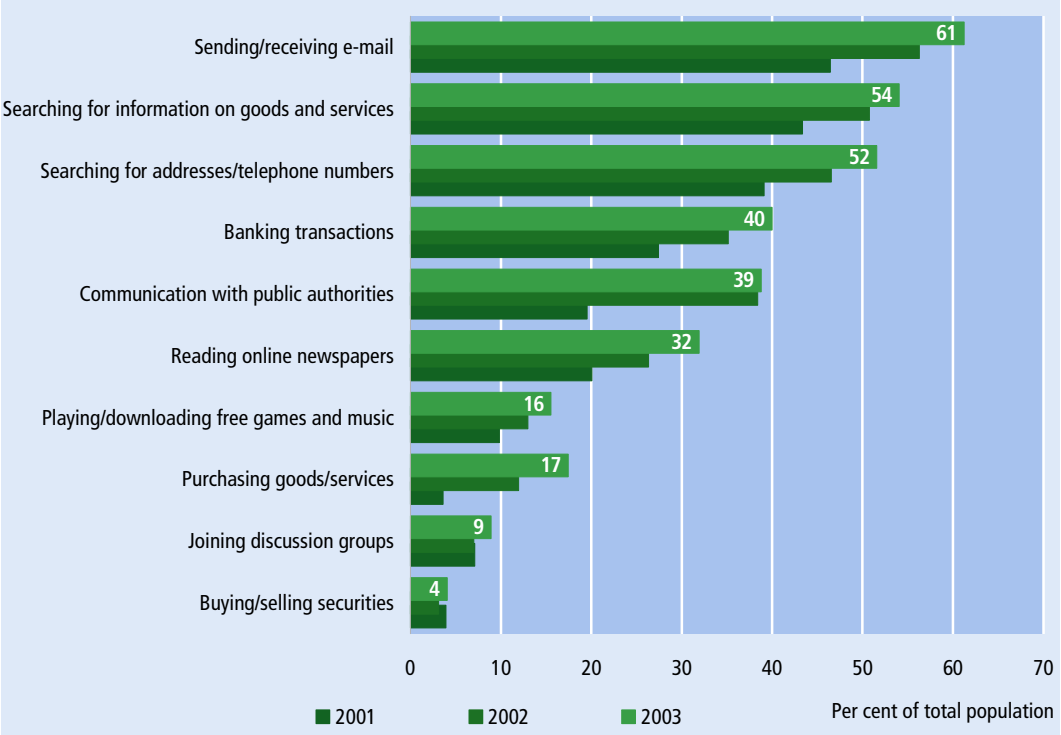
15 per cent have no need for the Internet

In 2003, 15 per cent of the population stated that the primary reason for not having Internet access at home was that they did not need or want it. This is the only one of the five barriers where the share has differed during the three years. The share was largest in 2002 when 20 per cent of the population stated a lack of need as the most significant barrier to having Internet access at home.

Concerns about personal data security are not a significant barrier

Also in 2003, 4 per cent of the population rated prohibitive connection costs as the most significant barrier, 3 per cent stated that they use the Internet elsewhere, and 2 per cent that the Internet is too difficult to use. Concerns about personal data security do not appear to be a significant barrier to having Internet access at home.

Figure 3.3 **Private purposes for using the Internet**



Note: The 2001 figure for Purchasing goods/services is not directly comparable with 2002 and 2003 figures. In 2001 respondents were asked whether they used e-commerce at least once a month, and in 2002-2003 whether they had used e-commerce within the last month.
Respondents have had more reply options during the three years; the figure shows ten selected private purposes.
Source: Statistics Denmark, Internet use by the population.

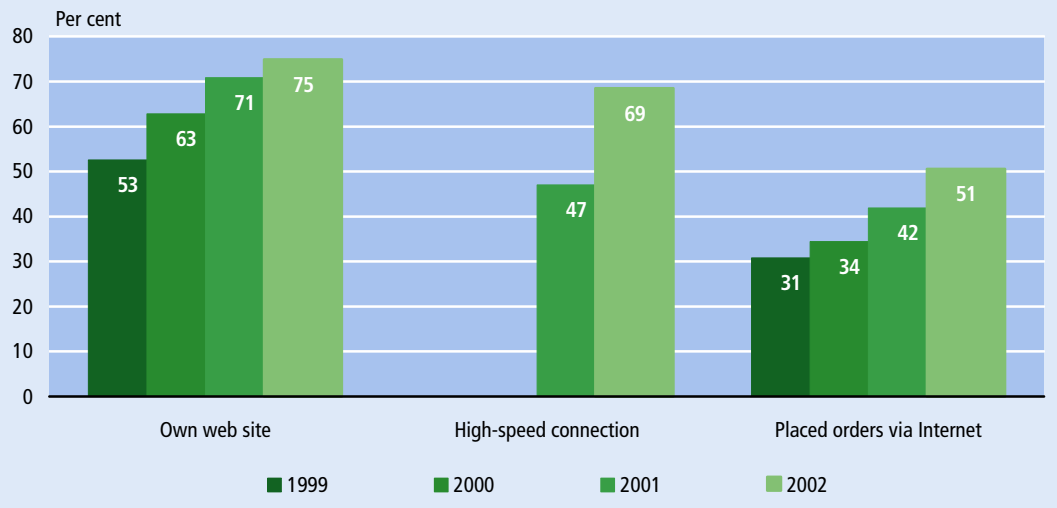
The most common private purposes for using the Internet are to communicate, to search for information and use online services. All private purposes show an increase during the three-year period from 2001 to 2003, and generally the largest increase occurred from 2001 to 2002. The priority of the purposes has remained unchanged during the three years.

Six in ten Danes use the Internet to send/receive e-mail

In 2003, 61 per cent of the population had used the Internet within the last month to send and receive e-mail, 54 per cent used it to search for information about goods and services, and 52 per cent to search for addresses or telephone numbers. 40 per cent used the Internet for banking transactions, and 39 per cent for communication with public authorities. 32 per cent used the Internet to read online newspapers/ magazines, and 17 per cent to purchase goods or services (financial services not included).

For further details on the population's use of the Internet for communication with public authorities, see Chapter 10.3, and for purchase of goods and services, see Chapter 8.1.

Figure 4.1 **Selected ICT use by enterprises**



Note: High-speed connection means fixed-line broadband access, ADSL, etc.
Source: Statistics Denmark, ICT use by Danish enterprises.

Three in four enterprises have a web site

Web sites are increasingly common among enterprises with 10 or more employees. In 1999 about every second enterprise had a web site – by 2002 this share had increased to three in four enterprises.

Seven in ten enterprises have high-speed connections

The share of enterprises with high-speed connections, i.e., fixed broadband access, ADSL or the like, rose steeply from 47 per cent in 2001 to 69 per cent in 2002. Also electronic commerce has seen a noticeable rise in terms of purchases on the Internet. Less than every third enterprise had placed an order through the Internet in 1999 – in 2002 more than every second had placed an order.

Web sites also common among small and medium-sized enterprises

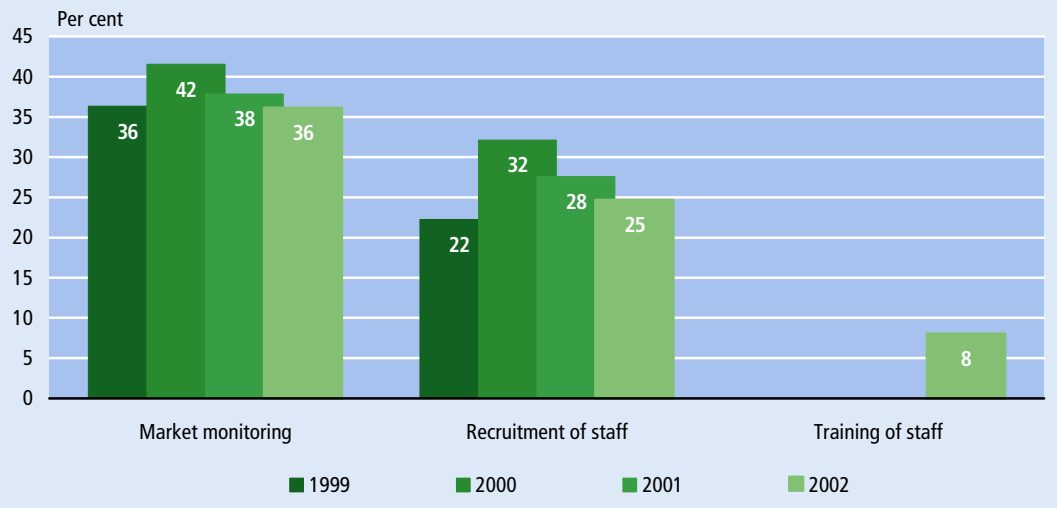
In all three areas, large enterprises are ahead of smaller ones. The difference is smallest regarding having a web site and largest regarding high-speed connections and placing orders through the Internet. The difference regarding high-speed connections will presumably narrow down in future due to the penetration of ADSL.

Table 4.1 **Selected ICT use –distributed by size of enterprise, 2002**

	10-49 employees	50-99 employees	100+ employees	Total
	per cent			
Own web site	71	89	93	75
High-speed connection	64	85	95	69
Placed orders via the Internet	46	61	77	51

Source: Statistics Denmark, ICT use by Danish enterprises.

Figure 4.2 **Internet use by enterprises**



Source: Statistics Denmark, ICT use by Danish enterprises.

One in four enterprises recruit staff through the Internet

36 per cent of Danish enterprises with 10 or more employees use the Internet for market monitoring, a share that has remained largely unchanged over the last few years. One in four enterprises recruited staff via the Internet in 2002; this share was slightly higher in both 2000 and 2001. 8 per cent state that they use the Internet for training their staff.

Large enterprises use the Internet for several purposes

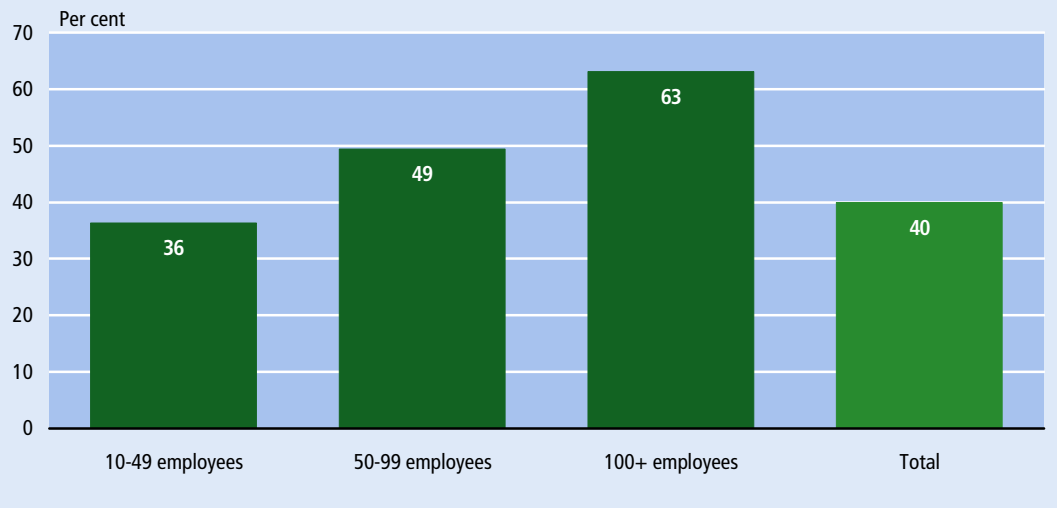
Large enterprises typically use the Internet for more purposes than smaller enterprises do. Thus, recruitment through the Internet is more widespread among large enterprises. Among enterprises with 100 or more employees 58 per cent had recruited staff through the Internet in 2002 as compared to 20 per cent of the enterprises with 10 to 49 employees. Also in the other fields of application, large enterprises are somewhat ahead of smaller ones.

Table 4.2 **Selected Internet use –distributed by size of enterprise, 2002**

	10-49 employees	50-99 employees	100+ employees	Total
	per cent			
Market monitoring	32	44	64	36
Recruitment of staff	20	35	58	25
Training of staff	7	9	16	8

Source: Statistics Denmark, ICT use by Danish enterprises.

Figure 4.3 **Enterprises with ICT systems for managing orders, 2002**



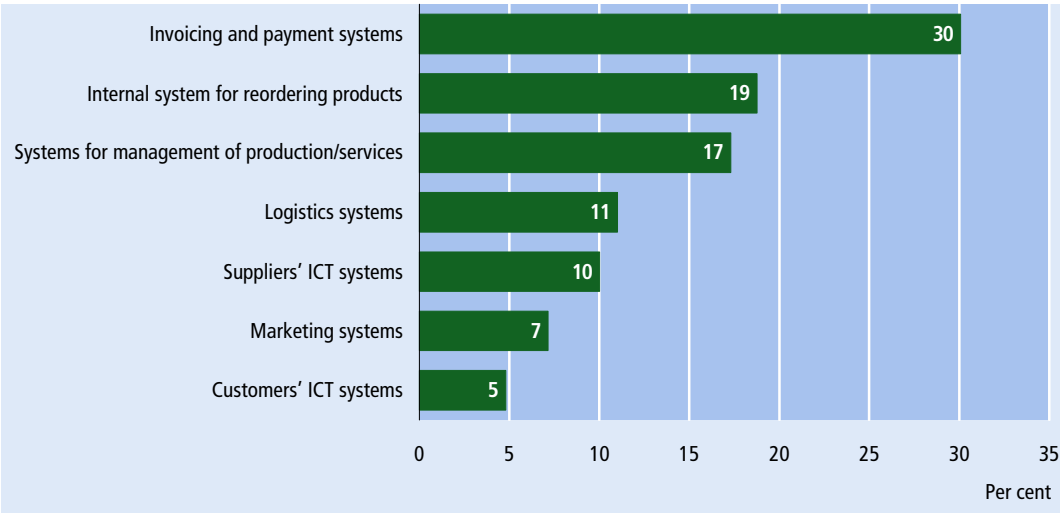
Note: The enterprises were asked whether they had dedicated ICT systems for placing or receiving orders. Accordingly, they may have one system that covers both these functions.

Source: Statistics Denmark, ICT use by Danish enterprises.

Four in ten enterprises have ICT system for managing orders

In 2002, 40 per cent of enterprises with 10 or more employees used dedicated ICT systems for managing orders. There is a certain variation deriving from the size of the enterprises. Thus, a large majority, 63 per cent of enterprises with 100 or more employees, had such a system, while the corresponding share of enterprises with 10 to 49 employees was just over one third.

Figure 4.4 **Integration of systems for managing orders with other ICT systems, 2002**



Note: Integration with "other ICT systems" also means integration of business processes in one and the same system.
Source: Statistics Denmark, ICT use by Danish enterprises.

Purchasing or ordering systems most frequently integrated with invoicing

As mentioned in connection with Figure 4.3, 40 per cent of all enterprises had ICT systems for managing orders in 2002. These systems are connected to the other systems of the enterprise to a varying extent. Most commonly with invoicing and payment systems; 30 per cent of all enterprises have systems for managing orders with such integration.

One in five have purchasing/ordering system with integration to product ordering

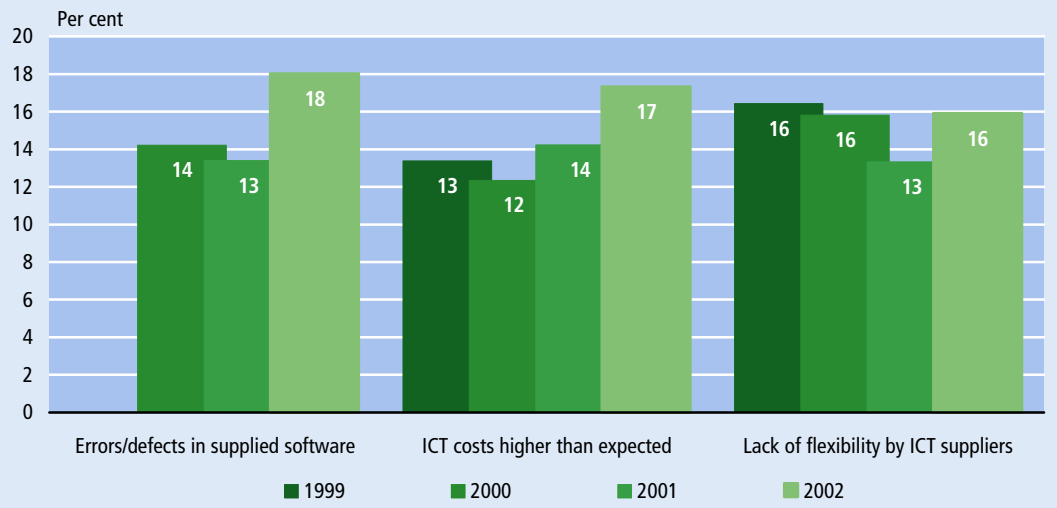
One in five enterprises have ICT systems for managing orders that is integrated with systems for reordering of products and nearly the same number with production systems. The number is somewhat lower for logistics systems, suppliers' ICT systems, marketing systems, and for customers' ICT systems. ICT systems for managing orders are more frequently integrated with more ICT systems in large enterprises.

Table 4.4 **Integration of systems for managing orders with other ICT systems, 2002**

	10-49 employees	50-99 employees	100+ employees	Total
	per cent			
Other ICT systems				
Invoicing and payment systems	26	39	54	30
Internal systems for reordering products	16	24	39	19
Systems for management of production/services	14	27	38	17
Logistics systems	8	20	33	11
Suppliers' ICT systems	10	8	16	10
Marketing systems	6	9	14	7
Customers' ICT systems	4	8	11	5

Source: Statistics Denmark, ICT use by Danish enterprises.

Figure 4.5 **Barriers to ICT use by enterprises**



Note: The figure includes enterprises that considered the barriers to be of 'high' importance. Assessment of barriers is sensitive to current events at the time of the survey, which may contribute to differences between the individual years.

Source: Statistics Denmark, ICT use by Danish enterprises.

Nearly one in five enterprises have problems with errors in purchased software

Among the most significant barriers to the use of ICT by Danish enterprises in 2002 were errors/defects in purchased software, which 18 per cent considered to be of high importance. This is closely followed by ICT costs that are higher than expected, and lack of flexibility by ICT suppliers.

Same perception of barriers by small and medium-sized enterprises

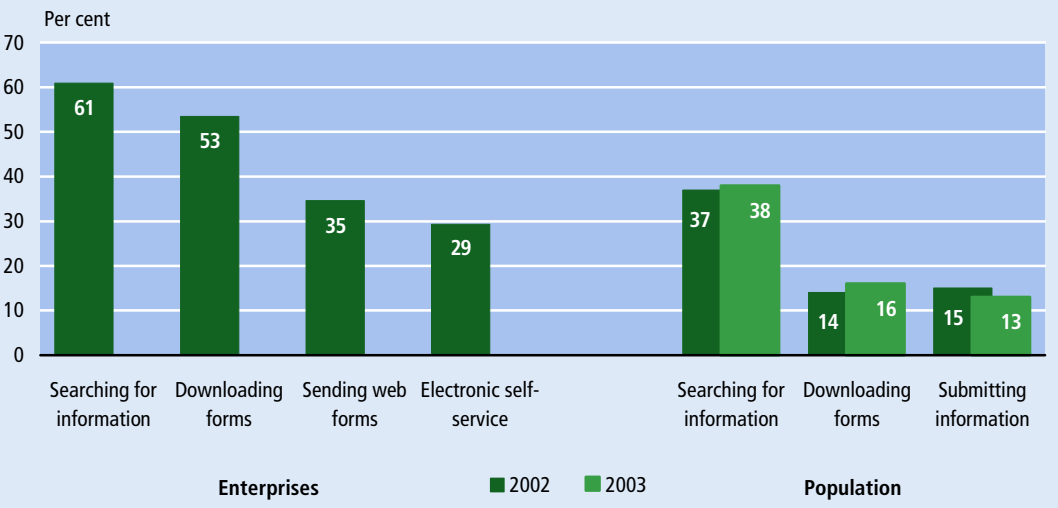
Errors/defects in supplied software and unexpected ICT costs have increased slightly in 2002 in relation to the preceding years. There is no noteworthy difference between small and large enterprises regarding these barriers.

Table 4.5 **Barriers to ICT use –distributed by size of enterprise, 2002**

	10-49 employees	50-99 employees	100+ employees	Total
	per cent			
Errors/defects in supplied software	17	22	23	18
ICT costs higher than expected	17	21	16	17
Lack of flexibility by ICT suppliers	16	18	16	16

Source: Statistics Denmark, ICT use by Danish enterprises.

Figure 5.1 **Use of public digital services by the population and enterprises**



Source: Statistics Denmark, ICT use by Danish enterprises and Internet use by the population.

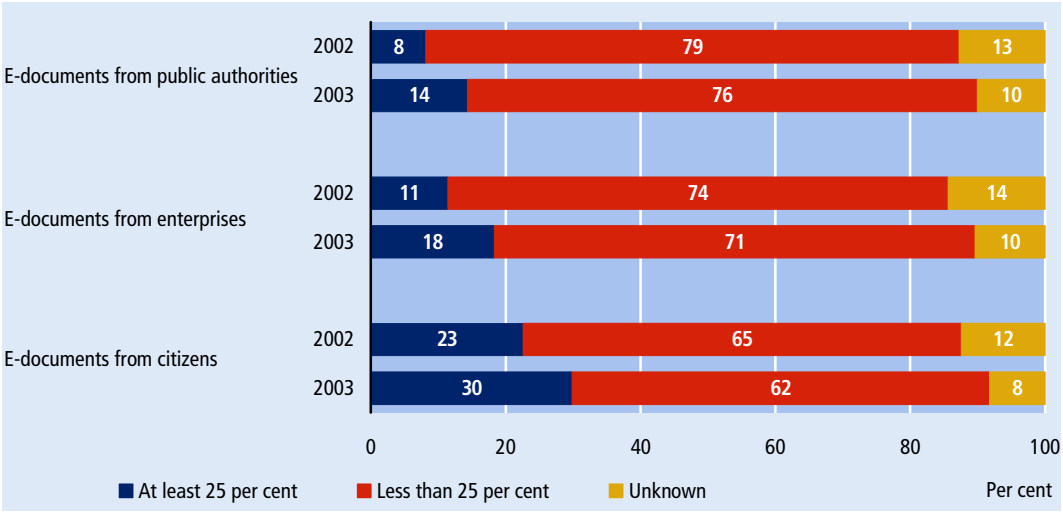
One in two enterprises have downloaded forms

By the end of 2002, six in ten enterprises had searched for information on official web sites and just over one in two enterprises had downloaded forms, etc. About one in three had submitted information in a web form, for instance in connection with personal application or reporting, and nearly the same number had used electronic self-service with automatic electronic decision.

No noticeable increase in citizens' use of public digital services

Also among Danish citizens, information searches are more common than more advanced communication. In 2003, nearly four in ten citizens made information searches on official sites, 16 per cent downloaded forms and 13 per cent submitted information to the authorities. There was no noticeable increase in Danish citizens' use of public digital services from 2002 to 2003.

Figure 5.2 **Share of documents received electronically by the public sector**



Note: 'Documents' do not include informal e-mails (such as brief messages, replies, etc.)
Source: Statistics Denmark, ICT use by the public sector.

Increase in electronic documents

There is an increasing number of documents received electronically from citizens, enterprises and public authorities. Central government in particular receives a large proportion of electronic documents.

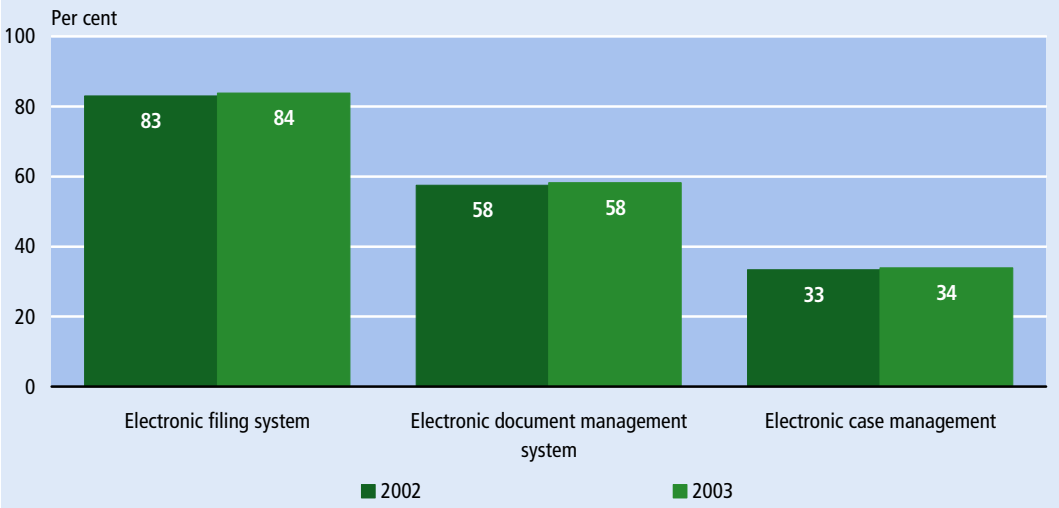
However, most public authorities receive less than a quarter of their documents in electronic form, irrespective of the senders being citizens, enterprises or other authorities.

Table 5.2 **Share of documents received electronically by the public sector**

	2002				2003			
	Central gov.	Regional authori-ties	Local authori-ties	Total	Central gov.	Regional authori-ties	Local authori-ties	Total
	per cent							
E-documents from citizens								
At least 25 per cent	19	0	4	8	29	8	9	14
Less than 25 per cent	74	67	82	79	62	67	82	76
Unknown/n.a.	7	33	14	13	10	25	9	10
E-documents from enterprises								
At least 25 per cent	13	0	11	11	34	17	12	18
Less than 25 per cent	74	67	75	74	56	58	78	71
Unknown/n.a.	13	33	14	14	10	25	10	10
E-documents from public authorities								
At least 25 per cent	38	17	17	23	49	42	21	30
Less than 25 per cent	56	58	69	65	45	42	70	62
Unknown/n.a.	6	25	14	12	5	17	9	8

Source: Statistics Denmark, ICT use by the public sector.

Figure 5.3 **Electronic case and document management in the public sector**



Source: Statistics Denmark, ICT use by the public sector.

Vast majority has electronic filing system

In 2003 the vast majority of public authorities, 84 per cent, had an electronic filing system for recording of documents and case files. Electronic document management had been implemented by 58 per cent of the public authorities. Actual electronic case management, i.e. where the case process is supported electronically, had been implemented by 34 per cent of the public authorities.

No increased implementation of systems for electronic case management

The share of public authorities with electronic case management in 2003 largely corresponds to the share in 2002, and the same applies to more basic systems for electronic filing and electronic document management. The stagnant trend is presumably explained by the fact that many public authorities have awaited the common solution for electronic document management in the public sector, which is expected to be finalised in the course of 2004.

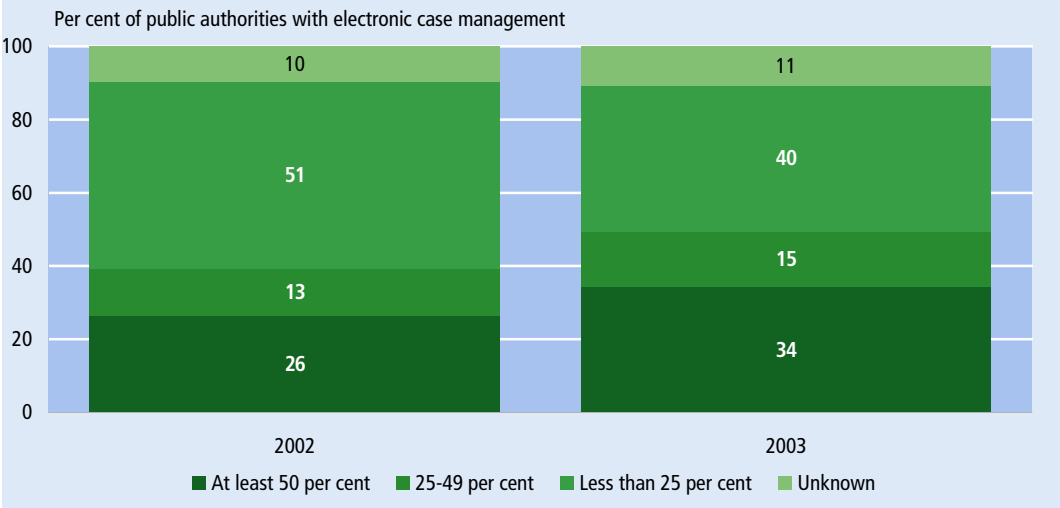
Table 5.3 **Case and document management systems in the public sector**

	2002				2003			
	Central gov.	Regional authorities	Local authorities	Total	Central gov.	Regional authorities	Local authorities	Total
	per cent							
Electronic filing system	92	100	79	83	90	100	80	84
Electronic document management system	46	67	61	58	49	83	60	58
Electronic case management	18	58	38	33	11	75	41	34

Note: It is assumed that the most advanced systems also incorporate the functionality of more basic systems, i.e. that a system for electronic case management also contains facilities for document management and filing.

Source: Statistics Denmark, ICT use by the public sector.

Figure 5.4 **Share of cases in the public sector that are entirely handled electronically**



Source: Statistics Denmark, ICT use by the public sector.

Growth in the number of paperless cases

The public authorities using electronic case management have seen an increase in the number cases that are exclusively handled electronically. In 2003, 34 per cent of public authorities with electronic case management estimated that at least half of all cases were handled without the use of paper by means of electronic case management. The corresponding figure in 2002 was 26 per cent. Despite this increase, the figures show that paper-based case processing remains the prevailing method applied by the majority of Danish public authorities.

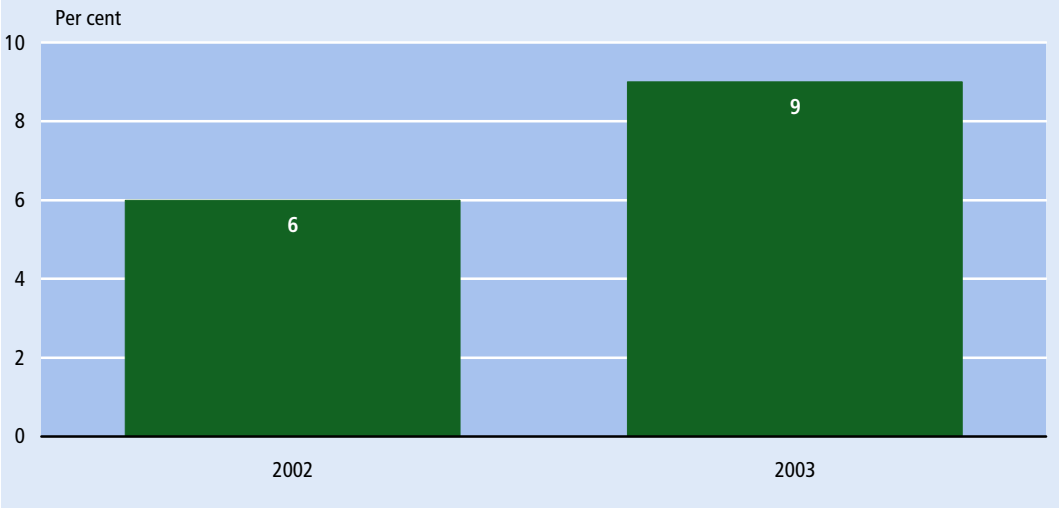
The figures concern public authorities with electronic case management (34 per cent of all public authorities in 2003 – see Figure 5.3).

Table 5.4 **Share of cases that are handled electronically in the public sector**

	2002				2003			
	Central gov.	Regional authorities	Local authorities	Total	Central gov.	Regional authorities	Local authorities	Total
	public authorities with electronic case management (per cent)							
At least 50 per cent	20	0	30	26	40	22	35	34
25-49 per cent	7	0	15	13	0	0	18	15
Less than 25 per cent	73	100	43	51	50	56	37	40
Unknown/n.a.	0	0	13	10	10	22	10	11

Source: Statistics Denmark, ICT use by the public sector.

Figure 5.5 **Communication in XML format between public authorities**



Source: Statistics Denmark, ICT use by the public sector.

Communication in XML format on the rise

Nine per cent of all Danish public authorities used XML format in communicating with other authorities. This is an upward trend in relation to 2002 when 6 per cent used XML. XML has been chosen as the common format for exchange of data in the public sector, and between the public sector and private enterprises.

Most frequent use by central and regional authorities

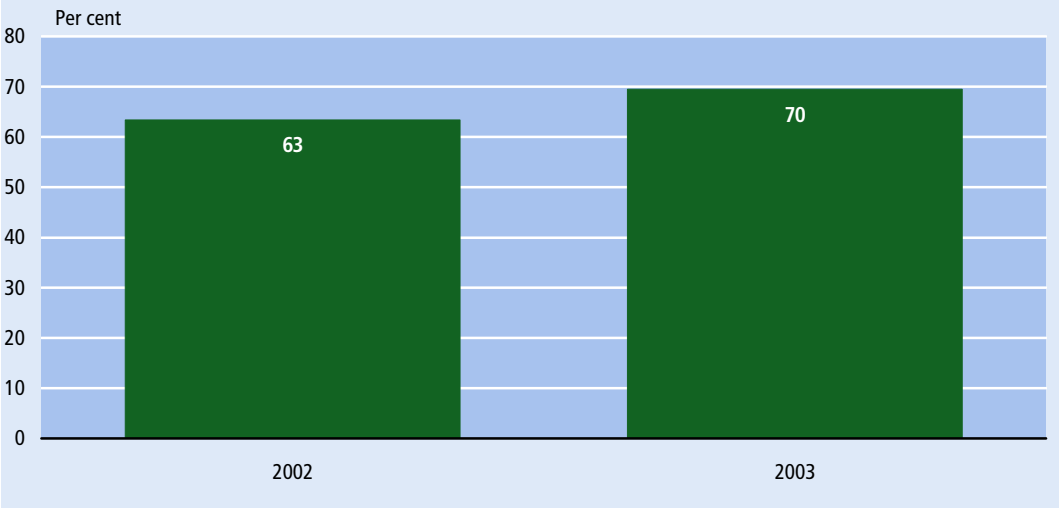
Use of the XML format is slightly more frequent among central and regional authorities as compared to local authorities.

Table 5.5 **Communication in XML format between public authorities**

	2002				2003			
	Central gov.	Regional authori-ties	Local authori-ties	Total	Central gov.	Regional authori-ties	Local authori-ties	Total
	per cent							
Communication in XML	8	0	5	6	11	17	8	9

Source: Statistics Denmark, ICT use by the public sector.

Figure 5.6 **Public authorities with updated ICT strategy**



Source: Statistics Denmark, ICT use by the public sector.

Most public authorities have ICT strategy

In 2003, 70 per cent of public authorities had an updated ICT strategy. This is a moderate increase on 2002 when 63 per cent had an ICT strategy. The increase derives solely from Danish local authorities, as opposed to central government and regional authorities where the number of updated ICT strategies appears to have decreased slightly (the statistical uncertainty may be somewhat greater for data concerning central government and regional authorities).

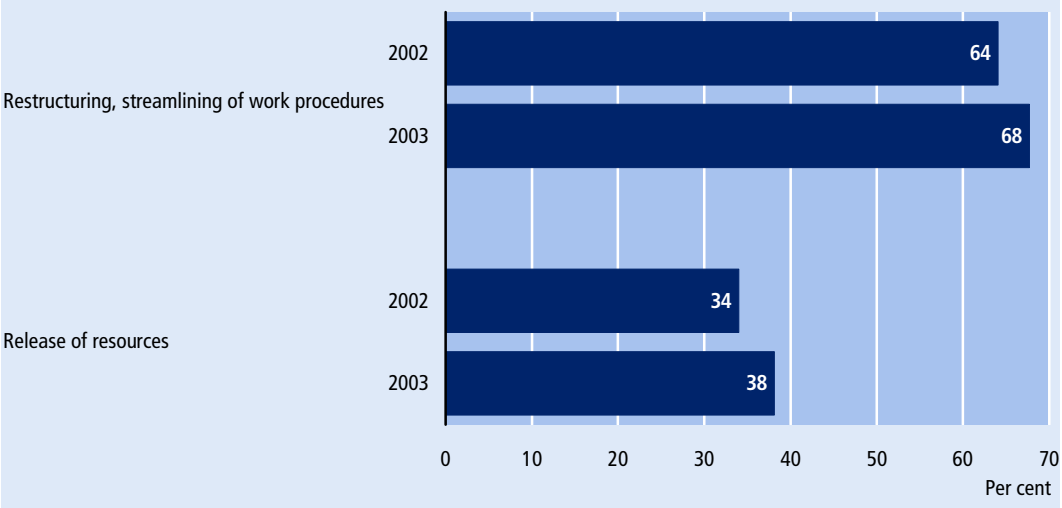
Table 5.6 **Public authorities with updated ICT strategy**

	2002				2003			
	Central gov.	Regional authori-ties	Local authori-ties	Total	Central gov.	Regional authori-ties	Local authori-ties	Total
	per cent							
Public authorities with updated ICT strategy	77	67	58	63	70	58	70	70

Note: The ICT strategy must have been updated within the last two years.

Source: Statistics Denmark, ICT use by the public sector.

Figure 5.7 **Perceieved effect of digitalisation projects in the public sector**



The columns indicate the shares of public authorities having experienced effects to a high extent or to some extent.

Source: Statistics Denmark, ICT use by the public sector.

Digitalisation changes task handling

In addition to their direct impact on citizens and enterprises, digitalisation projects also affect the internal organisation of the public authorities. Digitalisation projects frequently lead to restructuring and streamlining of work procedures. This was the case in 2003 among 68 per cent of the public authorities to a high extent or to some extent.

Majority experienced no release of resources

A smaller share of public authorities, 38 per cent, experienced a release of resources in 2003. Release of resources appears to be less frequent among local authorities than at the central and regional levels. The calculation shows that 55 per cent of public authorities that have restructured their work procedures have experienced a release of resources due to digitalisation projects as compared to 1 per cent of public authorities that have restructured their work procedures to a minor extent.

Growing effect of digitalisation projects

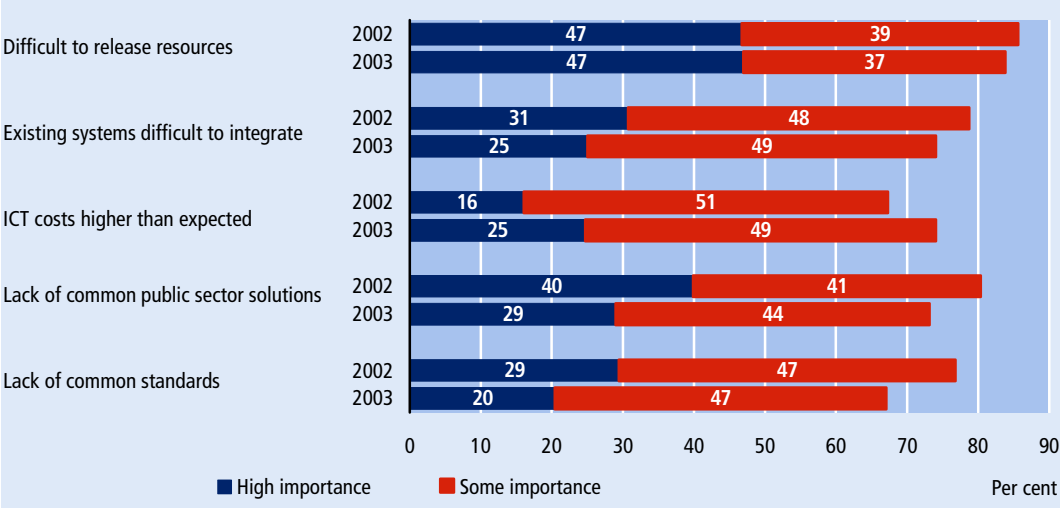
When comparing 2003 to 2002, a slightly higher number of public authorities have experienced the effect of digitalisation projects. This applies to both restructuring of work procedures and release of resources.

Table 5.7 **Effect of digitalisation projects in the public sector**

	2002				2003			
	Central gov.	Regional authorities	Local authorities	Total	Central gov.	Regional authorities	Local authorities	Total
	per cent							
Restructuring, of work procedures	65	83	62	64	69	75	67	68
Release of resources	39	67	30	34	46	58	34	38

Source: Statistics Denmark, ICT use by the public sector.

Figure 5.8 **Barriers to e-government**



Note: The figures show the five most significant barriers to e-government.

Source: Statistics Denmark, ICT use by the public sector.

Difficult to release resources for e-government

Among the five most significant barriers to e-government, the most distinctive barrier is problems of releasing resources. More than eight in ten public authorities found this barrier to be of high or some importance in 2003. A relatively high number of them, more than half, stated that the barrier is of high importance.

Improved public framework

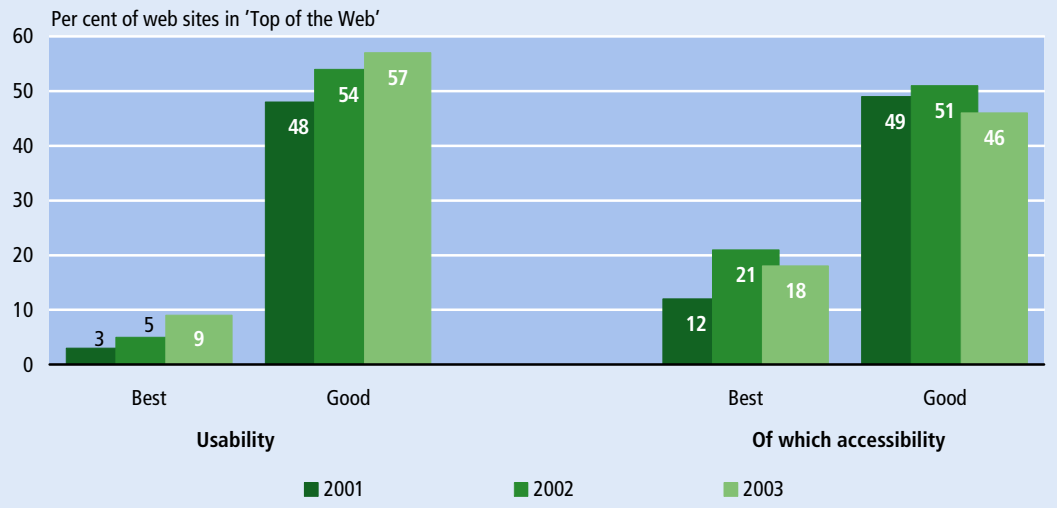
From 2002 to 2003 a decrease occurred in the importance of the lack of common public sector solutions and common standards. Contrary to this, an increase occurred in the share of public authorities experiencing unexpected ICT costs.

Table 5.8 **Barriers to e-government**

	2002				2003			
	Central gov.	Regional authorities	Local authorities	Total	Central gov.	Regional authorities	Local authorities	Total
	per cent							
Difficult to release resources	79	92	85	84	81	92	87	86
Existing systems difficult to integrate	62	100	78	74	70	83	82	79
ICT costs higher than expected	62	75	79	74	62	67	70	67
Lack of common public sector solutions	65	83	76	73	70	67	85	80
Lack of common standards	51	92	72	67	57	92	84	77

Source: Statistics Denmark, ICT use by the public sector.

Figure 5.9 **Usability and accessibility of public web sites**



Note: Includes all public web sites that have joined the initiative "Top of the Web". Usability is measured by accessibility, navigation, communication and user focus. The category "Best" means that 80 per cent of the requirements of Top of the Web are satisfied, and "Good" means that 60-79 per cent are satisfied. The remaining web sites fall in the categories "Average", "Poor" and "Very poor".

Source: Top of the Web, 2003 (www.bedstpaanettet.dk)

Improved usability of public web sites

Each year, "Top of the Web" makes an assessment of public sector web sites based on a number of criteria. Usability has increased over the past three years. Thus, 9 per cent of the web sites in the assessment in 2003 were placed in the category "best" as against 3 per cent in 2001. The share of web sites in the category "good" also showed fair growth.

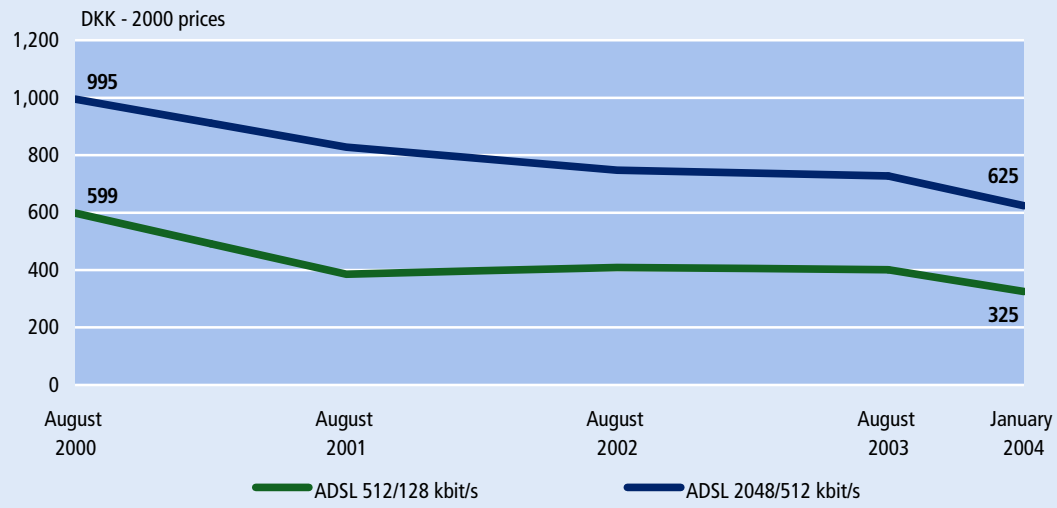
Enhanced demands for accessibility

Accessibility is one of the sub-categories of usability. From 2001 to 2002 there was an increase in the number of web sites categorised as "good" or "best" in terms of accessibility, but a decrease from 2002 to 2003. The decrease may have been affected by enhanced demands in 2003 in connection with the European Disability Year.

Who is assessed?

Over the last three years an increasing number of web sites have joined the assessment. In 2001, 1,661 web sites were assessed, while the figure for 2003 was 2,076. In 2003 particular emphasis was on the participation of central government, regional and local authorities, as well as institutions with special public information obligations. They account for about 60 per cent of the web sites in the assessment.

Figure 6.1 **Development in fixed prices of ADSL**



Note: The figure illustrates the development in the lowest prices. The prices are list prices and do not include temporary campaign offers, etc., or combined services such as fixed-line subscriptions.

Source: National IT and Telecom Agency, January 2004.

Lower prices of fast Internet access

ADSL prices have decreased in the period from August 2000 to January 2004. Calculated in fixed prices, the price per month of a 512/128 kbit/s ADSL connection has dropped by 46 per cent. The price per month of a 2048/512 kbit/s ADSL connection has dropped by 37 per cent in fixed prices, cf. Table 6.1 below.

Falling prices of fixed-line and mobile telephony

The prices of fixed-line and mobile telephony have decreased in the period from August 1998 to January 2004. At a quarterly use of 900 minutes the price of fixed-line telephony has decreased by 23 per cent in fixed prices. At a quarterly use of 450 minutes the price of mobile telephony has decreased by 54 per cent in fixed prices.

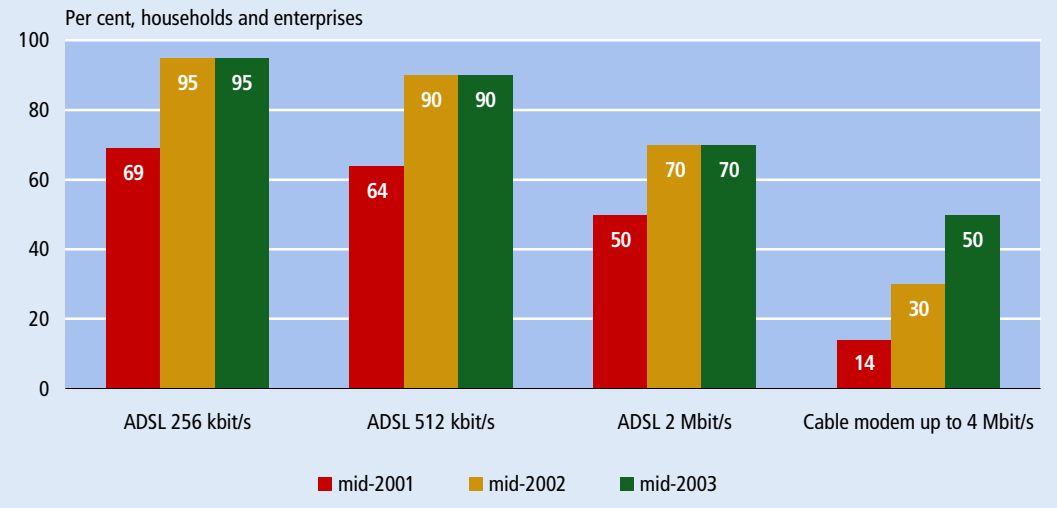
Table 6.1 **Prices of fixed-line telephony, mobile telephony and ADSL**

	August 1998	August 1999	August 2000	August 2001	August 2002	August 2003	January 2004	Total price decrease
	DKK - 2000 prices							per cent
Fixed-line telephony (900 min. per quarter)	677	665	559	546	538	524	520	23
Mobile telephony (450 min. per quarter)	685	589	540	501	489	334	317	54
ADSL 512/128 kbit/s (price per month)	•	…	599	385	409	401	325	46
ADSL 2048/512 kbit/s (price per month)	•	…	995	828	748	728	625	37

Note: The data concern the development in the lowest prices. Quarterly use of fixed-line and mobile telephony includes subscription, call setup charge and minute charge. ADSL prices are list prices and do not include temporary campaign offers, etc. ADSL prices do not include combined services such as fixed-line subscriptions.

Source: National IT and Telecom Agency, January 2004.

Figure 6.2 **Availability of ADSL and cable modem**



Note: The availability of cable modem is only calculated for households, as households constitute the great majority of users applying cable modems to get Internet access.
Source: National IT and Telecom Agency, January 2004.

Increased availability of ADSL and cable modem

The number of households and enterprises that can connect to the Internet through an ADSL connection has increased considerably from mid-2001 to mid-2003. This applies to all three speeds included in Figure 6.2. The availability of cable modem has risen steeply during the period. Thus, by mid-2003 Internet access via a cable modem was available to 50 per cent of all households.

Strong growth in penetration of fast Internet access

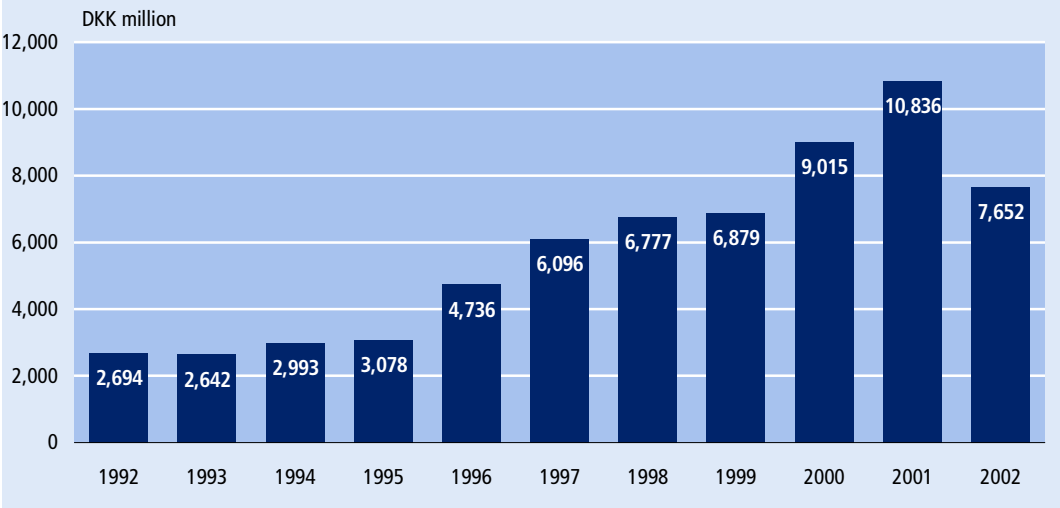
Table 6.2 below shows that the penetration of ADSL and cable modem increased markedly from year-end 2001 to year-end 2003. The penetration of fast Internet access nearly tripled during the period. This trend also appears from the number of connections per 100 inhabitants, which rose from 4.4 to 13.1. The table does not include Fixed Wireless Access (FWA), which accounted for 2,300 connections at the end of 2003.

Table 6.2 **Penetration of ADSL, cable modem and LAN**

	Year-end 2001	Year-end 2002	Year-end 2003
	number of connections		
Total	**237 500**	**440 500**	**702 800**
ADSL	150 000	307 000	473 500
Cable modem	87 500	133 500	194 300
LAN connections	…	…	35 000
	per 100 inhabitants		
Total penetration	4.4	8.2	13.1

Source: National IT and Telecom Agency, January 2004.

Figure 6.3 **Investments in the Danish telecommunications sector**



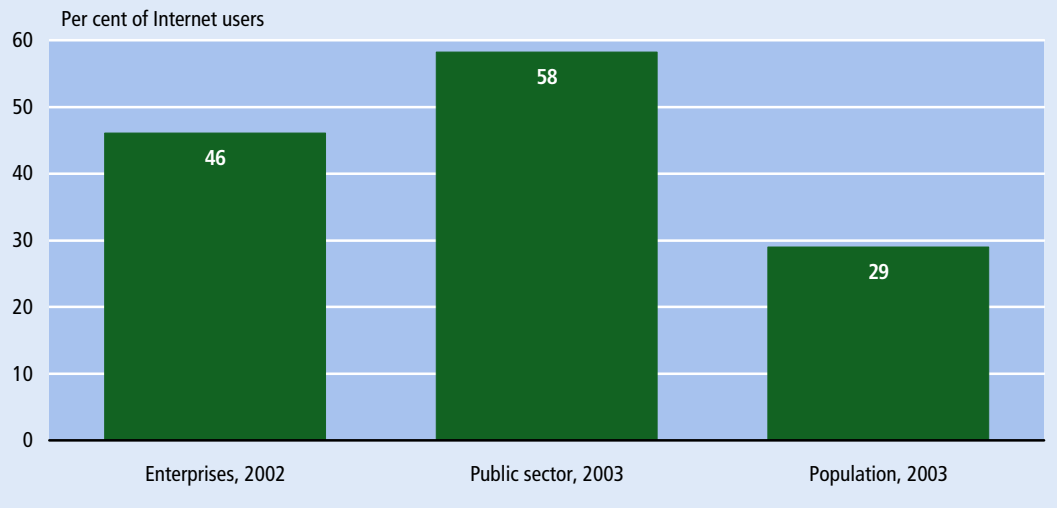
Note: Investments include capital investments broken down into telecommunications investments (such as telephony exchanges and lines) in Denmark and other investments (such as land, buildings and computer equipment) in Denmark. Investments in intangible assets are not included. The figures for 2001 and 2002 are calculated excluding investments in UMTS licences. In 2001 and 2002, UMTS licencees paid an aggregate amount of DKK 950m and DKK 285m, respectively, as instalments on the licence price. Up to and including 2011, the licencees will together be paying annual instalments of DKK 285m in payment of the licence price.

Source: National IT and Telecom Agency, January 2004.

Investments peaked in 2001

Investments in the Danish telecommunications sector rose steeply between 1992 and 2002. This development peaked in 2001 with total investments amounting to nearly DKK 11bn. From 2001 to 2002, investments dropped noticeably, corresponding to 29 per cent. However, investments in 2002 remain above the level of the 1990s.

Figure 7.1 **Virus attacks on citizens, enterprises and public authorities**



Note: Internet users are in all three sectors defined as Internet access. The virus attack refers to the last 12 months. For enterprises and public authorities, virus attacks are characterised by being 'disruptive' or 'severe'.

Source: Statistics Denmark, ICT use by Danish enterprises, ICT use by the public sector and Internet use by the population.

Broad impact of computer viruses

Virus attacks are among the most frequent ICT security problems in Denmark. By the end of 2002, 46 per cent of enterprises with 10 or more employees had experienced a disruptive or severe virus attack. The same applied to 58 per cent of public authorities in 2003 and 29 per cent of the Danish population in 2003. The difference between enterprises and public authorities in terms of exposure relates to the size of the organisation, for example measured by the number of users.

Unauthorised access to systems or data of one in ten public authorities

Among the security problems particularly among large organisations are 'denial of service' attacks (see the note to the table) and unauthorised access to systems or data. About one in ten public authorities have experienced these problems, while only one in twenty enterprises have been affected.

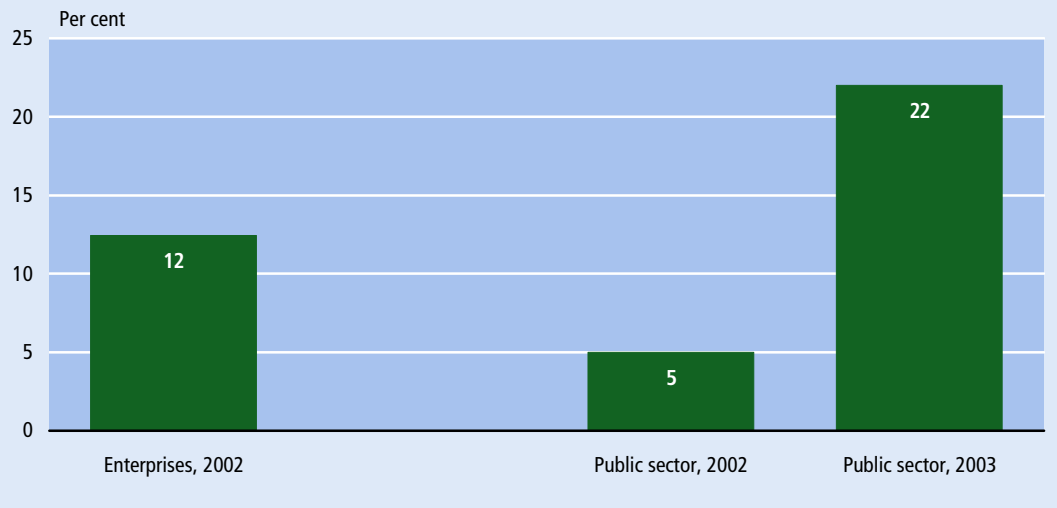
Table 7.1 **ICT security problems**

	Enterprises 2002	Public sector 2002	Public sector 2003	Population 2003
	per cent of Internet users			
Virus attack	46	59	58	29
Denial of service attack[1]	5	12	14	…
Unauthorised access	5	11	9	…

[1] Attempt to disrupt communication to a network by sending superfluous data.

Source: Statistics Denmark, ICT use by Danish enterprises, ICT use by the public sector and Internet use by the population.

Figure 7.2 **Enterprises and public authorities that can receive digital signatures**

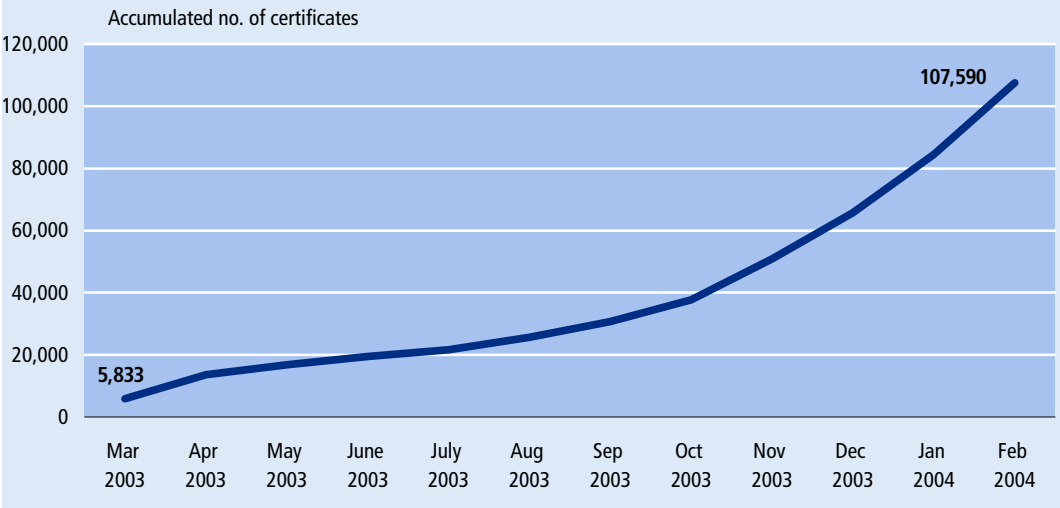


Source: Statistics Denmark, ICT use by Danish enterprises and Internet use by the population.

Growth in digital signatures with public authorities

In 2002 and 2003, the use of digital signatures by enterprises and the public sector was still in its starting phase. Among all enterprises with 10 or more employees, 12 per cent were able to receive digital signatures by the end of 2002 compared with 5 per cent of public authorities earlier that year (August-September). The rapidly increased diffusion is illustrated by the fact that 22 per cent of the authorities were able to receive digital signatures at the same time in 2003.

Figure 7.3 **Number of digital signature certificates issued**



Note: Estimates based on weekly figures. A certificate for digital signature is a program to be installed on the computers of enterprises or private individuals. Digital signatures protect electronic communication so that the sender's identity is verified and the content cannot be modified by unauthorised persons. Examples of applications of digital signatures are tax returns, access control on web sites, etc.

Source: TDC, 2004.

Noticeable increase in digital signature diffusion

The number of certificates issued for digital signatures increased substantially in the course of 2003. Following a modest beginning in the first half of 2003, the development picked up in the second half with an accelerating trend. By the end of February 2004, 107,590 digital signature certificates had been issued.

Diffusion is an expression of the number of potential users

The number of certificates for digital signatures shows how many citizens or enterprises are able to use digital signatures, for instance in relation to enterprises and public authorities (see the preceding page). Despite the rapid increase in diffusion, only a minor part of the Danish population and enterprises have digital signatures.

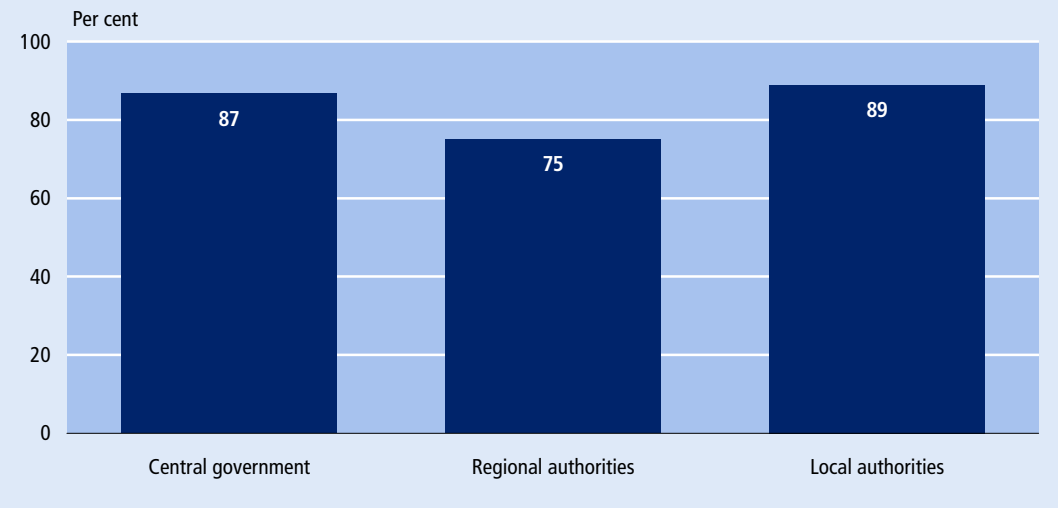
Table 7.3 **Number of digital signature certificates issued**

	Q1 2003	Q2 2003	Q3 2003	Q4 2003	Jan-Feb 2004
	number				
Issued quarterly	5 833	13 569	11 220	35 179	41 789
Accumulated	5 833	19 402	30 622	65 801	107 590

Note: Estimates based on weekly figures.

Source: TDC, 2004.

Figure 7.4 **Public authorities with approved ICT security policy, 2003**



Note: Approved means approved by the management of the particular authority.
Source: Statistics Denmark, ICT use by the public sector.

Majority have ICT security policy

The majority of public authorities in 2003 had an ICT security policy approved by management. This is the case for nearly nine in ten central and local authorities, and three in four regional authorities.

Fair growth from 2002 to 2003

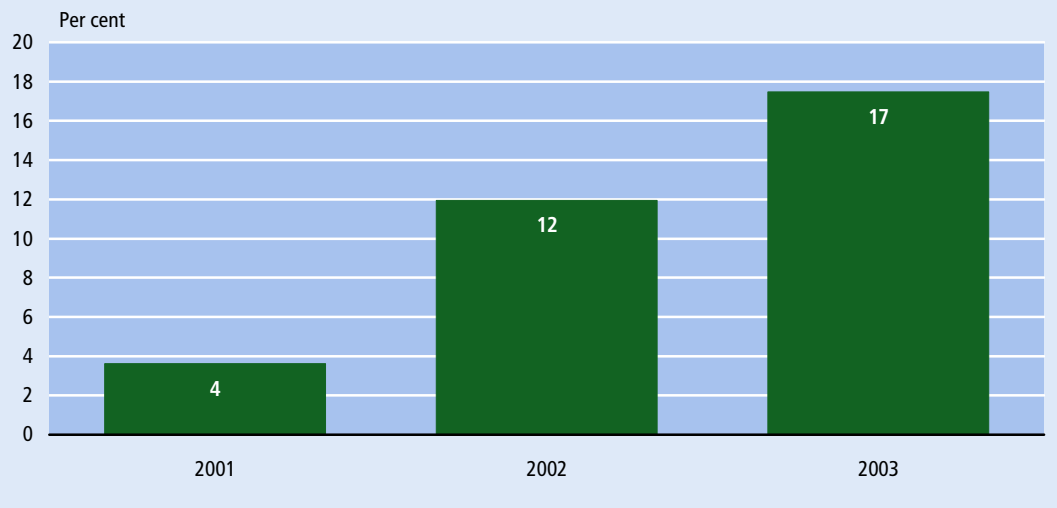
The share of public authorities with an ICT security policy showed fair growth from 2002 to 2003, not least in respect of local authorities. Part of this growth, however, is due to a narrower wording of the question in the 2002 survey.

Table 7.4 **Public authorities with approved ICT security policy**

	2002				2003			
	Central gov.	Regional authori-ties	Local authori-ties	Total	Central gov.	Regional authori-ties	Local authori-ties	Total
	per cent							
ICT security policy approved by management	71	58	50	56	87	75	89	88

Note: Part of the increase over the two years is due to a narrower wording of the question in the 2002 survey.
Source: Statistics Denmark, ICT use by the public sector.

Figure 8.1 **Purchasing/ordering of goods/services on the Internet within the last month by the population**



Note: 2001 is not directly comparable to 2002 and 2003. In 2001, respondents were asked whether they used e-commerce at least once a month, while in 2002 and 2003 whether they had used e-commerce within the last month.

Source: Statistics Denmark, Internet use by the population.

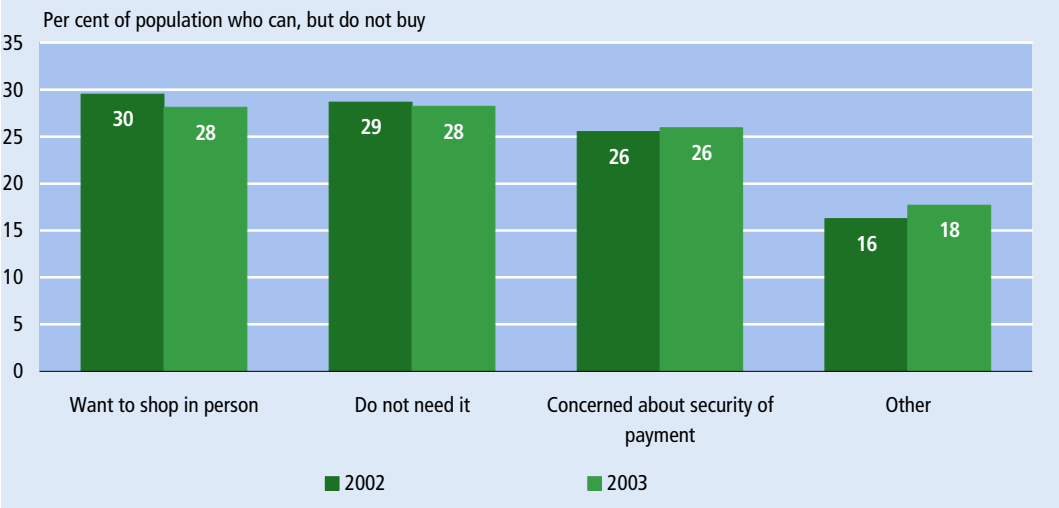
The last few years have seen a marked increase in the share of the population having purchased/ordered goods or services on the Internet within the last month.

One in six used e-commerce within the last month

In 2003, 17 per cent of the population had purchased/ordered goods or services within the last month. The corresponding figure in 2001 was 12 per cent. This equates to a 42 per cent increase from 2002 to 2003 in the share of the population having used e-commerce within the last month.

In 2003, 38 per cent of the population had at some time purchased/ordered goods or services on the Internet.

Figure 8.2 **Most significant barrier to purchases of goods/services via the Internet by the population**



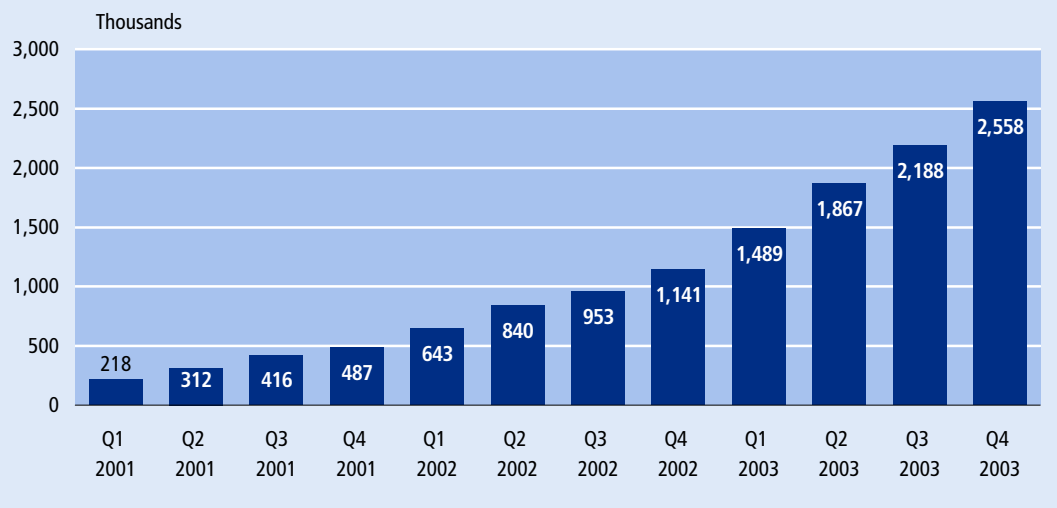
Source: Statistics Denmark, Internet use by the population.

As shown in Figure 10.1, 79 per cent of the population had Internet access in 2003; furthermore, Figure 8.1 shows that 17 per cent of the population had used e-commerce within the last month, and 38 per cent had at some time used e-commerce. Hence, a large proportion of the population has the opportunity to use e-commerce, but do not use it.

Greatest barrier is lack of need and a desire to shop in person

In 2003, the majority of the respondents stated that the most significant barrier to e-commerce was that they do not need it and that they want to shop in person or see the product before buying it (both 28 per cent). The third most significant barrier to using e-commerce is concerns about security in connection with payment (26 per cent).

Figure 8.3 **Number of card payments in Danish Internet shops**



Note: Includes payments by Dankort, Visa/Dankort, Visa, Eurocard and MasterCard in Danish Internet shops.
Kilde: PBS, 2004.

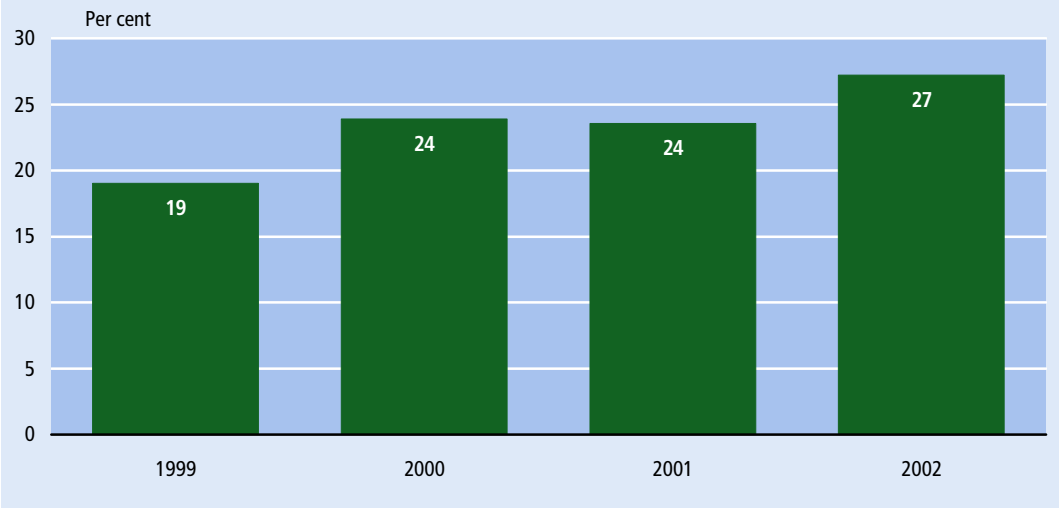
Online card payments have doubled each year

The number of card payments in Danish Internet shops has risen steadily in the period 2001 to 2003. In 2003 card payments through PBS totalled 8.1 million compared with 3.6 million in 2002 and 1.4 million in 2001. In round figures the number has more than doubled each year.

Dankort in nine out of ten transactions

Dankort and Visa/Dankort accounted for more than nine in ten of the above card payments in 2003.

Figure 8.4 **Enterprises that have received orders via the Internet**



Source: Statistics Denmark, ICT use by Danish enterprises.

Increase in orders received via the Internet

The number of enterprises that have received orders via the Internet has increased moderately from 19 per cent in 1999 to 27 per cent in 2002 (measured at year-end).

Purchases more common than sales – especially among large enterprises

Purchases on the Internet are more common than sales; thus, 51 per cent of the enterprises had placed orders through the Internet in 2002, cf. Table 8.4. There is no distinct difference between large and smaller enterprises in respect of order reception through the Internet, while the difference is greater in respect of purchases. Of enterprises with 10 to 49 employees 46 per cent had placed orders through the Internet, compared to 77 per cent of enterprises with 100 or more employees.

Nearly all enterprises have Internet access

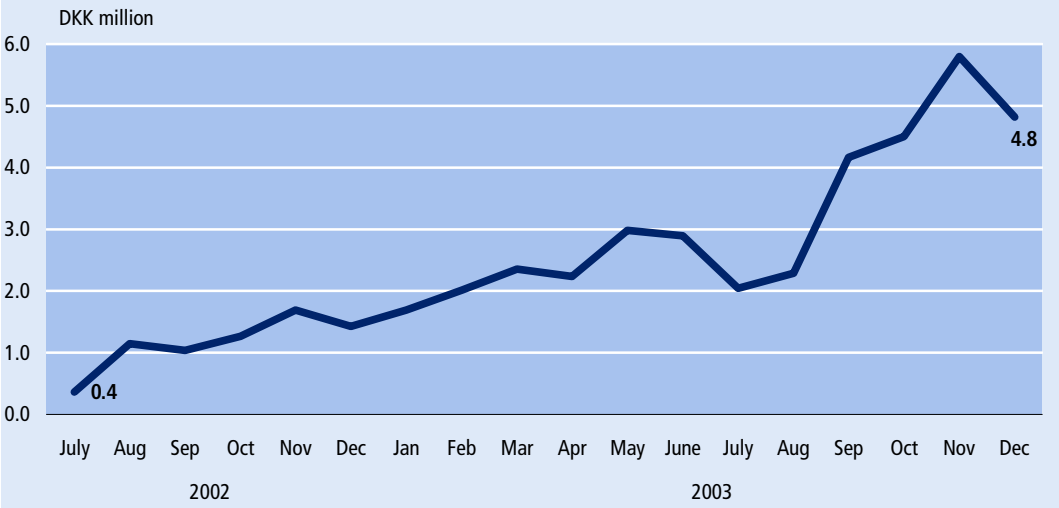
Internet access is a prerequisite to e-commerce. Largely all enterprises with 10 or more employees had Internet access in 2002.

Table 8.4 **Orders placed/received via the Internet –by size of enterprise, 2002**

	10-49 employees	50-99 employees	100+ employees	Total
	per cent			
Internet access	96	99	99	96
Orders received via the Internet	27	28	32	27
Orders placed via the Internet	46	61	77	51

Source: Statistics Denmark, ICT use by Danish enterprises.

Figure 8.5 **Turnover on the Public Procurement Portal (DOIP)**



Note: DOIP is a common public web-based market place, where buyers in the public sector can do business with private enterprises.
Source: www.DOIP.dk, 2004.

Increasing growth in public e-commerce

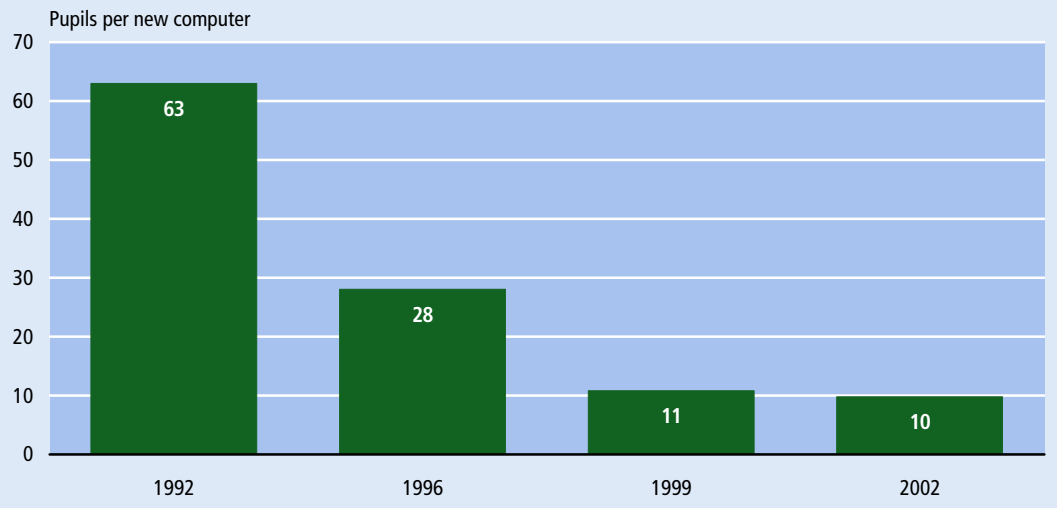
The turnover on the Public Procurement Portal increased steadily throughout 2002 and the first half of 2003, but then it accelerated somewhat in the second half of 2003. Thus, turnover in the second half of 2003 came to DKK 23.6m against DKK 14.2m in the first half of 2003 and DKK 6.9m in the second half of 2002. For the full year 2003 the turnover totalled DKK 37.8m.

Table 8.5 **Turnover in public e-commerce**

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
	DKK million											
2002	…	…	…	…	…	…	0.4	1.1	1.0	1.3	1.7	1.4
2003	1.7	2.0	2.4	2.2	3.0	2.9	2.0	2.3	4.2	4.5	5.8	4.8

Source: www.DOIP.dk, 2004.

Figure 9.1 **Development in the number of pupils per new computer**



Source: Danish Ministry of Education, IT i folkeskolen (ICT in primary and lower secondary schools), 2003

10 pupils per new computer ...

The possibility for pupils to work with new computers has improved substantially since the early 1990s. In 1992 there was one new computer for every 63 pupils on average, while the corresponding figure in 2002 was one computer for every 10 pupils.

..but only 7, if old computers are also included

As these statistics are based on pupils' access to new computers, there are more pupils per computer on average than if the statistics included both new and old computers. If old computers are also included, there was an average of seven pupils per computer in Denmark in 2002.

Figure 1.4 in Chapter 1 shows an international comparison for 2000.

Table 9.1 **Computers in Danish primary and lower secondary schools**

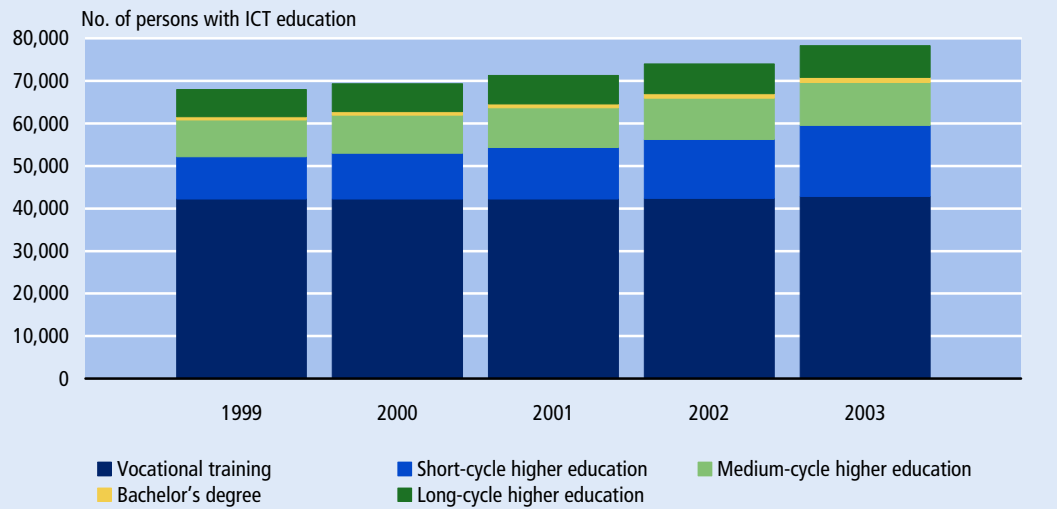
	1992	1996	1999	2002	2002[1]
	pupils per computer				number
New computers	63	28	11	10	60 400
Total no. of computers	35	13	9	7	82 000
Computers with Internet access	…	…	18	9	66 200

Note: New computers are defined as computers less than five years old and computers more than five years old used as thin clients (i.e. computers with no hard disc, connected to a server).

[1] The number of computers is calculated on the basis of reports from 93.6 per cent of Danish primary and lower secondary schools.

Source: Danish Ministry of Education, IT i folkeskolen (ICT in primary and lower secondary schools), 2003

Figure 9.2 **Persons with formal ICT education**



Source: Statistics Denmark, Education and employment of the population, 1999-2003.

Ever more Danes have ICT education

In 2003, 78,300 Danes had a formal ICT education. This is 15 per cent more than in 1999 when the number was 68,000. Of the total number of persons in 2003 with a formal education, 55 per cent had vocational training, such as data processing assistants, while 21 per cent had a short-cycle higher education, such as datamaticians, and 13 per cent had a medium-cycle education, e.g. a bachelor's degree in informatics. 11 per cent had a long-cycle higher education, e.g. a master's degree in computer science.

Highest employment rate among graduates from higher education programmes

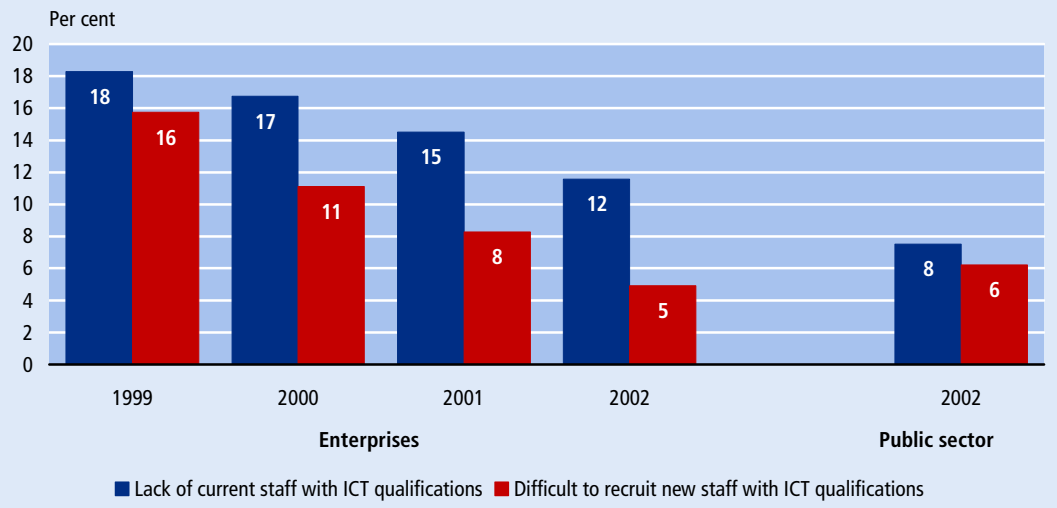
In 2002, 86 per cent of persons with a formal ICT education were employed. The employment rate was highest among persons with medium or long-cycle education, with 96 per cent for both groups. Persons with vocational training had the lowest employment rate of 81 per cent.

Table 9.2 **Persons with formal ICT education**

	1999	2000	2001	2002	1999	2000	2001	2002	2003
	Total no. of employed				Total no. with ICT education				
Persons with ICT education, total	**59 008**	**60 315**	**61 926**	**63 910**	**67 962**	**69 296**	**71 284**	**74 016**	**78 271**
Vocational training	34 596	34 677	34 441	34 329	42 292	42 281	42 238	42 414	42 877
Short-cycle higher education	9 290	10 001	11 234	12 625	9 913	10 719	12 092	13 824	16 643
Medium-cycle higher education	8 346	8 608	8 985	9 331	8 652	8 954	9 335	9 736	10 120
Bachelor's degree	695	780	865	919	759	838	944	1 033	1 220
Long-cycle higher education	6 081	6 249	6 401	6 706	6 346	6 504	6 675	7 009	7 411

Source: Statistics Denmark, Education and employment of the population, 1999-2003.

Figure 9.3 **Lack of ICT qualifications among enterprises and public authorities**



Note: The figure includes the barriers considered to be of 'high' importance. Assessment of barriers is sensitive to current events at the time of the survey, which may contribute to differences between the individual years.

Source: Statistics Denmark, ICT use by Danish enterprises.

The lack of ICT qualifications among enterprises and public authorities is a barrier to ICT usage. More specifically, the problem concerns

– lack of staff with ICT qualifications internally in the organisation
– difficulty in recruiting staff with ICT qualifications.

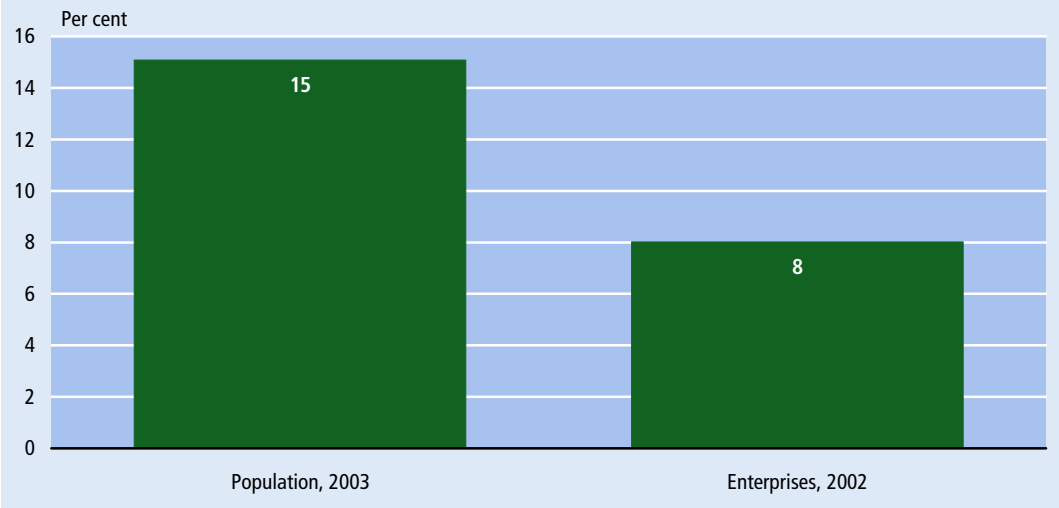
Internal lack of qualifications is of highest importance

The lack of ICT qualifications internally is more frequent than recruitment problems. In 2002, 12 per cent of Danish enterprises found that the lack of staff with ICT qualifications was of high importance, while only 5 per cent found that recruiting staff with ICT qualifications was a major problem. In the public sector the same year the corresponding figures were slightly lower: 8 per cent and 6 per cent, respectively.

Lack of ICT qualifications becoming less important

The importance of both barriers decreased from 1999 to 2002 in respect of enterprises. Particularly regarding difficulty in recruiting staff with ICT qualifications, the figure dropped from 16 per cent of enterprises in 1999 to 5 per cent in 2002.

Figure 9.4 **Use of the Internet for educational purposes**



The population was asked whether they had used the Internet for education and training within the last month. Enterprises were asked whether they used the Internet for training of staff.

Source: Statistics Denmark, ICT use by Danish enterprises and Internet use by the population.

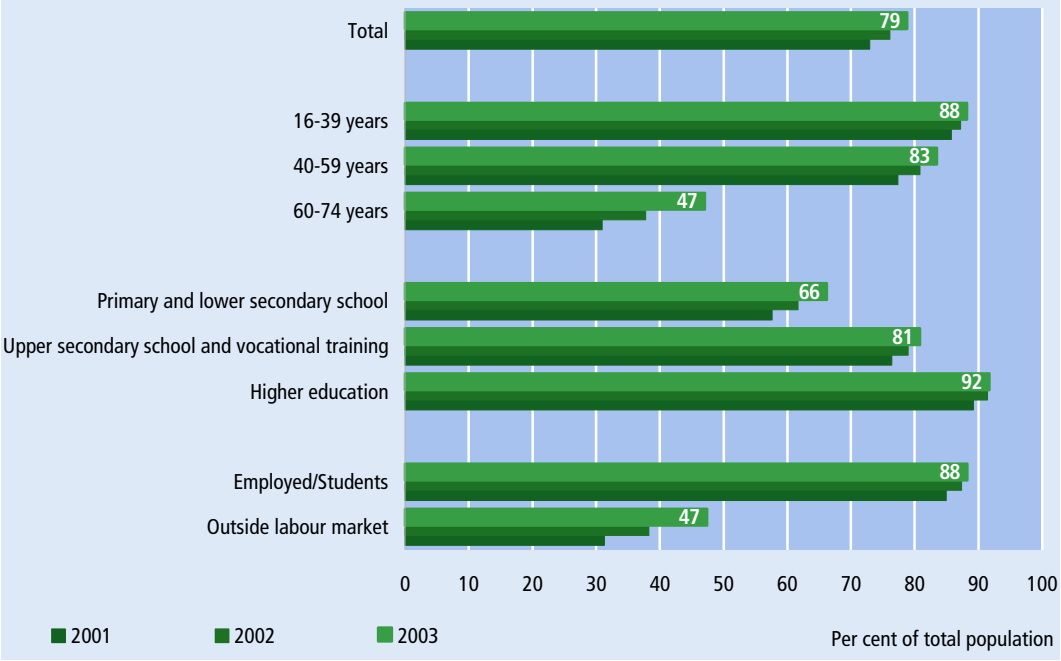
15 per cent of the Danes use the Internet for education and training

In 2003, 15 per cent of the population had used the Internet within the last month for purposes related to education and training. Correspondingly, 8 per cent of enterprises used the Internet for training of their staff in 2002. In 2002, the population was asked a more narrow question, namely whether they had used the Internet for educational purposes, to which 4 per cent gave an affirmative answer.

Highest training activity outside enterprises

The figures are only comparable to a certain degree, as the training activities of Danish enterprises differ from those of the population in terms of scope and content. First of all, students constitute the largest group of the population regarding education, and typically they have little or no contact with the training activities of the business sector.

Figure 10.1 **Internet access among the population**



Source: Statistics Denmark, Internet use by the population.

Eight in ten Danes have Internet access

Over the last three years an ever increasing number of the Danes have gained Internet access. In 2003, 79 per cent of the population had Internet access at home and/or at their work/educational institution. This is an increase in relation to 2002 when the corresponding figure was 76 per cent, and 2001 when it was 73 per cent. The increase is attributable to the share of persons with Internet access at home, cf. Chapter 5.

About one in two 60-74-year-olds have Internet access

All age groups have seen a steady increase over the years, the largest being among 60-74-year-olds. Thus, in 2003 47 per cent of people aged 60-74 years had Internet access, against 31 per cent in 2001. With 88 per cent in 2003 the share remains highest among persons aged 16-39 years.

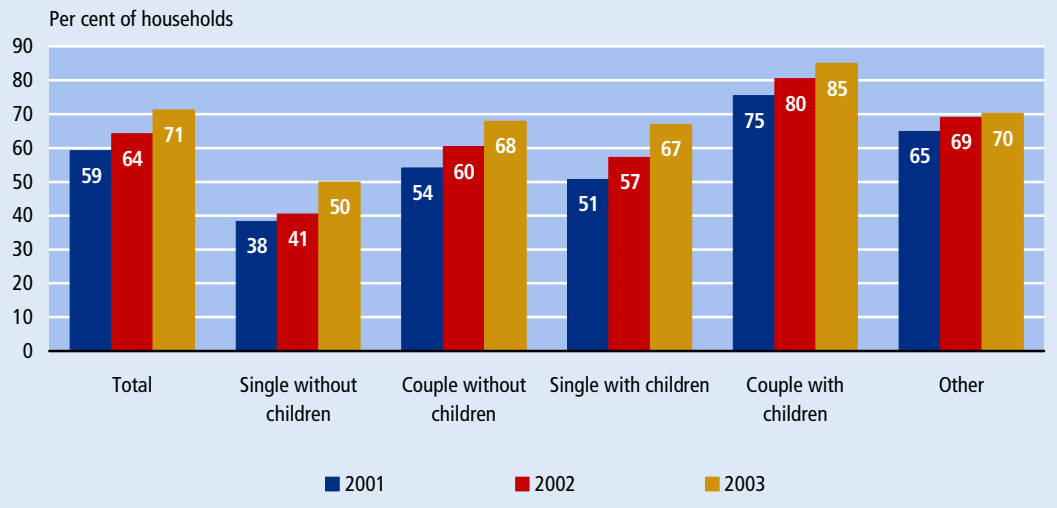
Nine in ten with higher education have Internet access

Regarding the population divided into three levels of education, the largest increase has taken place among persons with lower secondary school as the highest level of education. In this group 66 per cent had Internet access in 2003. Among those with higher education as the highest educational level, 92 per cent had access in 2003 compared to 89 per cent in 2001.

Particularly employed persons have Internet access

Particularly the employed and students have Internet access and accounted for 88 per cent in 2003. But the group of persons outside the labour market have seen the largest increase over the last three years. In this group, 47 per cent had access in 2003 against 31 per cent in 2001.

Figure 10.2 **Household access to the Internet by type of household**



Source: Statistics Denmark, Internet use by the population.

Seven in ten have Internet access at home

In 2003, 71 per cent of the population had Internet access at home, against 64 per cent in 2002 and 59 per cent in 2001. Regarding access by type of household, the share is higher among households with children and/or two adults living together. The share of the population with Internet access at home is higher among households with couples than with singles whether or not there are any children in the household. This applies to all three years.

85 per cent of couples with children have Internet access at home

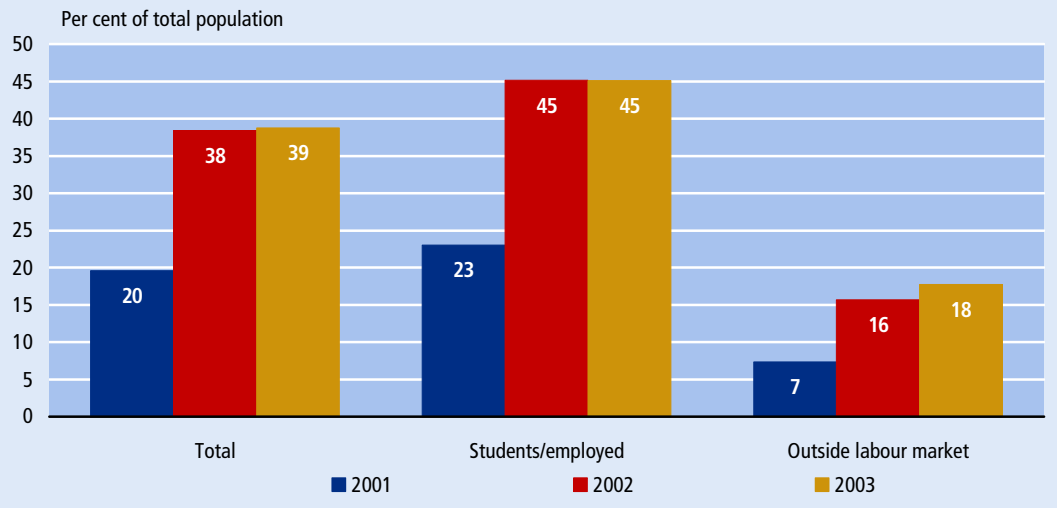
In 2003, 85 per cent of the population living in households with two adults and children had Internet access at home, followed by 68 per cent of the households with two adults and no children. 50 per cent of singles with no children had Internet access at home against 67 per cent of singles with children.

Reduced difference between the shares of couples with children and singles with children

Regarding the two types of households with children, the difference has narrowed down considerably between couples with children and singles with children. In 2001, the difference between the share of couples with children who had Internet access at home and the corresponding share of singles with children amounted to 24 percentage points. This difference was reduced to 18 percentage points in 2003.

The figures have increased for all types of households over the last three years. From 2002 to 2003, large increases occurred particularly for singles, both with and without children, and in 2003 there was hardly any difference between couples without children and singles with children.

Figure 10.3 **The population's communication with public authorities via the Internet**



Note: There has been a change in the questions from 2001 to 2002-2003. In 2001, a general question was asked concerning use of the Internet for communication with public authorities; in 2002 and 2003, three questions were asked in the category of communication with public authorities, namely finding information on web sites of public authorities, downloading forms from web sites of public authorities, and finally submitting completed forms to public authorities.

Source: Statistics Denmark, Internet use by the population.

Four in ten use the Internet to contact public authorities

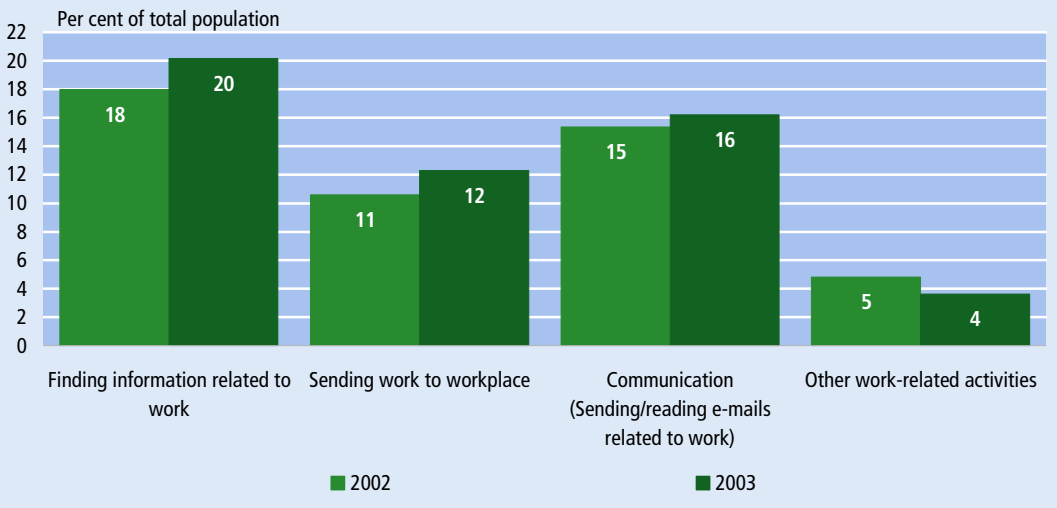
In 2003, 39 per cent of the population had used the Internet for communication with public authorities. Communication with public authorities covers finding information on official web sites, downloading forms from public authority web sites and submitting information to public authorities.

There was a major development in the share of the population that used the Internet for those purposes from 2001 to 2002. The explanation to this is probably dual, namely that the possibility to use the Internet for such purposes has been greatly enhanced and that the population has embraced this new possibility.

Two in ten outside the workforce use the Internet for that purpose

Particularly employed persons and students use the Internet to communicate with public authorities, namely 45 per cent in 2003. In the group outside the labour market, 18 per cent used the Internet for that purpose in 2003.

Figure 10.4 **Work-related purposes of Internet use outside the workplace**



Source: Statistics Denmark, Internet use by the population.

The population also use the Internet outside the workplace for work-related purposes. There is hardly any development from 2002 to 2003 in the share of the population that use the Internet for work-related purposes.

One in five Danes search for information in connection with job

The most frequent work-related purpose for which most of the population use the Internet outside the workplace is to search for information in connection with their jobs. In 2003, 20 per cent of the population had used the Internet for that purpose within the last month. This is a small increase on 2002 when the corresponding figure was 18 per cent.

16 per cent e-mail

The second most frequent purpose of using the Internet outside the workplace is to send/read e-mails relating to the job. 16 per cent of the population used the Internet for that purpose outside their workplace in 2003.

One in ten Danes send work done at home

In 2003, 12 per cent of the population had used the Internet within the last month for sending work that they had done at home, and 4 per cent for other activities relating to their jobs.