

Key Figures on the Danish Information Society 2005

Danish Figures



Ministry of Science
Technology and Innovation



STATISTICS
DENMARK

**Key Figures on
the Danish Information Society 2005
Danish Figures**

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Explanation of symbols

$\begin{matrix} 0 \\ 0,0 \end{matrix} \}$ Less than 0.5 of the unit applied

. Category not applicable

.. Data too uncertain

... Data not available

- Nil

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Denmark is to reap the benefits of ICT

ICT plays a key role in the development of our society. This applies to both our citizens' access to information and skills, the competitiveness of Danish enterprises and efficiency in the public sector.

We must focus on the fact that ICT creates value. To reap the benefits of ICT, we must regularly evaluate and follow up on the existing ICT policies. The work carried out by Statistics Denmark and the Ministry of Science, Technology and Innovation in selecting and monitoring key figures is therefore important.

The key figures in this publication and the international key figures in the publication *Key Figures on the Danish Information Society 2005 - International Figures* form the basis of the Government's IT and telecommunications policy 2005.

Helge Sander, Minister of Science, Technology and Innovation

April 2005

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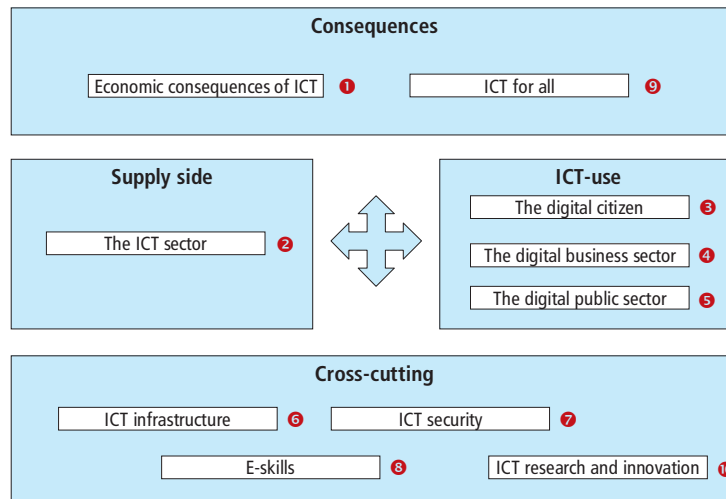
Introduction

Key figures on the Danish information society

Key figures on the Danish Information Society 2005 - Danish Figures is the second publication of key figures aimed at providing an overview of the development in the Danish information society.

Sources

The sources are statistics on ICT usage by individuals, the business sector and the public sector. Moreover, register data are applied to illustrate the Danish ICT sector and the ICT skills of the labour force. In addition to data from Statistics Denmark, the publication includes figures from the National IT and Telecom Agency and the Danish Centre for Studies in Research and Research Policy.



Structure of the publication

The figure illustrates the structure of the publication, the numbers referring to the chapters. A distinction is made between supply and demand. *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 precondition for ICT diffusion and adoption, and *ICT security* is central to further integration. The *ICT skills* of the population are a prerequisite for effective utilisation of ICT in society. *ICT research and innovation* describes the efforts in relation to new knowledge and development in the field of ICT.

Consequences of ICT

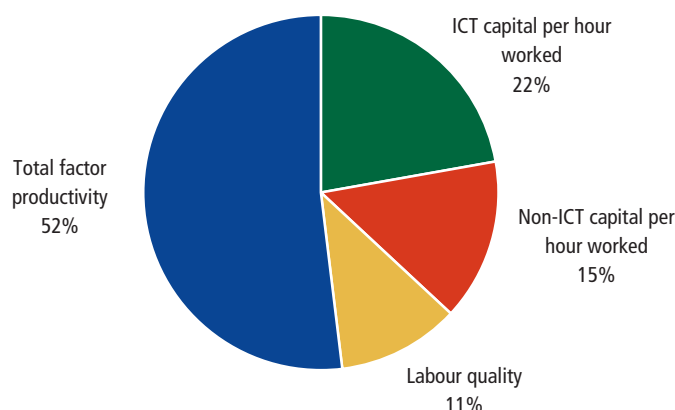
Economic consequences of ICT are described in the first chapter of the publication, illustrating the economic return of the information society. *ICT for all* shows the penetration and use of ICT among different parts of the population.

New publication with international figures

This year, comparisons between Denmark and other countries are compiled in a separate publication entitled *Key Figures on the Danish Information Society 2005 - International Figures*.

1. Economic consequences of ICT

Figure 1.1 Distribution of average growth in labour productivity 1988-2000



Source: Statistics Denmark, (Produktivitetsudviklingen i Danmark (Productivity in Denmark) 1988-2000.

ICT capital has significant impact on growth in labour productivity

Just under a quarter of the average growth in labour productivity in the period from 1988 to 2000 is explained by ICT capital per hour worked. The development in labour productivity is a measure of the degree to which the resources in society are utilised and can be calculated on the basis of factors such as 1) ICT capital, i.e., ICT equipment and software, 2) non-ICT capital such as plant, buildings and means of transport, etc., 3) level of education, and 4) total factor productivity, see the note to Table 1.1.

Constant contribution from ICT capital in the period 1988 to 2000

In the period from 1988 to 2000, labour productivity increased annually by an average of 2.7 per cent. As shown in Table 1.1 the effect of ICT capital on labour productivity is fairly constant throughout the period 1988 to 2000.

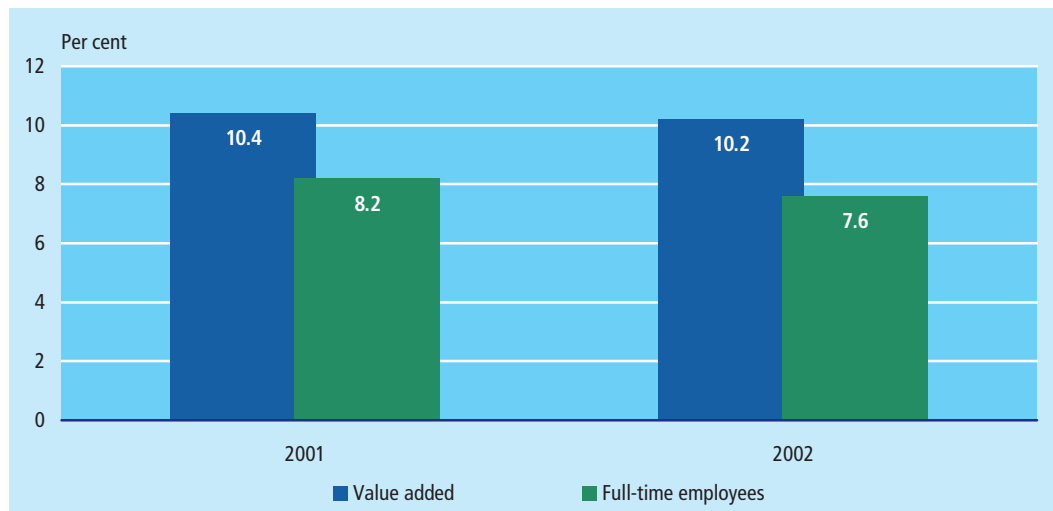
Table 1.1 Labour productivity by type, 1988-2000

	1988-1992	1993-1996	1997-2000	1988-2000
	average annual growth rate (%)			
Labour productivity	2,9	3,2	1,9	2,7
by:				
ICT capital per hour worked	0,6	0,7	0,7	0,6
Non-ICT capital per hour worked	0,9	0,3	-0,1	0,4
Labour quality	0,3	0,2	0,2	0,3
Total factor productivity	1,1	1,9	1,1	1,4

Note. Total factor productivity is an expression of changes in labour productivity that cannot be explained by changes in ICT capital, non-ICT capital or level of education.

Source: Statistics Denmark, Produktivitetsudviklingen i Danmark (Productivity in Denmark) 1988-2000.

Figure 1.2 ICT sector's share of value added and full-time employees in the business sector



Source: Statistics Denmark, Enterprise statistics.

ICT sector of major importance to value added

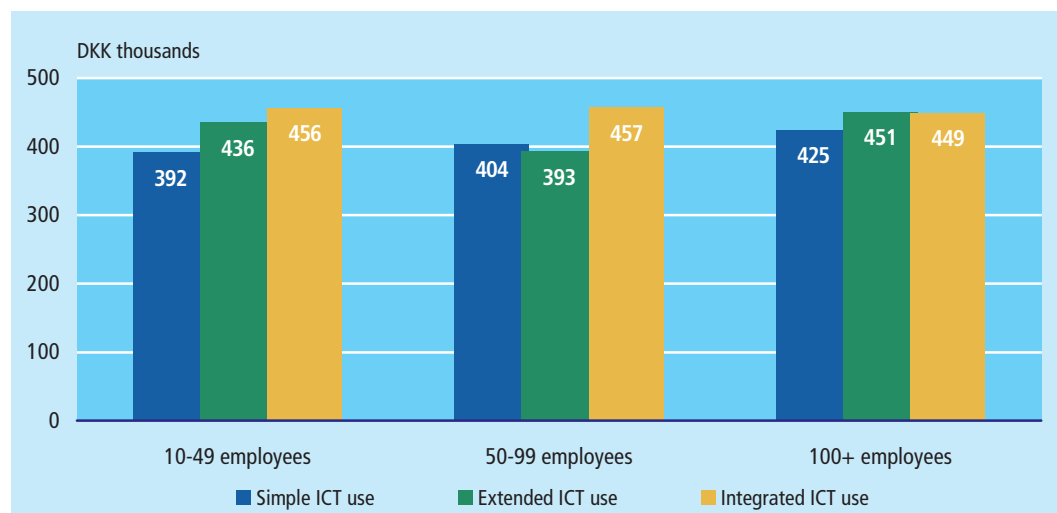
The ICT sector has a larger effect on the value added in the business sector than implied by its share of employment. In 2002, the ICT sector's share of the value added in the business sector in general was 10.2 per cent, while its share of employment was 7.6 per cent.

Decreasing share of value added and employment

From 2001 to 2002, the ICT sector saw a decrease in its shares of both employment and value added. Employment dropped the most by 0.6 percentage points, while the value added decreased by 0.2 percentage points. Conversely, this means that the value added per full-time employee rose from about DKK 585,000 in 2001 to DKK 625,000 in 2002.

High value added in telecommunications

The value added in the telecommunications industry was first calculated in 2001. Given the very high value added in the telecommunications industry, the industry accounts for a large share of the total value added of the ICT sector.

Figure 1.3 ICT use and value added per full-time employee, selected industries, 2001

Note. Based on 2,224 enterprises in selected industries (high-tech industry, low and medium-tech industries, construction, transport and mail, commerce, hotels and restaurants). Non-raised figures.

Source: Statistics Denmark, ICT use by Danish enterprises, 2001, special extract for the Ministry of Science, Technology and Innovation, 2004, and Ministry of Science, Technology and Innovation: "It på rette tid og sted - It-anvendelse i danske virksomheder og indsatser i andre lande" (IT at the right time and place).

*Analysis of
interaction between
ICT use
and value added*

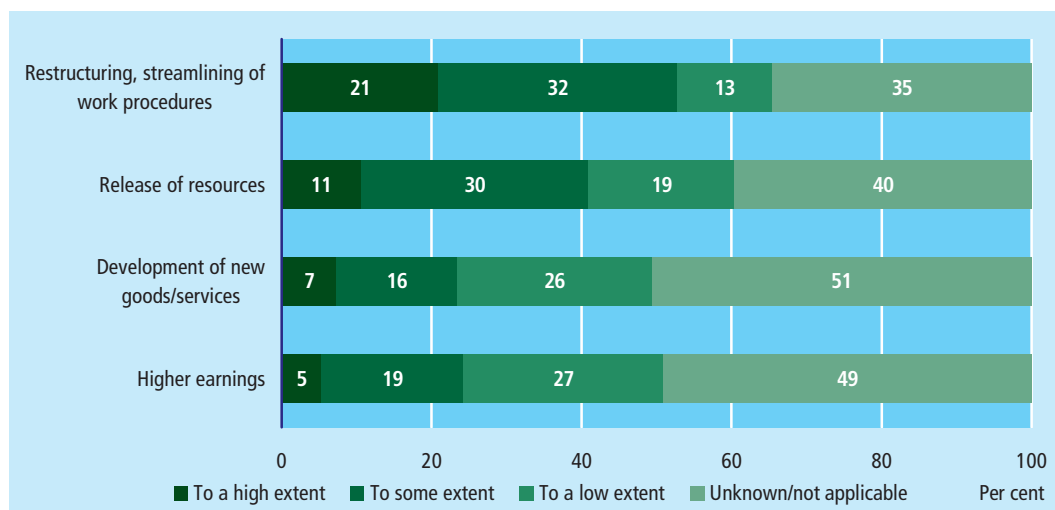
An analysis of the ICT use by enterprises shows a correlation with the value added. The analysis is based on a stepwise model, dividing Danish enterprises into groups with simple, extended and integrated ICT use, respectively. The enterprises are further divided by size into the following subgroups: 10 to 49, 50 to 99, and 100 or more employees.

*Tendency of higher
value added at
extended ICT use*

In all three groups in the selected industries, the enterprises with integrated ICT use have a higher value added per full-time employee than enterprises with simple ICT use. Enterprises with extended ICT use occur more randomly in each of the categories.

*Clearest correlation in
smaller enterprises*

The correlation is most distinct among enterprises with 10 to 49 employees. In this group, the value added in enterprises with integrated ICT use is 16 per cent higher than in the enterprises with simple ICT use. For the larger enterprises, it must be assumed that other factors must be present for the effect of ICT use to occur.

Figure 1.4 Effect of ICT projects in enterprises, 2004

Note. The enterprises were asked the following: "To what extent have the ICT projects of the last two years caused changes in relation to previous task handling?". Enterprises with no ICT projects answered "Unknown/not applicable".

Source: Statistics Denmark, ICT use by Danish enterprises, 2004.

Restructured work procedures most common

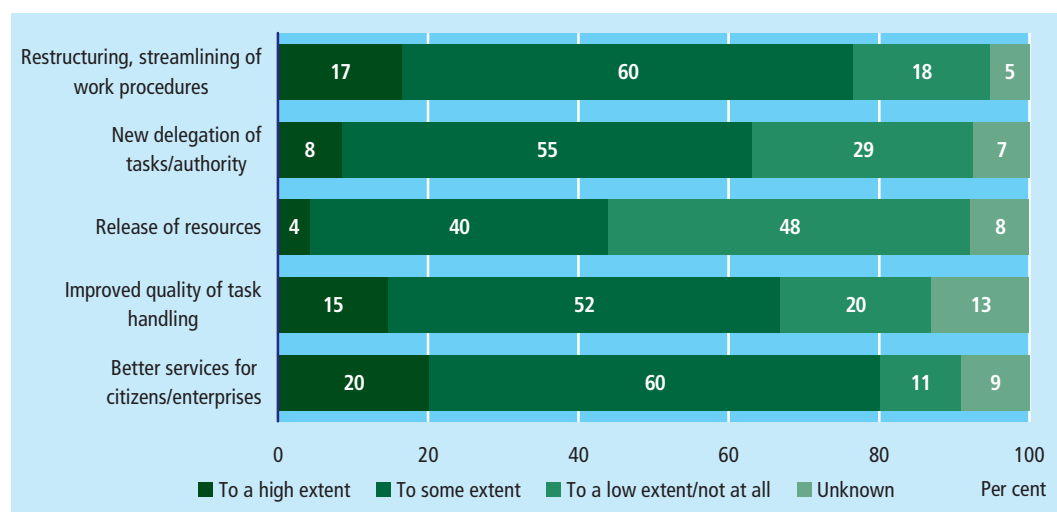
Enterprises with 10 or more employees have assessed the impact of four effects of the digitalisation projects implemented the last two years. Restructuring and streamlining of work procedures is the effect experienced most frequently by the enterprises. Thus, 53 per cent have noted such an effect to a high extent or to some extent, 21 per cent of which to a high extent.

ICT projects result in new products in one in four enterprises

Forty-one per cent of the enterprises have experienced a release of resources as a result of ICT projects to a high extent or to some extent, 11 per cent of which to a high extent. Development of new goods/ services comes in second: 23 per cent has experienced this to a high extent or to some extent. About the same share, 24 per cent, have experienced higher earnings in connection with ICT projects.

The majority experience release of resources when restructuring and streamlining work procedures

Release of resources, and ultimately higher earnings, are probably the reasons behind many ICT projects and will often depend on restructuring of work procedures or development of new products. Calculations show that, of the many enterprises that have restructured their work procedures, no less than 75 per cent have released resources and 44 per cent have experienced higher earnings.

Figure 1.5 Effect of digitalisation projects at public authorities, 2004

Note. The public authorities were asked the following: "To what extent have the ICT projects of the last two years caused changes in relation to previous task handling?" The answers were given in relation to the areas comprised by digitalisation.

Source: Statistics Denmark, ICT use by the public sector, 2004.

Digitalisation frequently affects organisation

The public authorities have evaluated the extent of five effects of the digitalisation projects of the last two years. Nearly eight in ten authorities have restructured and streamlined work procedures to a high extent or to some extent, and six in ten have changed the delegation of tasks and authority.

Release of resources by less than one in two

Release of resources occurred at 44 per cent of the public authorities. However, they barely ever experience a release of resources without at least one of the other effects being present.

Release of resources at authorities with restructured work procedures

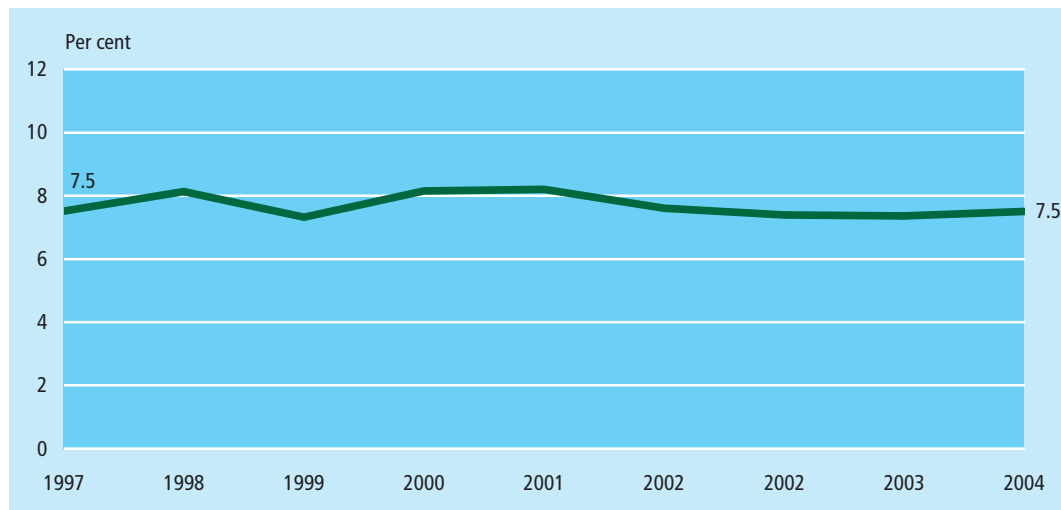
By way of example, 57 per cent of the public authorities that have restructured their work procedures have released resources to a high extent or to some extent, as compared to 3 per cent of the public authorities that have not. A similar effect on the release of resources is found in combination with new delegation of tasks and authority.

Eight in ten have achieved better services for citizens or enterprises

Two in three public authorities have experienced improved quality of task handling. Finally, eight in ten find that digitalisation has led to better services for citizens and enterprises.

2. The ICT sector

Figure 2.1 Full-time employees in the ICT sector



Note. 2004 only contains data for the first three quarters.

Note. The figure is based on data from the ATP statistics, which use another statistical method than the Enterprises statistics; this is the reason for the difference between Figure 2.1 and Table 2.1.

Source: Statistics Denmark, ATP statistics 2000-2004.

Employment in ICT sector came to 7.5 per cent in 2004

In 2004, employment in the ICT sector accounted for 7.5 per cent of total employment in the business sector. This is the same share as in 1997. Total employment in the ICT sector, however, rose from about 80,000 in 1997 to about 91,000 in 2004.

Large fluctuations in employment between 1997 and 2004

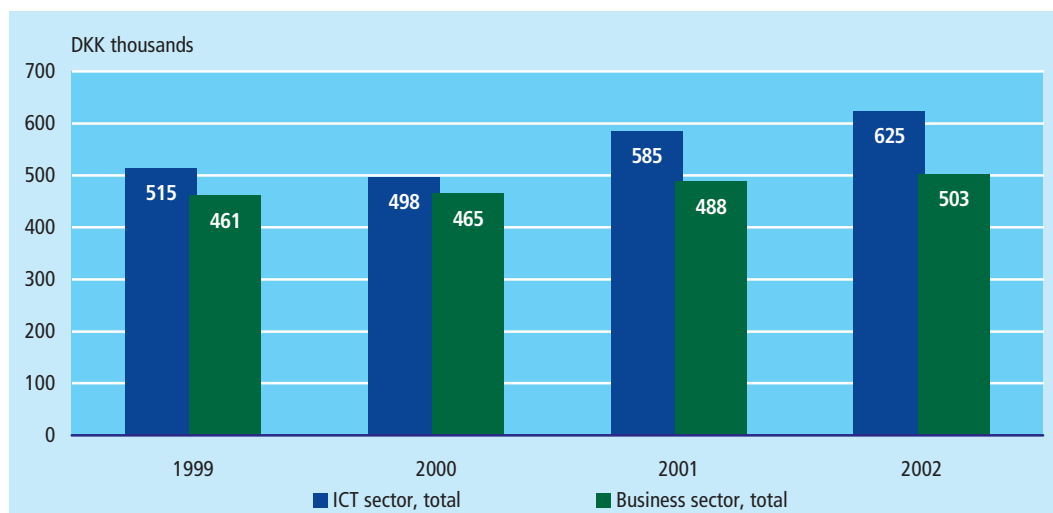
The unchanged share fails to reflect certain fluctuations during the period, as the ICT sector's share of employment rose from 7.3 per cent in 1999 to 8.2 per cent in 2000 and 2001, and then decreased the following year. ICT manufacturing's share of total employment in the ICT sector decreased from 24.2 per cent in 1997 to 16.4 per cent in 2004, corresponding to a decrease of about 4,500 full-time employees.

Table 2.1 Full-time employees in the ICT sector

	1997	1998	1999	2000	2001	2002	2003	2004
1,000 employees								
Business sector, total	1 064	1 092	1 314	1 275	1 275	1 279	1 235	1 220
ICT sector, total	80	89	96	104	105	97	91	91
percentage of business sector								
ICT sector's share	7.5	8.1	7.3	8.2	8.2	7.6	7.4	7.5

Note. The figures for 2004 are based on an average of the first three quarters. ATP figures for Q3 2004 are provisional.

Source: Statistics Denmark, Enterprise statistics (1996-1998), General enterprise statistics (1999-2002), ATP statistics 2003-2004.

Figure 2.2 Value added per full-time employee

Note. Telecommunications are included as from 2001, which accounts for most of the increase in 2001 and 2002 in the ICT sector.
Source: Statistics Denmark, Enterprise statistics.

Higher value added per employee in ICT sector than in the rest of the corporate sector

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. In 2002, the ICT sector had an average value added per full-time employee of DKK 625,000, or 25 per cent above the level of the business sector, which was DKK 503,000 per full-time employee.

Major mutual differences within ICT sector

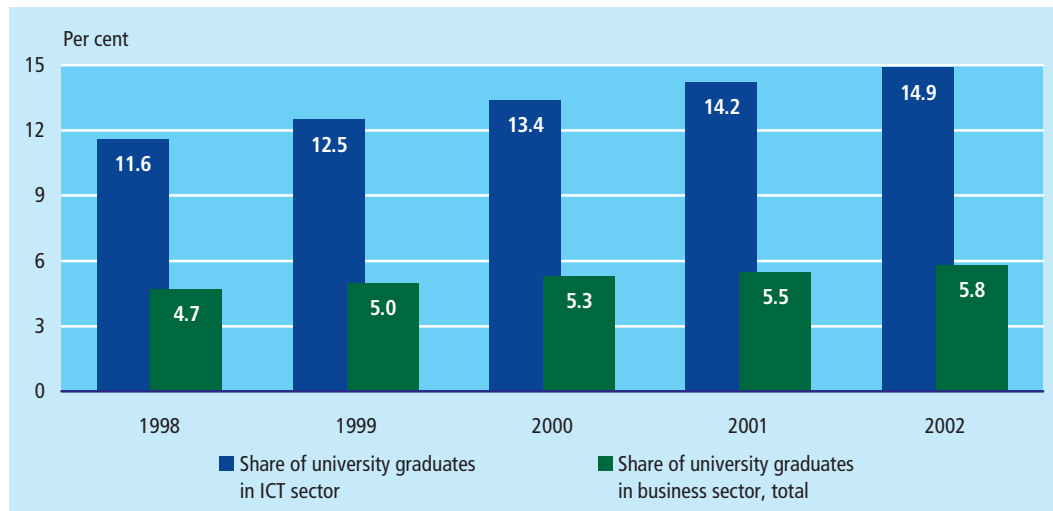
There are major mutual differences between the value added per full-time employee of the individual industries within the ICT sector. In 2002, the telecommunications industry had a value added per full-time employee of DKK 854,000, while the corresponding figure for ICT manufacturing was DKK 484,000.

Telecommunications were not calculated until 2001, which explains most of the increase in the value added in the ICT sector from 2001 in Figure 2.2.

Table 2.2 Value added per full-time employee

	1999	2000	2001	2002
	DKK 1,000			
Business sector	461.3	465.2	488.1	503.5
ICT sector, total	514.7	497.6	585.1	624.6
ICT manufacturing	428.4	393.0	445.3	484.1
ICT wholesale	521.0	548.4	533.2	566.2
ICT consulting services	575.3	525.0	544.3	599.6
Telecommunications	854.4	853.8

Note. Telecommunications were not calculated until 2001 and are therefore only included in "ICT sector, total" as of that year.
Source: Statistics Denmark, Enterprise statistics.

Figure 2.3 Share of university graduates in the ICT sector

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

High educational level in ICT sector

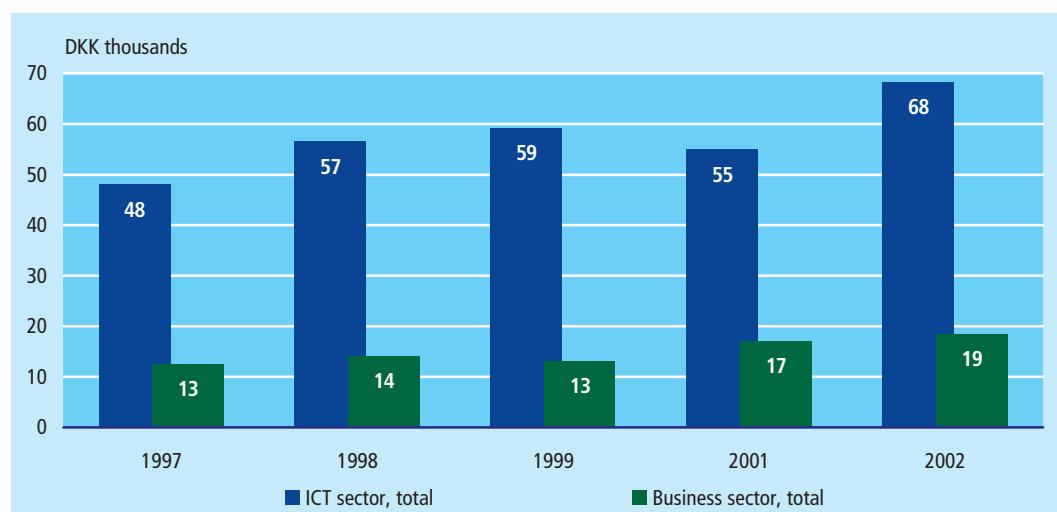
The labour force of the ICT sector generally has a high, and increasing, educational level. Fifteen per cent of ICT sector employees had a university degree in 2002, i.e., either a bachelor's degree, a master's degree or a Ph.D. This is nearly three times higher than the percentage for the business sector as a whole regarding the share of university graduates.

3 percentage points increase in share of university graduates

The ICT sector has seen a larger increase in the share of university graduates than the overall business sector - from just under 12 per cent in 1998 to 15 per cent in 2002, or an increase of 3 percentage points - while the share of the business sector as a whole during the same period rose from just under 5 per cent to 6 per cent, or 1 percentage point.

One in six university graduates works in the ICT sector

The share of all university graduates working in the ICT sector rose from 13 per cent in 1998 to 16 per cent in 2002, corresponding to one in six university graduates. This large share should be seen in relation to the fact that the ICT sector accounted for just under 8 per cent of total employment in the business sector in 2002.

Figure 2.4 Research and development per full-time employee in the ICT sector

Source: Danish Centre for Studies in Research and Research Policy, 2002, and Statistics Denmark, Enterprise statistics.

*ICT sector invested
DKK 6.6bn in R&D
in 2002 ...*

Total investments in research and development (R&D) in the ICT sector showed an increase in the period from 1997 to 2001. From 1999 to 2002 the amount increased by 18 per cent from DKK 5.6bn to DKK 6.6bn.

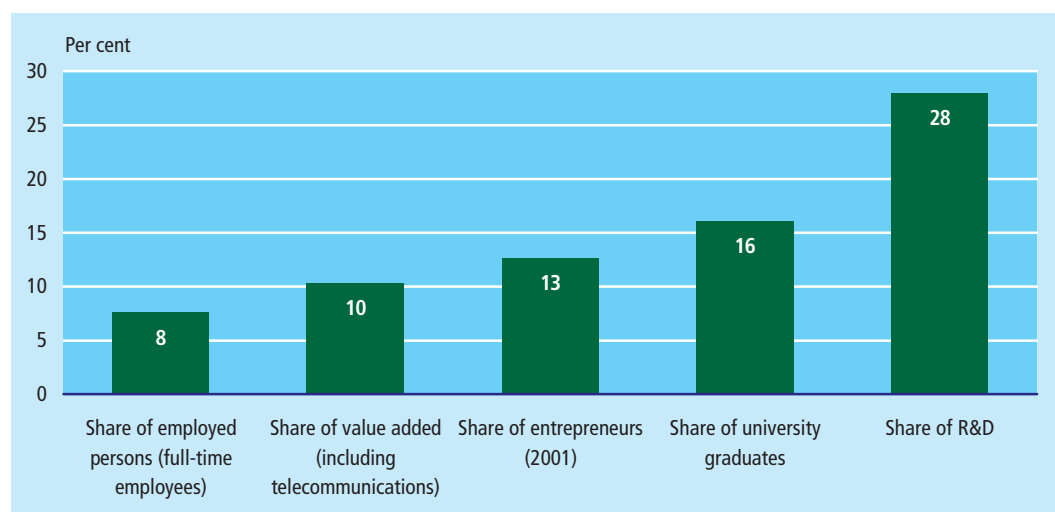
*...corresponding to
DKK 68,000 per
full-time employee ...*

In 2002, R&D investments in the ICT sector came to DKK 68,000 per full-time employee, corresponding to an increase of about 42 per cent since 1997, despite a slight drop between 1999 and 2001.

*...about 3.5 times
higher than in the
business sector*

R&D investments per full-time employee in the ICT sector are markedly higher than in the business sector in general, the figure being about 3.5 times higher per full-time employee in the ICT sector than in the business sector in 2002. All in all, R&D investments in the ICT sector account for 28 per cent of total R&D investments in the business sector.

Figure 2.5 Size, value added and knowledge intensity of the ICT sector



Note. The ICT sector's share of the value added for 2002 includes the value added in telecommunications. The share of entrepreneurs is from 2001.

Source: Statistics Denmark, Enterprise statistics, and Danish Centre for Studies in Research and Research Policy, Erhvervslivets forskning og udviklingsarbejde 2002 (research and development by trade and industry).

ICT sector characterised by high knowledge intensity

In terms of size, the ICT sector accounted for 7.6 per cent of employment in 2002. The ICT sector is considerably more knowledge-intensive than the business sector as a whole by virtue of its substantial R&D investments and a large share of its employees being university graduates.

Substantial investments in R&D

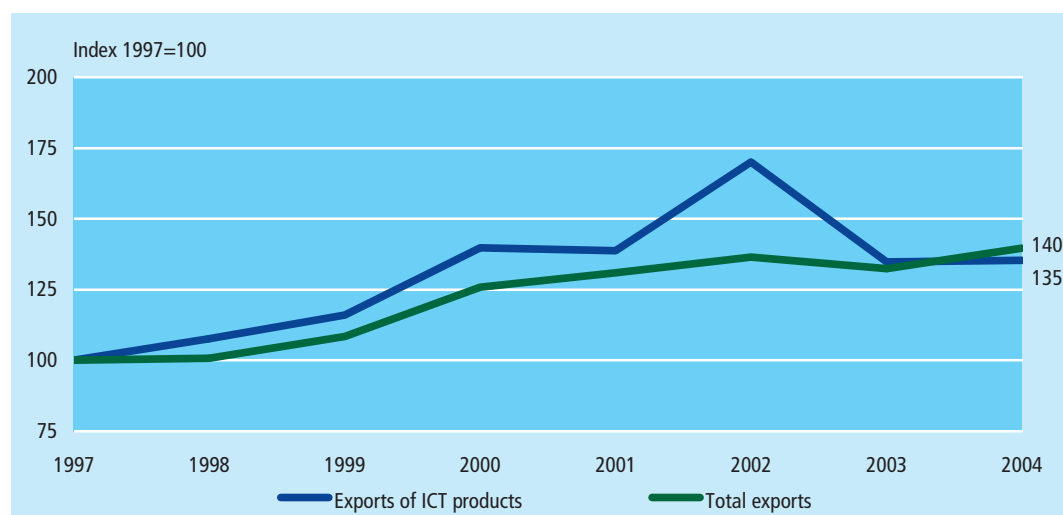
The most distinctive figure is the ICT sector's contribution to total R&D investments, which in 2002 corresponded to 28 per cent of total R&D investments by the business sector.

High level of education ...

Employees in the ICT sector generally have considerably higher degrees than employees in the business sector as a whole. In 2002, employment in the ICT sector accounted for 7.6 per cent of total employment in the business sector, while the sector's share of university graduates was more than twice as high.

... 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 2002 the value added in the ICT sector constituted 10.3 per cent of the total value added in the business sector.

Figure 2.6 Exports of ICT products and services

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

Exports of ICT products came to DKK 34bn in 2004

Danish exports of ICT products totalled DKK 34bn in 2004, which is a 35 per cent increase since 1997. Following a steep drop from 2002 to 2003, the development has been largely unchanged from 2003 to 2004. In 2004, ICT exports accounted for 7.6 per cent of Denmark's total exports.

Exports of high-tech products on the rise

Despite the drop in ICT exports from 2002 to 2003, the overall importance is rising in the period as a whole. For example, exports of ICT products accounted for 54 per cent in relation to exports of agricultural products in 1997, but 70 per cent in 2004. Similarly, exports of another group of high-tech products, medical products, rose in relation to exports of agricultural products from 33 per cent in 1997 to 67 per cent in 2004.

Exports of ICT services for DKK 6.3bn in 2003

Exports of services by ICT consulting firms amounted to DKK 6.3bn in 2003, or 15 per cent of total turnover of the industry. Exports from ICT consulting firms have decreased by about 7 per cent in relation to 2002.

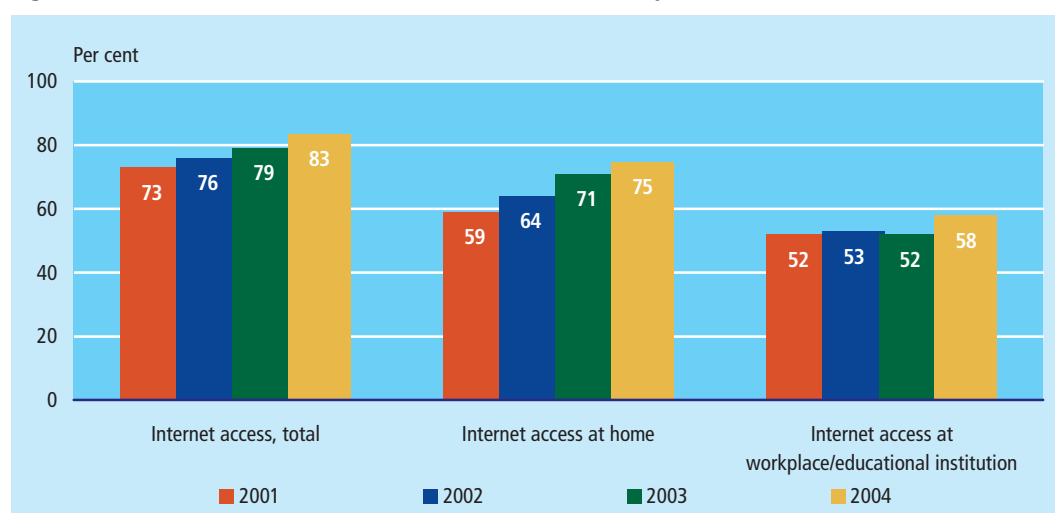
Table 2.6 ICT exports and exports of selected product groups

	1997	1998	1999	2000	2001	2002	2003	2004
	DKKbn							
Total exports	324.3	326.5	351.9	408.2	424.7	442.8	429.3	453.0
Exports of ICT products	25.3	27.3	29.4	35.4	35.1	43.1	34.1	34.3
Exports of medical products	15.6	16.9	21.2	24.1	28.2	30.4	32.2	32.8
Exports of agricultural products	47.2	42.5	42.9	47.7	52.4	49.3	47.1	48.8

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

3. The digital citizen

Figure 3.1 Internet access at home or at workplace/educational institution



Source: Statistics Denmark, Internet use by the population.

83 per cent had Internet access

In 2004, 83 per cent of the population had Internet access at home and/or at their workplace/educational institution; this compares to 79 per cent in 2003, 76 per cent in 2002 and 73 per cent in 2001.

Steady increase in share with Internet access at home

The development has been characterised by a steady increase in the share of the population that has acquired Internet access at home. From 2001 to 2004 the share rose from 59 to 75 per cent. Internet access at the workplace or educational institution remained steady at about 50 per cent from 2001 to 2003, while in 2004 six in ten Danes had access.

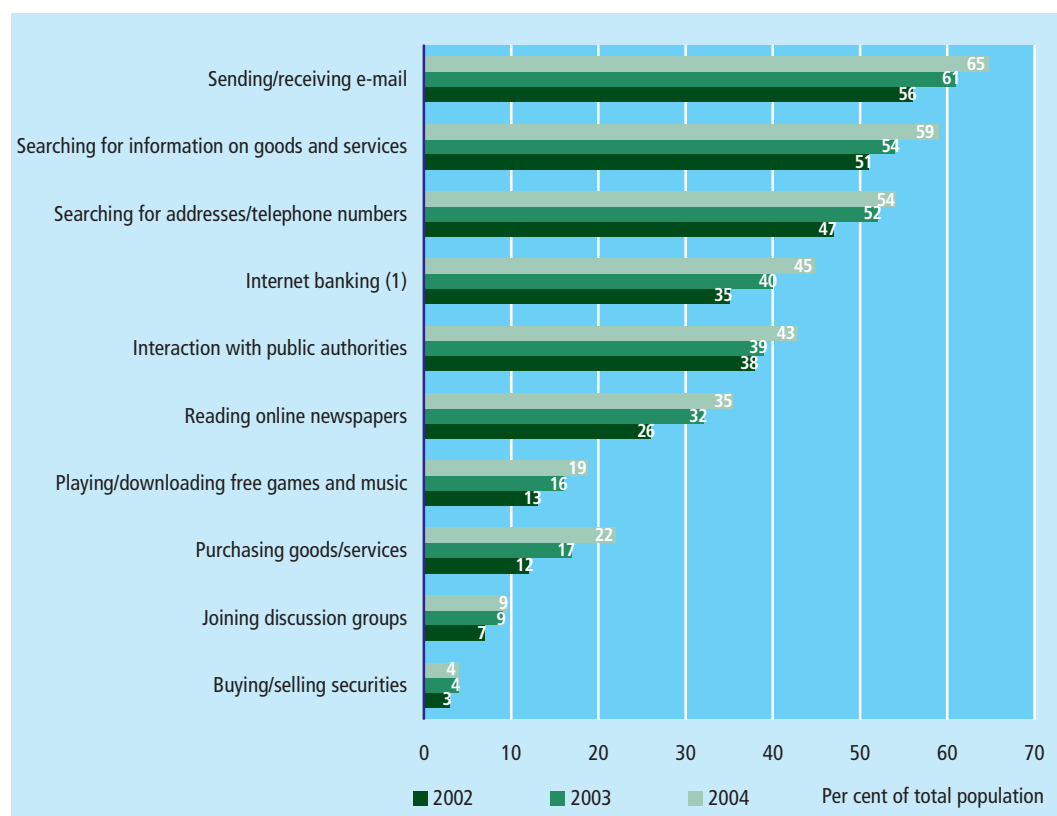
Steep rise in access from mobile phones

In 2004, 74 per cent of the population had Internet access at home through their PCs. Moreover, 3 per cent had access from a handheld computer, and no less than 13 per cent had access through their mobile phones, which is a noticeable rise compared to 2003 when this share was 4 per cent.

Table 3.1 Devices for home Internet access

	2003	2004
	per cent of total population	
PC	71	74
Handheld computer	2	3
Mobile phone	4	13

Source: Statistics Denmark, Internet use by the population.

Figure 3.2 Private purposes for using the Internet

¹ In 2002 and 2003 the question related to banking transactions.

Source: Statistics Denmark, Internet use by the population.

Rise over time in private purposes for Internet use

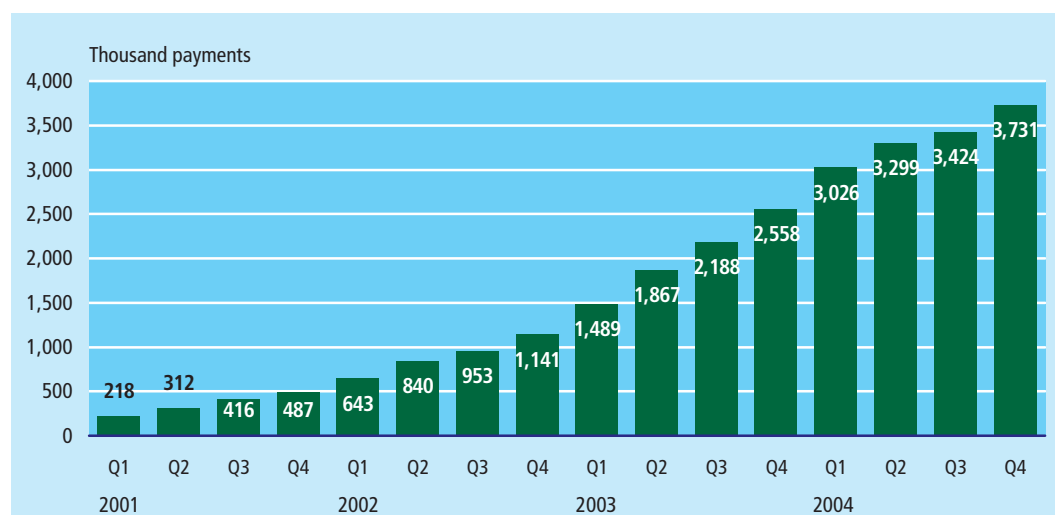
The most common private purposes for using the Internet are to communicate, search for information and use online services. All the private purposes have seen an increase over time. Generally, the largest increase occurred from 2002 to 2003. The ranking of the purposes has generally been unchanged over the three years, but e-commerce appears to be gaining ground.

65 per cent used the Internet to receive and send e-mails

In 2004, 65 per cent of the population had used the Internet within the last month to send and receive e-mail, 59 per cent used it to search for information about goods and services, and 54 per cent to search for addresses or telephone numbers.

One in four used e-commerce

In 2004, 45 per cent of the population did their banking online, while 43 per cent communicated with public authorities; 35 per cent used the Internet to read online newspapers/magazines, and 22 per cent to purchase goods or services (financial services not included).

Figure 3.3 Number of payments in Danish Internet shops

Source: PBS, January 2005.

Large increase in card payments through PBS

The number of card payments in Danish Internet shops has risen steadily in the period 2001 to 2004. In 2004, a total of 13.5 million card payments were effected through PBS as compared to 8.1 million in 2003. This corresponds to a 66 per cent increase.

29 per cent worried about security at payment

A large proportion of the population has the opportunity to use e-commerce, but does not do so. In 2004, the majority of the respondents stated that the most significant barrier to e-commerce was that they did not need it and/or that they were concerned about security in connection with payment (both 29 per cent).

Change in most significant barrier to e-commerce

Regarding the whole period from 2002 to 2004, a change has occurred between the barrier "want to shop in person" and the barrier "concerns about security in connection with payment". Thus, 30 per cent stated in 2002 that they preferred to shop in person, against 26 per cent in 2004. In 2002, 26 per cent were concerned about security in connection with payment as compared to 29 per cent in 2004.

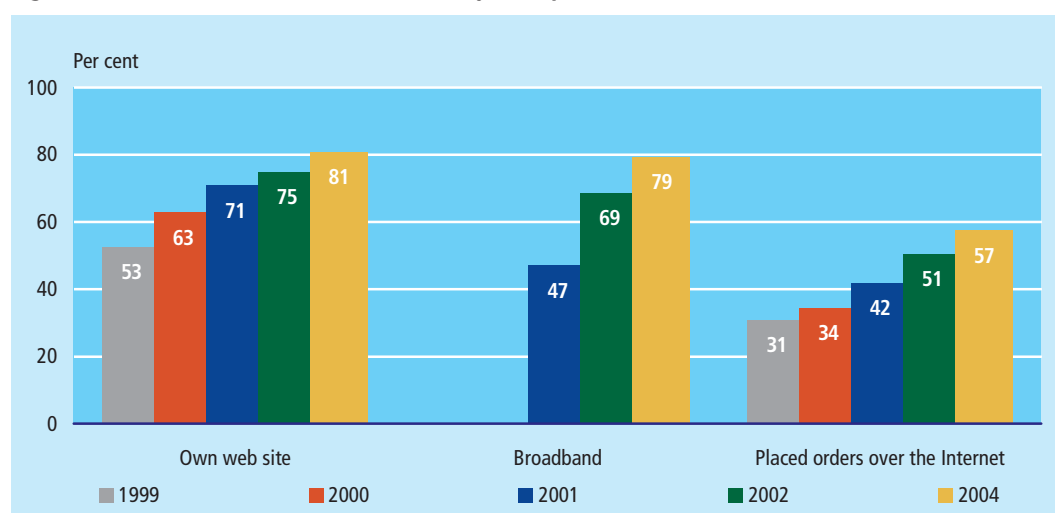
Table 3.3 Most significant barriers to purchases of goods/services over the Internet

	2002	2003	2004
	per cent of total population		
Purchase/order over the Internet	12	17	22
	percentage of people who have access to e-commerce, but do not use it		
Prefer to shop in person	30	28	26
No need	29	28	29
Concerned about security in connection with payment	26	26	29
Other	16	18	16

Source: Statistics Denmark, Internet use by the population.

4. The digital business sector

Figure 4.1 Selected ICT use by enterprises



Note. Broadband means ADSL and the like, or other cable-based Internet connections (i.e., access roads faster than analogue modems or ISDN). Enterprises with 10+ employees.

Source: Statistics Denmark, ICT use by Danish enterprises.

Three in four enterprises have web sites

The share of enterprises with web sites rose markedly from 1999 to 2004 among enterprises with 10 or more employees. In 1999 about every second enterprise had a web site - by 2004 this share had increased to four in five enterprises.

Strong increase in number of enterprises with broadband

The share of enterprises with broadband connections rose steeply from 47 per cent in 2001 to 79 per cent in 2004. Also electronic commerce has seen a noticeable rise in terms of purchases on the Internet. In 1999, less than every third enterprise with 10 or more employees had placed orders on the Internet, while the corresponding figure for 2004 was 57 per cent.

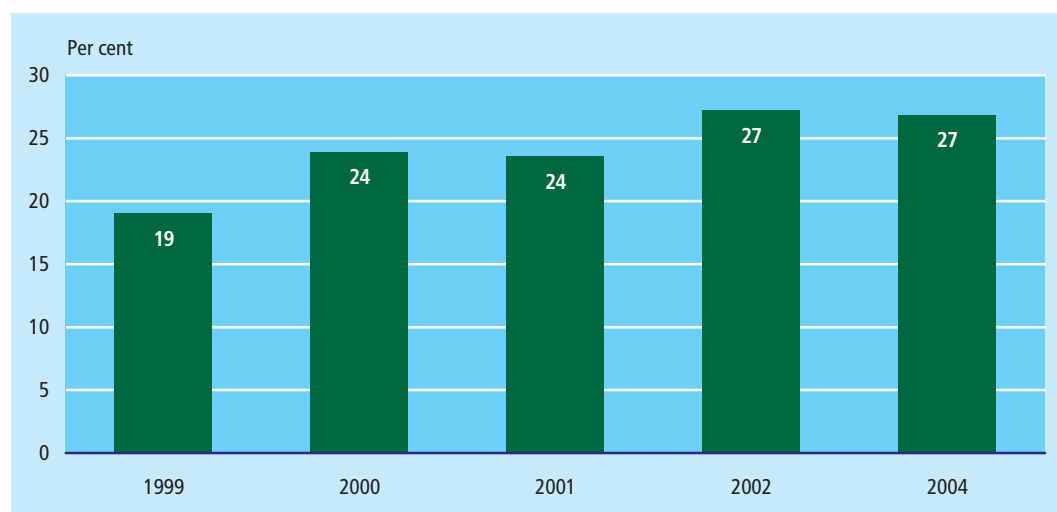
Large enterprises ahead

The level of ICT use is higher among large enterprise in all areas than among smaller ones.

Table 4.1 Selected ICT use by size of enterprise, 2004

	Number of employees			Total
	10-49	50-99	100+	
	per cent			
Own web site	78	91	95	81
Broadband	77	90	94	79
Orders placed over the Internet	54	66	79	57

Source: Statistics Denmark, ICT use by Danish enterprises, 2004.

Figure 4.2 Enterprises that have received orders over the Internet

Note. In 2004 respondents were asked at the beginning of the year about orders received in 2003. In the other years, they were asked at the end of the year about orders received during the year.

Source: Statistics Denmark, ICT use by Danish enterprises.

Increase in orders received over the Internet

The number of enterprises that have received orders over the Internet has increased moderately from 19 per cent in 1999 to 27 per cent in 2004. Not all years have seen a noticeable increase, however.

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 2004. There is no distinct difference between the shares of large or small enterprises that have received orders over the Internet.

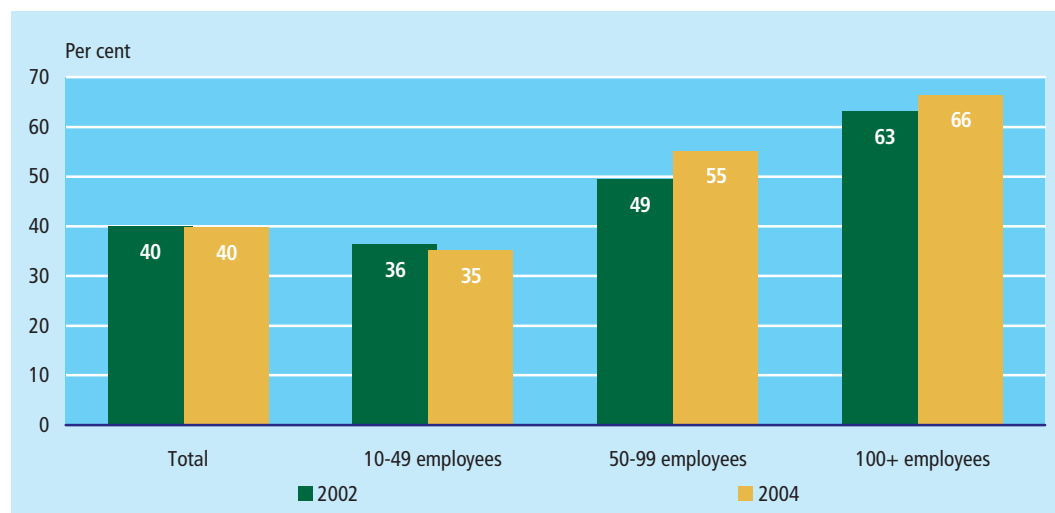
Internet purchases more frequent among large enterprises

The opposite applies to enterprises that have made purchases over the Internet; 54 per cent of enterprises with 10 to 49 employees did that, as compared to 79 per cent of enterprises with 100 or more employees. Purchases over the Internet are generally twice as frequent as orders received.

Table 4.2 Orders placed or received over the Internet, 2004

	Number of employees			Total
	10-49	50-99	100+	
	per cent			
Internet access	97	99	100	97
Orders received over the Internet	26	27	31	27
Orders placed over the Internet	54	66	79	57

Source: Statistics Denmark, ICT use by Danish enterprises, 2004.

Figure 4.3 Enterprises with ICT systems for handling orders

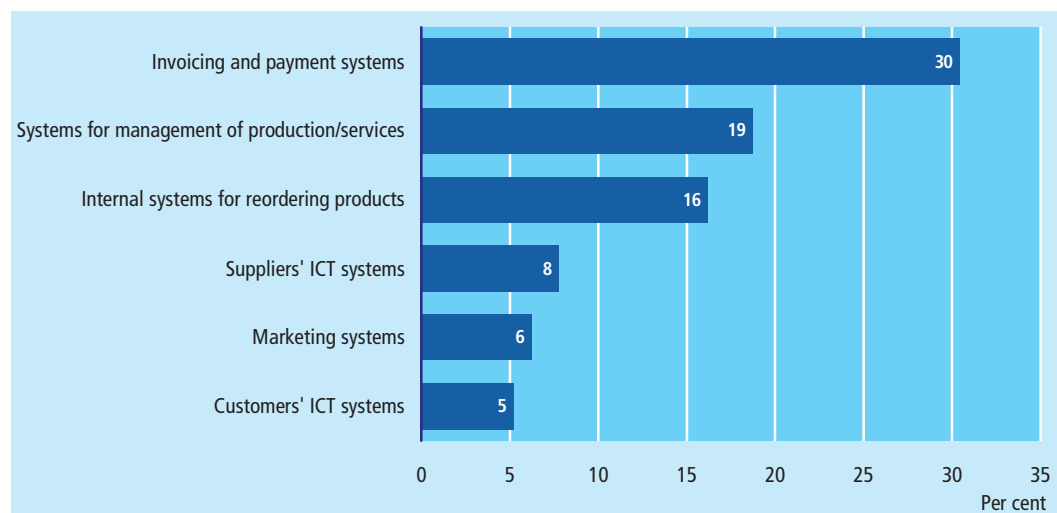
Source: Statistics Denmark, ICT use by Danish enterprises.

Four in ten enterprises have ICT systems for handling orders

In 2004, 40 per cent of enterprises with 10 or more employees used dedicated ICT systems for handling orders. This is no major change in relation to 2002. 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.

Questions changed

The seemingly unchanged share of all enterprises as a whole may be affected by a slight change in the wording of questions in the survey. Apparently, this has an effect particularly among enterprises with 10 to 49 employees. Among enterprises with 50 or more employees, there was a growing share.

Figure 4.4 Integration of order handling systems with other ICT systems, 2004

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, 2004.

Purchasing or ordering systems most frequently integrated with invoicing

As mentioned in connection with Figure 4.3, 40 per cent of the Danish enterprises have ICT systems for handling orders. 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 order handling systems with such integration.

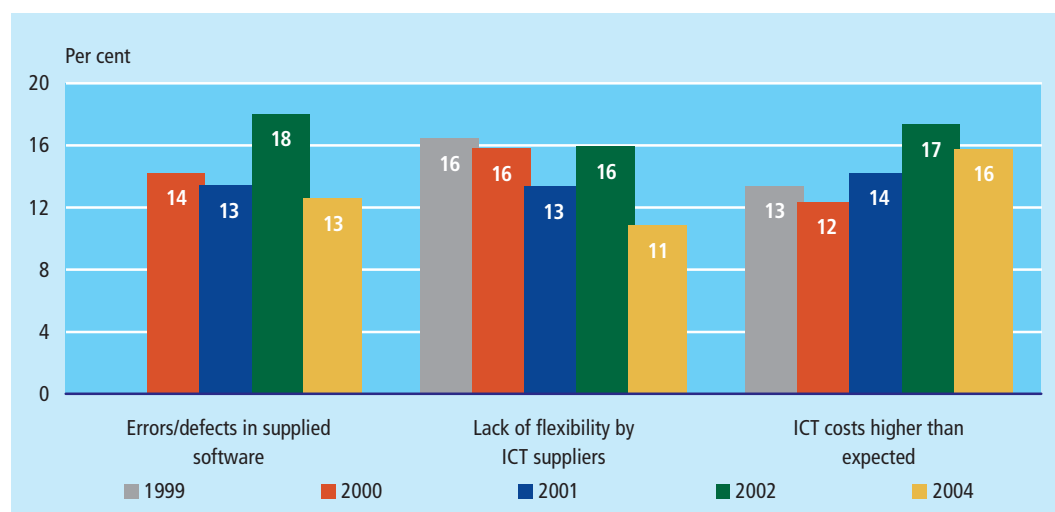
One in five has order handling system with integration to production management

Nearly one in five enterprises has an order handling system that is integrated with systems for managing production or services. A slightly lower number, 16 per cent, have integration with systems for reordering of products. This is followed by suppliers' ICT systems (8 per cent), marketing systems (6 per cent) and integration with customers' ICT systems with the lowest share (5 per cent).

Table 4.4 Integration of order handling systems with other ICT systems, 2004

	Number of employees			Total
	10-49	50-99	100+	
	per cent			
Invoicing and payment systems	26	44	56	30
Systems for management of production/services	14	34	47	19
Internal systems for reordering products	13	24	36	16
Suppliers' ICT systems	7	9	16	8
Marketing systems	5	12	15	6
Customers' ICT systems	4	8	14	5

Source: Statistics Denmark, ICT use by Danish enterprises, 2004.

Figure 4.5 Barriers to ICT use by enterprises

Note. The figure includes enterprises that considered the barriers to be of 'high' importance. The 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.

Most common barriers

Among the most significant barriers to the use of ICT by Danish enterprises, which have been traceable in recent years, are errors/defects in purchased software, lack of flexibility by ICT suppliers and higher ICT costs than expected. On average, one in seven enterprises rated these barriers as being of high importance in the years from 1999 to 2004.

Unexpected ICT costs increasingly important

The importance of the individual barriers has not varied considerably over the period. 2002 is an exception in the sense that all three barriers have high ratings that year. The barriers errors/defects in purchased software and lack of flexibility by ICT suppliers have seen a downward trend. Conversely, higher-than-expected ICT costs have seen a slightly upward trend, up from 13 per cent in 1999 to 16 per cent in 2004.

Same perception of barriers by small and large enterprises

Generally, there is no noteworthy difference between small and large enterprises regarding the importance of these barriers. The large enterprises with 100 or more employees, however, appear to experience problems with errors/defects in purchased software more frequently.

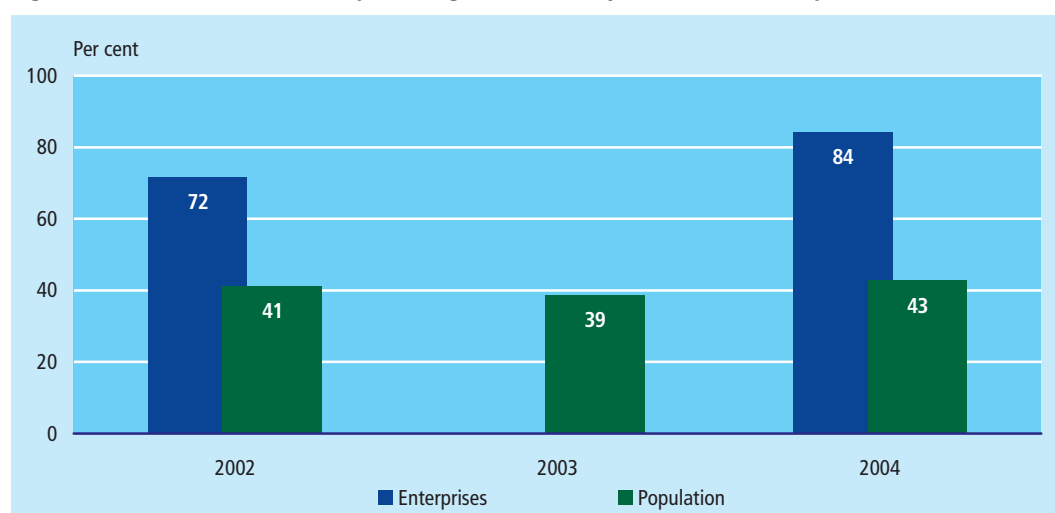
Table 4.5 Barriers to ICT use by enterprises, 2004

	Number of employees			Total
	10-49	50-99	100+	
	per cent			
Errors/defects in supplied software	12	15	18	13
Lack of flexibility by ICT suppliers	10	13	13	11
ICT costs higher than expected	15	19	16	16

Source: Statistics Denmark, ICT use by Danish enterprises, 2004.

5. The digital public sector

Figure 5.1 Use of public digital services by citizens and enterprises



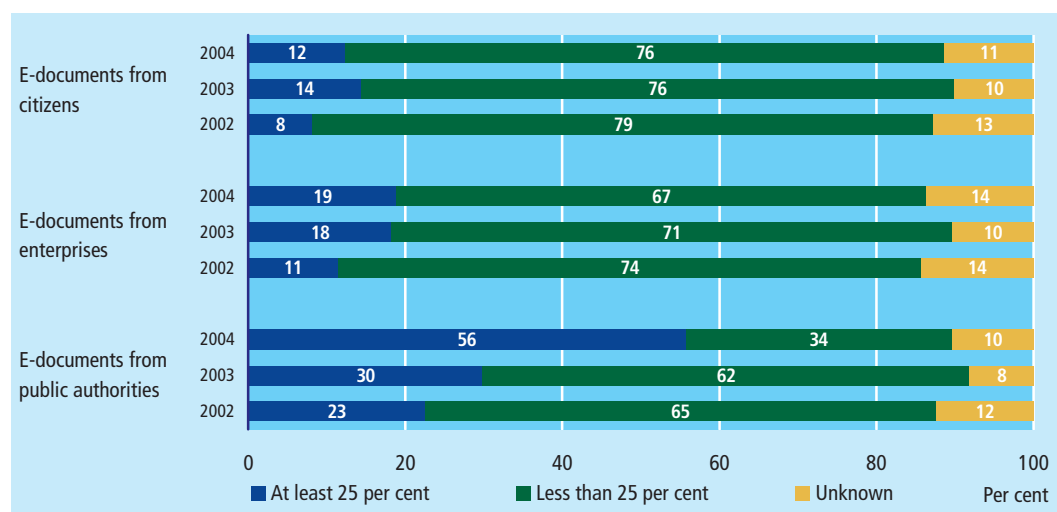
Source: Statistics Denmark, ICT use by Danish enterprises and Internet use by the population.

Enterprises are the most frequent users of public digital services

In 2004, 84 per cent of enterprises and 43 per cent of the population used public digital services to search for information on web sites, download forms and submit web forms. The number of users among the population has been relatively constant since 2002, whereas the number of enterprises has increased somewhat.

Information searches more common than submission of forms

Among Danish citizens, information searches are more common than more advanced communication. In 2004, 42 per cent searched for information on official sites, 16 per cent downloaded forms and 14 per cent submitted information to the authorities.

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.

Electronic communication between authorities

The amount of electronic documents received by Danish authorities has increased from 2002 to 2004. The increase is particularly obvious regarding the share of documents received electronically from other authorities. In 2002, 23 per cent of public authorities received at least a quarter of the documents from other authorities electronically; by 2004 this figure had risen to 56 per cent.

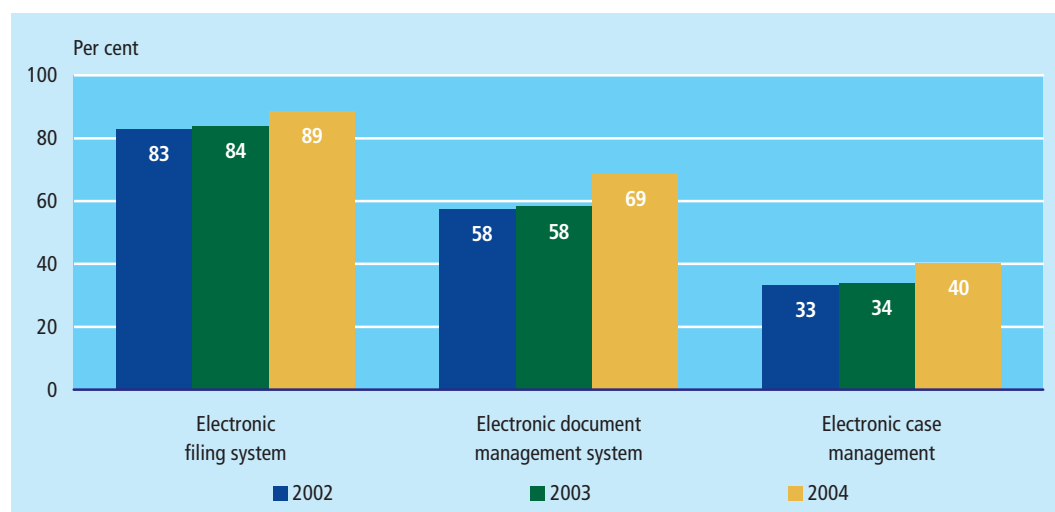
Fewest e-documents from citizens and enterprises

Most authorities receive less than a quarter of documents from citizens and enterprises electronically, however. Central government in particular, and the regional authorities to some extent, receive a large proportion of electronic documents.

Table 5.2 Share of documents received electronically by the public sector, 2004

	Central gov.	Regional authorities	Local authorities	Total
	per cent			
E-documents from citizens				
At least 25 per cent	36	0	3	12
Less than 25 per cent	47	90	87	76
Unknown/n.a.	16	10	9	11
E-documents from enterprises				
At least 25 per cent	38	40	10	19
Less than 25 per cent	40	60	79	67
Unknown/n.a.	22	0	11	14
E-documents from public authorities				
At least 25 per cent	79	90	45	56
Less than 25 per cent	13	10	43	34
Unknown/n.a.	8	0	12	10

Source: Statistics Denmark, ICT use by the public sector, 2004.

Figure 5.3 Electronic case and document management in the public sector

Note. Electronic case and document management is defined in detail in Statistical News, ICT use by the public sector.

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

*Four in ten have
electronic case
management*

In 2004 the vast majority of public authorities, 89 per cent, had electronic filing systems for recording of documents and case files. Electronic document management had been implemented by 69 per cent of the public authorities. Actual electronic case management, i.e. where the case process is supported electronically, had been implemented by 40 per cent of the public authorities.

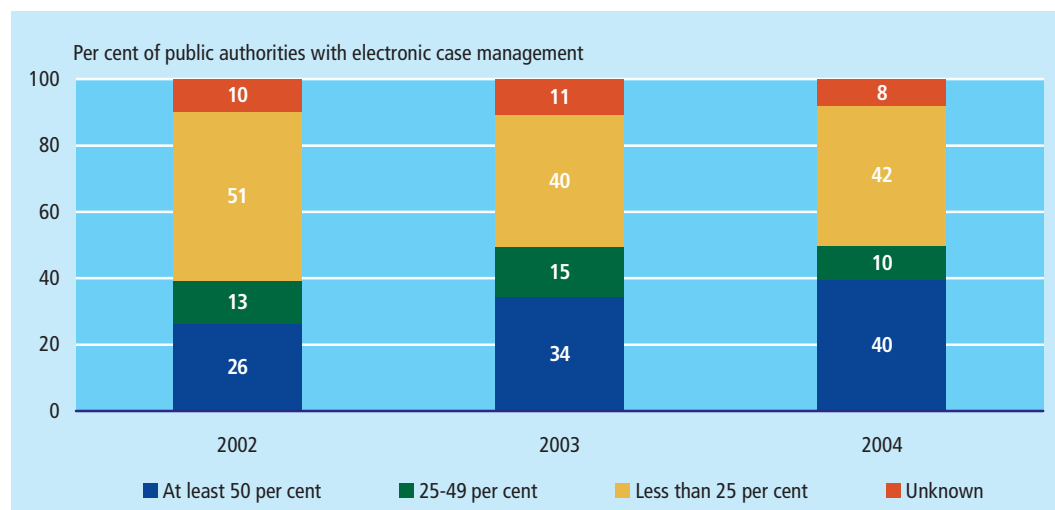
*Moderate rise in use
of electronic case
and document
management*

There has been a moderate rise in the use of electronic case and document management from 2003 to 2004. The rise might be affected by the common public system for electronic case and document management (FESD), which was not ready until 2004. Regional and local authorities are somewhat ahead of central government in terms of electronic case management.

Table 5.3 Case and document management systems in the public sector, 2004

	Central gov.	Regional authorities	Local authorities	Total
	per cent			
Electronic filing system	95	100	85	89
Electronic document management system	69	100	67	69
Electronic case management	28	60	44	40

Source: Statistics Denmark, ICT use by the public sector, 2004.

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

Note. Electronic case processing means a system that supports the administration of the case by different caseworkers.

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 of cases that are exclusively handled electronically. In 2002, 26 per cent of public authorities with electronic case management estimated that at least half of all cases was handled without the use of paper by means of electronic case management. The corresponding figure had in 2004 increased to 40 per cent.

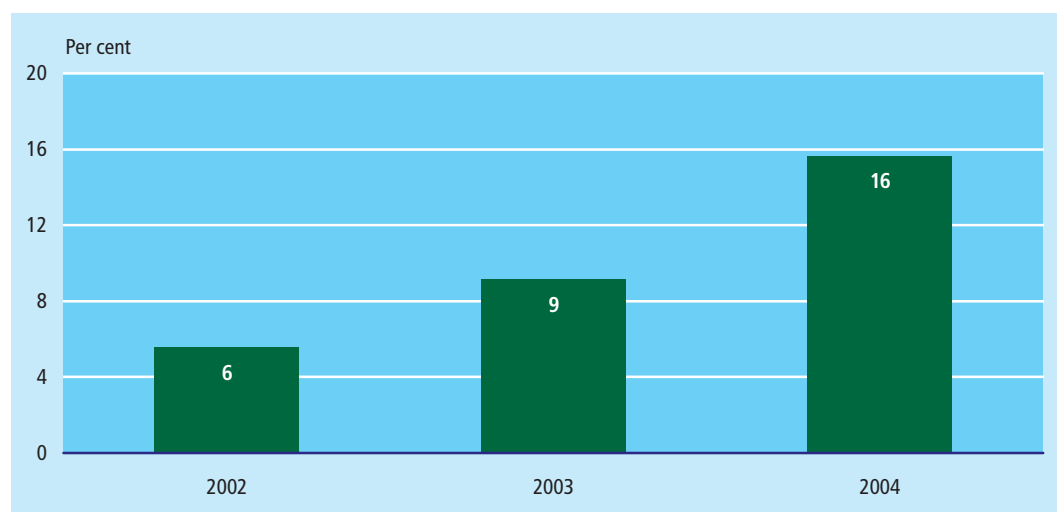
Paper-based case processing still the main rule

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, 2004

	Central gov.	Regional authorities	Local authorities	Total
public authorities with electronic case management (%)				
At least 50 per cent	58	33	35	40
25-49 per cent	4	33	11	10
Less than 25 per cent	38	33	44	42
Unknown	0	0	11	8

Source: Statistics Denmark, ICT use by the public sector, 2004.

Figure 5.5 Communication in XML format between public authorities

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

Continued rise in communication in XML format

Sixteen per cent of all Danish public authorities used XML format in communicating with other authorities. This is a distinct upward trend in relation to 2002 and 2003 when 6 per cent and 9 per cent, respectively, 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.

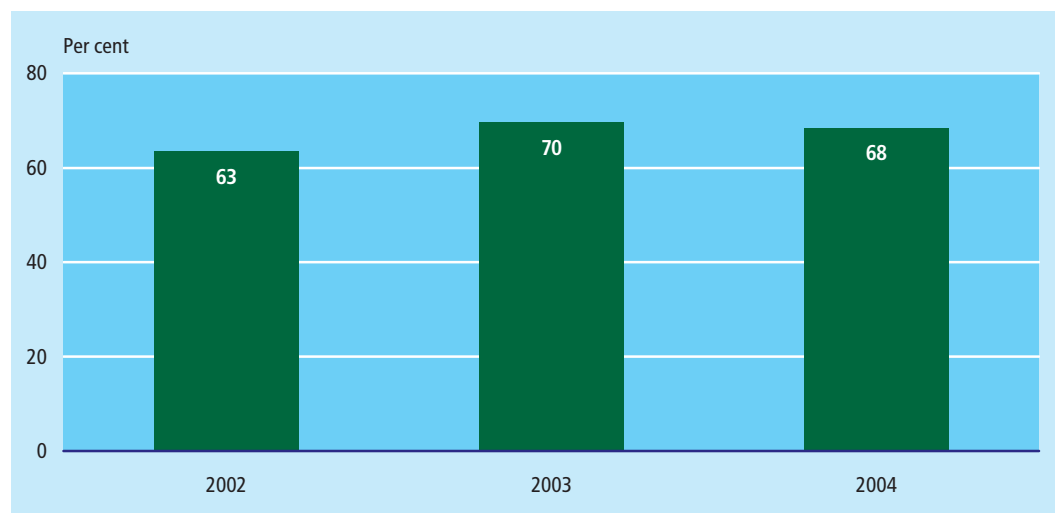
Most frequent use by central and regional authorities

The XML format is being used by most regional authorities, by about one in five central government authorities and about one in ten local authorities. The increase in the use in recent years has primarily occurred among regional authorities and central government.

Table 5.5 Communication in XML format between public authorities

	Central gov.	Regional authorities	Local authorities	Total
	per cent			
2002	8	0	5	6
2003	11	17	8	9
2004	21	80	10	16

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

Figure 5.6 Public authorities with updated ICT strategy

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

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

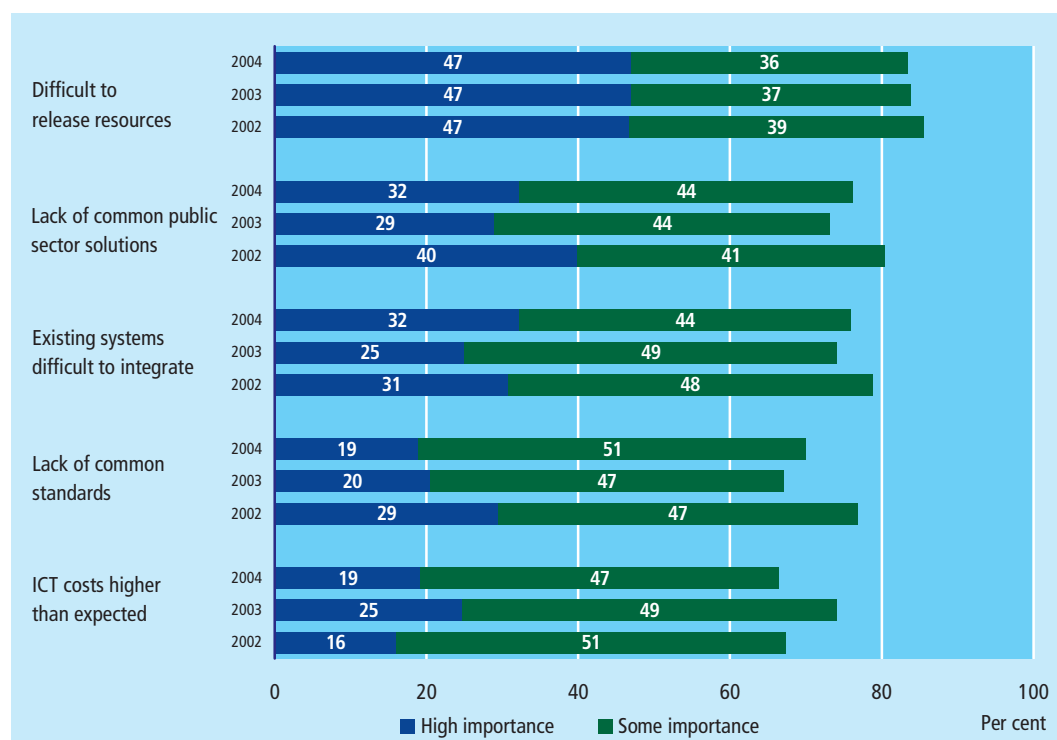
Most public authorities have ICT strategy

In 2003, 68 per cent of the public authorities had an updated ICT strategy. This is a moderate increase in relation to 2002, but a minor decrease compared to 2003 when 70 per cent of the public authorities had an updated ICT strategy.

Table 5.6 Public authorities with updated ICT strategy

	Central gov.	Regional authorities	Local authorities	Total
	per cent			
2002	77	67	58	63
2003	70	58	70	70
2004	68	60	69	68

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

Figure 5.7 Barriers to e-government

Note. The figure shows the five most significant barriers to e-government.

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

Difficult to release resources for e-government

Of the five most significant barriers to e-government, difficulty in releasing resources is the most distinct. More than eight in ten public authorities found this barrier to be of high or some importance in 2004. A relatively high number of them, more than half, stated that the barrier is of high importance.

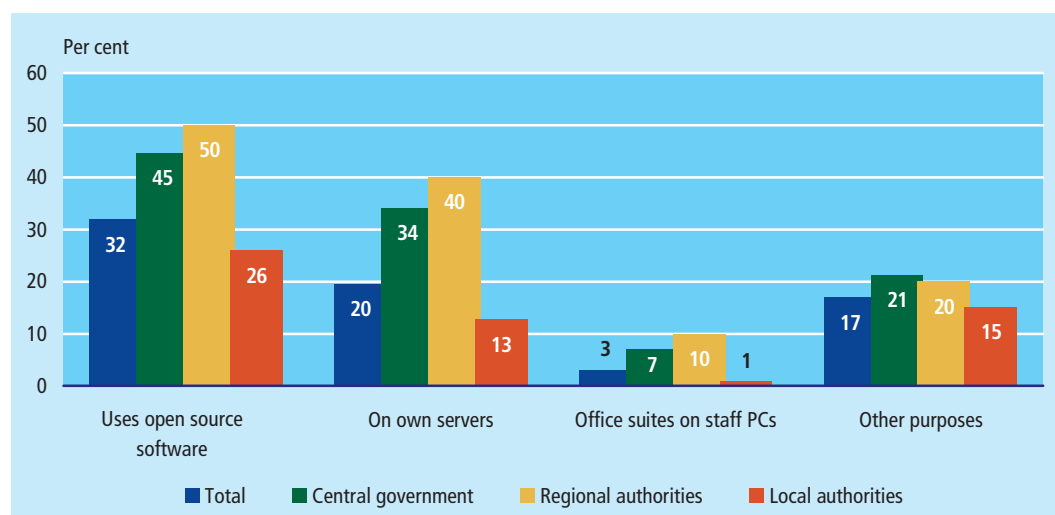
Decrease in several barriers

From 2002 to 2003 a decrease occurred in the importance of most of the barriers, particularly the lack of common public sector solutions and common standards. These barriers were given the lowest ratings in 2003, however.

Table 5.7 Barriers to e-government, 2004

	Central gov.	Regional authorities	Local authorities	Total
	per cent			
Difficult to release resources	74	100	86	83
Lack of common public sector solutions	64	80	81	76
Existing systems difficult to integrate	59	100	82	76
Lack of common standards	58	80	75	70
ICT costs higher than expected	48	60	74	66

Source: Statistics Denmark, ICT use by the public sector, 2004.

Figure 5.8 Use of open source software by public authorities, 2004

Note. Use of open source software requires no licence. The source code is open and freely available.

Source: Statistics Denmark, ICT use by the public sector, 2004.

Most commonly used by central government and regional authorities

Nearly a third of public authorities uses open source software in one or more areas. It is most commonly used by central government and regional authorities, namely by about 50 per cent. About a quarter of local authorities uses open source software.

Office suites are very rarely open source software

Twenty per cent use open source software, such as control systems, on their own servers. By contrast, open source software in the form of office suites is very rare and only occurs in 3 per cent of the cases.

Six in ten have guidelines for ICT architecture

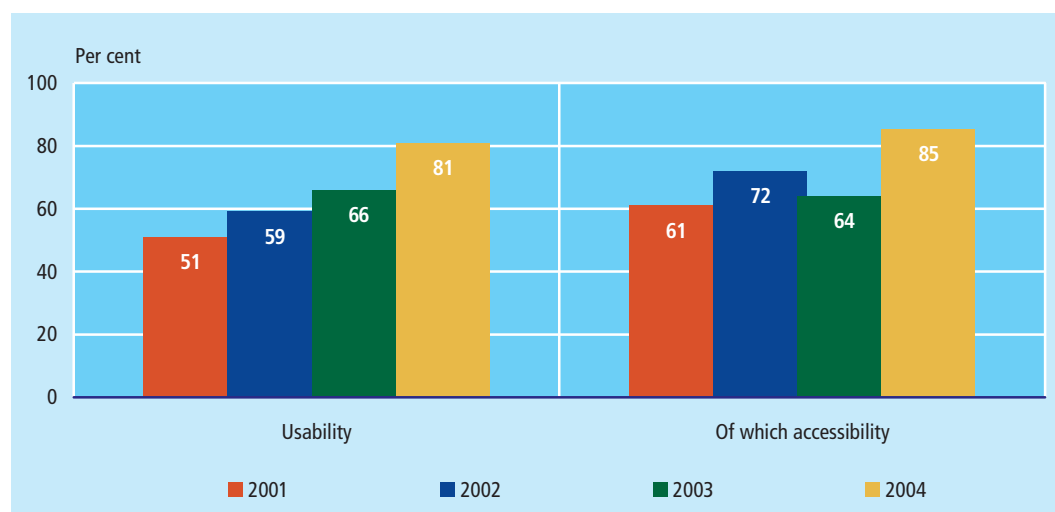
Six in ten public authorities have basic guidelines for ICT architecture, and 16 per cent use the reference profile in relation to their ICT architecture.

Table 5.8 ICT architecture, 2004

	Central gov.	Regional authorities	Local authorities	Total
	per cent			
Public authorities with basic guidelines for ICT architecture	68	70	62	64
Public authorities that assess ICT system measures on the basis of ICT architecture	65	70	59	61
Public authorities with specified targets for ICT architecture	26	30	25	26
Public authorities that use the "reference profile" ¹ in relation to their ICT architecture	25	30	11	16

¹ The reference profile published on 'Offentlig Information Online' (public information online) (www.oio.dk/referenceprofilen).

Source: Statistics Denmark, ICT use by the public sector, 2004.

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 figure shows the level of compliance within the categories "best" and "good". "Best" means that at least 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, 2004 (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 improved from 2001 to 2004. Thus, 81 per cent of the web sites in the assessment in 2004 were placed in the categories "best" or "good" against 51 per cent 2001.

Improved accessibility

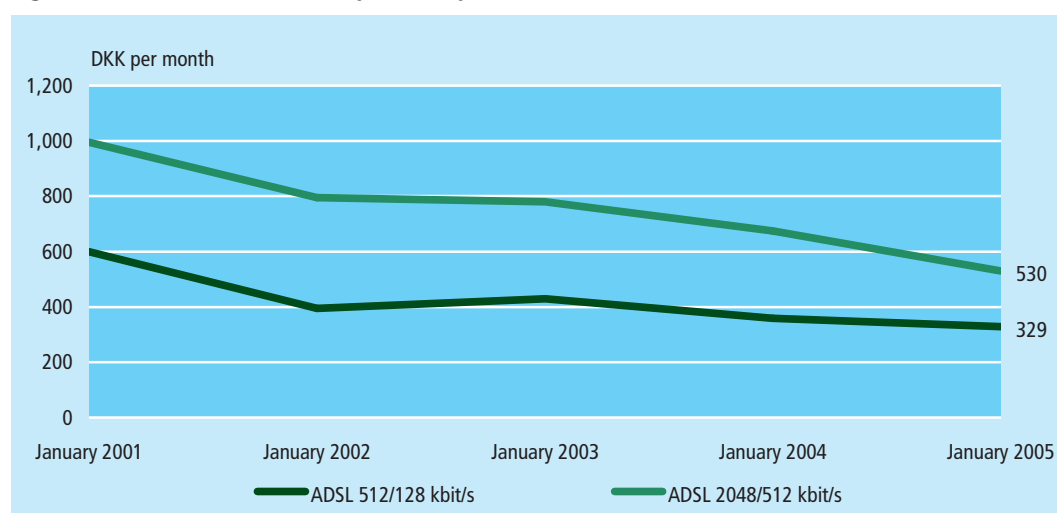
Accessibility is one of the sub-categories of usability. Also in terms of accessibility, there was a fair increase in the number of web sites categorised as "good" or "best" from 2001 to 2004, albeit with a decrease from 2002 to 2003. The decrease may have been affected by enhanced demands in 2003 in connection with the European Disability Year.

Who is assessed?

The number of web sites assessed in Top of the Web came to 2,076 in 2003. In 2004, the concept was changed so that the web managers of the institutions assessed about 80 per cent of the quality criteria themselves, while the National IT and Telecom Agency assessed the remaining 20 per cent or so concerning usability, etc. The higher degree of self-assessment led to a decrease in the number of institutions participating in the assessment to about 600 in 2004.

6. ICT infrastructure

Figure 6.1 Development in prices of ADSL



Note. The data concern the development in the lowest prices. The survey only includes ADSL without separate billing for traffic. ADSL prices are list prices and do not include temporary campaign offers, etc. ADSL prices do not include combined services such as with fixed-line subscriptions. Calculation of the real decrease in prices is based on the net price index of Statistics Denmark.

ADSL prices halved over the last four years

ADSL prices have decreased in the period from January 2001 to January 2005. The monthly price for an ADSL connection of 512/128 kbit/s has dropped by 45 per cent, and the monthly price for an ADSL connection of 2,048/512 kbit/s has dropped by 47 per cent, in current prices.

Continued price drop for Internet, dial-up and mobile telephony

Prices of mobile telephony have decreased from 1999 to 2005, but have stabilised towards the end of the period. The prices of dial-up connections have dropped by 67 per cent, but have shown variations.

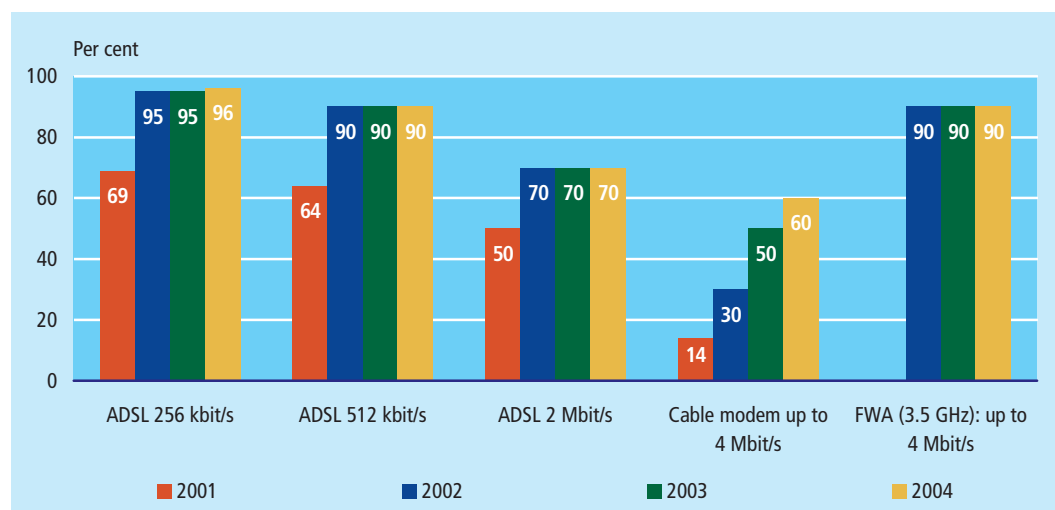
Table 6.1 Development in prices of fixed-line telephony, Internet (dial-up), mobile telephony and ADSL (per quarter)

	1999	2000	2001	2002	2003	2004	2005	Total price decrease	Real price decrease
DKK per quarter (current prices)									
Fixed-line telephony (900 min.)	637	619	559	563	570	560	557	13	23
Internet, dial-up (600 min.)	165	83	46	83	83	83	54	67	71
Mobile telephony (270 min.)	477	477	400	357	345	244	236	51	57
Mobile telephony (450 min.)	574	574	540	514	367	341	333	42	49
DKK per month (current prices)									
ADSL 512/128 kbit/s	599	395	430	359	329	45	49
ADSL 2,048/512 kbit/s	995	795	780	674	530	47	51

Note. The data concern the development in the lowest prices. Quarterly use of fixed-line and mobile telephony includes subscription, call setup charge and traffic. The calculation of the real decrease in prices is based on the net price index of Stat. Denmark.

Source: National IT and Telecom Agency.

Figure 6.2 Availability of broadband in relation to number of households and enterprises



Note. Availability covers whether households and enterprises have the option to acquire a broadband Internet connection. Cable modems are only calculated in relation to the number of households, as households are largely the only ones to use cable modems for Internet access. Households: 2,456,059 (2002) Enterprises: 248,169 (2002, number of workplaces with 1-99 employ.). Source: National IT and Telecom Agency, Mapping of broadband in Denmark, October 2004.

Continued expansion of broadband infrastructure

The availability of broadband products describes the share of households and enterprises with the option to acquire a broadband Internet connection. The availability of ADSL rose to 96 per cent in 2004, while the availability of cable modems rose steeply over the entire period from 2001 to 2004.

Over one million broadband connections to the Internet

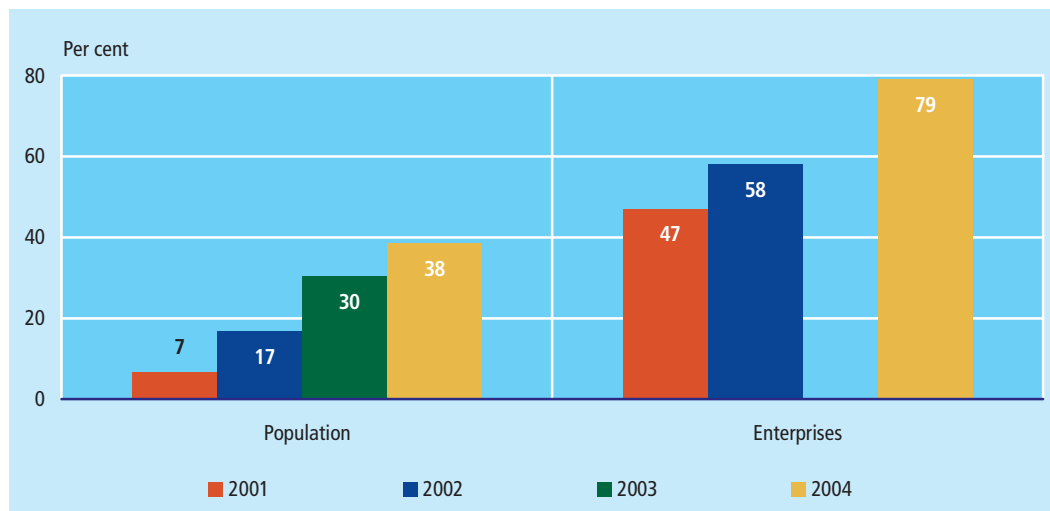
Penetration of broadband connections (i.e., ADSL, cable modem and shared connections in housing associations) rose markedly from 2001 to 2004. In 2004, the number of connections thus exceeded one million, corresponding to about 18.8 connections per 100 inhabitants.

Table 6.2 Penetration of ADSL, cable modem and housing association connections

	Year-end 2001	Year-end 2002	Year-end 2003	Year-end 2004
	number of connections			
Total	237 500	448 500	714 500	1 013 500
ADSL	150 000	307 000	473 500	633 500
Cable modem	87 500	141 500	206 000	295 000
Housing association connections	35 000	85 000
	per 100 inhabitants			
Total penetration	4.4	8.3	13.2	18.8

Note: Penetration generally concerns the number of broadband subscriptions for both households and enterprises. Thus, the figures do not relate to the number of users or who can gain access, but rather how many connections have been established. The number of FWA connections (wireless) is not included in the table, but totalled 3,019 connections at the end of 2004.

Source: National IT and Telecom Agency, January 2005.

Figure 6.3 Broadband access for individuals and enterprises

Note: For the population, broadband means ADSL and other fixed-line connections (e.g., cable modem). For enterprises, broadband means ADSL and similar, or other cable-based Internet connection.

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

Eight in ten enterprises have broadband

The share of Danes with broadband connections has grown considerably. In 2004, 38 per cent of the population had broadband access at home as against only 7 per cent in 2001. The share of enterprises with broadband connections has grown over the years to 79 per cent in 2004.

Over 5 million mobile phone subscriptions

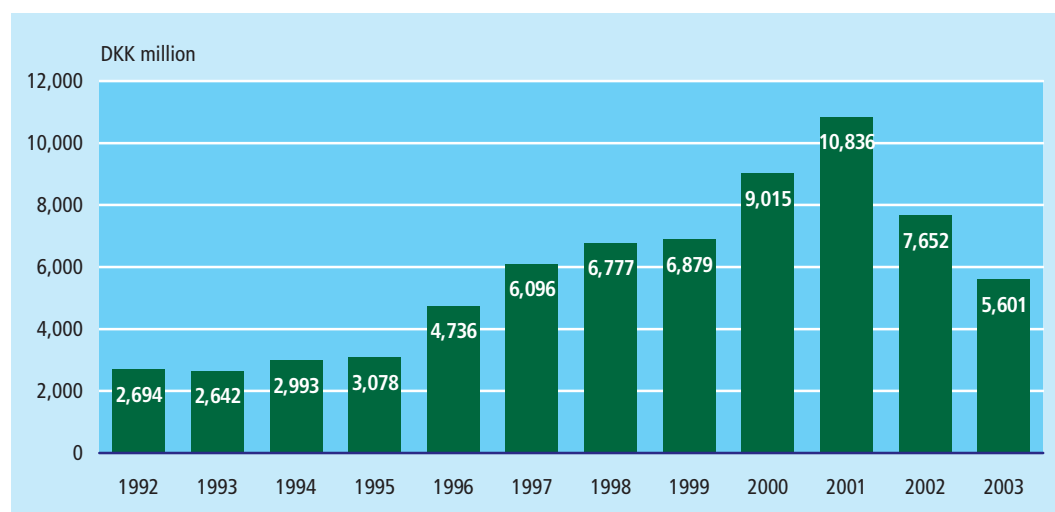
The number of mobile phone subscriptions nearly equals the number of inhabitants in Denmark. The mobile phones are increasingly being used for data transfer. More than 2.2 million mobile phone subscribers can use GPRS (data transmission at 57 kbit/s), and there are now over 125,000 3G subscriptions (max. data transmission at 384 kbit/s).

Table 6.3 Number of mobile subscriptions and SMS and MMS messages sent

	2001		2002		2003		2004	
	H1	H2	H1	H2	H1	H2	H1	H2
1,000 subscriptions								
Subscriptions, total	3 660	3 960	4 154	4 478	4 543	4 767	4 817	5 165
3G	•	•	•	•	•	3	50	125
GPRS	•	•	11	27	133	931	1 749	2 218
Subscriptions per 100 inhabitants	68.3	73.7	77.3	83.2	84.3	88.3	89.2	95.5
million messages								
SMS messages sent	619	743	871	1 141	1 517	2 472	2 958	3 541
MMS messages sent	•	•	•	•	0.498	2.262	4.366	8.232

Note. Subscriptions include active prepaid cards, 3G subscriptions and GPRS subscriptions. Up to and including 2002, prepaid cards must have been active at some time within the last 12 months. In 2003, only prepaid cards that had been active at some point within the last six months are included. In 2004, only prepaid cards that had been active at some point within the last three months are included.

Source: National IT and Telecom Agency, January 2005.

Figure 6.4 Telecom investments in Denmark

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 to 2003 are calculated exclusive of investments in UMTS licences. As instalments on the licence price, UMTS licensees paid an aggregate amount of DKK 950m in 2001 and DKK 285m annually in the period 2002 to 2004. Up to and including 2011, the licensees will together be paying annual instalments of DKK 285m in payment of the licence price.

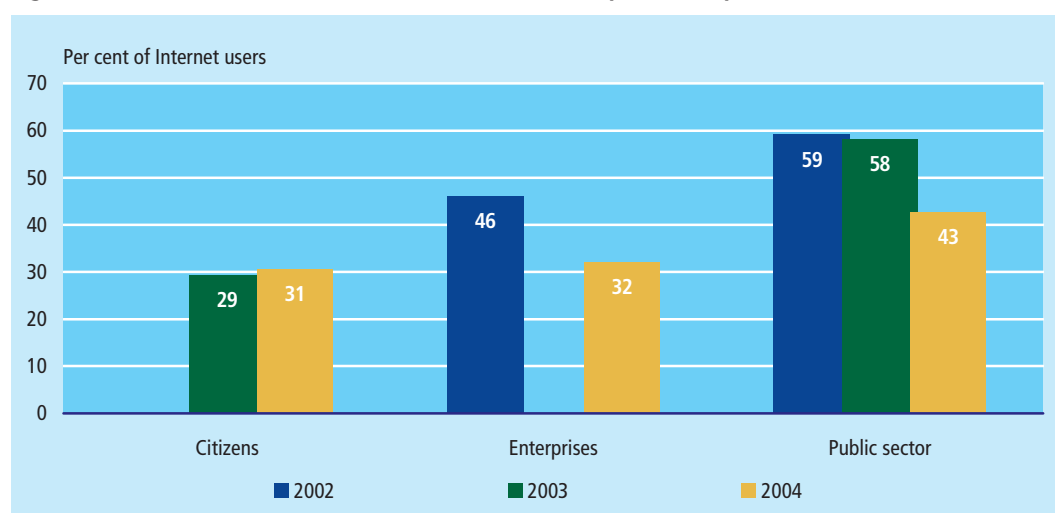
Source: National IT and Telecom Agency.

*Shift in level of
telecom investments
after 2001*

Investments in the Danish telecommunications sector rose steeply between 1995 and 2001. In 2002 and 2003, annual investments decreased, and the level in 2003 was the lowest since 1996. However, this shift should be seen in relation to a general decrease in investments at the international level after 2000-2001.

7. ICT security

Figure 7.1 Virus attacks on citizens, enterprises and public authorities



Note. The figures relate to virus attacks causing loss of data or working hours within the last 12 months. For enterprises and public authorities, virus attacks are characterised by being 'disruptive' or 'severe'.

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

Fewer enterprises and public authorities ...

Virus attacks are among the most frequent ICT security problems. There is no significant change in the number of virus attacks on citizens in the last year, but both enterprises and the public sector experienced a distinct drop from 2002 to 2004.

... experience virus attacks

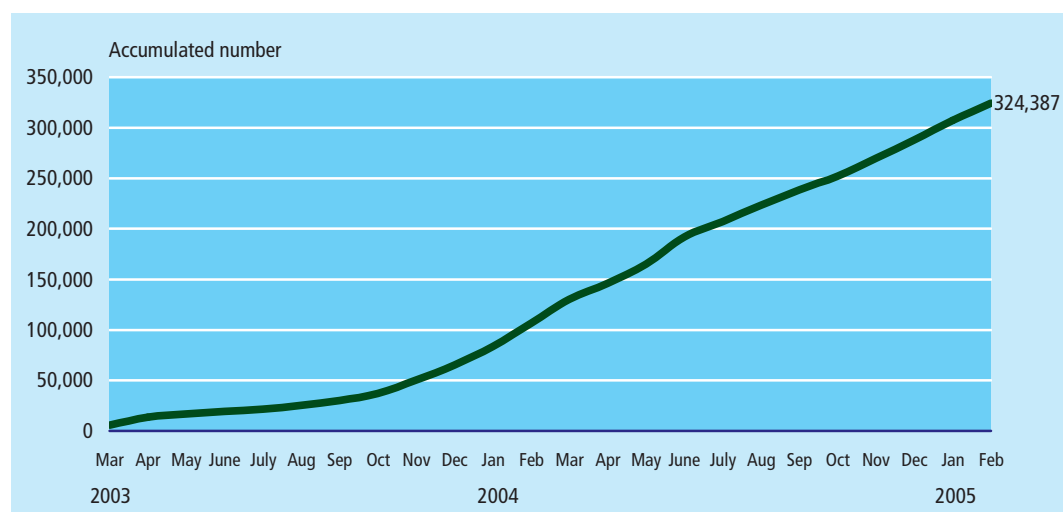
Thus, 32 per cent of enterprises experienced severe or disruptive virus attacks in 2004, against 46 per cent in 2002. The corresponding figures for public authorities were 43 per cent in 2004 and 59 per cent in 2002.

Table 7.1 ICT security problems

	2002	2003	2004
	per cent of Internet users		
Citizens			
Virus attack	...	29	31
Enterprises			
Virus attack	46	...	32
Denial of service attack ¹	5	...	4
Unauthorised access	5	...	4
Public sector			
Virus attack	59	58	43
Denial of service attack ¹	12	14	20
Unauthorised access	11	9	12

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

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

Figure 7.2 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 allow secure communication, i.e., with electronic identification, signature and encryption. Examples of applications of digital signatures are tax returns, access control on web sites, etc.

Source: TDC, 2005.

By the end of 2004, some 290,000 digital signature certificates had been issued

The number of certificates issued for digital signatures has increased substantially since the end of 2003. Following a modest beginning in the first half of 2003, the development picked up in the second half-year. Two months into 2005, nearly 325,000 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. Despite the rapid increase in diffusion, only a minor proportion of the Danish population and enterprises has digital signatures.

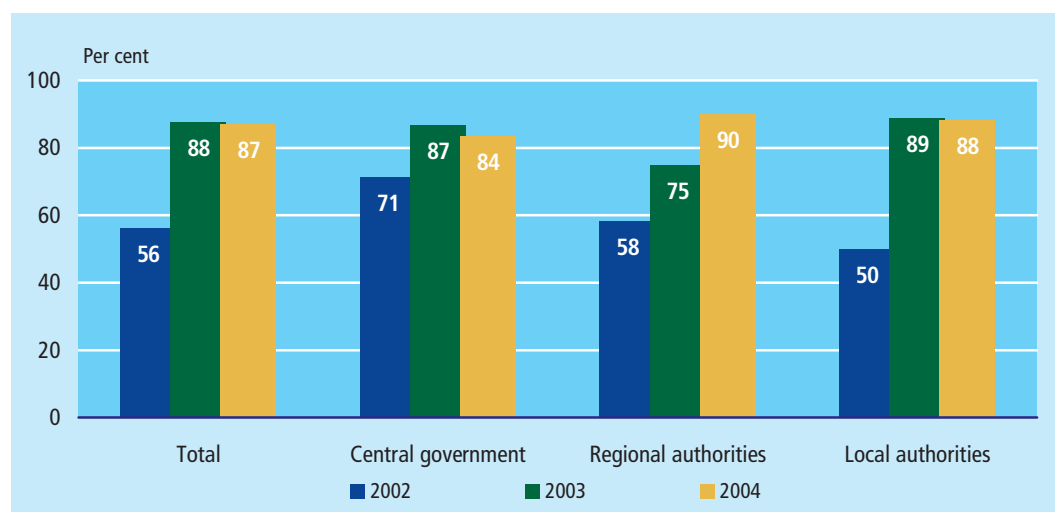
Table 7.2 Number of digital signature certificates issued

	2003				2004				2005	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Jan.	Feb.
	number									
Certificates issued	5 833	13 569	10 669	35 079	64 993	61 633	46 474	49 645	19 394	17 098
Accumulated	5 833	19 402	30 071	65 150	130 143	191 776	238 250	287 895	307 289	324 387

Note. Estimates based on weekly figures.

Source: TDC, 2005.

Figure 7.3 Public authorities with approved ICT security policy



Note. Approved means approved by the management of the particular authority.

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

The majority have approved ICT security policy

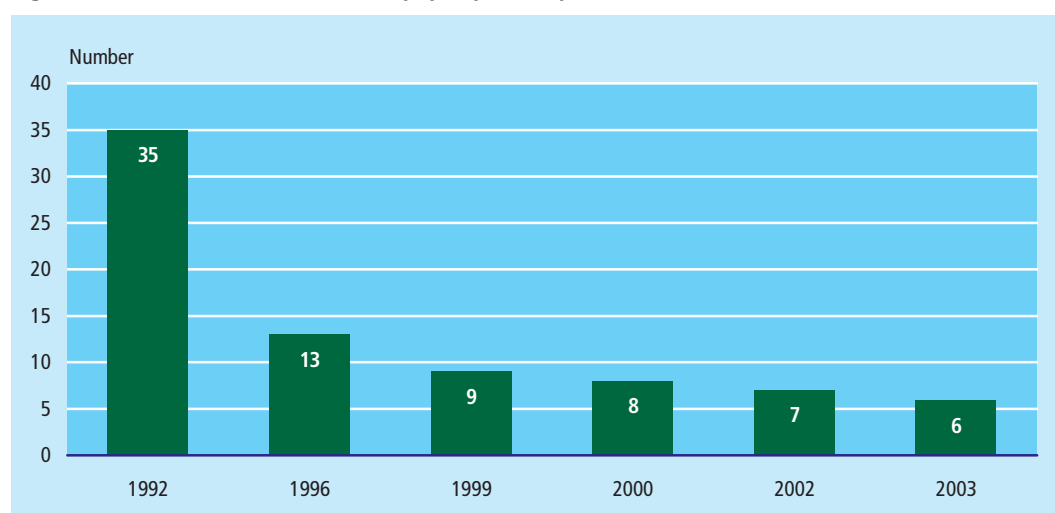
In 2004, nearly nine in ten public authorities had an ICT security policy that had been approved by management. The share of public authorities with an approved ICT security policy has grown somewhat from 2002 to 2004. Over the past year, however, the share decreased slightly for central government, but the share of regional authorities increased.

Same diffusion in the three sectors

The diffusion of an approved ICT security policy in 2004 is largely the same among central government, regional and local authorities as opposed to 2002 when central government was in the lead.

8. E-skills

Figure 8.1 Number of pupils per computer



Note. Aggregate figures for computers in 2000 and 2003 are based on the PISA surveys and comprise Danish primary and lower secondary schools that have stated both the number of pupils and computers. The calculation is based on the total number of computers at each school.

Source: Ministry of Education, It i folkeskolen (ICT in primary and lower secondary schools), 2003, and OECD, PISA surveys 2000 and 2003.

Less than six pupils per computer in 2003

The number of pupils per computer has fallen substantially since 1992, down to six pupils per computer in 2003. The number of pupils per new computer has seen a similar trend as the aggregate number of pupils per computer. In 1992, there were 63 pupils per new computer compared to 10 pupils per new computer in 2002.

Still fewer pupils per computer with Internet access

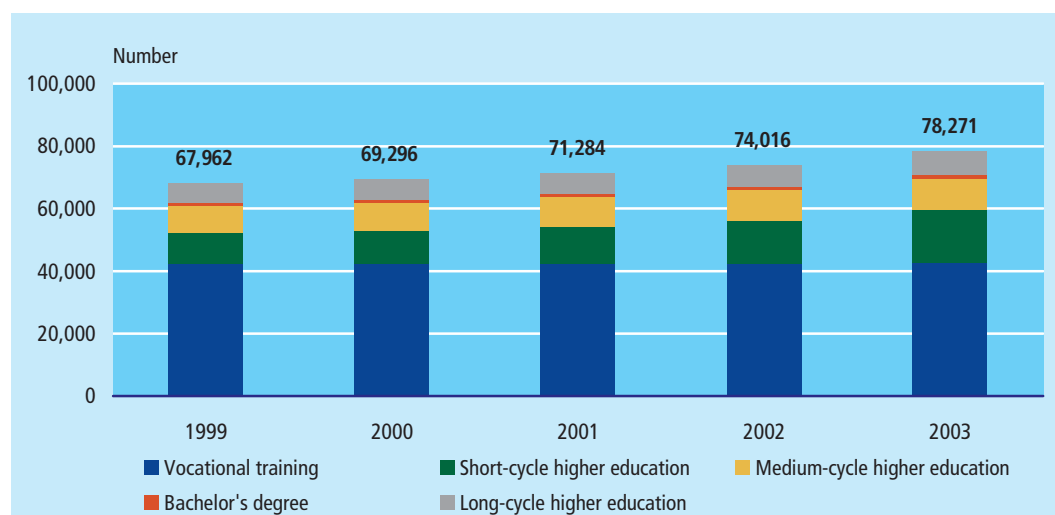
In spite of the low number of years with statistics on the number of computers with Internet access, a markedly upward trend is noticeable: In 2002, there were nine pupils per computer with Internet access against 18 pupils per computer with Internet access in 1999.

Table 8.1 Computers in Danish primary and lower secondary schools

	1992	1996	1999	2000	2002	2003
	number of pupils per computer					
New computer	63	28	11	...	10	...
Computer with Internet access	18	...	9	...
Total no. of computers	35	13	9	8	7	6

Note. Aggregate figures for computers in 2000 and 2003 are based on the PISA surveys and comprise Danish primary and lower secondary schools that have stated both the number of pupils and computers. The calculation is based on the total number of computers at each school.

Source: Ministry of Education, It i folkeskolen (ICT in primary and lower secondary schools), 2003, and OECD, PISA surveys 2000 and 2003.

Figure 8.2 Persons with ICT education as highest educational level

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

**78,300 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 ICT education, 55 per cent had vocational training as for instance 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.

**93 per cent with
medium or
long-cycle education
had jobs in 2003**

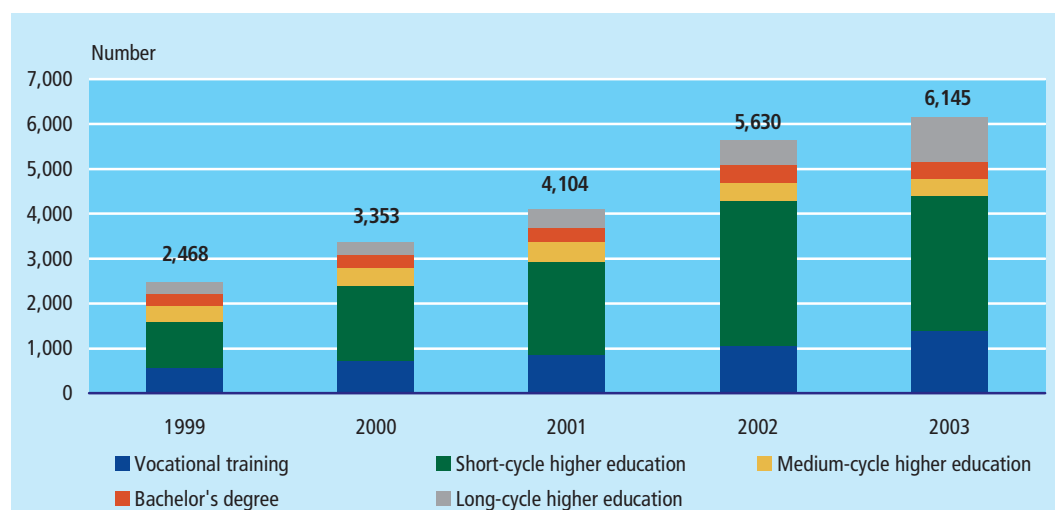
In 2003, 84 per cent of persons with a formal ICT education were employed. The employment rate was highest among persons with medium or long-cycle education, with 93 per cent for both groups. Persons with vocational training had the lowest employment rate of 79 per cent.

Table 8.2 Persons with ICT education

	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003
	— employed persons with ICT education —					— persons with ICT education, total —				
Total	59 008	60 315	61 926	63 910	65 543	67 962	69 296	71 284	74 016	78 271
Vocational training	34 596	34 677	34 441	34 329	33 843	42 292	42 281	42 238	42 414	42 877
Short-cycle higher education	9 290	10 001	11 234	12 625	14 293	9 913	10 719	12 092	13 824	16 643
Medium-cycle higher education	8 346	8 608	8 985	9 331	9 427	8 652	8 954	9 335	9 736	10 120
Bachelor's degree	695	780	865	919	1 064	759	838	944	1 033	1 220
Long-cycle higher education	6 081	6 249	6 401	6 706	6 916	6 346	6 504	6 675	7 009	7 411

Note: The total number of employed persons also covers persons with ICT education who do not have an ICT-related job.

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

Figure 8.3 Persons with newly completed ICT education

Note: The statistics are based on persons who completed an ICT education in the period from 01.10 to 01.10 during the year (cross-section year).

Source: Statistics Denmark, Integrated student register (INTE).

Number of completed ICT educations doubled

The number of students who completed an education in the field of ICT as the highest educational level more than doubled from 1999 to 2003 - from 2,468 to 6,145.

Large increase in short-cycle higher education

The group of short-cycle higher education stands out - here, the number of new graduates in the field of ICT nearly trebled; in 2003 the number was close to 3,000. The majority in this group have graduated as either datamaticians or multimedia designers. In long-cycle higher education, the number of graduates nearly quadrupled during the same period - from 252 graduates in 1999 to 997 graduates in 2003.

Changes in the uptake of ICT students

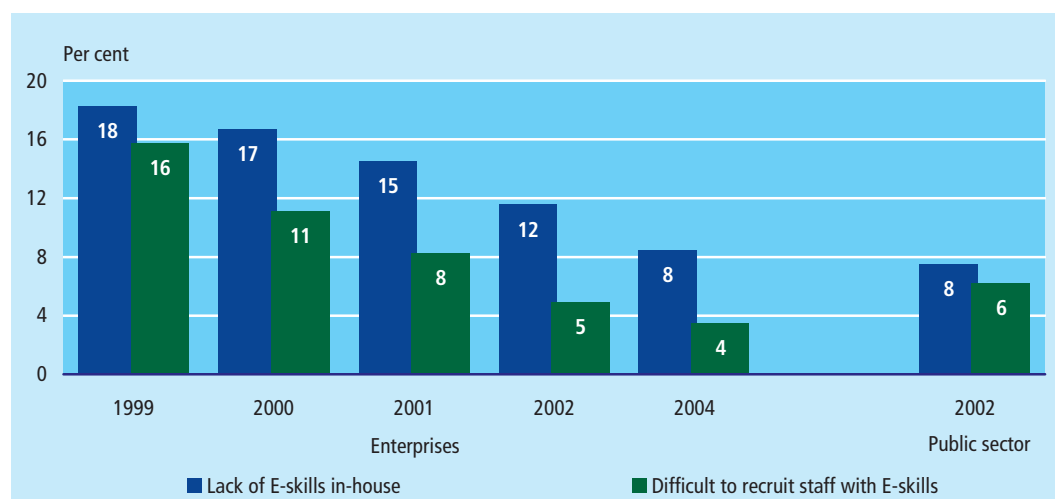
The uptake of students for the datamatician's programme has declined since 2001. The uptake at the IT University of Copenhagen and IT University West increased from 182 in 1999 to 456 in 2004.

Table 8.3 Student uptake in selected ICT education programmes

	1999	2000	2001	2002	2003	2004
	number					
Datamaticians	1 784	1 940	1 400	940	545	370
BSc (Electrical Engineering)	272	235	156	182	162	156
MSc (Computer science)	246	242	212	233	327	276
Students at IT University of Copenhagen	123	327	346	384	382	302
Students at IT University West	59	147	167	169	170	154

Note. The figures for IT University West and the IT University of Copenhagen are the actual uptake figures. The figures for 1999 of the IT University of Copenhagen only apply to the autumn of 1999.

Source: Sekretariatet for den koordinerede tilmelding (KOT) (co-ordinated enrolment secretariat), 2004, IT University of Copenhagen, 2005, and IT University West, 2005.

Figure 8.4 Lack of E-skills among enterprises and public authorities

Note. The figure includes the barriers considered to be of 'high' importance. The assessments are 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 and ICT use by the public sector.

Two types of lacking E-skills

The lack of E-skills is among the barriers to ICT usage experienced by enterprises and public authorities. More specifically, it is about the lack of staff with E-skills in-house and problems of recruiting staff with E-skills.

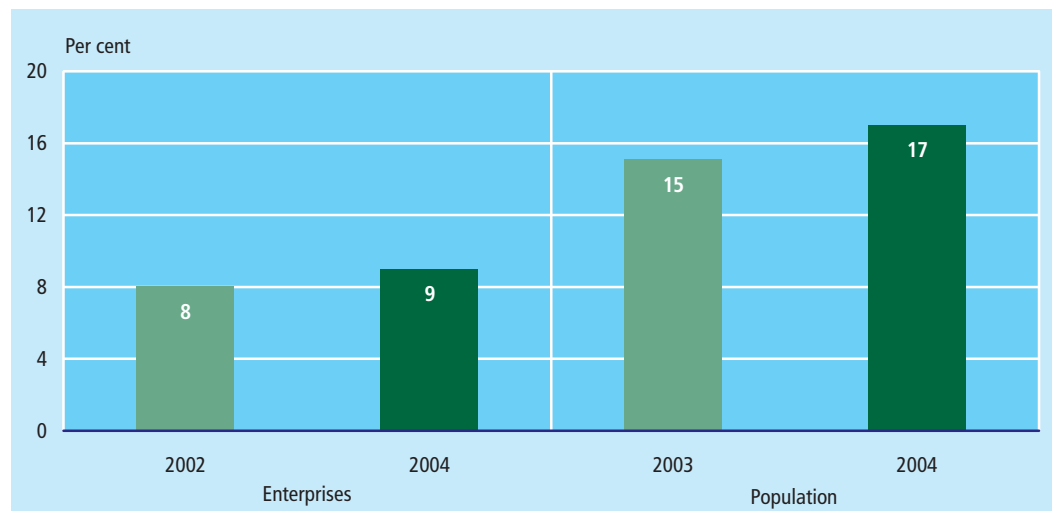
Lack of E-skills becoming less important

The lack of E-skills internally is more frequent than recruitment problems. In 2004, 8 per cent of Danish enterprises found that the lack of staff with E-skills was of high importance, while only 4 per cent found that recruiting staff with E-skills was a major problem. In the public sector, the shares in 2002 were slightly smaller, namely 8 and 6 per cent, respectively.

Few enterprises have problems of recruiting staff with E-skills

The importance of both barriers decreased considerably from 1999 to 2004 in respect of enterprises. Particularly regarding difficulty in recruiting staff with E-skills, the figure dropped from 16 per cent of enterprises in 1999 to 4 per cent in 2004.

Figure 8.5 Use of the Internet for educational purposes



Note. Enterprises were asked whether they used the Internet for training of staff. Individuals were asked whether they had used the Internet for education and training within the last month.

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

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

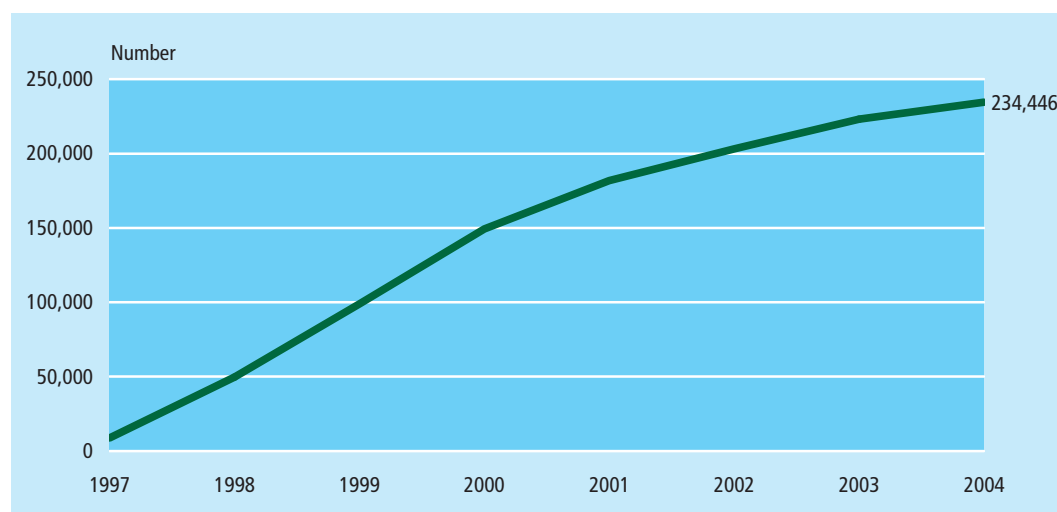
In 2004, 17 per cent of the population had used the Internet within the last month for purposes relating to education and training. Correspondingly, 9 per cent of enterprises used the Internet for training of their staff in 2004.

Slight increase

Accordingly, Internet use for education and training has increased slightly over the last two years among both citizens and enterprises. For enterprises, by 1 percentage point from 2002 to 2004, and for the population by 2 percentage points from 2003 to 2004.

Most training activities outside enterprises

One reason why the population accounts for a higher figure for Internet use for education and training than the enterprises is that the students use the Internet to a wide extent, but typically have little or no connection with the enterprises' training activities.

Figure 8.6 Computer driving licences issued, total number

Source: Dansk IT (Danish IT society).

*In 2004
234,400 computer
driving licences had
been issued ...*

The number of computer driving licences, the Danish PC-kørekortÆ, has increased since the beginning of 1997 from 8,800 to about 234,500 driving licences in 2004. PC-kørekortÆ is an internationally recognised licence and comprises training in seven different computer skills. The number of driving licences issued peaked in 2000 when 50,000 driving licences were issued. Since then, the annual number has decreased, probably due to generally improved computer skills among the population. In 2003, nearly 20,000 computer driving licences were issued.

*..and 43,000
computer driving
licences to teaching
staff*

In cooperation with the Danish company Dansk IT, the Ministry of Education issues a computer driving licence to teaching staff that is not included in table 8.4. The licence is aimed at teachers at different levels of education, and about 43,000 driving licences had been issued in 2004.

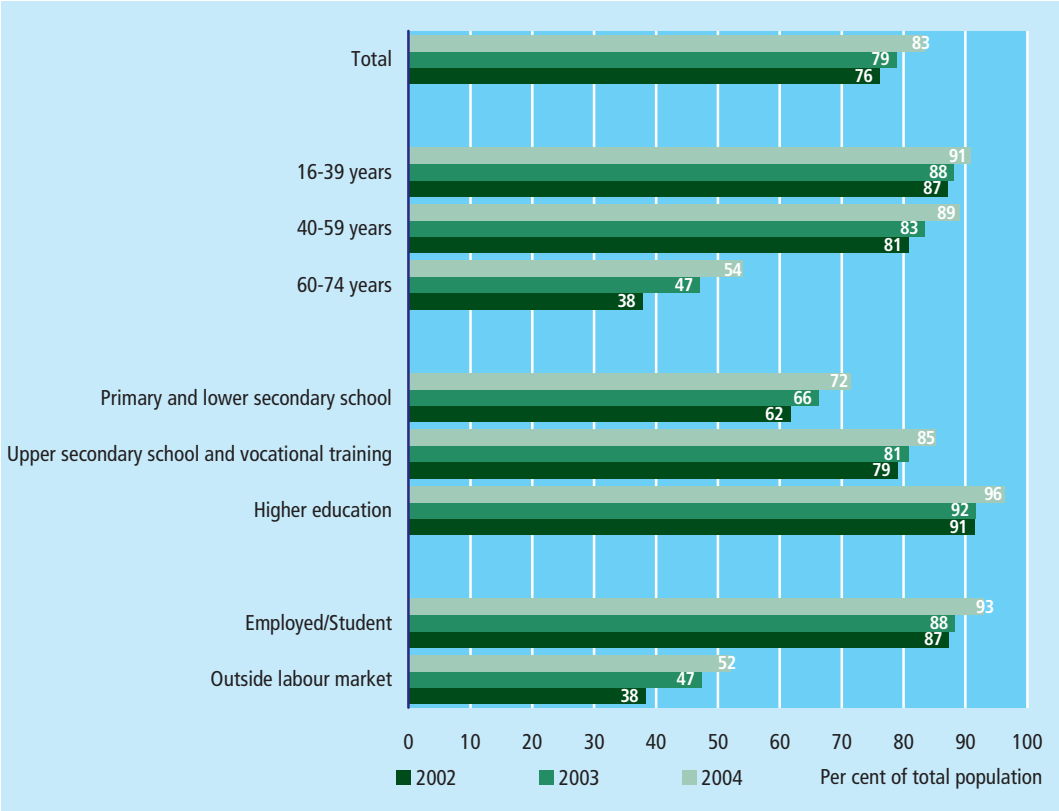
Table 8.6 Computer driving licences issued

	1997	1998	1999	2000	2001	2002	2003	2004
	number							
Annual number issued	8 817	40 707	49 579	50 117	32 754	21 270	19 966	11 236
Total number issued	8 817	49 524	99 103	149 220	181 974	203 244	223 210	234 446

Source: Dansk It.

9. ICT for all

Figure 9.1 Internet access among the population



Source: Statistics Denmark, Internet use by the population.

More and more Danes gain Internet access

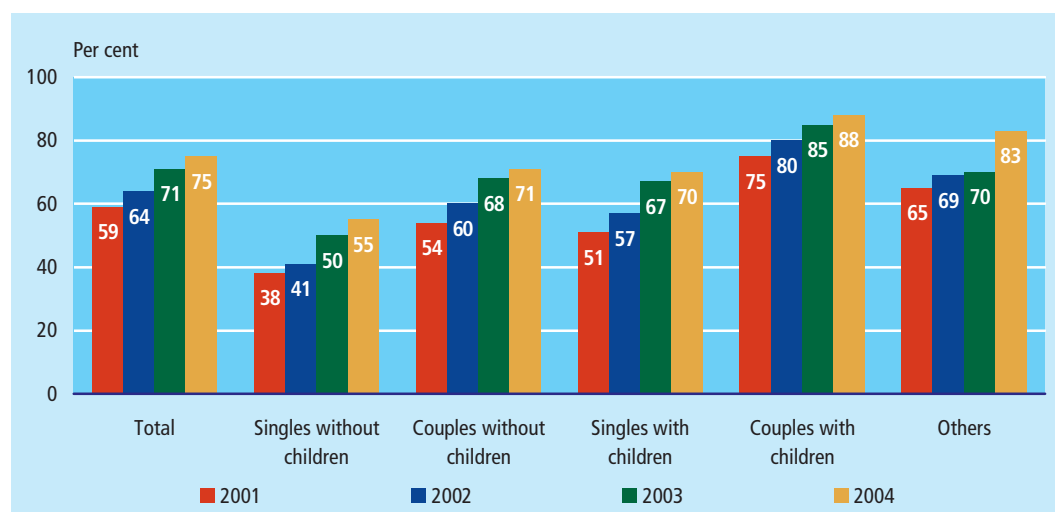
Over the last three years an ever increasing number of the Danes have gained Internet access. In 2004, 83 per cent of the population had Internet access at home and/or at their workplace/educational institution. This is an increase compared to 2003 when the percentage was 79 per cent.

Largest increase in Internet access among 60 to 74-year-olds

All age groups have seen a steady increase in Internet access over the years, the largest being among 60 to 74-year-olds. Thus, 54 per cent of people aged 60-74 years had Internet access in 2004, against 38 per cent in 2002. This means that over 100,000 more people aged 60 to 74 years gained access in the period from 2002 to 2004.

One in two people outside the labour market had Internet access

Of the group of people outside the labour market, 52 per cent had Internet access in 2004, compared to 38 per cent in 2002. This means that over 100,000 more people outside the labour market gained access during those years. 93 per cent per cent of employed persons/students had access in 2004 compared to 87 per cent in 2002.

Figure 9.2 Household access to the Internet by type of household

Source: Statistics Denmark, Internet use by the population.

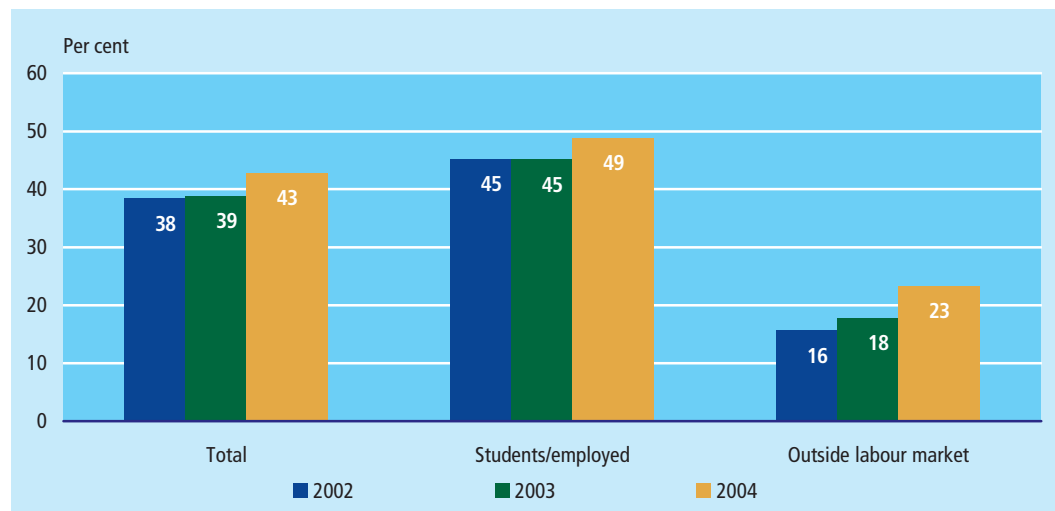
Three in four had Internet access at home

In 2004, 75 per cent of the population had Internet access at home, against 71 per cent in 2003, 64 per cent in 2002 and 59 per cent in 2001. The share of the population with Internet access at home is higher among households with couples than among singles whether or not there are any children in the household. This applies to all four years.

Nine in ten couples with children had Internet access at home

In 2004, 88 per cent of the population living in households with two adults and children had Internet access at home, followed by 83 per cent of other types of families. 55 per cent of singles with no children had Internet access at home in 2004 compared to 70 per cent of singles with children.

Figure 9.3 The population's communication with public authorities over the Internet



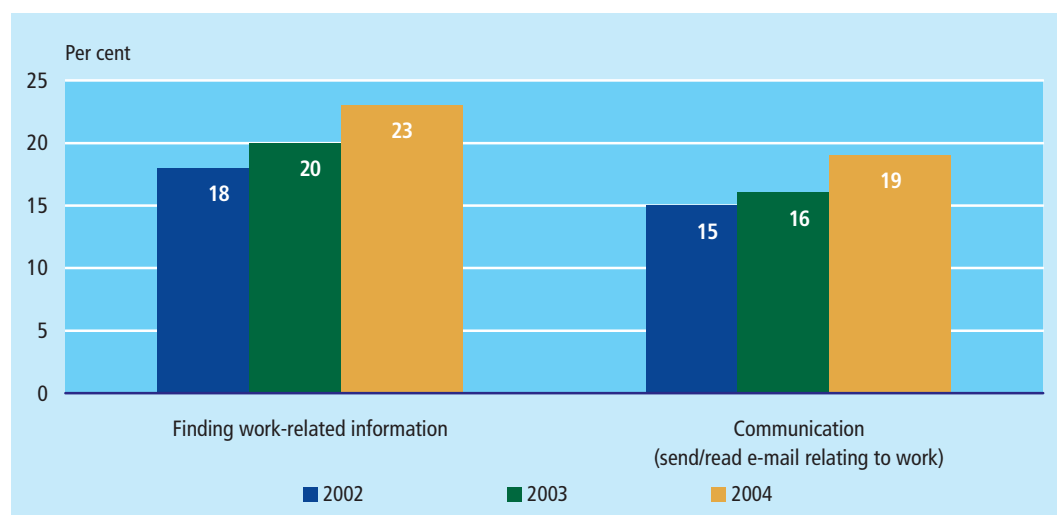
Source: Statistics Denmark, Internet use by the population.

Four in ten used the Internet to interact with public authorities

In 2004, 43 per cent of the population had used the Internet for interaction with public authorities. Interaction with public authorities covers finding information on official web sites, downloading forms from public authority web sites and submitting information to public authorities.

Employed persons and students accounted for the largest share

Particularly employed persons and students used the Internet to interact with public authorities, namely 49 per cent in 2004. In the group outside the labour market, 23 per cent used the Internet for that purpose in 2004.

Figure 9.4 Work-related purposes of Internet use outside the workplace

Source: Statistics Denmark, Internet use by the population.

Possibility of enhanced flexibility

Access to the Internet offers enhanced flexibility; thus, Danes use the Internet outside their workplaces for work-related purposes.

One in four searched for information in connection with their jobs in 2004

The most frequent work-related purpose for which most Danes use the Internet outside the workplace is to search for information in connection with their jobs. In 2004, 23 per cent of the population had used the Internet for that purpose within the last month. This is an increase from 18 per cent in 2002 - corresponding to an increase by 5 percentage points.

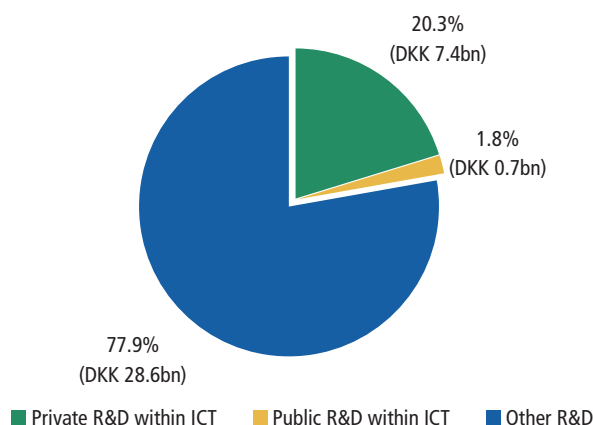
More people send/read e-mails outside the workplace

The second most frequent purpose of using the Internet outside the workplace is to send/read e-mails relating to the job. In 2004, 19 per cent of the population used the Internet for that purpose outside their workplace.

10. ICT research and innovation

Figure 10.1

Investments in ICT R&D, 2003



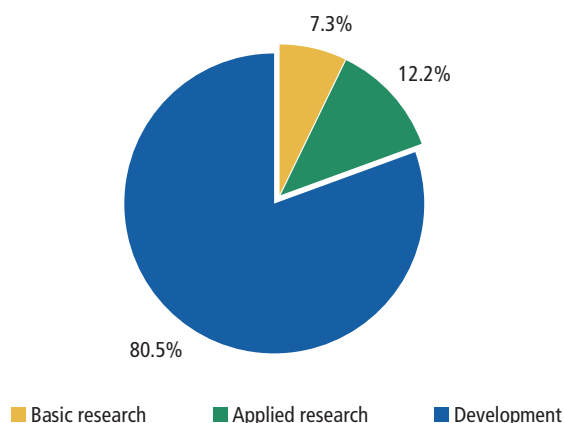
Source: Danish Centre for Studies in Research and Research Policy, 2004. Provisional estimates for total R&D investments in Denmark.

R&D investments accounted for 2.6 per cent of GDP in 2003

Investments in research and development (R&D) totalled DKK 36.7bn in Denmark in 2003. This corresponds to 2.6 per cent of the gross domestic product (GDP), which is an increase from 2.5 per cent of GDP in 2002.

22 per cent of R&D funds invested in ICT

About 22 per cent of funds invested in R&D were invested in ICT R&D. With DKK 7.4bn, investments in ICT R&D in Danish enterprises accounted for over one fifth of total R&D investments in Denmark in 2003. Public research institutes invested DKK 677m in ICT R&D in 2003, and thus accounted for about 1.8 per cent of total investments in R&D.

Figure 10.2 Private investments in ICT R&D by type of research, 2003

Note. Basic research covers experimental or theoretical work aimed at acquiring new knowledge and insight. Applied research covers experimental or theoretical work aimed at specific fields of application. Development work covers systematic work based on new knowledge aimed at creating new products, processes, systems, services, etc.

Source: Danish Centre for Studies in Research and Research Policy. Danske virksomheders forsknings- og udviklingsarbejde inden for informations- og kommunikationsteknologi 2003 (R&D in ICT in Danish enterprises).

80 per cent of private investments in ICT R&D invested in development

Total private investments in ICT R&D in 2003 amounted to over DKK 7.4bn; 80 per cent of the funds were invested in development, while of the remaining investments in ICT R&D, just under 20 per cent of the funds, 7 per cent went to basic research and 12 per cent to applied research.

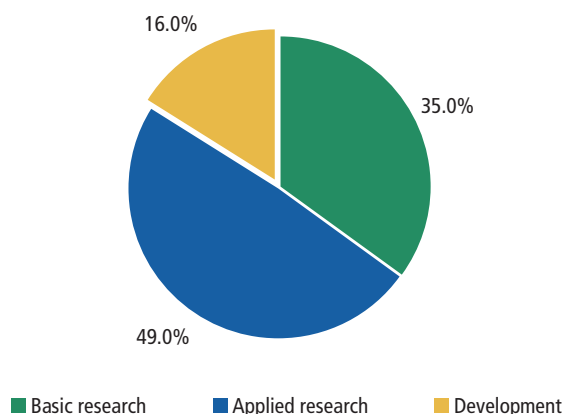
Business and communication systems

Private enterprises particularly invest in R&D relating to business systems and communication systems. Together, these two fields account for 41 per cent of total private investments in ICT R&D.

Table 10.2 Largest R&D areas within ICT in the private sector, 2003

	Largest R&D areas within ICT in the private sector	
	DKK million	per cent
Total	7 444	100
Business systems	1 545	21
Communication systems	1 473	20
Databases, etc.	704	9
Devices and appliances	338	5
Security systems	238	3
Other	3 146	42

Source: Danish Centre for Studies in Research and Research Policy, 2004.

Figure 10.3 Public investments in ICT R&D by type of research, 2003

Note. Basic research covers experimental or theoretical work aimed at acquiring new knowledge and insight. Applied research covers experimental or theoretical work aimed at specific fields of application. Development work covers systematic work based on new knowledge aimed at creating new products, processes, systems, services, etc.

Source: Danish Centre for Studies in Research and Research Policy. Forsknings- og udviklingsarbejde inden for informations- og kommunikationsteknologi i den offentlige sektor i 2003 (R&D in ICT in the public sector).

35 per cent of public investments in ICT R&D invested in basic research

Total public investments in ICT R&D amounted to nearly DKK 677m in 2003; 84 per cent of the funds were invested in research, 35 per cent of which in basic research and 49 per cent in applied research. The remaining 16 per cent of public investments in ICT R&D were invested in development work.

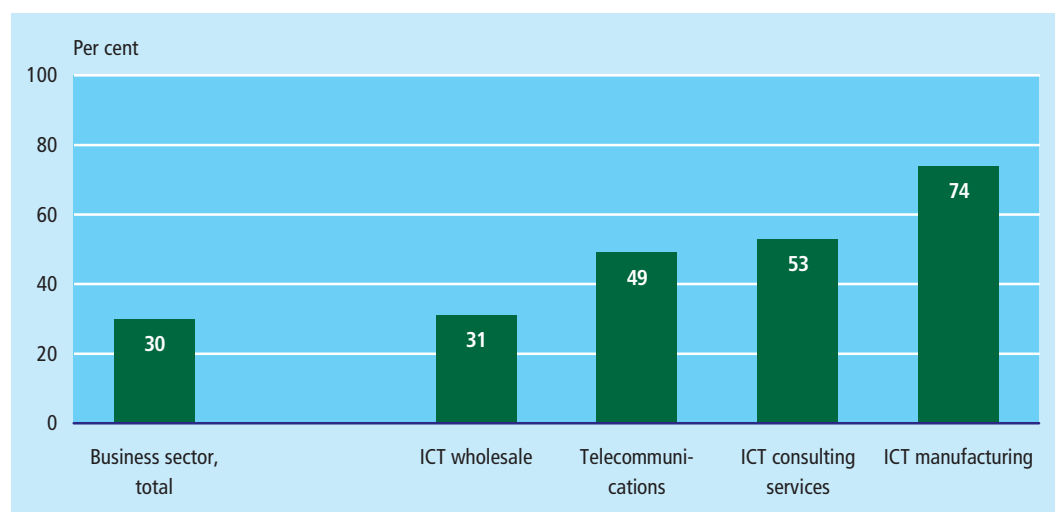
Diversified investments by public sector

Public sector investments in ICT R&D are less concentrated than private investments. About one third of investments goes to R&D relating to databases, etc., communication and usability

Table 10.3 Largest R&D areas within ICT in the public sector, 2003

	Largest R&D areas within ICT in the public sector	
	DKK million	per cent
Total	677	100
Databases, etc.	101	15
Communication systems	66	10
Usability	54	8
Image technology	47	7
Devices and appliances	44	6
Other	365	54

Source: Danish Centre for Studies in Research and Research Policy. Forsknings- og udviklingsarbejde inden for informations- og kommunikationsteknologi i den offentlige sektor i 2003.

Figure 10.4 Innovative enterprises in the ICT sector and the business sector, 2002

Source: Danish Centre for Studies in Research and Research Policy, Innovation statistics 2002.

Half the enterprises in the ICT sector are innovative

Fifty per cent of enterprises in the ICT sector were active in terms of innovation in the period from 2000 to 2002. This is a markedly higher proportion of enterprises than in the business sector in general where the share is 30 per cent. With 74 per cent, the ICT sector has the most innovative enterprises. Enterprises in the fields of telecommunications and ICT consulting are on the same level as the ICT sector as a whole.

Table 10.4 Innovation activity and innovation expenditure in the ICT sector by industry, 2002

	Share of innovative enterprises	Own innovation	Purchased innovation services	Purchased knowhow, patents and licences
	per cent	expenditure (DKKm)		
Business sector, total	30	33 872	7 013	1 405
ICT manufacturing	74	2 218	202	11
ICT wholesale	31	1 315	108	49
Telecommunications	49	912	242	2
ICT consulting services	53	4 713	237	21
ICT sector, total	50	9 158	789	83
Other	27	24 714	6 224	1 322

Note. The ICT industries are stated on the basis of their main activity.

Source: Danish Centre for Studies in Research and Research Policy, Innovation statistics 2002.